ABSTRACT

Title of Thesis: THE INFLUENCE OF STUDENT AND TEACHER
CHARACTERISTICS ON STUDENT-TEACHER CLOSENESS

Ho Lam Yiu, Master of Arts, 2011

Thesis directed by: Professor Gary D. Gottfredson
Department of Counseling and Personnel Services

Close student-teacher relations correlate positively with students' academic, behavioral, and social competences. The present study examined predictors of student-teacher closeness, extending previous studies by including Asian Americans students as well as teacher beliefs about students in a multilevel analysis. Results indicated that students' race, gender, in-class behaviors, and academic achievement affected how close teachers felt to them. Teachers' race, grade taught, and beliefs about Asian students explained additional variance in closeness. Gender match and Black student-teacher racial match influenced teacher-perceived closeness. Furthermore, teacher beliefs about students moderated the association between race and closeness in expected ways. Findings showed that teachers display reliable individual differences in closeness, and race and beliefs are important in predicting student-teacher closeness.

THE INFLUENCE OF STUDENT AND TEACHER CHARACTERISTICS ON
STUDENT-TEACHER CLOSENESS

by

Ho Lam Yiu

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Advisory Committee:

    Professor Gary D. Gottfredson, Chair
    Assistant Professor Matthew J. Miller
    Professor Sylvia A. Rosenfield

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List of Abbreviations

ESOL = English for Speakers of Other Languages

FARMS = Free and Reduced Meals Services

STR = Student-teacher relational

STRS = Student-Teacher Relationship Scale

TOCA-R = Teacher Observations of Classroom Adaptation-Revised

TRSB = Teacher Report on Student Behaviors

TSR = Teacher Self-Report

Theoretical Rationale

Research on social development, attachment theory, and educational psychology has shown that adult-child relationships contribute to the social context in which children develop (Pianta & Steinberg, 1992). Kellam, Branch, Agrawal, and Ensminger's (1975) Life Course-Social Field model proposed that young children are most influenced by their families and the classroom. In the United States where education is mandated by law, meaning that every child must receive schooling and thus must form a relationship with an instructor, one important child-adult relationship is with the teacher. Because teachers interact with children almost daily, investigations of teacher-student relationships are required to obtain a complete picture of school-aged children's development. This student-teacher relationship is one focus of the present inquiry. Also, in view of the ethnic diversity of the U.S., the influence of race or ethnicity on this relationship is a second focus.

Importance of Positive Student-Teacher Relationships

Students' basic psychological needs must be met to allow for adaptive development (Connell & Wellborn, 1991). These needs have been conceptualized as the needs to be competent, autonomous, and related to others (Skinner & Belmont, 1993). Skinner and Belmont studied teacher-reported classroom structure to foster competence, their level of autonomy support for students, and their involvement with students; they found that the latter was the strongest and most consistent correlate with students' perceptions of their teachers as providers of these basic psychological needs. In order for learning to take place for every student, effective communication between the teacher and each individual student must occur. In this way, "a teacher forms an interpersonal

relationship with each student. . . [and] teaching must be viewed as an interpersonal communication process" (McCroskey & McCroskey, 1986, p. 158). Accordingly, Pianta and Steinberg (1992) proposed that children's relations with their teachers are especially important in their educational experience and linked to their adjustment. This is also echoed in Skinner and Belmont's findings of the importance of teacher warmth and affection in students' positive classroom experience.

According to the Kellam et al. (1975) theory, teachers are natural raters of children once they reach school-going age, and as such *define* adjustment for the children. That is, the adjustment task for children is more or less to please the teacher. In effect, the teacher becomes the environment in which students develop. One need not adopt this perspective, however, to see that teacher-student relationships affect students' school adjustment in terms of academic and psychosocial outcomes. Several studies, reviewed here, support this conclusion.

Defining Student-Teacher Closeness

What is interpersonal closeness? It has been described as the perception of warmth and affection (Pianta, 2001), the perceived psychological distance (Ho & Chau, 2009), and the degree of fondness or affinity (McCroskey & McCroskey, 1986) between two individuals. Obviously, the closeness between a student and a teacher is different from that between peers or between romantic partners. Regardless, student-teacher closeness is important to study because effective communication (i.e., student learning) is more likely to occur when people like each other (McCroskey & McCroskey, 1986).

Appendix D summarizes the literature reviewed and the way in which student-teacher relational closeness was construed, the instruments used to measure this construct,

and how the measure correlated with other measures. When researchers have investigated the role of positive student-teacher relations in producing student outcomes, terms used to describe this positive relationship have included positive interactions, involvement, bonding, relatedness, relationship quality, emotional support, and closeness. The varied conceptualizations of positive student-teacher relations make it difficult for practitioners to obtain a clear understanding of which aspect of positive student-teacher relationships to target in order to improve student outcomes. Nonetheless, from the descriptions of how they measured positive student-teacher relations, it appeared that all of the researchers implicitly agreed that such a construct described how close psychologically the student and teacher felt toward one another, as opposed to a physical closeness, a burdening dependence, or mere interaction frequencies.

Little research on the student-teacher relationship has attended to the cultural dimension of interpersonal relations. This omission is alarming because classrooms today serve students from diverse backgrounds which might affect how comfortable teachers or students feel in building a close bond with one another. For example, cultures heavily influenced by Confucian philosophy, learning and education are greatly valued, and teachers are seen as elderly figures to be respected (den Brok, Levy, Rodriguez, & Wubbels, 2002). In both Hispanicand Asian cultures, students might not expect to become *close* to their teachers in the sense that teachers could be confidants for personal problems, so they may not exhibit closeness-related behaviors toward teachers. Instead, den Brok et al. suggested that compared to their American peers, these students might be more likely to be "culturally influenced to expect their teachers to be more powerful, authoritative figures" (p. 450). To Asian students, then, close student-teacher relations

may mean acquiring instrumental help that help them succeed academically (Ang, 2005), because that is what a good teacher is expected to do—invest in student learning. These perspectives about the role of the teacher may influence what student-teacher closeness means to students from diverse backgrounds.

Despite possibly differing cultural expectations about what a close student-teacher relationship looks like, closeness as defined by the mainstream culture is important because this conceptualization may be the schema from which teachers operate, especially when most public school teachers are White (Schools and Staffing Survey, 2008). In addition, the literature largely supports the benefits of positive student-teacher relations in promoting student outcomes, as discussed below.

Academic Outcomes

Academic achievement. Controlling for student gender, socioeconomic status (SES), and previous student-teacher relational conflict and closeness ratings at 54 months and in kindergarten, Pianta and Stuhlman (2004) reported that the higher the first grade teacher's perception of student-teacher closeness, the higher the teacher rated the student in academic achievement ($\beta = .22$). Conversely, first grade teachers rated students slightly lower on achievement if they also reported a more conflictual relationship with the students ($\beta = -.10$). The variance in academic rating explained by student-teacher closeness and conflict was significant beyond that explained by the covariates ($\Delta R^2 = .06$). The students sampled in this study were mostly White (86%). Hamre and Pianta (2005) used measures of children's attention, externalizing behavior, social skills, and academic competence as indicators of the student's risk status for school failure. When previous academic performance was held constant, the researchers found that, in their sample

(79% Caucasian, 11% African American, 5% Hispanic, 4% other), students in classrooms with higher emotional support as rated using the Classroom Observation System for First Grade (COS-1) had academic performance similar to their lower risk peers, while higher risk students in classrooms with lower levels of emotional support performed slightly worse than their lower risk peers ($d = .01$). The COS-1 classified classrooms with emotional support as having teachers who showed positive regard and warmth in interactions with students; were sensitive to children needs, moods, interests, and capabilities; and were tactful to allow for student autonomy in classroom activities.

Similarly, Pianta, Belsky, Vandergrift, Houts, and Morrison (2008) tracked children from first through fifth grade. They believed that they had identified two types of readers: "Typical" readers who showed steady growth extended over a longer period of time, and "fast" readers who showed rapidly increasing growth early and then decelerated. Although Pianta et al. did not observe significant correlations between an emotionally supportive classroom (as defined using the COS) and fast readers' reading achievement, the researchers found that the emotional support provided by teachers in the classroom was a significant predictor for reading achievement of third and fifth grade typical readers (for every point above the mean, scores increased by 1.60 points ($SD = 15.84$) for third graders and 3.65 points ($SD = 14.51$) for fifth graders), suggesting that emotionally supportive teacher-student relations were more helpful for typically-achieving students than for faster readers.

Baker, Grant, and Morlock (2008) examined the amount of variance explained in (a) reading grades, (b) positive habits, and (c) classroom adjustment by student-teacher closeness/conflict, externalizing/internalizing behaviors, four interactions between the

student-teacher relationship and student behavioral variables, and the teacher rater, in a sample of 68 teachers and 423 students who were mostly African American (63%) or Caucasian (21%). An interaction was found such that students who displayed externalizing behavior problems did slightly better in reading if they had a closer relationship with their teachers than if they did not (partial $\eta^2 = .02$). Although Baker et al. accounted for error variance due to the nested nature of students within classrooms by using teachers as a fixed factor in the analyses, the authors did not to adjust for student gender or race.

Behavioral engagement. Using teacher ratings of students' behavioral risk (Achenbach's Child Behavior Scale) and the student-teacher relationship (Pianta's Student Teacher Relationship Scale), student self-reports of peer relationships (sociometric nomination procedures), and student achievement measures (Wide Range Achievement Test-Revised), Ladd and Burgess (2001) asked 151 teachers in the Midwest to rate 385 kindergarten and first grade students (77% Caucasian, 18% African Americans, and 6% other). Findings revealed that relationship 'protectors' (i.e., peer acceptance, number of mutual friendships, and teacher-child closeness) explained additional, albeit small, variance in students' cooperative participation in the classroom and fondness for school ($\Delta R^2 = .07$ and .06, respectively) beyond the variance explained by the students' gender and early aggressive risk status. Specifically, Ladd and Burgess showed that more student-teacher closeness incrementally contributed to students' cooperative participation in the classroom ($\beta = .14$) and fondness for school ($\beta = .19$). Student-teacher closeness was an even stronger predictor of cooperative participation and school liking for students who were chronically aggressive ($\beta = .18$ and .28, respectively).

Since both measures were teacher-rated, criterion contamination is possible. Plus, the positive relational predictors (i.e., teacher-child closeness, number of mutual friendships, and peer acceptance) were entered as a block in the regression analyses, which makes it difficult to determine whether any variable by itself was influential in predicting closeness. Moreover, while the authors controlled for gender and aggression risk by entering those blocks prior to later predictors of interest, other demographic variables such as SES and race were not accounted for in the regression model. The omission is noteworthy because these variables have also been shown to explain variance in school adjustment (e.g., Kuperminc, Blatt, Shahar, Henrich, & Leadbeater, 2004).

Students in Skinner and Belmont's (1993) study were found to engage more in classrooms in which they perceived their teachers as more affectionate (e.g., liking and enjoyment of the student), more attuned (e.g., understanding and knowledgeable of the student), dedicated more time and energy to students, and more dependable ($r = .60$ to .65). Furrer and Skinner (2003) measured relatedness to teachers with items gauging students' agreement to statements such as feeling accepted and special, and not ignored nor unimportant. They observed that, after taking into account student-reported relatedness to parents and to peers, students' sense of relatedness to their teachers was a significant predictor of their behavioral engagement ($\beta = .14$ and .26 for teacher- and student-reported, respectively), as well as their emotional engagement ($\beta = .17$ and .40 for teacher- and student-reported, respectively).

Psychosocial Outcomes

Research about student-teacher relationships and psychological outcomes are less common than studies on academic outcomes, perhaps because of the emphasis on

achievement tests. Nonetheless, the relationship in which a children engages with their teacher undoubtedly plays an influential role in their psychosocial development.

Psychological adjustment. Ladd and Burgess (2001) found that ratings on chronic aggression or on student-teacher conflicts did not predict thought problems, operationalized by items such as "hears things" or "can't get mind off certain thoughts." The interaction between these two predictors, however, was statistically significant. After accounting for student gender and being rated repeatedly as aggressive, kindergarten and first grade students with higher student-teacher conflict ratings concurrently had more teacher-rated behavioral misconduct ($\beta = .15$) and attention problems ($\beta = .15$). Again, this study did not examine the role of race. This is important because it has been shown that teachers perceive behaviors of students differently according to the student's race (Chang & Sue, 2003).

Social competence. First graders' social competence as rated by their teachers and neutral observers was predicted by teacher ratings of student-teacher closeness in Pianta and Stuhlman's (2004) study ($\beta = .32$ and .10, respectively, adjusting for student gender, SES, and previous teacher-rated conflict and closeness with students). Also, teacher perceived level of conflict with students was negatively correlated with their ratings of students' social competence ($\beta = -.38$, adjusting for the same conditions). Similarly, in Ladd and Burgess's (2001) study, scores on student-teacher closeness had a weak-positive correlation with peer acceptance ratings for the kindergarteners sampled. On the other hand, students who scored lower on the closeness measure received slightly higher scores on a peer rejection measure from kindergarten through the first grade ($r \approx -.20$, $p < .001$).

Externalizing behaviors. Using hierarchical multiple regression analyses, Meehan, Hughes, and Cavell (2003) found that teachers' (79% Caucasian) ratings of the degree of supportive relationships with students (37% Caucasian, 41% African Americans, and 22% Hispanic) as measured by the Network of Relationships Inventory explained substantial variance in teacher-rated student level of aggression (β = -.49, adjusting for previous year aggression, minority status, and negative parenting, and previous year's teacher-rated support). Ladd and Burgess (2001) reported similar findings using student-teacher conflicts assessed through Pianta's Student-Teacher Relationship Scale and student aggressive behaviors as measured by the teacher form of Achenbach's Child Behavior Scale. Again, teachers rated both the supportive relationship as well as aggression, so results may simply reflect a tendency for there to be a halo in teacher ratings.

Positive student-teacher relations may serve as a protective factor for higher risk status students against negative outcomes such as problem behaviors. Meehan et al.'s (2003) study also explored student race as a moderator for how much the student benefited from having a more supportive student-teacher relationship. They found that higher teacher support predicted lower teacher-rated aggression in Caucasian, African, and Hispanic students, but the variance explained by a more supportive relationship was significantly greater for the minority than for the Caucasian students (ΔR^2 = .03, controlling for previous year's aggression rating).

Fear about school violence. Gainey and Seyfrit (2001) found that the more a high school student in their sample felt that they were integrated into a social community, the less likely the individual would be fearful of potential victimization in violence or

crimes. Teachers play an important role in the social community of the school. Akiba (2010) investigated the relationship between teacher-student bonding and student reports of being fearful of school violence in a national sample of students from publicly available data collected for the Program for International Student Assessment. Student-teacher bonding was assessed by asking students to indicate their levels of agreement to items such as "students get along well with most teachers," "most teachers are interested in students' well-being," "most of my teachers really listen to what I have to say," "if I need extra help, I will receive it from my teachers," and "most of my teachers treat me fairly." Using a student nested within school design to explain variance observed in student reports of fear of school violence, characterized by the degree of agreement to items such as "my school is a place where I often feel as if someone will attack or harm me," Akiba found that student-teacher bonding explained variation in school fear.

Measuring Student-Teacher Closeness

Although an exact definition for student-teacher closeness has not been agreed upon, Pianta's Student-Teacher Relationship Scale (STRS) is commonly used to assess the quality of student-teacher relations.

Student-Teacher Relationship Scale

The STRS (Pianta, 2001) contains 28 items related to three factors: Conflict, Closeness, and Dependency. Teachers rated students on a Likert-type, five-point scale ranging from "Definitely does not apply" to the highest "Definitely applies," in response to statements about their relationships with their students. The STRS Closeness scale is composed of 11 items that relate to the teacher's perception of the students' expression of

positive affect in their interactions, and include items that tap into the teacher's feelings of warmth and openness in their relationship with the child.

Previous studies have demonstrated good internal consistency for STRS Closeness (α coefficient > .85; Hamre & Pianta, 2001; Ladd & Burgess, 1999). Researchers who employed the STRS in their investigations reported moderate negative correlations between Closeness and Conflict scales, whereas Closeness and Dependency were statistically unrelated (Doumen, Vershueren, Buyse, De Munter, Max, & Moens, 2009; Ladd & Burgess, 1999).

Doumen et al. (2009) found that STRS Closeness showed convergent validity with other measures that tap student-teacher relational closeness, such as students' self-report of their feelings about mutual fondness in the student-teacher relationship as measured by the Feelings About School interview (FAS; Valeski & Stipek, 2001), and a peer nomination procedure to determine students' perception of which classmates were the closest to their teachers. Doumen et al. also found evidence that STRS Closeness was positively correlated with teacher-student interactions as observed using the Attachment Q-Set's (Waters, 1995) Enjoyment of Physical Contact scale, which measured behaviors expected to be displayed by students if they were engaged in student-teacher relationships characterized by warmth and closeness.

The STRS Closeness scale's discriminant validity, however, is less established. In Doumen et al.'s (2009) study, although STRS Closeness correlated negatively with STRS Conflict as predicted, this negative correlation was stronger than the convergent correlation between STRS Closeness and closeness as measured by the other instruments (i.e., the FAS and peer nominations). In other words, not surprisingly, teacher ratings of

student-teacher relational conflicts were more powerful predictors of teacher ratings of student-teacher closeness than were student self- or peer-reported student-teacher closeness. The negative correlations observed between STRS Closeness and the peer nominated student-teacher conflicts and dependency scores provided validity evidence for the measures. Although it is not a perfect measure of the student-teacher relation construct, Pianta's (2001) STRS is currently one of the most established instruments to measure student-teacher relationship in the field.

Factors Influencing Student-Teacher Relations

Although it is the more common practice to use teachers as raters of the student-teacher relationship, a relationship, by definition, involves more than one individual. The importance of studying the interaction between an individual and his or her environment when investigating developmental phenomena calls for a multimethods analysis approach (Cicchetti, 2008). In other words, to approximate the student-teacher relationship construct more closely, multiple methods of measurement must be employed. Not only should the child's inherent qualities such as gender be considered, but the teacher's attributes should be accounted for as well. Past studies of student-teacher relations have emphasized student characteristics as predictors, with a lack of focus on teacher characteristics that affect the degree of closeness in these relationships (Yoon, 2002). For instance, student academic orientation, in-class behaviors, and social competence have been the foci of many studies that investigated variability in teacher-student relations (e.g., Eisenhower, Baker, & Blacher, 2007; Murray & Murray, 2004). Yet, student-teacher relations are products of individual characteristics, student-teacher interactions, and the classroom and school context (Pianta, 1999). Although students influence the

student-teacher relationship, teacher traits also affect this bond. Furthermore, students are customarily clustered within a classroom run by a teacher, making it obvious that teachers affect student-teacher relations for many students. The present study focuses on student-teacher closeness by examining both student and teacher characteristics, as well as the interactions between the two groups' traits.

Despite increasing racial diversity in the U.S., the role of race has largely been ignored in studies about student-teacher relations. In the few studies that examined race, Asians have not been a focus of inquiry. Yet, this minority group is the second fastest growing racial minority group in the U.S.; the Asian population is predicted to double by 2050 (U.S. Census Bureau, 2008). School-based studies about Asian American students are necessary. The present study aims to add to this literature.

Student Characteristics

Gender, socioeconomic status, and grade-level. Many studies have shown that teachers, on average, feel closer to girls than to boys (e.g., Murray & Murray, 2004; Saft & Pianta, 2001). Ladd, Birch, and Buhs (1999) found that children from lower socioeconomic status had more distant relationships with their teachers than their wealthier peers. The grade-level of the student affects student-teacher closeness as well. Students in middle school reported less secure relationships with their teachers than children in elementary grades (Lynch & Cicchetti, 1997). Lynch and Cicchetti defined "secure" as relational patterns characterized by high levels of positive emotion and average to high levels of psychological closeness.

Race. In a recent study using a large sample ($N = 25,642$ students rated by 1,186 teachers), Yiu (2010) found that only Caucasian students received student-teacher

closeness ratings above the grand mean using an adaptation of Pianta's (2001) STRS, and the remaining three racial minority groups (i.e., African American, Hispanic, and Asian) obtained ratings that were lower than their non-minority peers. Surprisingly, Asian American students were not rated by teachers as being the closest even though, on average, Asian American students were rated the highest on an adaptation of the Teacher Observation of Classroom Adaptation-Revised (TOCA-R; Werthamer-Larsson, Kellam, & Wheeler, 1991) behavioral engagement scale and the lowest on externalizing behaviors. This finding was contrary to expectations because previous studies had demonstrated that higher on-task behaviors resulted in higher closeness in the student-teacher relationship. For instance, Skinner and Belmont (1993) found that teachers' ratings of their liking, appreciation, and enjoyment, as well as their understanding, sympathy, and knowledge of students, correlated with teacher-perceived student behavioral engagement in the classroom ($r = .56$). Thus, race may moderate the effect of student behavior on the student-teacher relations. Yiu's exploratory study did not examine the role of teacher race on student-teacher relations.

English proficiency. Fumoto, Hargreaves, and Maxwell (2007) reported that early childhood teachers' ratings of the degree of closeness in the student-teacher relationship was lower for four year-old children with less experience in spoken English than those who were more proficient English speakers in the beginning of the school year, but that these differences were not observed by the end of the academic year. The authors conjectured that such results indicated the importance of oral communication in the closeness of student-teacher relationships, which is heavily influenced by the student's level of English proficiency.

Behavioral engagement. In a comprehensive review by Fredricks, Blumenfield, and Paris (2004), school engagement has been identified as a multifaceted construct with three distinct dimensions: behavioral, emotional, and cognitive. Research on elementary school students' school engagement tends to focus on the behavioral aspect of engagement. Behavioral engagement entails such behaviors as observed student effort in school-related activities, persistence, attention, concentration, and on-task behaviors. Positive behavioral engagement has been shown to correlate with positive academic outcomes ($r > .40$, $p < .001$; Finn, Pannozzo, & Voelkl, 1995). Since higher academic achievement correlates with more positive student-teacher relations, behavioral engagement is important when assessing the student-teacher relationship.

Externalizing and internalizing behaviors. Ladd and Burgess (1999) and Henricsson and Rydell (2004) investigated the trajectories of interpersonal relationship development in children as influenced by the child's behaviors. Ladd and Burgess were interested in the differences in these interpersonal outcomes for children rated more severely as aggressive and/or withdrawn by their teachers, versus their peers who received average ratings on these behaviors. Research have shown that children with confrontive forms of aggression (e.g., arguing, hitting, and pushing; Ladd & Burgess, 2001) are at risk for negative relationship development (Coie & Dodge, 1983). Ladd and Burgess reasoned that negative relational outcomes resulted from these behaviorally at-risk children's tendency to distance themselves from others. Further, others might feel less invested in developing a relationship with aggressive children because it might require more effort to engage in such relationships with aggressive children than with children without such behaviors (Ladd & Burgess, 1999). On the other hand, children

who are withdrawn tend to engage in activities alone. As a result, children who exhibit

withdrawn behaviors fail to learn social skills such as reciprocity and building emotional

ties that allow for creating and continuing interpersonal relationships (Hartup, 1983, as

cited in Ladd & Burgess, 1999). Naturally, children who display comorbid aggressive

and withdrawn behavioral patterns may be at even greater risk for undesirable relational

development trajectories.

In their longitudinal study of two cohorts totaling 250 children and 34 teachers

from kindergarten through second grade, Ladd and Burgess (1999) tested the above

hypotheses using a combination of student self-reports, teacher ratings of student

behaviors, and peer friendship nomination and ratings data administered at four time

points throughout the study. Using teacher ratings, students were classified as normative,

aggressive, withdrawn, or comorbid aggressive and withdrawn. Taking a slightly

different approach, Henricsson and Rydell (2004) also examined teacher-child relations

by analyzing classroom interactions, as well as both the child's and teacher's perceptions

of their relationship, in a sample of 95 Swedish first grade students selected from a pool

of 526 students based on their teacher-rated ($N = 23$ teachers) behavioral scores ($n = 26$

externalizing, 25 internalizing, and 44 problem-free). The following paragraphs describe

the results from these two studies.

Externalizing. Ladd and Burgess (1999) found that, on the Student-Teacher

Relationship Scale: Closeness subscale (range 1 to 5), children who were comorbid

aggressive and withdrawn were rated lowest at all measurement points ($M = 3.34$),

followed by students who were only aggressive ($M = 3.61$), only withdrawn ($M = 3.84$),

and the closest to the normative behavior group ($M = 4.12$). Findings by Henricsson and

Rydell (2004) showed that, contrary to expectations, children characterized by externalizing behaviors had more positive teacher interactions than problem-free students. At the same time, however, externalizing students had more mutual anger interactions with teachers than nonproblematic children. This leads to the question of what was actually measured when using frequency of interactions with teachers as a proxy for the student-teacher relation construct, implying a need to distinguish between number of interactions and relationship quality.

Externalizing students had the most conflicts with their teachers (Henrisson & Rydell, 2004), while internalizing students received the lowest conflictual relation ratings out of the three groups studied (i.e., externalizing, internalizing, and problem-free). Similarly, on the teacher-student conflict measure, Ladd and Burgess (1999) reported that students in the aggressive and comorbid groups were rated as having more conflictual relationships than were students in the withdrawn and normative groups.

Internalizing. Children classified as shy have been reported to be less likely to initiate social interactions with peers than their non-shy peers (Rydell, Bohlin, & Thorell, 2005). This may be attributed as a lower level of social competence, or, Rudasill and Konold (2008) suggested that shy children were also more likely than their peers to exhibit other forms of prosocial behaviors, such as showing empathy and conscience. Rydell et al. further hypothesized that shy children may be less likely to engage in conflictual relationships with their teachers because of their generally lower rates of antisocial behaviors. On the other hand, Yiu (2010) found a negative relationship between internalizing behaviors and student-teacher closeness ($r = -.46$), and a positive association between internalizing behaviors and student-teacher conflicts ($r = .26$).

Achievement. Buriel (1983) demonstrated that, as might be expected, student achievement was negatively correlated with teacher criticism. In other words, students who performed better in school received less teacher criticism than their lower-performing peers. Along the same lines, Murray and Murray (2004) found that teacher-perceived student academic orientation, as measured by student attendance and teacher-rated student effort, explained an additional six percent of the variance on the STRS closeness subscale when student demographic variables (i.e., race, gender, and disability status) were held constant.

Teacher Characteristics

Gender. Little research has examined the effect of teacher gender in student-teacher closeness, usually due to the small samples of male teachers in studies (e.g., Saft & Pianta, 2001). Nonetheless, since teachers generally rate closer relationships with girls than boys, teacher gender likely affects student-teacher closeness as well.

Grade-level taught. As students progress in grades, teachers are less likely to rate student-teacher closeness as highly as when students were in lower grades (Pianta & Stuhlman, 2004).

Teacher beliefs. Attitudes and beliefs that teachers form about populations influence how they interact with students from these populations (Pianta, 1999). For instance, Asian students, who may be believed by teachers to be the "model minority," are expected to be academically oriented and well-behaved, yet quiet and reserved (Chang & Demyan, 2007; Chang & Sue, 2003; Rosenbloom & Way, 2004). Other studies revealed differences in teacher perceptions of the appropriateness of student behavior due to the student's race (e.g., Entwisle & Alexander, 1988; Pigott & Cowen, 2000). Such

assumptions may lead teachers to interact with students from diverse races differently by reacting to students according to implicit biases, ultimately affecting student-teacher closeness.

Teacher-Child Interactions

      Racial match. Kesner's (2000) study revealed that Caucasian teachers rated minority students as significantly more dependent than Caucasian students. In his correlational study, Buriel (1983) observed that Mexican American students received less teacher affirmation for correct responses than Caucasian students. Buriel also found that teacher affirmation was correlated with positive academic achievement for the Mexican American students, but not for Caucasian students. Buriel only sampled from five classrooms, which might limit the generalizability of the results to other settings. Along the same lines, Saft and Pianta (2001) employed teacher-student racial match as a predictor for teacher-student relationship outcomes in regression analyses whereas Zimmerman, Khoury, Vega, Gil, & Warheit (1995) utilized analysis of variance procedures to observe mean differences between teacher ($N = 236$) rated student behavior scores for 2,389 subjects of various racial groups (68% Hispanic, 14% African American, 18% White). Both studies found evidence that teachers were significantly more likely to rate children more positively if their own race matched the students' race. In particular, Saft and Pianta found racial match to be significant for all three racial groups examined (Caucasian, African American, and Hispanics), in explaining variance in STRS overall ratings (i.e., Conflicts, closeness, dependency; $\beta = .16$). They also found that the positive influence of racial matching was most significant for the Hispanic dyads. Racial match was the only significant predictor of Closeness ($\beta = .16$; other predictors were the child's

age, race, gender, and interaction terms among these predictors). On the other hand,

Zimmerman et al., who looked at teacher-rated behavior problems as predicted by

student-teacher racial match, found that racial match was significant only for the African

American teacher-student dyads but not for Hispanic and Caucasian students.

   Gender match. Research has found that girls consistently get higher teacher-

rated closeness than boys do (e.g., Saft & Pianta, 2001), but these studies did not have a

large enough sample of male teachers to use teacher gender as a predictor for student-

teacher closeness.

Present Study

   Taken together, the evidence points to the positive influence of emotional support

provided by close teacher-student relationships on children's adjustment, both

academically and psychosocially. Since close student-teacher relations are associated

with important student outcomes, it makes sense to examine the factors that lead to

increased closeness between students and teachers in order to understand better how

teachers can provide an optimal environment in which their students may develop.

Several studies (e.g., Ladd & Burgess, 2001; Pianta & Stuhlman, 2004) used multiple

methods such as different raters to gauge protective and risk factors like emotional

support and aggression in the classroom. Some studies (e.g., Meehan et al., 2003) lacked

statistical conclusion validity due to their small sample sizes. Specifically, small sample

sizes restricted the studies' statistical power, and small effects may have gone undetected.

Even with larger student samples, the number of teachers determined the effective sample

size for the studies because students were rated by their teachers. Nonetheless, many of

the studies cited (e.g., Hamre & Pianta, 2005; Pianta et al., 2008) possessed good

statistical power by having larger sample sizes. On the other hand, these studies derived

their samples from the same study, and were also conducted by some of the same

researchers. Replications in other samples are needed. The use of teachers as the primary

rater for both response and predictor variables threatens the construct validity of these

studies, as it is unclear whether the results indicated theorized constructs, or merely

reflected method variance due to the use of teacher ratings. In these cases, designs that

allowed for the separate estimation of influences of construct and method variance would

have helped to reduce this confound. Few studies employed a nested design in their

analytic approach. Moreover, in every study reviewed, the students sampled were mainly

identified as Caucasian, with African Americans being the largest racial minority, which

showed that differences exist between teacher ratings of this minority group and their

peers. None of the studies had a sample large enough to list Asian American students as a

major subgroup. Thus, the generalizability of the results to all students is unclear,

especially in regard to Asian American students.

A gap exists in the literature for students of Asian descent. Due perhaps to their

typically higher academic performance than students of other racial groups, psychosocial

wellbeing of Asian American students has often been ignored (Qin, Way, & Mukherjee,

2008). Although Asian American students may outperform their non-Asian peers

academically, how teacher-student relations affect their psychosocial wellbeing must not

be overlooked. Suh and Satcher's (2005) small-scale, qualitative study on interventions to

increase school adjustment for Korean American students suggested that these students

may require teacher sensitivity and personal (i.e., one-on-one) involvement. As noted by

the U.S. Department of Health and Human Services (2001), a limited research base exists on the mental health status of Asian American and Pacific Islander children.

One purpose of this study is to extend previous research to see if findings also apply to Asian American students.

Although the literature has established student-teacher relations characterized by warmth and closeness as significant social bonds for children that correlate with increased academic achievement and social adjustment, these studies were predominately descriptive and correlational rather than experimental. To my knowledge, no study had investigated the predictors for student-teacher relational closeness using a nested analysis approach and examining teacher beliefs about students as sources of variations in student-teacher closeness.

A second aim of the current study is to examine the plausibility of some causal hypotheses about factors that lead to close student-teacher relations.

A third, incidental, goal of the study is to examine the criterion-related validity and stability of an adaptation of Pianta's (2001) Student-Teacher Relationship Scale: Closeness.

In short, the present study investigates factors that predict closeness in student-teacher relationships using both student- and teacher-level variables, as well as the interactions between them. The operational definition for student-teacher closeness for this study is Pianta's (2001). Specifically, student-teacher closeness is the social relationship between a teacher and a specific student characterized by the teacher's perception that the child is warm and affectionate, who makes initiatives to seek

emotional support from the teacher. The following specific questions guided the main analyses:

1. How much individual student variance observed in teacher ratings of closeness is accounted for by student attributes such as race, gender, socio-economic status, English Speaker of Other Languages (ESOL) status, academic achievement, and in-class behaviors?

2. Beyond individual student differences, how much do teacher characteristics, such as race, and personal beliefs regarding how groups of students learn, explain the variance observed in teacher ratings of closeness in student-teacher relationships?

3. To what extent are predictors of student-teacher closeness the same or different for students of different races? Does teacher race interact with student race in predicting closeness?

Hypotheses

Based on the reviewed literature, I hypothesize that, on average, student-teacher relational (STR) closeness scores would be higher for girls than for boys, for students of higher SES, and for students not in the ESOL program. Students who demonstrate higher engagement and lower levels of externalizing and internalizing behaviors are predicted to obtain higher STR closeness ratings on average. Students of minority racial status are predicted to receive lower STR closeness ratings than their non-minority peers, on average. Finally, students with lower achievement are predicted to be rated lower on closeness.

I hypothesize that teachers who teach lower grades would feel closer to their students. Female teachers are predicted to feel closer to students than are male teachers,

and that teachers of lower grade-levels would feel closer to students than teachers who teach higher grade-levels. I predict no effect of teacher race on student-covariate-adjusted closeness ratings. I also hypothesize that teachers with more positive beliefs about specific groups of students would feel closer to students in general.

Finally, I hypothesize that a racial match or a gender match between student and teacher will contribute unique variance in STR closeness beyond the contribution of other variables. Teachers with more positive beliefs about certain groups of students will feel closer to that specific student group than students from other racial groups.

Method

Participants

As part of a larger study, teachers in first through fifth grades in 45 elementary schools within the same suburban school district rated their students' behaviors. A sample of general education teachers ($N = 873$) rated a total of 18,609 students' behaviors. After filtering out subjects with incomplete data, the final dataset included $N = 754$ teachers and $N = 16,084$ students. Descriptions of the sample in terms of race and gender are presented in Table 1. Students' mean age by grade level is presented in Table 2. Table 3 presents demographics by grade.

Procedure

Forty-five elementary schools in a large, suburban school district located in a Mid-Atlantic state were recruited for a study (Rosenfield & Gottfredson, 2004) of the effectiveness of Instructional Consultation Teams (Rosenfield & Gravois, 1996). The study involved four waves of annual data collection beginning with the 2005-06 school year. The present study examined predictors in the final wave of data (2008-09).

Student demographics were extracted from school system records. Teacher demographics were provided by the schools' program evaluation office and from a teacher self-report survey.

All teachers in the 45 participating schools were asked by the district to complete a Teacher Report on Student Behaviors (TRSB) questionnaire for each of their students in the beginning of the second semester of the academic year. Only general education teachers were included in the present study. Each student was rated by exactly one teacher for that academic year. The TRSB survey was administered via the school district's intranet. The school district allocated time and computer access for teachers to complete the survey. The response rate for the TRSB survey was 93% in 2008-09.

Separately, the University of Maryland research group asked teachers to complete a teacher self-report (TSR) questionnaire. The TSR was administered online using SurveyMonkey and participation was voluntary. One week prior to survey collection, a memo was sent to each teacher in the schools along with a small gift (a notepad). On the first day of data collection, electronic mail with an invitation and instructions on completing the survey were sent to teachers. In addition, paper memoranda were placed in teachers' school mailboxes to encourage response. Survey directions included a web link to access the questionnaire on SurveyMonkey. Every four to five days, a reminder email was sent to teachers who had not yet responded. The response rate for the TSR was 84% in the 2009 data collection. The teacher self-report survey is described by Vu et al. (2010).

Measures

Student predictor variables. These were student gender, race, English Speaker of Other Languages status, free and reduced meal program status, academic achievement, and teacher-rated behaviors (engagement, externalizing, internalizing).

Gender. School records identified each student or teacher as male (1) or female (0).

Race. School records indicated the racial group membership of students using seven categories: American Indian/Alaskan Native, Asian, Black, Hispanic, Caucasian, Hawaiian, and unspecified. Race was coded as three dummy variables with Caucasians serving as the reference group.

English for Speakers of Other Languages (ESOL). School records identified students as ESOL (1) or not (0).

Free and reduced meal (FARM). School records indicated if students received FARM services (1) or not (0). FARM was used as an indicator of disadvantaged socioeconomic status.

Academic achievement. Students' average report card grade (GPA) from the prior year was used to measure academic performance. GPA was measured as continuous, with the highest score at 4.00. Using the previous year's GPA was an attempt to remove potential criterion contamination between teacher-rated academic performance and teacher-rated closeness scores.

Behavioral engagement. Based on a factor from the Teacher Observation of Classroom Adaptation-Revised (TOCA-R, Werthamer-Larsson, Kellam, & Wheeler, 1991), the engagement scale measured teachers' perceptions of students' behavioral engagement in educational tasks versus off-task behavior or distractibility in the past

month. The eight items asked teachers to rate how easily distracted a student was or how eager the student was to learn on a four-point scale from zero ("Never/Almost Never") to three ("Very Often"). The internal consistency of the scale in this sample was high, with $\alpha = .92$. The score was the average of the eight items, which was standardized to $M = 0$, $SD = 1$.

Internalizing behaviors. Based on the TOCA-R, the eight-item internalizing scale assessed the student's anxious, shy or withdrawal behaviors through four-point items such as "seems sad" and "interacts with teachers." The internal consistency of the scale in this sample was moderately high ($\alpha = .84$). The metric is again the average rating for the eight items (range = 0 to 3), which was transformed to $M = 0$, $SD = 1$.

Externalizing behaviors. In a recent study, Yiu (2010) observed that teacher ratings of students' aggressive behavior using an adaptation of the TOCA-R (Werthamer-Larsson et al., 1991) had a correlation of .76 with teachers' ratings of STR conflict using items adapted from Pianta's (2001) Conflict scale, which indicated that the two measures did not show discriminant validity. Thus, only the externalizing behaviors scale was used the present research. The scale contains eight items from the TOCA-R in which teachers used a 4-point scale to rate statements such as "defies teacher or other school personnel," "is disruptive," or "is physically aggressive or fights with others." The internal consistency of the scale in this sample was moderately high ($\alpha = .90$). The metric is again the average rating for the eight items (range = 0 to 3), which was linearly transformed to $M = 0$, $SD = 1$.

Teacher predictor variables. These were teacher characteristics, including gender, race, grade-taught, and teacher beliefs about teaching and learning.

Grade-taught. Students were nested within teachers and students were assigned to teachers by grade-level. Since there was no variation among students in grade-level within teacher, it was treated as a teacher-level predictor. Grade-taught data were extracted from school records and dummy coded, with fifth grade as the reference group.

Gender. Teachers' gender was extracted from school records and coded as an indicator variable (male = 1, female = 0).

Race. In most cases, teacher race was obtained from school district records. In cases for which the teacher had a missing race datum in the school-provided demographic file, self-reported race from the teacher self-report (TSR) questionnaire was used. Race was coded as four dummy variables (Asian, Black, Hispanic, Native American) with Caucasians serving as the reference group. No other racial groups for teachers were in the sample.

Beliefs about teaching and learning. Three items in the TSR assessed teacher beliefs regarding instruction and learning for racial minority students, which were: (a) I believe African American males learn differently from other students, (b) I should not be expected to provide the language services that English Language Learners (ELL) students require, and (c) I believe Asian students are often difficult to get to know. Items were Likert-type with five response options from "Strongly Disagree" to "Strongly Agree." Items were coded so that the most desired responses were assigned a value of 5 and the least desired a value of 1. Scores were then transformed to $M = 0$, $SD = 1$. The three items were each treated as separate predictors of STRS closeness as they do not form an internally consistent scale (Johnstun & Yiu, 2010).

Outcome Variable

Student-teacher closeness. Derived from Pianta's (2001) STRS Closeness scale, the four-item closeness scale measured the degree of a close teacher-student relationship. Sample items included "I share a caring, warm relationship with this child" and "This child spontaneously shares his/her feelings and experiences with me." Teachers rated students on a five-point scale ranging from "Definitely does not apply" to "Definitely applies." Alpha reliability in this sample was moderately high at .86. The average rating across the four items was linearly transformed to $M = 0$, $SD = 1$.

Data Analysis

Due to very small sample sizes of students identified as Alaskan Indian/Native American and Hawaiian, these subjects were excluded from the predictive analyses. Further, because the current study focused on racial match as a predictor of student-teacher closeness, students and teachers who identified as unspecified or other race were also excluded.

Reliability and predictive validity of the closeness measure. Reliability of the closeness scale was interpreted from (a) the correlations among students' annual closeness ratings across the four years of the main study, and (b) the intraclass correlation coefficient and lambda reliability coefficient from the fully unconditional hierarchical linear model. Predictive validity was examined using the longitudinal correlations of closeness ratings with other teachers' ratings for the same student on other behaviors in future years.

Hierarchical linear modeling (HLM). The dependent variable was teacher ratings of individual student-teacher closeness, a student-level variable. Because these individual ratings of the students were clustered within teachers' classrooms, a two-level

hierarchical model was required. Data were analyzed using HLM (Raudenbush & Bryk, 2002). The level 1 model included student-level variables: Student race, gender, ESOL status, FARM status, behavioral engagement, internalizing behaviors, externalizing behaviors, and previous year's GPA. To examine the influence of student characteristics on closeness, the regression equations were:

$$Y_{ij} = \beta_{0j} + \sum_{h=1}^{H} \beta_{hij} X_{hij} + r_{ij} \tag{1}$$

$$\beta_{0j} = \gamma_{00} + u_j \tag{2}$$

where Y_{ij} represents the closeness z-score for child i, rated by teacher j;

β_{0j} is the mean for the reference category (i.e., Caucasian, female, non-ESOL, non-FARM) evaluated at a value of zero for the *remaining* covariates;

β_{hij} is the deviation from the reference group mean associated with a unit change in the respective covariate;

X_{1ij} = Asian student i in classroom j (1 if Asian, 0 otherwise);

X_{2ij} = Black student i in classroom j (1 if Black, 0 otherwise);

X_{3ij} = Hispanic student i in classroom j (1 if Hispanic, 0 otherwise);

X_{4ij} = gender for student i in classroom j (0 = female, 1 = male);

X_{5ij} = ESOL status for student i in classroom j (0 = non-ESOL, 1 = ESOL);

X_{6ij} = FARM services for student i in classroom j (0 = non-FARM, 1 = FARM);

X_{7ij} = Engagement z-score for student i in classroom j;

X_{8ij} = Internalizing behavior z-score for student i in classroom j;

X_{9ij} = Externalizing behavior z-score for student i in classroom j;

X_{10ij} = Previous year's GPA z-score for student i in classroom j; and

r_{ij} is the term due to remaining individual differences and error for student i in classroom j.

In equations 1 and 2, race, gender, ESOL, and FARM were uncentered indicator variables; and engagement, internalizing, and externalizing behaviors, as well as previous year's GPA were—because they are z-scores—grand-mean centered. An error term was included at level 2 to account for the design effect of students nested within teachers. The regression coefficients in this model reflect the influence of each student characteristic controlling for the other variables in the model.

To test the effects of teacher characteristics on the student-adjusted closeness scores, teacher characteristics were used to predict the level 1 intercept in equation 1:

$$\beta_{0j} = \gamma_{00} + \sum_{g=1}^{G} \gamma_{gj} W_{gj} + u_j \tag{3}$$

where γ_{00} is the grand mean of the closeness score for teachers in the reference group (i.e., Caucasian, female, taught the fifth grade) adjusted for the other covariates in equation 1;

W_{1j} = Asian for teacher j (1 if Asian, 0 otherwise);

W_{2j} = Black for teacher j (1 if Black, 0 otherwise);

W_{3j} = Hispanic for teacher j (1 if Hispanic, 0 otherwise);

W_{4j} = Native American for teacher j (1 if Native American, 0 otherwise);

W_{5j} = gender for teacher j (0 = female, 1 = male);

W_{6j} = grade-level taught by teacher j (1 if 1st grade, 0 otherwise);

W_{7j} = grade-level taught by teacher j (1 if 2nd grade, 0 otherwise);

W_{8j} = grade-level taught by teacher j (1 if 3rd grade, 0 otherwise);

W_{9j} = grade-level taught by teacher j (1 if 4th grade, 0 otherwise);

W_{10j} = teacher j z-transformed beliefs about African American male learning;

W_{11j} = teacher j z-transformed beliefs about providing services to ELLs;

W_{12j} = teacher j z-transformed beliefs about getting to know Asian American students;

u_j is the error term at the teacher level for teacher j.

To test interaction effects between teacher and student characteristics, the level 2 model also included teacher variables that might account for variability in other coefficients at level 1. Thus, in addition to equation 3, the slopes were predicted using teacher variables:

$$\beta_{hj} = \gamma_{h0} + \sum_{g=1}^{G} \gamma_{gj} W_{gj} + u_j \tag{4}$$

Whether coefficients should be fixed or free across teachers was tested using group-mean centering at level 1. If the null hypothesis of equal coefficients was not rejected at the $p < .05$ level, they were fixed in the model. For instance, if random variance was found in the coefficients for race at level 1, then further analyses were conducted using the level 1 student race coefficients as the dependent variables to evaluate the extent to which teacher race moderates the effect of student race (a cross-level interaction). However, if the homogeneity hypothesis were retained, then the slope for the variable was fixed in the model. Regardless, grand-mean centering was used to test for main effects of teacher-level continuous variables on student-teacher closeness. Specifically, level 2 effects on the intercept at level 1 (using β_{0j} as the dependent variable) used uncentered indicator variables and grand-mean centered continuous z-transformed variables. When β_{hj} ($h \neq 0$) was the dependent variable, group-mean centering was used at level 1 because then these beta coefficients were estimates of the within-teacher regression coefficients to show the effects of interactions between a teacher and the students whom she rated, after adjusting for the deviation of student characteristics from

the classroom mean. Thus, Equation 5 is exchanged for Equation 1 as the level-1 equation.

$$Y_{ij} = \beta_{0j} + \sum_{h=1}^{H} \beta_{hij}(X_{hij} - \overline{X}_{h \cdot j}) + r_{ij}$$

(5)

Missing data. A variable was constructed to indicate whether a student had complete data on the teacher rating scales and previous year's GPA (coded 0) or had missing data (coded 1). The assumption of randomly missing data was then tested using multilevel logistic regression analysis, regressing the log odds that children had missing data on the student predictors at level 1. Examination of the data revealed significant differences in the rate of missingness of the TRSB rating scales among the various student racial groups at the $p < .05$ level. A multiple imputation procedure using the NORM software (Schafer, 2000) was used in which ten sets (Rubin, 1987) of imputed data were estimated and then averaged to impute missing data.

Results

Closeness Scale

Reliability. Table 4 shows the correlations among students' closeness ratings by teachers over four consecutive years. These are predominantly different teachers in different years because pupils change teachers as they advance through the grades. Accordingly error associated with rater and error associated with time are both included in the definition of error when these correlations are viewed as reliability coefficients. All correlations were significantly different from zero at $p < .001$ and fluctuated around $r = .20$ in size. The intraclass correlation coefficient indicated that 41% of the variance in closeness ratings was between teachers (see Table 5). One interpretation of the intraclass correlation is that the single-occasion reliability of a rating of a single student as a

measure *of the teacher's* rating disposition is .41. Each teacher rated many students and a mean rating can be calculated. An estimate of the reliability of the mean rating as a measure of the *teacher's* rating disposition for teachers with the average number of students rated is lambda-hat (Raudenbush & Bryk, 2002) and for this sample equals .94.

     Predictive validity. Table 6 shows the correlations among all teachers' ratings of students during the baseline year and correlations among measures over all four years. Longitudinal correlations involving closeness ratings over time were small in size but significantly different from zero at $p < .001$, and the relationships ranged from an absolute value of $r = .1$ to .2. In other words, approximately 1 to 4% of the variance in the other teacher rated student behaviors in future years is associated with student-teacher closeness. The longitudinal correlations were about .2 between closeness and engagement; about -.1 between closeness and externalizing behaviors; about -.2 between closeness and internalizing behaviors; and about -.1 between closeness and student-teacher conflicts. The table shows only weak evidence of convergent and discriminant validity, as the correlation of closeness in one year with closeness ratings in other years is generally only slightly higher in absolute value than its correlation with other rating scales—indeed it is sometimes less than correlations with ratings of other student characteristics.

Multicollinearity Diagnostics

     Correlations. The bivariate correlations among student-level variables are shown in Table 7. Student-teacher closeness was statistically significantly correlated with all student-level predictors at the .05 level. In general, lower STR closeness was associated with students who were non-Caucasian ($r = -.07$ to $-.02$), male ($r = -.18$), ESOL ($r = -.05$), FARM-eligible ($r = -.08$), rated as more internalizing ($r = -.46$), or more externalizing (r

= -.22). Higher student-teacher closeness scores were associated with students who were Caucasian ($r = .09$), rated as more engaged ($r = .40$), or had higher GPA ($r = .16$). A high degree of association between being Hispanic and ESOL status was observed ($r = .69$), as well as between engagement and externalizing ($r = -.52$). Special attention to these predictors was given in the subsequent procedure to assess multicollinearity.

Multiple regression. Student-level covariates were tested for presence of multicollinearity by comparing the standardized partial regression coefficients obtained from a multiple regression of closeness on all student characteristics with the corresponding zero-order correlation for each covariate (see Table 8). When ESOL was included in the model, inflated coefficients were observed, and ESOL was dropped from the model. Similarly, FARM status introduced inflations in the coefficients when it was included. Both ESOL and FARM were dropped from the final model.

Level-2 predictors were then added one by one in order to evaluate changes in the coefficients observed as a new predictor was added. No dramatic increases in the partial regression coefficients from their respective zero-order relationship with closeness were observed. Multicollinearity among the level-2 variables was not of concern.

Model specification. The student level model initially included all proposed variables at level-1 with no predictors or error terms at level-2 to determine which student characteristics significantly predicted closeness. Using a backward elimination procedure, non-significant covariates were deleted from the model. The resulting student-level model included the student race indicator variables, gender, engagement rating, externalizing rating, internalizing rating, and previous year's GPA. ESOL and FARM

indicator variables were dropped. This conclusion converged with that of the multicollinearity diagnostic check described earlier.

Sources of Variations in Student-Teacher Closeness

The intraclass correlation coefficient (ρ) calculated from the fully unconditional model supported between-teacher differences in student-teacher closeness ratings (see Table **5**). The ρ of .41 means that 41% of the variance in closeness lied between teachers; 59% of the variance was within teacher (individual child differences and error).

Whether level 1 slopes should be fixed or random was determined by first allowing all slopes to vary to test whether the null hypothesis of equal between-teacher slopes could be retained. Group mean centering was used at level-1. HLM results indicated that the slopes for student being Hispanic, male, engagement, externalizing behaviors, internalizing behaviors, and the previous year's GPA varied between teachers. The level-1 slopes for student Asian and Black indicator variables were fixed and did not vary between teachers.

Student Effects on Closeness

Table 9 displays the results for student effects on closeness while taking into account the nested nature of students within teachers by including an error term at level-2 in HLM. The intercept refers to the average closeness rating for Caucasian, female students, adjusted for externalizing, internalizing, and engagement ratings and prior grades. The parameter estimates may be interpreted as the average effect of student characteristics across teachers. Generally, teachers rated their relations with boys as less close than with girls ($\beta_4 = -.242$, *SE* = .012). In other words, boys scored almost a fourth of a standard deviation lower than girls on the student-covariate-adjusted closeness score.

Student race accounted for significant variance when student gender; engagement, externalizing, and internalizing ratings; and previous year's GPA were statistically controlled. Being Asian, Black, or Hispanic resulted in lower closeness ratings, on average (β = -.172, -.076, and -.085, respectively; *SE* = .022, .015, and .016, respectively). Specifically, on average, Asian students scored the lowest on closeness when other student traits were accounted for, scoring about one sixth of a standard deviation lower than Caucasian students on the covariate-adjusted closeness score. Next were Hispanic students, who scored about one 12th of a standard deviation lower than Caucasians; and Black students scored about one 13th of a standard deviation lower than Caucasians.

In terms of students' in-class behaviors as predictors for student-teacher closeness, internalizing behaviors had the largest standardized partial regression coefficient. On average, as students' internalizing behavior rating increased by one standard deviation above the grand mean, teachers rated them almost a third of a standard deviation lower on closeness (β_6 = -.308, *SE* = .009). Student engagement had the next biggest coefficient, with more engaged students receiving higher closeness ratings (β_5 = .160, *SE* = .010). Thus, when the other covariates were held constant, as students' engagement score increased by one standard deviation above the grand mean, they were rated about a sixth of a standard deviation higher on closeness. Finally, students' level of externalizing behaviors had a much smaller partial coefficient. When the other covariates were held constant, as students' level of externalizing behaviors increased by one standard deviation above the grand mean, teachers rated them about one 12th of a standard deviation lower on closeness (β_7 = -.083, *SE* = .009).

Students' academic achievement was a significant, *negative* predictor of student-teacher closeness ($\beta_8 = -.062$, *SE* = .008) beyond the variance explained by student race, gender, and in-class behaviors. A higher GPA in the previous year was correlated with *lower* closeness ratings such that as students' previous year's GPA increased by one standard deviation above the grand mean, teachers rated them about one 16th of a standard deviation lower on closeness, on average.

Teacher Effects on Closeness

To determine which teacher characteristics predicted closeness after adjusting for student characteristics, the intercept at level-1 was regressed on all proposed teacher covariates with grand mean centering at level-1 as presented in Table 10. After taking into account student characteristics, teacher race, grade-level taught, and belief about Asian students contributed additional variance to closeness scores. Though in the expected direction, the effect of the teacher being male did not predict closeness ratings statistically significantly. Teachers' beliefs about African American and ESOL students also were not unique predictors of student-adjusted closeness scores. The intercept (γ_{00} = .027) refers to the mean student-adjusted closeness rating given by Caucasian teachers who taught the fifth grade, and responded at the grand mean on the belief item (i.e., *z*-score = 0).

Controlling for the grade-level taught, and beliefs about Asian students, the intercept-as-outcome model indicated significant effects of teacher race on closeness ratings adjusted for student characteristics: Asian teachers were more likely than Caucasian teachers to give higher student-teacher closeness ratings ($\gamma_1 = .225$, *SE* = .063). Teachers identified as Black or Hispanic gave lower closeness ratings than did Caucasian

teachers (γ_2 = -.172, *SE* = .079 for Black teachers; γ_3 = -.259, *SE* = .115 for Hispanic

teachers). In other words, Asian teachers felt almost a fourth of a standard deviation

closer to students than did Caucasian teachers, whereas Black teachers felt about one

sixth of a standard deviation less close to students, and Hispanic teachers felt more than a

fourth of a standard deviation less close to students than did Caucasian teachers. Due to

the tiny sample size for Native American teachers, the results from these teachers are not

interpreted.

The grade-level taught was significant in predicting how close teachers felt to

students after adjusting for student characteristics. On average, teachers who taught lower

grades reported feeling closer to students than teachers who taught higher grade-levels.

The regression coefficients for first through fourth grades were γ = .318, .258, .206,

and .164, respectively (*SE* ranged from .068 to .075). Fifth grade served as the reference

category. Teachers who taught grades one through four gave higher closeness ratings

than teachers who taught the fifth grade, with teachers in grade one feeling the closest to

their students (about a third of a standard deviation higher than fifth grade teachers),

followed by teachers in grade two, then grade three, four, and finally, fifth grade teachers

felt the least close to their students.

The mean raw scores of teacher belief items by teacher race are presented in

Table 11 and the standardized deviations from the mean by race—rescaled so that group

differences are easier to interpret in terms of the standard deviation of each item's

distribution—are graphically presented in Figure 1. Asian teachers are most likely to

believe that African American students learn differently, are relatively likely to believe

that helping English language learners is their responsibility, and reject the notion that

Asian students are difficult to get to know. Hispanic teachers are also positively disposed, on average, to the notion that they have responsibility for helping English language learners.

Teacher beliefs about Asian students predicted student-covariate-adjusted closeness uniquely. After controlling for teacher race and grade taught, teachers who more strongly believed that Asian students were not difficult to get to know felt closer to students, on average ($\beta = .089$, $SE = .025$). A one standard deviation increase in agreement with the statement that Asian students were not difficult to get to know was associated with an increase of one 11th of a standard deviation in closeness. Teachers' beliefs about ESOL and African American students' learning did not affect the student-adjusted closeness ratings.

Interactions Between Student and Teacher Characteristics

The slopes determined to vary across teachers in previous steps (i.e., Hispanic students and student gender) were predicted in a slope-as-outcome model to assess cross-level interactions. In addition, although the slopes for Asian and Black did not vary across teachers, they were considered random in separate analyses because of a theoretical interest to examine the effect of a student-teacher racial match on student-teacher closeness. For each slope-as-outcome model, only teacher characteristics with obvious possible relevance to the student characteristic the slope for which was being examined were included. Specifically, teacher gender was entered as a predictor for the student gender slope; teacher Asian indicator, beliefs about teaching ESOL students, and beliefs about getting to know Asian students were entered as predictors for the slope of Asian students; teacher Black indicator and teacher beliefs about African American

students were entered as predictors for the slope of Black students; and teacher Hispanic indicator and belief about teaching ESOL students were entered as predictors for the slope of Hispanic students.

The ESOL belief item was examined for an interaction effect with Hispanic and Asian students' slopes to explain closeness scores because the bivariate correlations indicated that these two racial groups were significantly and positively related to ESOL status. The results concerning cross-level interaction effects are reproduced in Table 12.

The intercept-as-outcome equation included only those teacher variables determined in the previous steps to be significant predictors of student-teacher closeness. This was included for completeness.

Gender match. Holding constant student race, in-class behavior ratings, and previous GPA, male teachers rated higher student-teacher closeness with students who were boys than with students who were girls ($\gamma_{4,5} = .106$, $SE = .046$), on average. When the other covariates were held constant, a male teacher rated boys about a tenth of a standard deviation higher in closeness than they rated girl students.

Racial match. Holding constant student gender, in-class behavioral ratings, and previous GPA, Black teachers gave higher closeness scores for Black students than students of other races ($\gamma_{2,2} = .096$, $SE = .040$). When the other covariates were held constant, Black teachers rated Back students almost a tenth of a standard deviation higher in closeness than they rated other students, on average. Though in the expected, positive direction, a significant racial match interaction was not observed for the Asian or Hispanic dyads.

Student race and related teacher belief. Holding other student predictors constant, teachers who agreed more strongly that it is *not* difficult to get to know Asian students rated Asian students higher than other students on closeness ($\gamma_{1,12} = .077$, *SE* = .024). A one standard deviation increase in disagreement level with the statement that Asian students are often difficult to get to know resulted in an increase in closeness by one 13th of a standard deviation. Teacher beliefs about support for ESOL students did not interact significantly with Asian student racial identity to influence the closeness rating.

Teachers who more strongly believed that it was their responsibility to provide learning support for ESOL students felt closer to Hispanic students than students of other races when other student characteristics were held constant ($\gamma_{3,11} = .044$, *SE* = .016). Thus, as teachers increased by one standard deviation on their agreement level with the statement that they should be expected to support ESOL students, closeness increased by one 23rd of a standard deviation.

Teacher beliefs about African American male student learning differently from other students or not did not account for significant variance in the slope for Black students in predicting student-adjusted closeness ratings.

<div align="center">Discussion</div>

Teacher-Rated Closeness

The literature on student-teacher closeness is confusing. No clear definition of this construct has been operationalized, and it is convoluted with terms like "emotional support" or the degree of "warmth" in the relationship. Needless to say, the psychometric properties of a scale that purports to measure a murky construct have not been thoroughly investigated. The present study found that 41% of the variance in student-teacher

closeness ratings was between teachers. This finding suggests that the current adaptation of Pianta's (2001) STRS Closeness scale provides a reliable measure of *teachers' disposition* for closeness at the classroom level ($\hat{\lambda} = .94$). In other words, this scale may reflect teacher personality. Though not an entirely new finding, this result has not been a focus of the student-teacher closeness literature in the past. For example, Baker, Grant, and Morlock's (2008) study to predict elementary students' school adaptation variables consistently showed that *classroom teachers* contributed the most variance to the criterion variables among other predictors such as STRS Closeness and Conflict.

The current adaptation of a scale to tap student-teacher closeness contained four items, three of which described children's tendencies to approach their teachers socially, and the remaining item approximated the degree of social reciprocity in the student-teacher relationship. Thus, besides the scale potentially reflecting teacher disposition, it may also have culturally-loaded elements. For example, in the case of Asian students, some cultural psychologists make a distinction between Western societies as individualistic in which individuals are expected to take initiatives and approach others openly, and Eastern societies as collectivist in which individuals are expected to blend in and keep more defined personal boundaries, especially between generations (Kingston & Forland, 2008; Lin & Fu, 1990). Parallel arguments related to Black persons' and Hispanic persons' differing cultural expectations about close student-teacher relationships could be made. Therefore, a legitimate question about the closeness scale is which *aspect* of closeness it might be measuring, assuming that relational closeness is a construct with different aspects especially when cultural differences are taken into account.

Although the current closeness scale may possess cultural "glitches," and despite a strong tendency for teachers to rate in a certain direction, *race and beliefs still influence student-teacher closeness* as measured from a perspective that approximates how European Americans view closeness. This finding is important because according to Kellam et al. (1975), psychological adjustment has two components, one of which involves others' perception of the individual. Thus, students might be expected to exhibit this aspect of closeness in order to adapt optimally as residents of the United States. It is primarily from this perspective that student-teacher closeness as currently measured remains an important metric by which to assess students' positive adaptation in our society that the results are interpreted.

Research Question One

An important finding from this analysis is that student race *does* predict student-teacher closeness. Here, a conceptual question arises about the meaning of using categorical race indicators as predictors in modeling closeness. Do these dummy race variables represent some latent "race" construct that *causes* student-teacher closeness? Eagly and Chin (2010) argued that such membership categories "have a psychological reality at deeper levels than the surface of the human body" because these readily observable phenotypes are linked with certain worldviews about these categories in the minds of social perceivers (p. 934). According to this position, student race has an indirect effect on closeness via the thoughts activated in teachers' cognition when they see their students whom they spontaneously socially categorize (Allport, 1954). Future research could test this theory.

As Yiu (2010) had earlier found in the data for these schools, teachers on average felt the closest to Caucasian students. Of the four racial groups examined (Asian, Black, Hispanic, and Caucasian), Asian students were rated the lowest in closeness when gender, in-class behaviors, and academic achievement were held constant. Given the literature on the associations between positive teacher ratings on student-teacher relations and better academic and psychosocial outcomes for students, that teachers in general feel less close (i.e., less positive in this aspect) with Asian students likely negatively influences Asian students' performance in school settings. What is it about students being Asian that cause teachers to feel less close to them? Referring back to the closeness items, Asian students' lower ratings may be an accurate reflection of their behavior in light of widely published notions of Asian cultural values of discreetness (Kim, 2009) and respect for authority (Lin & Fu, 1990). If teachers perceive such behaviors as characteristic of internalizing behaviors, then it would be expected that student-teacher closeness ratings would be compromised since students' internalizing behaviors negatively affect student-teacher closeness. It appears that teachers feel the closest to students who show fewer behaviors such as being a loner, feeling sad, being shy or timid around adults, seeming anxious or worried, and being withdrawn.

As for the effect of other in-class behaviors on student-teacher closeness, the current study corroborates the existing literature. Specifically, more engaged students were closer to their teachers, while students who displayed internalizing or externalizing behaviors received lower student-teacher closeness ratings. Contrary to expectations, externalizing behaviors was found to be one of the weaker predictors of student-teacher

closeness when student demographic variables and other in-class behaviors were taken into account. Girls were also found to receive higher closeness ratings than boys.

It is worrisome that being an Asian American student predicted the lowest student-teacher closeness rating, especially in the face of the "model minority" stereotype which posits Asians as a well-adjusted group. Specifically, Asian students might not be receiving the teacher support that they need to facilitate adaptive psychosocial development. Further research on this issue is needed, as school-based research regarding Asian students is relatively rare. This finding also leads to another question: Given that other traits are equal, what makes teachers feel less close to Asian students than non-Asian students? From the current analyses, teachers' stronger belief that Asian students are not difficult to get to know allowed them to feel closer to Asian students. Perhaps an important role for school-based mental health professionals (psychologists and counselors) is to educate teachers about Asian American culture to dispel misconceptions of Asian American students that may exist. Yiu (2010) reported elevated internalizing behavior ratings for Asian students compared to their peers. In other words, teachers were more likely to perceive Asian students as shy or timid, withdrawn, and anxious or worried. Although it might be true that Asian American students truly are more internalizing than their peers, an alternative explanation is that confirmation bias operates such that teachers perceive Asian students as more internalizing *because* they believe that they are difficult to get to know. Specifically, the internalizing measure, because it is based on teacher ratings, may be flawed and may simply reflect a teacher bias rather than a real difference in internalizing. If the latter explanation applied, then teachers can opt to initiate contact with Asian students in order to get to know them better. Scheduled

lunches with a few students at a time toward the beginning of the school year might serve as a bridge between teachers and students to get to know one another in a non-threatening environment. This and other ideas about ways to promote cross-group familiarity may be worthy of experimental tests in schools.

An interesting finding was that, after controlling for the other student covariates, students' previous year's GPA actually predicted *lower* closeness ratings, although its zero-order correlation with closeness was weak positive. Also, students' ESOL and FARM status were not found to be unique predictors of STR closeness after race, gender, in-class behaviors, and previous academic achievement were taken into account. Thus, except for the finding on the relationship between previous GPA and closeness, and the non-significance of ESOL and FARM as predictors, my first hypothesis was supported by the current findings.

Overall, it appears that the primary source of information used by teachers to rate the degree of closeness with students is most affected by students' behaviors. This finding suggests a re-examination of the current adaptation of the STRS Closeness scale to evaluate what construct is actually measured (i.e., behavior or interpersonal closeness).

Research Question Two

Contrary to expectations that teacher race would have no effect on how close teachers felt to students after adjusting for student characteristics, Asian teachers, in general, felt *closer* to students than did Caucasian teachers. Asian teachers were the only minority group who gave higher closeness ratings than Caucasian teachers (Native American teachers disregarded because of their sample size of $n = 2$). The opposite was

true for Black and Hispanic teachers, who felt less close to students than did Caucasian teachers.

Of the four racial groups with at least ten teachers (Asian, Black, Caucasian, and Hispanic), teachers being Asian predicted the highest student-adjusted closeness scores. This is interesting because although generally teachers did not feel as close to Asian students as to other students, Asian teachers perceived closer relationships to students than non-Asian teachers. If Asian students share a similar relational style as Asian teachers, it is possible to speculate that even though teachers feel less close to Asian students, Asian students nonetheless feel closer to their teachers than their peers do. This is important because the subjective experience of the individual is an important component of defining mental health (Kellam et al., 1975). Still, another essential component of mental health comes from external pressures, which involves the community's judgment of the person's performance, or one's social adaptational status (Kellam et al., 1975). To attain equal opportunities to succeed, Asian Americans require acceptance from mainstream society. Thus, if the general public regarded Asians as more internalizing than others, this perception itself may negatively affect Asian children's mental health status, and could jeopardize their opportunity to reach the same level of success that may currently be implicitly reserved for individuals not members of a racial minority.

My hypothesis that female teachers would give higher closeness ratings is also refuted: Teacher gender did not reach the .05 significance level to qualify as a statistically significant predictor of student-teacher closeness when student characteristics were taken into account. Nonetheless, the regression coefficient for teacher being male yielded an

effect in the expected (negative) direction when predicting closeness, with a significance value at .10. The non-significant finding may be attributable to the fact that a majority of the teachers were females, with only about 8% ($n = 64$) of whom identified as males. A small sample size is more susceptible to the Type I error, which states that a hypothesis is incorrectly refuted when in fact a true difference exists.

My hypothesis that teachers with more positive beliefs about specific groups of students would feel closer to students is only partially supported. The results indicate that teachers' self-reported beliefs about minority student groups can have an influence on the degree of closeness in their relationships with students. On average, teachers who believed more strongly that Asian students are not difficult to get to know felt closer to students than their colleagues who agreed less readily to this statement. This finding suggests that one barrier to increased closeness between students and teachers is the teacher's perception that certain students are more difficult to get to know. It is important to note that this perception may not reflect reality accurately and is based on the teacher's beliefs. School administrators might consider it a goal to foster positive classroom environments by encouraging teachers to get to know their students on a more personal level to increase opportunities for close relationship development. Even though Belief Item 6 here specifically assessed teachers' attitudes toward getting to know Asian students, teachers who believe that Asian students are not difficult to get to know might hold similar beliefs toward other students in general, and minority students more specifically. Assessing such a possibility requires further research. The other two items that assessed beliefs about male African American students' learning style and teaching

responsibility toward ESOL students, however, did not affect how teachers rated closeness in general.

Research Question Three

The hypothesis that the presence of a racial match between student and teacher would contribute unique variance in closeness beyond the other covariates was only observed for student and teacher pairs who were Black. In other words, when student gender, engagement, internalizing behaviors, externalizing behaviors, and academic achievement are held constant, Black teachers felt closer to students who were also Black than to students of other races. Although the effects were in the expected, positive direction, racial match was not found to predict student-adjusted closeness ratings significantly for Asian nor Hispanic students, but the sample sizes of Asian and Hispanic teachers were small ($n = 11$ and 21, respectively). Furthermore, even though teachers on average felt closer to female students, an interaction between teacher and student genders existed such that male teachers felt closer to male students when student race, engagement, internalizing behaviors, externalizing behaviors, and academic achievement were accounted for. These findings on student-teacher matches in terms of phenotypic qualities like race and gender corroborate the social psychological literature on liking (Clark and Lemay, 2010), in which similarity is often found to be the strongest predictor of how much people like others.

As for the interaction between teachers' beliefs about a specific group of students, my hypothesis was only partially supported. Asian students received higher closeness ratings if their teachers believed that they are not difficult to get to know. This result is not surprising because teachers who find it less difficult to get to know students can also

be expected to find it easier to relate to their students on a more personal and closer level. In addition, Hispanic students were rated as being slightly closer to teachers who adhered more to the belief that it was their responsibility to provide learning support to ESOL students. One interpretation of this finding is that teachers who feel more personally responsible for a group of students' learning outcomes would naturally want to get to know these students better in order to understand better the conditions under which they learn best. On the other hand, teacher beliefs about African American students' learning style did not interact significantly with how close they felt toward Black students. This final finding demonstrates discriminant validity for the closeness scale in measuring the STR closeness construct. Specifically, since closeness taps into the social relationship between students and teachers, teachers' perceptions of how African American students learn should not affect how they relate to these students.

Limitations

The sample is from a single suburban school district in a Mid-Atlantic state. The generalizability of results to districts with different teacher and student compositions is unknown. All data on relationship quality and student psychosocial and academic characteristics (including classroom grades) are derived from teachers' perspective. Students' in-class behaviors are measured in terms of the teachers' perceptions of the students. The degree of closeness perceived by the teacher may not be the same as that felt by the student in the pair's relationship. Information on how students perceived the student-teacher relationship is not available. It is somewhat reassuring in this regard that Skinner and Belmont (1993) demonstrated that teacher-reported emotional involvement with students was the strongest correlate of student perceptions of the same construct.

The interrater correlation between teacher- and student-reported teacher emotional involvement in Skinner and Belmont's study was .23 ($p < .01$), which is not uncommonly low in the interrater reliability literature on teachers and children (Nebbergall, 2009).

The current research employed assumptions about causal ordering to infer causal influences of teacher and student characteristics on student-teacher closeness. Thus, the conclusions drawn are only as good as the assumptions of the model. In other words, the inferences based on the results of the analyses are valid only if the model were specified properly using relevant and sufficient predictor variables. Causal ordering cannot be definitely established between some predictor variables and the hypothesized outcome variable in the present examination. For instance, the relationship between a student's externalizing behaviors and STR closeness is ambiguous. It may be that a student acts out, resulting in a more distant student-teacher relationship. On the other hand, it is also possible that a more distant relationship between the teacher and the student causes the student to feel alienated, and displays his negativity through externalizing behaviors. Or, as Bandura (1985) might say, the relationship is reciprocal. Similar scenarios occur with the engagement and internalizing scales as well. Finally, to the extent in which measurement errors exist, in other words, if the scales do not measure the intended constructs or measure them with error, causal inferences are to that degree weakened.

Virtues

Despite these limitations, the current study utilized a large sample from a diverse school district. This diverse sample of students with a large Asian American subgroup allows for inferences to be drawn about Asian American students based on the analyses with some confidence. This type of quantitative analysis to predict teacher-student

closeness in Asian American students has not been previously performed. Furthermore, measures of teacher characteristics were included. To my knowledge, no previous study controlled for these potential sources of variance even though teachers have been the only raters of both predictor and response variables.

Implications and Future Research

Culture and closeness using Asian Americans as an example. Compared to studies on Hispanic and African American student populations, fewer studies focus on Asian students. The current discussion aims to add to the literature by emphasizing the present findings as they relate to Asian students in the U.S. The lower closeness ratings for Asian students suggest that more investigation into interpersonal style in the teacher-child context would be helpful. Much literature supports the concept of similarity between people as a foundation for liking and close relationships (for a review, see Clark & Lemay, 2010). Some earlier research has examined relations between college undergraduates and professors, or graduate students and advisors, but investigations of student-teacher relations in the K-12 context are less prevalent. The issue is complicated by differing cultural expectations of interpersonal style. A study comparing Chinese (Ho & Chau, 2009) relational style to that of Western Europeans suggested that in this East Asian culture, more emphasis is placed upon the relationship itself rather than on the individuals inside the relationships. Surveying Taiwanese international students in the U.S., Lee, Bei, and DeVaney (2007) found that these students experienced culture shock when they discovered the different interpersonal styles between graduate students and their advisors in the U.S. On average, Taiwanese students perceived a greater hierarchical relationship between students and faculty than did U.S. students.

It has been observed that student-teacher relationships differ between Asian and Western European cultures. For example, using archival data from the Trends in International Mathematics and Science Study (TIMSS) 1999 study, Leung (2005) found that the student to teacher spoken word ratio was the lowest in Asian societies such as Hong Kong and Japan, while the United States had the highest ratio. It appears that in Asian cultures, students may be used to exchanging fewer words with their teachers compared to their peers who go to school in the U.S. Because communication plays an important role in the development of dyadic relations in our society, the lower frequency of verbal communication expected of Asian students toward their teachers may negatively affect their relationship with teachers as students in the U.S. This may be further complicated by differently prioritized values across cultures. For instance, filial piety and obedience to elders are important cultural values in Chinese cultures (Lin & Fu, 1990), whereas individualism and an inquisitive nature are expected of U.S. children (Kingston & Forland, 2008). In other words, some Asian students may be expected to be obedient and respectful toward their teachers (Lee, Lam, & Li, 2003). The salience of a hierarchical relationship between teacher and student in Asian families may hinder Asian American students from forming positive relationships with their teachers as valued in North American cultures. This is problematic since the majority of teachers in the U.S. school system are Western European (Schools and Staffing Survey, 2008). Terms such as *large power distance* (Hofstede, 1980) and *relationship dominance* (Ho, Peng, Lai, & Chan, 2001) have been used to describe the relational style of East Asians.

What, then, are the implications of different conceptualizations of student-teacher closeness in the applied setting? The current literature generally measures STR closeness

in terms of the teacher's perception that the relationship is warm and that the student

makes initiatives to seek psychosocial support from the teacher. A challenging question

that arises from the current findings is whether educators should expect all students to

express the qualities valued by Western societies as features of a close relationship, or if

teachers should be the ones to adjust to their students with varying cultural backgrounds

instead. The current trend in the field is an emphasis on training for multicultural

awareness and competence in order for U.S. education to accommodate to the rapidly

changing demography of students.

School-based interventions. Young people do not possess the legal and social

status required to make decisions about their own psychosocial wellbeing, and must rely

on external agents such as their families and school personnel as providers of mental

health resources (Takeuchi, Bui, & Kim, 1993). From a community health framework, all

persons in need are afforded services in order to prevent mental illness in the larger

community (Kellam et al., 1975). Public school systems are part of the community that

has the responsibility to ensure its members' welfare in order for it to continue proper

functioning. Accordingly, schools have an obligation to participate in the prevention and

early treatment of mental dysfunctions for their students.

The finding here that teachers' personal beliefs interacted with student race can be

interpreted as consistent with the hypothesis (Murray, Bellavia, Holmes, Griffin, &

Dolderman, 2002) that *perceived* similarity may predict closeness differently than *actual*

similarity. Results of this study may have implications for students' academic and

psychosocial adjustments as well. Future research and intervention efforts may address

whether interventions to help teachers become more aware of the importance of

developing closer relationships with these students leads to better outcomes. One such intervention may be in the form of teacher professional development to support teachers in understanding how their attitudes might affect their students. Many studies have focused on reducing conflicts in the student-teacher relationship as an intervention to prevent future behavioral and academic problems (e.g. Hamre & Pianta, 2005), but interventions to increase the closeness between a student and a teacher are less prevalent. Perhaps for students who are not overtly displaying a risky status (i.e., they are performing well in their academics), attention should be given to increase their closeness with teachers. Closer student-teacher relationships may allow teachers to gain insight into how students are doing beyond their academic performance, and to intervene in a timely manner as necessary. This is especially critical for students from families whose parents are less involved in school for one reason or another. For instance, if Asian families value discreetness in regards to mental health needs, there exists potential for teachers of Asian students to fill the gap as a resource to enhance the students' psychosocial wellbeing (Kim, 2009). As the adult figure who occupies a majority of school-going children's waking hours, teachers can become the active force to initiate contact with students' families through getting to know their students on a closer level to provide a common conversational ground to instigate parent-school relations. A future study might examine the effect of a closer student-teacher relationship on outcomes such as the level of family involvement in school, parental attention given to mental health issues, as well as changes in patterns of utilization of mental health services.

Kalyanpur and Harry (1999) proposed the concept of the posture of cultural reciprocity in facilitating the professional-parent relationship to enhance the student's

school and home lives simultaneously. This posture of cultural reciprocity may be manifested within the professional (e.g., school psychologists, counselors, teachers), as well as in the actions performed by the professional. According to this perspective, in fostering trust in home-school relations, it is critical that the professional become aware of potential cultural differences that may exist between hers and the student's social milieus, and to take action to reduce conflicts that may arise as a result. At the same time, the bond built between the school and the family can serve as a support within mainstream society from which families may seek advice and support in the future. This bond may be important for families not from the mainstream culture to feel more integrated into their communities. Regardless of the merits of these speculations, the finding that teachers' ratings of their relationships with their students depend on racial congruence and race-related beliefs in some instances deserves research attention and concern. The present results may stimulate further research on this phenomenon.

Table 1

Sample Race and Gender

	Students		Teachers	
	N	%	*N*	%
Asian	1250	7.8	11	1.5
Black	3546	22.0	78	10.3
Hispanic	4301	26.7	21	2.8
Caucasian	6987	45.1	643	85.2
Native American	0	.0	2	.3
Female	7914	49.2	691	91.5
Male	8170	50.8	64	8.5
Total	16084	100.0	755	100.0

Table 2

Student Age in Years by Grade Level

Grade	*M*	*N*	*SD*	Min.	Max.
First	5.6	3357	.53	5	8
Second	6.6	3192	.54	5	8
Third	7.6	3142	.56	6	10
Fourth	8.6	3300	.58	7	11
Fifth	9.6	3093	.57	8	12
Total	7.6	16084	1.54	5	12

Table 3

Student Demographics by Grade Level

	First	Second	Third	Fourth	Fifth
	N	*N*	*N*	*N*	*N*
	(%)	(%)	(%)	(%)	(%)
Asian	268	245	228	254	255
	(8)	(8)	(7)	(8)	(8)
Black	680	673	720	754	719
	(20)	(21)	(23)	(23)	(23)
Hispanic	973	897	861	814	756
	(29)	(28)	(27)	(25)	(24)
Caucasian	1436	1377	1333	1478	1363
	(43)	(43)	(42)	(45)	(44)
Male	1706	1635	1596	1694	1539
	(51)	(51)	(51)	(51)	(50)
ESOL	1052	917	805	771	681
	(31)	(29)	(26)	(23)	(22)
FARM	1250	1143	1113	1104	1036
	(37)	(36)	(35)	(34)	(34)
Total	3357	3192	3142	3300	3093

Note. ESOL = English for Speakers of Other Languages; FARM = Free and Reduced Meals.

Table 4

Longitudinal Inter-teacher Correlations of Closeness Ratings

Occasion	Year 1	Year 2	Year 3	Year 4
Year 1	-			
Year 2	.220	-		
Year 3	.202	.227	-	
Year 4	.176	.187	.201	-

Note. $p < .001$ for all. Pairwise Ns $> 6{,}300$ students for each r.

Table 5

Decomposition of Variance Within and Between Teachers

Origin	Variance	*sig. (τ)*	ρ
Between Teacher (τ)	.410	$< .001$	.41
Within Teacher (σ^2)	.590		.59

Table 6

Concurrent and Longitudinal Correlations Among Teachers' Ratings of Student Behaviors and Teacher Relations with Students

Year	Year 1					Year 2					Year 3					Year 4				
	Eng	Ext	Int	**Clos**	Conf	Eng	Ext	Int	**Clos**	Conf	Eng	Ext	Int	**Clos**	Conf	Eng	Ext	Int	**Clos**	Conf
1 Eng	-																			
Ext	-.52	-																		
Int	-.43	.10	-																	
Clos	**.39**	**-.20**	**-.47**	**-**																
Conf	-.56	.76	.23	**-.33**	-															
2 Eng	.56	-.36	-.21	**.20**	-.36	-														
Ext	-.34	.52	.02	**-.12**	.45	-.52	-													
Int	-.24	.03	.40	**-.20**	.10	-.42	.12	-												
Clos	**.16**	**-.09**	**-.18**	**<u>.22</u>**	**-.10**	**.38**	**-.21**	**-.45**	**-**											
Conf	-.34	.46	.08	**-.13**	.42	-.55	.74	.24	**-.34**	-										
3 Eng	.54	-.36	-.20	**.18**	-.36	.58	-.35	-.22	**.18**	-.37	-									
Ext	-.32	.48	.02	**-.10**	.40	-.34	.50	.01	**-.08**	.44	-.52	-								
Int	-.24	.04	.37	**-.20**	.10	-.24	.03	.40	**-.20**	.12	-.44	.15	-							
Clos	**.17**	**-.11**	**-.16**	**<u>.20</u>**	**-.11**	**.20**	**-.12**	**-.19**	**<u>.22</u>**	**-.15**	**.40**	**-.25**	**-.44**	**-**						
Conf	-.32	.42	.08	**-.12**	.36	-.34	.42	.08	**-.12**	.41	-.56	.74	.26	**-.37**	-					
4 Eng	.50	-.34	-.18	**.19**	-.34	.56	-.35	-.21	**.18**	-.36	.58	-.36	-.23	**.19**	-.36	-				
Ext	-.29	.44	.02	**-.10**	.36	-.31	.47	.02[a]	**-.09**	.41	-.34	.50	.03	**-.11**	.41	-.53	-			
Int	-.22	.05	.34	**-.17**	.12	-.23	.02	.38	**-.18**	.09	-.22	.02[a]	.40	**-.18**	.08	-.44	.14	-		
Clos	**.12**	**-.09**	**-.16**	**<u>.18</u>**	**-.10**	**.14**	**-.07**	**-.18**	**<u>.18</u>**	**-.10**	**.16**	**-.11**	**-.17**	**<u>.20</u>**	**-.12**	**.38**	**-.22**	**-.45**	**-**	
Conf	-.28	.36	.06	**-.11**	.33	-.30	.38	.08	**-.10**	.36	-.32	.40	.10	**-.12**	.38	-.55	.74	.26	**-.34**	-

Note. Eng = Engagement; Ext = Externalizing behaviors; Int = Internalizing behaviors; Clos = Student-teacher closeness; Conf = Student-teacher conflicts. **Boldface** values show correlations of closeness with other variables. <u>**Underlined**</u> values show correlations among closeness measures for different years (and different teachers).

[a] $p < .05$ except for the two cells marked by "a."

Table 7

Bivariate Correlations Among Student-Level Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Closeness	-											
2. Asian	-.02**	-										
3. Black	-.06**	-	-									
4. Hispanic	-.02**	-	-	-								
5. Caucasian	.09**	-	-	-	-							
6. Male	-.18**	-	-	-	-	-						
7. ESOL	-.05**	.12**	-.24**	.69**	-.48**	.01	-					
8. FARM	-.08**	-.06**	.10**	.46**	-.47**	-.00	.46**	-				
9. Engagement	.40**	.10**	-.16**	-.04**	.12**	-.22**	-.08**	-.16**	-			
10. Internalizing	-.46**	.01	.04**	.05**	-.08**	.06**	.08**	.10**	-.43**	-		
11. Externalizing	-.22**	-.08	.20**	-.06**	-.06**	.16**	-.08**	.07**	-.52**	.12**	-	
12. Previous GPA	.16**	.08**	-.14**	-.22**	.27**	-.10**	-.27**	-.34**	.51**	-.24**	-.22**	-

Note. ESOL = English for Speakers of Other Languages; FARM = Free and Reduced Meals; GPA = Grade point average.

**p < .001

Table 8

Multicollinearity Diagnostics: Standardized Regression of Closeness on Predictors

Student-level covariate	r_{yh}	$\hat{\beta}$	Tolerance	VIF
Asian	-.021	-.047	.808	1.237
Black	-.069	-.040	.731	1.367
Hispanic	-.028	-.028	.384	2.602
Male	-.179	-.105	.945	1.058
ESOL	-.053	-.013	.429	2.330
FARM	-.084	-.016	.649	1.541
Engagement	.400	.232	.464	2.157
Internalizing	-.458	-.358	.791	1.265
Externalizing	-.221	-.054	.687	1.455
Previous GPA	.156	-.089	.639	1.564

Note. ESOL = English for Speakers of Other Languages; FARM = Free and

Reduced Meals; GPA = grade point average; VIF = Variance Inflation Factor.

Table 9

Estimated Student Characteristic Effects on Closeness: Coefficients for Student-Level Covariates in a Two-Level Model

Covariate	β	SE	t	df	p
β_0 for reference	.190	.022	8.80	754	$< .001$
β_1 for Asian$_{ij}$	-.172	.022	-7.98	16075	$< .001$
β_2 for Black$_{ij}$	-.076	.015	-4.94	16075	$< .001$
β_3 for Hispanic$_{ij}$	-.085	.016	-5.34	754	$< .001$
β_4 for Male$_{ij}$	-.242	.012	-19.18	754	$< .001$
β_5 for Engagement$_{ij}$	.160	.010	15.70	754	$< .001$
β_6 for Internalizing$_{ij}$	-.308	.009	-32.86	754	$< .001$
β_7 for Externalizing$_{ij}$	-.083	.009	-9.02	754	$< .001$
β_8 for Previous GPA$_{ij}$	-.062	.008	-8.21	754	$< .001$

Note. Variables are uncentered, except that continuous variables are in *z*-score form.

Table 10

Estimated Teacher Effects on Student-Covariate-Adjusted Closeness

Coefficient	Est.	SE	t	df	p
For intercept β_{0j}					
$\gamma_{0,0}$	.027	.061	.44	742	.658
$\gamma_{0,1}$ for teacher Asian	.225	.063	3.56	742	.001
$\gamma_{0,2}$ for teacher Black	-.172	.079	-2.16	742	.030
$\gamma_{0,3}$ for teacher Hispanic	-.259	.115	-2.24	742	.025
$\gamma_{0,4}$ for teacher Native Am.	.418	.108	3.88	742	< .001
$\gamma_{0,5}$ for teacher Male	-.154	.095	-1.61	742	.107
$\gamma_{0,6}$ for Grade 1	.318	.068	4.66	742	< .001
$\gamma_{0,7}$ for Grade 2	.258	.071	3.62	742	< .001
$\gamma_{0,8}$ for Grade 3	.206	.072	2.84	742	.005
$\gamma_{0,9}$ for Grade 4	.164	.075	2.18	742	.029
$\gamma_{0,10}$ for African Am. Belief Item	-.029	.020	-1.43	742	.153
$\gamma_{0,11}$ for ESOL Belief Item	.026	.020	1.28	742	.200
$\gamma_{0,12}$ for Asian Belief Item	.089	.025	3.50	742	.001
$\gamma_{1,0}$ for student Asian, β_1	-.172	.022	-8.00	16063	< .001
$\gamma_{2,0}$ for student Black, β_2	-.073	.015	-4.79	16063	< .001
$\gamma_{3,0}$ for Student Hispanic, β_3	-.084	.016	-5.30	754	< .001
$\gamma_{4,0}$ for Student Male, β_4	-.242	.012	-19.18	754	< .001
$\gamma_{5,0}$ for Engagement, β_5	.160	.010	15.65	754	< .001
$\gamma_{6,0}$ for Internalizing, β_6	-.307	.009	-32.71	754	< .001
$\gamma_{7,0}$ for Externalizing, β_7	-.082	.009	-8.94	754	< .001
$\gamma_{8,0}$ for Previous GPA, β_8	-.062	.008	-8.03	754	< .001

Note. Variables are uncentered, except that continuous variables are in *z*-score form.

Table 11

Mean Raw Scores on Teacher Belief Items by Teacher Race

| | | Item 4 | Item 5 | Item 6 |
| | | *M* | *M* | *M* |
Teacher race	*N*	(*SE*)	(*SE*)	(*SE*)
White	643	3.62	3.96	4.23
		(.04)	(.04)	(.03)
Black	78	3.33	3.83	4.21
		(.15)	(.11)	(.10)
Hispanic	21	3.38	4.19	4.24
		(.22)	(.24)	(.12)
Asian American	11	3.00	4.27	4.45
		(.43)	(.19)	(.21)
Native American	2	4.00	4.50	4.50
		(.00)	(.50)	(.50)
Total	755	3.58	3.96	4.23
		(.04)	(.04)	(.03)

Note. Item 4 = I believe African American males learn differently from other students; Item 5 = I should not be expected to provide the language services that English Language Learners (ELL) students require; Item 6 = I believe Asian students are often difficult to get to know. Items are rescaled such that rejecting each item earns a higher score (range 1 to 5).

Table 12

Within-Teacher Model: Interaction Effects from HLM

Coefficient	γ	SE	t	df	p
β_0					
γ_{00}	-.204	.068	-2.96	745	.004
$\gamma_{0,1}$ for Teacher Asian	.240	.094	2.56	745	.011
$\gamma_{0,2}$ for Teacher Black	-.151	.090	-1.68	745	.093
$\gamma_{0,3}$ for Teacher Hispanic	-.175	.129	-1.36	745	.176
$\gamma_{0,4}$ for Teacher Native Am.	.583	.184	3.16	745	.002
$\gamma_{0,6}$ for Grade 1	.396	.078	5.05	745	< .001
$\gamma_{0,7}$ for Grade 2	.298	.082	3.63	745	.001
$\gamma_{0,8}$ for Grade 3	.182	.083	2.19	745	.029
$\gamma_{0,9}$ for Grade 4	.184	.085	2.17	745	.030
$\gamma_{0,12}$ for Belief item 6 (Asians)	.119	.024	4.84	745	< .001
Student Asian[a] (β_1)					
γ_{10}	-.174	.021	-8.20	751	< .001
$\gamma_{1,1}$ for Teacher Asian	.024	.156	.153	751	.879
$\gamma_{1,11}$ for Belief item 5 (ESOL)	.016	.023	.682	751	.495
$\gamma_{1,12}$ for Belief item 6 (Asians)	.077	.024	3.10	751	.002
Student Black[a] (β_2)					
γ_{20}	-.084	.016	-5.14	752	< .001
$\gamma_{2,2}$ for Teacher Black	.096	.040	2.36	752	.018
$\gamma_{2,10}$ for Belief item 4 (African Am.)	.016	.013	1.16	752	.246
Student Hispanic[a] (β_3)					
γ_{30}	-.086	.016	-5.30	752	< .001
$\gamma_{3,3}$ for Teacher Hispanic	.018	.073	.25	752	.799
$\gamma_{3,11}$ for Belief item 5 (ESOL)	.044	.016	2.76	752	.006
Student Male[a] (β_4)					
γ_{40}	-.254	.012	-19.62	753	< .001
$\gamma_{4,5}$ for Teacher Male	.106	.046	2.26	753	.024
$\gamma_{5,0}$ for Engagement[a] (β_5)	.151	.010	14.84	754	< .001
$\gamma_{6,0}$ for Internalizing[a] (β_6)	-.301	.010	-31.61	754	< .001
$\gamma_{7,0}$ for Externalizing[a] (β_7)	-.086	.009	-9.33	754	< .001
$\gamma_{8,0}$ for Previous GPA[a] (β_8)	-.058	.008	-7.56	754	< .001

Note. Level-1 predictors are group mean centered. Level-2 variables are uncentered, except that continuous variables are in *z* score form; Item 5 = I should not be expected to provide the language services that English Language Learners (ELL) students require; Item 6 = I believe Asian students are often difficult to get to know. Items are rescaled such that rejecting each item earns a higher score (range 1 to 5).
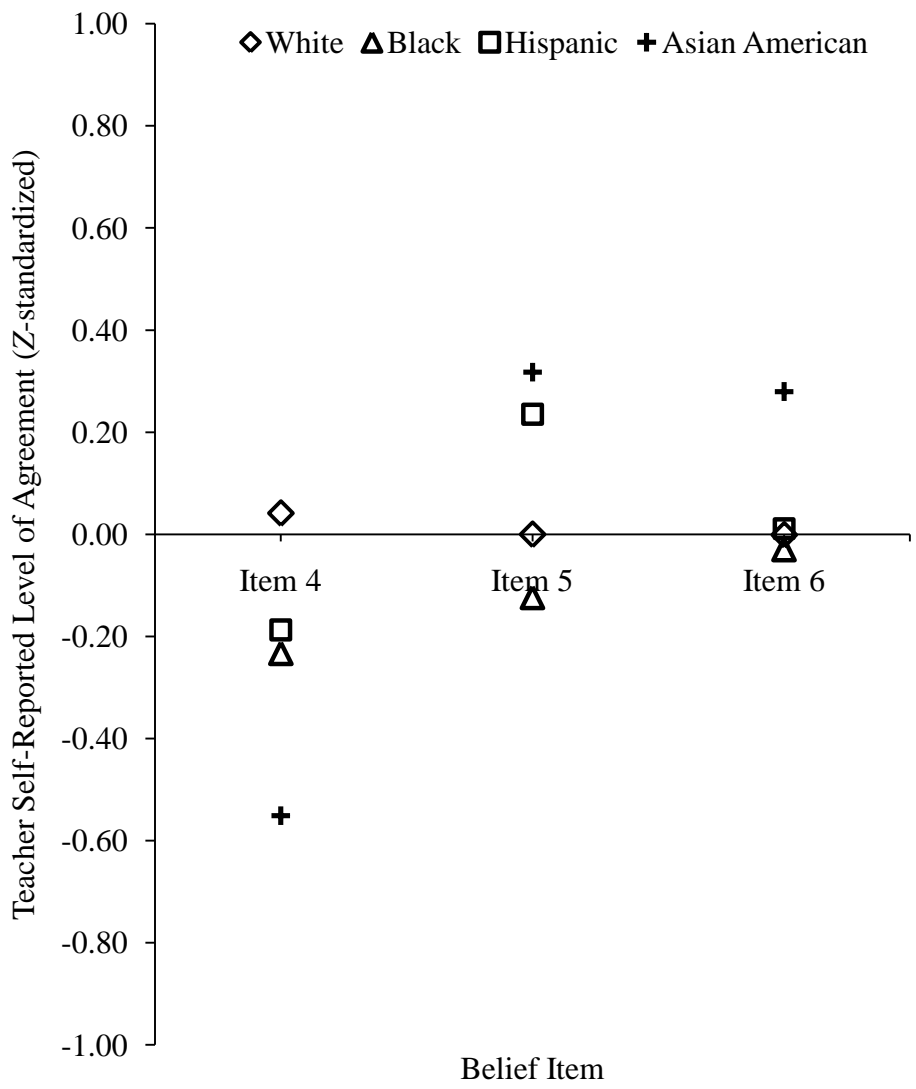[a]Group-mean centered variable

Figure 1. Teacher self-reported agreement to belief items by teacher race. Native American teachers were excluded due to a very small sample size of *n* = 2. Item 4 = I believe African American males learn differently from other students; Item 5 = I should not be expected to provide the language services that English Language Learners (ELL) students require; Item 6 = I believe Asian students are often difficult to get to know. Items are rescaled such that rejecting each item earns a higher score.

Appendices

Appendix A

Reduced Teacher Observation of Classroom Adaptation-Revised (TOCA-R) Scales

1. Interacts with teachers (reverse score)[c]

2. Easily distracted (reverse score)[a]

3. Seems sad[c]

4. Defies teacher or other school personnel[b]

5. Accomplishes assignments independently[a]

6. Makes friends easily (reverse score)[c]

7. Argues or quarrels with others[b]

8. Withdrawn doesn't get involved with others [c]

9. Teases or taunts others[b]

10. Seems anxious or worried[c]

11. Takes others property without permission[b]

12. Eager to learn[a]

13. Is physically aggressive or fights with others[b]

14. Gossips or spreads rumors[b]

15. Works to overcome obstacles in schoolwork[a]

16. Shy or timid around classmates or adults[c]

17. Socializes or interacts with classmates (reverse score)[c]

18. Says things like "I can't do it" when work is difficult (reverse score)[a]

19. Is a loner[c]

20. Is disruptive[b]

21. Stays on task[a]

22. Breaks rules[b]

23. Pays attention[a]

24. Learns up to ability[a]

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[a] Engagement items

[b] Externalizing behaviors items

[c] Internalizing behaviors items

Appendix B

Reduced Student-Teacher Relationship Scales (STRS)

1. I share a warm caring relationship with this child.[a]

2. This child and I always seem to be struggling with each other.[b]

3. If upset this child will seek me out for support.[a]

4. This child values his relationship with me.[a]

5. This child's feelings toward me can be unpredictable or change suddenly.[b]

6. This child is sneaky or manipulative with me.[b]

7. Dealing with this child drains my energy.[b]

8. This child spontaneously shares his feelings and experiences with me.[a]

_____

[a] Closeness items

[b] Conflict items

Appendix C

Table 13

Means and Standard Deviations of z-Standardized Continuous Variables by Student Race and Gender

	Closeness		Engagement		Internalizing Behaviors		Externalizing Behaviors		Previous Year's GPA	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Asian	-.07	1.05	.34	.90	.04	1.01	-.28	.67	.30	.88
Black	-.13	1.02	-.30	1.04	.06	.99	.38	1.26	-.28	1.04
Hispanic	-.04	1.01	-.06	.98	.08	1.02	-.11	.86	-.36	.96
Caucasian	.10	.96	.13	.96	-.09	.98	-.07	.91	.31	.89
Female	.18	.92	.22	.92	-.06	.98	-.16	.84	.10	.96
Male	-.18	1.04	-.21	1.02	.06	1.02	.15	1.11	-.10	1.02
Total	.00	1.00	.00	1.00	.00	1.00	.00	1.00	.00	1.00

Appendix D

	Akiba (2010)	Baker, Grant, & Morlock (2008)
Purpose	- Examine characteristics of students who fear being victimized by school violence - Examine teacher & school traits associated with students' fear	- Predict school adaptation of elementary school children with significant behavior problems using STRS closeness & conflict - potentially moderating effects of positive teacher relationship on association between behavior problems & school adaptation
Definition	- Student-teacher **bonding** (to indicate school community sense) - Perceived teacher support	- **positive STR** = high degrees of warmth and trust and low negativity - negativity = conflict & dependence - positive STR provide kids with the emotional security necessary to engage fully in learning activities and scaffold the development of social, behavioral, and self-regulatory competencies needed in the school environment - **no real definition of "closeness"
Instruments	- Student-reported student-teacher bonding o Students get along well with most teachers o Most teachers interested in student well-being o Most of my teachers really listen to what I have to say o If I need extra help, I'll receive it from my teachers o Most of my teachers treat me fairly - Student-reported perceived teacher support o (academic support, not closeness)	- STRS (Pianta & Nimetz, 1991) o 9 items total, 2 factor solution o 5-item closeness o 4-item conflict
Correlation	- $r = .41$ with perceived teacher support - $r = .30$ with student belonging	- $r = -.49$ with STRS conflict - $r = .46$ with classroom adjustment
Reliability	- Student-Teacher bonding: Alpha = .83 - Perceived teacher support: .85	- STRS closeness alpha: .80 - STRS conflict alpha: .86 - In all regression analyses to predict Reading Grades, Positive Habits, and Classroom Adjustment from STRS, behavioral predictors, and classroom teacher, **classroom teacher came out as contributing the most variance**
Results	- Student-teacher bonding explained variation in school fear	- Classroom teacher makes largest contribution to positive school adjustment of variables considered (effect size = .27) - Closeness associated with school adaptation, accounting for additional 5% variance - STR characterized by trust & warmth positively associated with school adaptation

Appendix D (Continued)

	Buriel (1983)	Decker, Dona, & Christenson (2007)
Purpose	- Relationship of teacher-student interactions to students' achievement	- What does quality of STR look like from student & teacher perspectives? - Is quality of STR predictive of student outcomes? - Whose perspective is more important in predicting outcomes? - Any dyadic patterns of student & teacher perceptions that predict STR?
Definition	- Interactions	- STRS Closeness

Instruments	- Brophy-Good Dyadic Interaction Observation System to code classroom interactions	- STRS (Pianta, 2001)
		- Relatedness Scale (Wellborn & Connell, 1987)
		  o Psychological Proximity Seeking: S's desire to be psychologically closer to T
		  o Emotional Quality: overall emotional tone of relationship from student perspective

Correlation	- n/a	- $r = .42$ with Emotional Quality - Non-sig. correlation with Psychological Proximity seeking - $r = .47$ with teacher report student social skills - $r = .38$ with teacher reported student engagement - $r = .42$ with student reported student engagement

Reliability	- Included only scores with intercoder reliability > 80%	- Internal consistency reliability for:
		  o STRS = .80
		  o Psychological Proximity Seeking = .86
		  o Emotional Quality = .77

Results	- Ethnicity main effects:
	  o Anglo receive greater proportion of product questions $(F(1, 79) = 8.29, p < .01)$
	  o Anglo more teacher affirmation following correct responses $(F(1, 79) = 5.01, p < .05)$
	- Sex main effect:
	  o Girls initial more work-related contacts with teachers than boys $(F(1, 79) = 8.65, p < .01)$
		- Teacher rated more negative relations, student more positive
		- STR more important predictor of social-emotional functioning and engagement outcomes versus academic outcomes
		- STRS most important predictor of suspension after controlling for all others
		- S-rated Emotional Quality most important predictor of behavior referrals & academic engaged time after controlling all others
		-

Appendix D (Continued)

	Doumen, Vershueren, Buyse, E., De Munter, Max, & Moens (2009)	Hamre and Pianta (2005)
Purpose	- Compare STRS against FAS and Attachment Q-Set - Multitrait-multimethod	- Classroom environment effects on student risk outcomes
Definition	- **STRS Closeness** = degree of warmth and openness in the relationship	- **Emotional support** encompasses classroom warmth, negativity, child-centeredness, teachers' sensitivity & responsiveness toward specific children (NICHD ECCRN, 2002b)

Instruments	- STRS (11 items on closeness)
	- Peer nominations
	- FAS: Child self-report
		- Outcome = STRS Conflict
		- COS-1: emotional & instructional support
		  o The emotional support composite included ratings of overcontrol (reflected), positive emotional climate, negative emotional climate (reflected), effective classroom management, teacher sensitivity, intrusiveness (reflected), and detachment (reflected).
		  o The instructional support composite included ratings of literacy instruction, evaluative feedback, instructional conversation, and encouragement of child responsibility

Correlation	- $r = .52$ with peer nominated closeness - $r = .28$ with FAS closeness - $r = -.53$ with STRS conflict - $r = -.27$ with peer nominated conflict - no sig corr. with Dependency	- $r = .57$ with instructional support
Reliability	- Alpha = .86	- Stable measure of classroom environment because test-retest correlations > .70
Results	- See correlations	- When previous academic performance was held constant, students in classrooms with higher emotional support had academic performance similar to their lower risk peers - Higher risk students in classrooms with lower levels of emotional support performed slightly worse than their lower risk peers ($d = .01$)

Appendix D (Continued)

	Ladd & Burgess (2001)	Lynch & Cicchette (1997)
Purpose	- Links between behavioral & relational risk & protective factors & children's adjustment following transition to grade school - Whether risk status of aggression predicted psychological & school maladjustment - Whether this association = additively/contingently altered by peer and teacher-child relationship risk/protective factors	- Descriptive data on perceived quality of children's relationships w others as they negotiate the transition from elementary to middle school
Definition	- **Closeness** = warmth & open communication between teacher & child; hypothesized to increase student ability to engage in scholastic tasks, participate in classroom activities - Conflictual = acrimonious, noncompliant interactions; hypothesized to operate as stressors (e.g., causes of anger, resentment, or anxiety) that interfere with student adjustment	- **Relatedness** - Emotional quality = children's feelings of specific positive & negative emotions when with specified relationship figure - Psychological proximity seeking = degree to which kids wish they were psychologically closer to relationship figure
Instruments	- STRS Closeness (Pianta et al., 1995)	- Relatedness Questionnaire: student self-report: emotional quality & psychological proximity seeking (4-point scales)
Correlation	- r = -.39 to -.20 with STRS Conflict - r = -.36 to -.23 with aggression in kindergarten, non-significant in 1st grade - r = -.29 to -.20 with peer rejection - r = .18 to .21 with peer acceptance in kindergarten, non-significant in 1st grade - no significant correlation with peer victimization or with number of mutual friends	- n/a
Reliability	- Cited that scale has been found to be reliable and valid	- Emotional quality alphas = .67 to .83 for different figures - Psychological proximity seeking = .83 to .93 for different figures
Results	- Relational support measures correlated in expected directions to each other - Relationship 'protectors' (peer acceptance, number of mutual friendships, STR closeness) explained additional variance in students' cooperative participation in the classroom and fondness for school (ΔR^2 = .07 & .06, respectively) beyond the variance explained by the students' gender and early aggressive risk status - Higher STRS Closeness linked to students' cooperative participation in the classroom (β = .14) and fondness for school (β = .19) - STRS closeness stronger predictor of cooperative participation and school liking for students who were chronically aggressive (β = .18 and .28, respectively)	- Majority of children reported having optimal or adequate pattern of relatedness with 3 of 4 relationship partners (67.5% w mothers, 78.5% w best friends, 60.7% w classmates) - Only 39.2% reported optimal/adequate patterns with teachers - Almost ½ reported disengaged patterns with teachers

Appendix D (Continued)

	Mashburn, Pianta, Hamre, Downer, Barbarin, Bryant, Burchinal, & Early (2008)	Meehan, Hughes, & Cavell (2003)
Purpose	- Development of academic, language, & social skills among 4-yr-olds in publicly supported pre-K programs due to pre-K quality as follows: (a) adherence to 9 standards of quality related to program infrastructure & design, (b) observations of overall quality of classroom environments, & (c) observations of teachers' emotional & instructional interactions with students in classrooms	- Teacher support as compensatory resource for children under conditions of dual risk (aggression & negative parenting or African American/Hispanic minority status) - Children's ethnicity as moderator of association between positive STR & adjustment for behaviorally at-risk children

Definition	- **Emotional support**
	  o Positive climate, negative climate (reverse), teacher sensitivity, overcontrol (reverse), behavior management
	- Instructional Support
	  o Concept development, quality of feedback
	- Determined *post hoc* via factor analysis of CLASS
		- Student-teacher relationship **quality**
		- More emphasis on CONFLICT than closeness
		- Characterized as *positive* or *negative*

Instruments	- Quality of overall environment: ECERS-R → 36 items, space & furnishings, personal care routines, language reasoning, activities, interactions, program structure; 1 – 7 scale
	- CLASS → Quality of teacher-child interactions: instructional & emotional support
	- Social skills from Teacher-Child Rating Scale
	-
		- Network of Relationships Inventory (NRI): structured interview, asks kids to rate persons (mom, teacher, etc) in social network with respect to 11 types of social support/conflict
		  o 5-point Likert-type scale
		  o Intimacy, affection, admiration, satisfaction, and reliable alliance
		- Parallel forms created for teachers and parents to rate
		- Seems like interpersonal support

Correlation	- $r = .41$ with instructional support - $r = .54$ with overall quality (ECERS-R)	- None performed
Reliability	- Acceptable intercoder reliability	- "adequate"
Results	- Teacher-child interactions in the classroom most consistent and strongest correlate with children's development	- Minority students lower scores on teacher-support

Appendix D (Continued)

	Murray & Murray (2004)	Pianta, Belsky, Vandergrift, Houts, & Morrison (2008)
Purpose	- Associations between child demographic characteristics (i.e., race, gender, and disability status), academic orientations (i.e., prior effort, tardiness, and absences), behavioral orientations (i.e., externalizing & internalizing symptomology) and teachers' perceptions of STR quality	- Association between observed classroom supports (emotional & instructional) & trajectories of achievement from 54-mo to fifth grade
Definition	- STR **quality** o Teacher perspective	- **Emotional aspects** of Student-Teacher interactions (sensitivity and emotional warmth) - **Positive classroom climate**

Instruments	- STRS
	  o Originally designed to assess attachment like qualities
	  o Cognitive and affective dimensions of warmth, open communication, involvement, dependency, and hostility
	- Closeness, contains 11 items related to warmth, communication, and involvement in teacher child relations
		- Classroom Observation System (COS)
		  o Classroom-level: overcontrol, chaos, positive/negative emotional climate, detachment of teacher, teacher sensitivity, productive use of instructional time, richness of instructional methods
		  o **Emotional support** = Reverse-overcontrol, reverse-chaos, positive emotional climate, reverse-negative emotional climate, sensitivity
		  o Instructional support = productive time use, instructional methods richness

Correlation	- $r = -.51$ with conflict - $r = -.33$ with externalizing (CBCL) - $r = -.29$ with internalizing (CBCL)	- $r = -.19$ with problem behaviors - $r = -.20$ with STR conflict - $r = -.12$ with teacher depression - $r = -.10$ with child-teacher ratio - $r = -.17$ with percent class poverty
Reliability	- Alpha = .81	- Alpha for emotional support scale = .84
Results	- 14% of the variance contributed by student demo, ac orientation, behavioral orientation (each contributed significantly) - Greater closeness with females - Lower closeness for students with disabilities -	- 2 groups of reader (fast, start off faster, then trail off vs. typical) - 1 group in Math - Teacher emotional support positively significant for "typical" readers

Appendix D (Continued)

	Pianta & Stuhlman (2004)	Saft & Pianta (2001)
Purpose	- Correlation between STRS with student social & behavior outcomes - Stability of teacher ratings from Pre-Kindergarten – 1st grade	- Whether teachers' perceptions of their relationships with students varied as a function of child age, ethnicity, and gender, and teacher ethnicity
Definition	- STRS	- **Teacher perception** of relationship with S - **STRS** Closeness → positive items

Instruments	- STRS (Pianta, 2001) short form
	  ○ Closeness = extent to which teacher feels relationship with student = characterized by warmth, affection, and open communication
		- STRS (Pianta, 1993): Closeness
		  ○ a teacher's feelings about her relationship with a student, the student's interactive behavior with the teacher, and the teacher's beliefs about the student's feeling toward the teacher

Correlation	Convergent: - $r = .25$ between 54-mo & Kindergarten - $r = .18$ between 54-mo & 1st grade - $r = .25$ between K & 1st - $r = .41$ (54-mo), .12 (K), and .23 (1st) with social competence @ 54-mo Discriminant: - $r = -.23$ to -.30 with conflicts - $r = -.36$ with internalizing - $r = -.10$ with externalizing - $r = .01$ with WJ-R Vocabulary	- Did not correlate with other predictors
Reliability	- STRS Closeness $r = .21$ to .31 year-to-year stability (across time & teacher)	- Not reported
Results	- See correlations	- Teacher-student ethnic match was the only significant predictor (R2 change = .032) in predicting teacher feelings of closeness with S

Appendix D (Continued)

	Skinner & Belmont (1993)	Stuhlman & Pianta (2001)
Purpose	- Reciprocal relationship between children's engagement & teacher behavior	- Associations between relationship-focused narratives & teachers' interactions w children in the classroom

Definition	- Teacher-student **interactions**
	 - **Involvement** = quality of interpersonal relationship with teachers and peers; its opposite is rejection or neglect – teachers level of involvement = extent they take time for, express affection toward, enjoy interactions with, are attuned to, & dedicate resources to their Ss
	 - Relationship between STR & engagement mediated by children's perceptions of teacher behavior toward them
		- Adult-child relationships as complex, multifaceted systems
		   o Attachment
		   o Adult's representation of being a secure base, a disciplinarian, a teacher, and a caretaker to the child
		 - Teachers' internal working models of their relation with a specific child examined through narratives elicited in semi-structured interviews

Instruments	- Teachers & students completed questionnaires in Fall & Spring as part of district-wide assessment
	 - Teacher & student self-reports containing 11 & 8 items each, respectively; 4-point Likert-type
		- COS: Total interactions between teacher & student → teacher positive affect, negative affect, teacher sensitivity
		 - Teacher Relationship Interviews
		   o Control/compliance (socialization)
		   o Child's achievement (instruction)
		   o Viewing oneself as a secure base for providing support to the child (**emotional support**)

Correlation	- $r = .23$ between student and teacher reports of involvement - more differentiation between involvement, structure, autonomy support when reported by teachers ($r = .27$ to .65); less differentiation from student reports ($r = .77$ to .81)	- Fairly well agreement among coders to satisfy research purposes, but low for applied/clinical purposes
Reliability	- $r = .72$ between fall & spring (teacher report) - $r = .55$ between fall & spring (student percept)	- Teachers' positive or negative affect in producing narratives stood out as the salient variable that correlated with student and teacher behaviors in the classroom

Results	- Reciprocal student-teacher relationship	- Unique contributions of relationship narratives beyond teacher& student traits
		   o Teacher more neg. affect in narrative, interacted more often with that specific kid in classroom
		   o When teacher talked more about compliance in ref to specific kid, observed to interact less frequently w that kid
		   o Neg. affect more prominent in teachers' relationship narratives about kids toward whom they expressed greater neg. affect in classroom
		   o Significant interaction between Compliance & Negative Affect and teacher experience

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