The Role of Cultural Humility, Teacher-Student Relationship Quality, and Academic Grit on Adolescents' Achievement Outcomes

Lauren Elizabeth Fennimore

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THE ROLE OF CULTURAL HUMILITY, TEACHER-Student RELATIONSHIP QUALITY, AND ACADEMIC GRIT ON ADOLESCENTS’ ACHIEVEMENT OUTCOMES

by

Lauren Fennimore

A Dissertation

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Major: School Psychology

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Abstract

The current study aimed to serve as an exploratory study, describing the nature of student’s relationships with their teachers, perceived cultural humility of their teachers, and their relation to student outcomes, including academic grit and academic achievement. Surveys were completed by high school students (N=81) at two schools in the Mid-South region of the United States. Results indicated that students most often report skin color, gender, or age as their most salient identity. Students also tended to view their teachers as demonstrating positive cultural humility and having developed trust with students. Across variables, only alienation was significantly correlated with grades, in that the more alienation experienced by students the lower the grades earned in their class. These findings indicate the need for research to continue examining the teacher-student relationship quality and the perceived cultural humility of teachers, to better understand their impact on student’s later outcomes. In particular, more research is needed on the impact of negative relationships on later outcomes.
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The Role of Cultural Humility, Teacher-Student Relationship Quality, and Academic Grit on Adolescents’ Achievement Outcomes

In examining factors that influence academic success, the specific environments within which students reside must be considered. Bronfenbrenner’s (2005) ecological systems theory proposes that students reside within different systems, going from their individual or immediate world out to their family, school, or community. Each system consists of relationships and influences that can both directly and indirectly influence factors within each system as well as those within other systems. The bioecological resilience perspective furthers Bronfenbrenner’s (2005) ecological systems theory by proposing that factors within an ecosystem may present as either protective or risk factors that impact one’s overall development and outcomes of success (Woolley & Bowen, 2007). Within the school ecology, teachers serve as one such factor that may either promote or hinder students’ success and interest in school.

Students’ academic success is impacted by the quality of the relationships they have with their teachers. Through their interactions with students, teachers have the opportunity to develop relationships with students which may serve to buffer the effects of negative factors and promote continued success (Woolley & Bowen, 2007). Past research has found teacher support to predict higher academic achievement, engagement, school satisfaction, motivation, and lower risk of dropping out of school when these positive relationships are present (Kincade et al., 2020; Lei et al., 2023; Roorda et al., 2017). Teachers who are successful in fostering these positive relationships are suggested to seek connection, promote communication, and develop trust with students through showing understanding and acceptance (Kiefer et al., 2014; Kincade et al., 2020). In turn, this allows for students to feel more secure in the classroom environment which may make them more willing to put forth effort, more likely to persist on difficult assignments,
and take more risks in learning new material (Bryce et al., 2022; Lei et al., 2023; Roorda et al., 2017). This then may lead students to feel more committed to their education and more capable of doing well academically (Bryce et al., 2022). These relationships with teachers may be particularly impactful for adolescents, as during this time adolescents are particularly sensitive to the impact of such potential risk or protective factors (Woolley & Bowen, 2007).

Positive teacher-student relationships appear important for students continued success, however teacher-student relationships often vary depending on the cultural identities of students, as boys, gender diverse youth, racially/ethnically minoritized youth, and immigrant students tend to possess poorer relationships with their teachers (Chiu et al., 2012; Gower et al., 2018; Hughes et al., 2012; Koomen & Jellsma, 2015; Murray et al., 2008). One potential reason for the disproportionate teacher-student relationship quality may be related to teacher’s personal beliefs or unconscious biases. Research has shown that teachers have been found to endorse stereotypes of students (DeCastro-Ambrosetti & Cho, 2011; Okura, 2022; Rudasill et al., 2023). For example, in one study White kindergarten teachers perceived their relationships with White children more positively and their relationships with Black children more negatively (Rudasill et al., 2023). The endorsement of stereotypes on students, intentionally or unintentionally, has been suggested to impact the teacher’s confidence and belief in student’s abilities which may negatively impact the teacher-student relationship, causing more conflict (García-Fernández et al., 2021). This may then counteract the potential positive impact of teacher-student relationships, decreasing students’ feelings of acceptance, commitment to school, and academic motivation (Blackberry & Kearney, 2021; Civitillo et al., 2021; Fletcher et al., 2011).

Research has begun to examine how cultural factors influence the teacher-student relationship and its outcomes on achievement but has yet to explore how these factors work
together to produce the positive outcomes seen. The present study extends current research by examining students’ perceptions of how cultural factors, such as cultural humility, influence the teacher-student relationship as well as their effects on academic motivation, using academic grit, and achievement. More specifically, two primary models were tested to examine the influence of positive teacher-student relationships and negative teacher-student relationships. In the positive model, we aimed to explore whether academic grit mediates the relation between positive teacher-student relationship quality and academic achievement with positive cultural humility enhancing the impact of positive teacher-student relationship quality (see Figure 1a and Figure 1b). In the negative model, we examined whether academic grit and negative cultural humility buffer the relationship between negative teacher-student relationship quality and academic achievement (see Figure 2).

**Figure 1a.**

*Mediated Moderation Model with TSRQ Communication.*
Figure 1b.

Mediated Moderation Model with TSRQ Trust.

Figure 2.

Moderated Moderation Model with TSRQ Alienation.
Teacher-Student Relationships

While teachers may impact students through several different means, their interactions and resulting relationships with students provide a consistent and lasting influence over the course of the year. These relationships may be conceptualized through teacher-student relationship quality (TSRQ); the perception of positive or negative connections between students and teachers, including the felt trust, communication, and acceptance experienced. As the teacher-student relationship is bi-directional, TSRQ may then be viewed through the viewpoint of students or teachers, providing a picture of the individual’s perception of interactions. While much of the existing research on TSRQ has focused on the teachers’ perspective of their relationships with students (e.g., Saft & Pianta, 2001), more recent research has focused on the students’ perceptions of their relationships with teachers (e.g., Karamane et al., 2023). Through the lens of students, positive TSRQ may be understood as the level of connection and understanding teachers provide to students, while negative TSRQ may be seen as higher levels of alienation perceived in relationships with teachers (Murray & Zvoch, 2011). TSRQ has emerged in the literature as a leading factor informing the impact teachers have on students, both positive and negative, within the classroom (Lei et al., 2023; Kincade et al., 2020; Roorda et al., 2017).

As teachers serve as a primary agent in students’ school ecology, research has examined the impact of teachers on students overall academic outcomes through TSRQ. Related to academics, positive TSRQ has been found to predict higher levels of academic achievement and grade point average for students (Lei et al., 2023; Roorda et al., 2011; Scales et al., 2020a; Scales et al., 2020b). A recent meta-analysis further suggested that the impact of positive TSRQ on academic achievement extended to both immediate achievement outcomes, such as course assignment grades, as well as longer-term achievement outcomes, such as semester grades (Lei
et al., 2023). In addition to the positive academic achievement outcomes, positive TSRQ has
been linked to lower rates of school dropout intention and risk as well as higher levels of student
engagement and academic motivation (Barile et al., 2012; Bergeron et al., 2011; Lessard et al.,
2014; Roorda et al., 2011; Scales et al., 2020a). While the literature has consistently supported
the influence of TSRQ on academic outcomes broadly, the way in which teacher-student
relationships affect these outcomes remains uncertain.

Recent research on TSRQ has begun to explore the potential mechanisms driving the
impact of teacher-student relationships on success outcomes in the academic context. One way in
which high quality, positive teacher-student relationships are suggested to promote academic
achievement is through fostering learning by developing a safe environment in which students
can learn (Bryce et al., 2022; Zee et al., 2021). Teachers may do this through a variety of
strategies, including holding high expectations, developing authentic connections with students,
providing learner-centered instruction, responding to student’s needs, and providing good
classroom management (Kiefer et al., 2014; Kincade et al., 2020). Teachers further develop
positive relationships through providing emotional support as well as a listening ear to students
(Kincade et al., 2020). In doing so, the safe and secure environment created allows students to
explore and learn without concern for scrutiny (Bryce et al., 2022; Zee et al., 2021). These
positive environments further promote classroom engagement (Bryce et al., 2022), as well as
allow for exploration through taking risks in school, enhancing students interest in school and
continual pursuit of academics (Zee et al., 2021). Therefore, it is likely that by developing a
positive environment and connection with students, teachers promote continued academic
interest, motivation, perseverance, engagement, and the development of academic skills that
function to increase students’ academic success.
To better understand how TSRQ improves students’ academic success, two potential mechanisms have been identified, motivation and engagement. Academic motivation has been found to mediate the relation between TSRQ and academic achievement both cross-sectionally (Scales et al., 2020b) and longitudinally (Zee et al., 2021), such that more positive TSRQ relates to higher levels of motivation and thus higher levels of academic achievement. It is suggested that through heightened motivation, students aim to learn more, put forth more effort, persevere, and bounce back from challenges more readily (Lei et al., 2023), which may improve students’ sense of agency or self-efficacy, making goals appear more attainable (Bryce et al., 2022). It may be that through enhanced motivation and interest in academics, students engage in their classes more readily. As such, students’ level of engagement has also been found as a mediator of the TSRQ and academic achievement relation, such that more positive TSRQ promotes higher levels of engagement in school and thus higher levels of academic achievement (Hughes et al., 2012; Roorda et al., 2017). The students’ enhanced engagement in class may allow them to be ready to learn and implement the strategies needed to succeed. It is likely that the positive teacher-student relationship increases students’ effort, persistence, and involvement in class due to the safe environment created by teachers, allowing students to engage in the academic behaviors needed to succeed.

The motivation and engagement mechanisms for TSRQ’s impact on academic achievement among students may also be captured by looking at academic grit. Academic grit relates to a student’s ability to continually pursue academic goals, bounce back from setbacks, and maintain interest in academic goals over long periods of time (Duckworth et al., 2007). These components align with suggestions in the literature that more positive teacher-student relationships enhance students’ ability to cope with stress or minor setbacks, by using necessary
tools in order to maintain focus on learning and achieving academic goals (Bryce et al., 2022). Therefore, it is likely that academic grit may also mediate the relation between positive TSRQ and academic achievement in adolescents.

Grit

Within the field of positive psychology, grit has become a leading non-cognitive factor predicting success both in and outside of school settings. Duckworth and colleagues (2007) define grit as an individual’s continued pursuit and commitment to long-term goals despite setbacks or obstacles. Grit was initially developed to help explain the variation seen in success rates of those with higher cognitive metrics, as while cognitive factors are highly linked to success, in practice this is not always true. The self-report construct was proposed as a general measure of one’s approach and motivation, suggesting that one’s grit would apply to a variety of domains and goals instead of just one (Duckworth et al., 2007). For example, among National Spelling Bee participants, those with high levels of grit were more likely to advance in the competition (Duckworth et al., 2007; Duckworth & Quinn, 2009). Later studies suggested that these participants high in grit were more likely to engage in deliberate practice which requires more intentional and consistent commitment, choosing this practice over more immediately rewarding tasks (Duckworth et al., 2011). This relation of high achieving individuals with high levels of grit as well as high levels of success has also been demonstrated among West Point Cadets and Ivy League undergraduates (Duckworth et al., 2007; Duckworth & Quinn, 2009).

The construct of grit may also be broken down into two components: perseverance of effort and consistency of interest (Duckworth & Quinn, 2009). The perseverance of effort component refers to an individual’s drive to bounce back from setbacks, developing novel ways of overcoming obstacles or approaching their goal. The consistency of interest component refers
to one’s pursuit towards a specified long-term goal for a prolonged duration, often for years if not decades. While each component of grit has been shown to predict performance and retention in school independently (Credé et al., 2017; Duckworth et al., 2007; Duckworth & Quinn, 2009; Eskreis-Winkler et al., 2014), perseverance of effort has shown more consistency in predicting achievement (Credé et al., 2017). Further research has highlighted concerns with the psychometric properties of the consistency of interest component, with some suggesting perseverance of effort to better capture grit (Credé et al., 2017; Eskreis-Winkler et al., 2014). However, perseverance of effort cannot be considered without acknowledging the passion and consistency needed for one to achieve and stick to their goals (Jachimowicz et al., 2018). Duckworth and colleagues (2021) responded to the concerns raised in the literature regarding the dimensionality of grit, admitting that the originally proposed factor structure is not adequate and necessitates further exploration of models of grit. The authors encouraged continued examination and refinement of grit and its components to better conceptualize the construct through the development of new measures of grit (Duckworth et al., 2021).

In response to the questions raised about grit’s factor structure and the utility of the consistency of interest factor, researchers have begun to explore more domain-specific measures of grit. One such construct is academic grit, which may be assessed by The Academic Grit Scale (AGS; Clark & Malecki, 2019). Academic grit aims to evaluate children and adolescents’ continued pursuit towards long-term goals within the academic context, and consists of three main sub-areas, determination, resilience, and focus. The determination area is similar to the original perseverance of effort sub-scale, focusing on one’s continued pursuit towards academic goals. The resilience area encompasses both perseverance of effort and consistency of interest, with a focus on one’s continued pursuit through setbacks and sustained interest despite setbacks.
The focus area encapsulates consistency of interest through a focus on long term academic goals. Overall, the construct has demonstrated strong internal consistency (alpha=.92) and criterion-related validity related to academic achievement ($b=0.49$), GPA ($b=0.31$), life satisfaction ($b=0.58$), and school satisfaction ($b=0.65$; Clark & Malecki, 2019). Academic grit also demonstrated strong construct validity with general grit ($b=0.51$), as well as incremental validity beyond general grit (Clark & Malecki, 2019).

Academic grit is a relatively new construct in the literature. However, the impact of general grit on the academic context has been established in the literature with research consistently demonstrating the link between grit and academic success (Credé et al., 2017; Duckworth et al., 2007; Duckworth & Quinn, 2009; Eskreis-Winkler et al., 2014). Within the school ecology, teachers have been shown to serve as an important factor in relation to grit and could have a more pronounced role in supporting the development of academic grit. Previously, poor social support provided from teachers was found to buffer the relation between grit and academic achievement among adolescents (Clark et al., 2020), suggesting that grit may make up for a lack of teacher support in the classroom. The buffering effects of the impact of teachers on grit has also applied to teacher-student relationship quality (TSRQ). Research has found that grit makes up for negative TSRQ, such that negative effects of the poor relationships are mitigated by high levels of grit (Lan & Moscardino, 2019; Lee & Ha, 2022). However, the buffering relation between TSRQ and grit has only been examined with general grit and on behavioral outcomes, such as student engagement (Lan & Moscardino, 2019; Lee & Ha, 2022). It is possible that when negative TSRQ is present, academic grit will buffer against the negative effects of a poor relationship on academic outcomes. In other words, negative TSRQ may moderate the relation between higher levels of academic grit and higher academic achievement.
The potential buffering effect of grit on TSRQ and academic achievement is in contrast to the potential mediating role of academic grit on TSRQ and academic achievement mentioned previously. As discussed, motivation and engagement have been found to mediate the relation between positive TSRQ and academic achievement (Roorda et al., 2017; Scales et al., 2020b; Zee et al., 2021). It is theorized that positive TSRQ fosters motivation and engagement through the enhancement of student’s interest in school, ability to overcome obstacles and challenges, remain focused and attentive in school despite distractions, and continually pursue their goals (Bryce et al., 2022; Lei et al., 2023). Research has yet to examine the potential mediating role of academic grit on the relation between positive TSRQ and academic achievement. As such, while grit has been suggested to serve as a moderator buffering the relation between negative TSRQ and academic achievement, it is also possible that academic grit may serve as a mechanism through which positive TSRQ affects academic achievement. However, further research is needed to determine the impact of academic grit in these competing models.

**Cultural Factors**

As public schools in the United States of America are becoming increasingly diverse, research has begun to focus more on addressing the impact of differing identities on our use and knowledge of culturally responsive techniques in the classroom (Schaeffer, 2021). However, more work is needed to better understand student experiences. Additionally, the school systems in the United States reflect the broader systemic inequalities in our society, which disproportionally affects minoritized students. These impacts are partially manifested by discrimination and the disproportionate use of discipline and special education referrals for racially minoritized students, which leads to the school-to-prison pipeline (Agudelo et al., 2021). While calls for action to implement change have been made, the impact of systemic inequalities
continues to be experienced by minoritized students. These inequalities are often perpetuated through existing systems within schools as well as through the actions of individuals, including teachers.

One way in which teachers perpetuate inequality is through the endorsement of stereotypes that then impact students’ educational experiences and motivation in school. Research has found teachers to classify students based on their physical appearance, aligning with racial and gender stereotypes, which are then used to make decisions for students (DeCastro-Ambrosetti & Cho, 2011; Okura, 2022). When these stereotypes are endorsed, both intentionally and unintentionally, teachers tend to perceive minoritized students as low achievers, lack confidence in their abilities, and attribute their success to external instead of internal forces (García-Fernández et al., 2021). As teachers hold immense power in students continued outcomes, such as through grades or placement in advanced courses, the impact of stereotyping on teachers’ perception of students may have effects on students' later outcomes, such as educational attainment. Further, the impact of stereotyping may hold more lasting implications for students by undermining their overall feelings of belonging, integration at school, engagement in class, and their motivation to pursue academic goals in the future (Blackberry & Kearney, 2021; Civitillo et al., 2021; Fletcher et al., 2011). These lasting effects present minoritized students with additional challenges and risks above and beyond those already faced in academic settings due to teachers’ personal biases (Steketee et al., 2021), further perpetuating systemic inequalities.

Considering the power imbalance between teachers and students and negative effects of the endorsement of stereotypes by teachers, various methods of counteracting bias to promote more culturally responsive approaches for teachers have been explored. Currently, much of the
research in this area focuses on more preventive teacher implemented strategies, such as the use of anti-oppressive practices in the classroom, culturally responsive teaching, authentic caring, and empathic discipline (Daftarry & Sugrue, 2022; Fletcher et al., 2011; Kumi-Yeboah et al., 2021; Newcomer, 2018; Okonofua et al., 2016). Teachers are recommended to practice these approaches by striving to recognize, acknowledge, and value students varying identities, continually pursue a better understanding of student’s diverse identities, view students’ identities as an asset instead of a deficit, and approach misbehavior from a stance of remediation and curiosity (Fletcher et al., 2011; Kumi-Yeboah et al., 2021; Newcomer, 2018; Okonofua et al., 2016). Strategies suggested to help facilitate these practices include a flexibility in teaching methods, academic support, care expressed towards students, and an intention to develop positive teacher-student relationships (Kumi-Yeboah et al., 2021; Newcomer, 2018). These practices are intended to improve teacher-student relationships, as well as students’ academic achievement, engagement, interest in learning, enjoyment of school, academic motivation, and overall educational trajectory (Blackberry & Kearney, 2021; Fletcher et al., 2011; Kumi-Yeboah et al., 2021; Newcomer, 2018; Salcido & Stein, 2023; Yu et al., 2022). In more recent literature, cultural humility has emerged as a growing area of interest that incorporates many of the existing strategies supported in the literature.

Cultural humility is grounded in its focus on one’s openness to others, awareness of intersectionality and differing identities, reflection on one’s own behavior and identities as they relate to others, and commitment to continually learning and reflecting on these impacts (Hook et al., 2013). As suggested in the multicultural orientation framework, the embodiment of cultural humility in combination with cultural opportunities and comfort may create a more welcoming environment in which individuals may be seen (Davis et al., 2018). While this framework was
developed with intentions for use in a therapeutic context, it’s components may be transferred to an academic context. In the schools, cultural humility may focus on the development of positive teacher-student relationships through facilitating teacher’s reflection on their own identities and limitations, knowledge of diverse identities broadly, valuing the identities of others, and integrating this understanding into teaching practices and course curriculum (Fletcher et al., 2011; Kumi-Yeboah et al., 2021; Newcomer, 2018). Lund and Lee (2015) proposed the use of a social justice oriented pre-service course to enhance components of cultural humility which increased student teachers use of self-reflection, openness to differing identities, and integration of their knowledge into teaching practices. These strategies aim to dismantle the existing discrimination experienced in schools at the hands of teachers, and as a result aid in supporting student success more broadly.

When embodied by teachers within the school environment, cultural humility may promote students’ overall well-being and academic success. Foremost, culturally responsive teaching through cultural humility has improved the overall teacher-student relationship, creating a safe environment for students within the classroom (Fletcher et al., 2011; Gaias et al., 2020; Slaton et al., 2023). In turn, this improved relationship has been linked to increased academic achievement, engagement, and grades in school, as well as students’ academic motivation (Fletcher et al., 2011; Gaias et al., 2020; Yu et al., 2022). Yu and colleagues (2022) suggested that utilizing cultural knowledge and background in teaching enhances students value of assignments and overall confidence in the classroom. Further, research has suggested that cultural humility strengthens relationships as those with higher levels of cultural humility tend to present with more forgiveness and focus on the positive (McLaughlin et al., 2019). Thus, it is possible that cultural humility may strengthen TSRQs effect on academic grit in turn improving
students’ grades. However, research has yet to examine the impact of cultural humility on this dynamic system.

Few studies have explored the impact of cultural factors on grit. Of the existing research on grit and cultural factors, much of the literature has focused on assessing the applicability of the construct across cultures (e.g., Datu et al., 2020, Raphiphatthana et al., 2019), largely finding grit to demonstrate strong cross-cultural relevance with some variation in item level differences on the measures across gender and race/ethnicity (Gonzalez et al., 2020). As previous studies have documented culturally responsive practices, such as cultural humility, to enhance motivation more broadly, it seems likely that grit may also be impacted by these factors (Gaias et al., 2020; Salcido & Stein, 2023). The current study fills this gap by examining the potential relation between cultural humility and academic grit, as well as the role of cultural humility, academic grit, and TSRQ on academic achievement through evaluating the unique variance of each and competing models.

**Purpose of the study**

Teachers serve as a key factor influencing student success outcomes by providing emotional and educational support, and promoting an interest in school (Kincade et al., 2020). By providing or failing to provide these supports, teachers develop either positive or negative relationships with their students which have been found to impact later outcomes including academic achievement, school engagement, and risk of drop out (Barile et al., 2012; Bergeron et al., 2011; Lei et al., 2023; Roorda et al., 2017). As studies have begun to examine potential mechanisms of the relation between TSRQ and academic success outcomes, it has been suggested that students present with an enhanced interest, persistence, and resiliency in pursuit of academic goals when they also hold positive relationships with teachers (Bryce et al., 2022; Lei...
et al., 2023; Roorda et al., 2017; Zee et al., 2021). Research has shown student motivation (Scales et al., 2020b; Zee et al., 2021) and school engagement (Hughes et al., 2012; Roorda et al., 2017) to mediate the relation between positive TSRQ and academic achievement but has yet to examine the role of academic grit on the relation between TSRQ and academic achievement (Lei et al., 2023; Roorda et al., 2017). In comparison, the role of grit on behavioral outcomes, such as school engagement, has suggested support for a buffering effect when TSRQ is negative (Lan & Moscardino, 2019; Lee & Ha, 2022). However, given the presence of competing models within the literature, more research is needed to understand academic grit’s impact on TSRQ and academic achievement.

Teachers and students each present with their own unique identities, making it vital to consider the impact of culture on the quality of teacher-student relationships. Cultural humility represents a potential factor influencing teachers’ interactions with students (Fletcher et al., 2011; Gaias et al., 2020; Slaton et al., 2023), as it assesses teacher’s acknowledgement and respect for the identities of others (Davis et al., 2018; Hook et al., 2013). Several studies have suggested that teachers may be key agents for dismantling the systemic racism and disproportionality experienced by minoritized students in educational contexts (Agduelo et al., 2021; Stekette et al., 2021). It seems reasonable that cultural humility would impact TSRQ across students and its ability to affect academic achievement through academic grit. However, research on the role of cultural humility on these factors has yet to be examined.

The current study examined how cultural humility, TSRQ, and academic grit relate to high school students’ academic achievement while controlling for race/ethnicity, gender, and teacher subject area (i.e., English, math, or science). Path analysis was used to examine three different theoretical models presented in the literature, including a moderated moderation model
and two mediated moderation models. The moderated moderation model (see Figure 2) aligned with several previous studies suggesting grit and TSRQ to serve as buffers for each other. In instances where one is low and the other is high, the high variable mitigates the potential negative effects of the low variable (Lan & Moscardino, 2019; Lee & Ha, 2022). In the moderated moderation model, TSRQ Alienation was expected to moderate the relation between academic grit and achievement such that when more TSRQ Alienation was present, high academic grit would have predicted higher academic achievement. Additionally, negative cultural humility was expected to strengthen the buffering effects of TSRQ Alienation on academic grit, in that more negative cultural humility would have strengthened the effect of TSRQ Alienation when TSRQ Alienation was high. The mediated moderation models (see Figures 1a and 1b) aligns with research on the mediating role of motivation (Scales et al., 2020b; Zee et al., 2021) and school engagement (Hughes et al., 2012; Roorda et al., 2017), as well as the academic performance model (Farrington et al., 2012), which points to the importance of academic persistence (i.e., grit) on academic outcomes. However, this has yet to be examined empirically. It was expected that positive TSRQ, captured by TSRQ Communication and TSRQ Trust, would contribute to academic grit, and this relation would be strengthened by positive cultural humility. Academic grit was then expected to relate to higher academic achievement.

Addendum

To examine the research questions proposed by this study, an anticipated sample size of 350 was targeted to ensure adequate power for the planned analyses. In the fall of 2023, a single high school with 850 students in the Mid-South was secured for data collection, which seemed reasonable given previous experiences collecting data and the size of the school. Unfortunately, only 47 participants were recruited across December and January. Due to the low parental
response rate, a second school with approximately 1,200 students was recruited in the Mid-South with a planned data collection for the end of February. However, due to unforeseen circumstances, the school withdrew from the study just prior to the planned data collection. Throughout that March, numerous schools across the Mid-South area as well as in the Southern Midwest were approached about participating in this study. However, all but one school declined or failed to respond to multiple requests. A third school was secured at the end of March and data collection was completed in early April. A total of 34 additional participants were recruited, for a grand total of 81 participants across both schools.

Due to the unforeseen difficulty in data collection, the available sample size was not sufficient to complete the planned analyses. Therefore, the research questions and planned analyses were modified to reflect approaches that were feasible given the available data. This deviation reduces the severity of the study, as the likelihood of being able to accurately detect whether a hypothesis is supported or not is reduced (Lakens, 2024). Thus, revised research questions and planned analyses were developed to align as closely as possible to those set forth initially in order to maintain as much severity as possible. Additionally, while these questions were generated post-hoc, they were developed during the data screening process before analyses were completed. The revised research questions comprise a combination of descriptive and relationally focused questions, and reflect a reframing of this work as an exploratory study. The revised study focused on key areas, including cultural identities of students, perceived cultural humility, teacher-student relationship quality, the occurrence of teacher-student match, and exploring relations between variables.
Cultural Identities

Student’s identities are important and impactful in how they interact with and perceive the world around them (Ceccon et al., 2024; Smith et al., 2022). Adolescents who have explored their ethnic identity, reporting increased acceptance of their identity, have been suggested to report increased academic self-efficacy, self-esteem, academic aspirations, academic achievement, optimism, and positive development (Johnson et al., 2023; Meca et al., 2017; Smith et al., 2022; Thomas et al., 2022). However, when an individual reports more confusion regarding one’s own identity or experiences microaggressions, the likelihood of disconnection from one’s own identity, aggression, or lower self-esteem increases (Meca et al., 2017; Thompson et al., 2016). As one’s identity appears to have an impact on student’s academic outcomes, it is important to acknowledge student’s varied cultural identities within schools to allow for their continued development and acceptance. Considering the importance of one’s identity, the current study aimed to describe the most salient identities students report. To the authors knowledge, no research thus far has examined the impact of the importance of a range of salient identities. The current study aimed to explore student’s salient identities and their importance with the following questions:

1. What do students report as their most salient cultural identity?
2. How important are these salient identities to students?

Cultural Humility

Student’s cultural identities impact their experiences interacting with others which impacts their own self-concept (Meca et al., 2017; Smith et al., 2022; Thompson et al., 2016), making it important to consider teachers handling of student’s varying identities. Research has shown that teachers have been found to endorse stereotypes of students that then impact their
beliefs of student’s abilities and the decisions made for students (DeCastro-Ambrosetti & Cho, 2011; Okura, 2022). To combat the effects of personal bias and systemic inequality in schools, various approaches have been developed (Agudelo et al., 2021; DeCastro-Ambrosetti & Cho, 2011; Okura, 2022; Schaeffer, 2021). Many of these approaches focus on strategies for teachers to implement, such as culturally responsive teaching, anti-oppressive practices, authentic caring, and empathic discipline (Daftarry & Sugrue, 2022; Fletcher et al., 2011; Kumi-Yeboah et al., 2021; Newcomer, 2018; Okonofua et al., 2016). While each of these strategies often uplift the embodiment of components of cultural humility in teachers, little research has explored cultural humility within a school context.

The current study aimed to explore how students perceive their teacher’s embodiment of cultural humility, exploring both positive and negative cultural humility. Additionally, due to the potential endorsement of racial or gender stereotypes on students (DeCastro-Ambrosetti & Cho, 2011; Okura, 2022), it is possible that perceived cultural humility may differ based on these demographic factors. Thus, the current study explored whether there may be differences in perceived positive or negative cultural humility depending on a student’s race/ethnicity or gender. The following questions were used to explore student’s perceived cultural humility of teachers:

3. What are students’ perceptions of their teacher’s cultural humility?

4. Are there differences in students reported Positive Cultural Humility or Negative Cultural Humility across race/ethnicity? What about for gender?

**Teacher-Student Relationship Quality**

While a large body of research has examined teacher-student relationship quality, many of these studies have utilized different measures and often focus on teachers’ perceptions of these
relationships (Murray & Zvoch, 2011). However, there is an emerging awareness of the need to understand student’s perceptions of their relationships with teachers and how these may differ from teacher reports (Karamane et al., 2023; Murray & Zvoch, 2011). The current study aimed to add to the literature through exploring students’ experiences regarding their relationships with teachers by describing student’s levels of perceived Communication, Trust, and Alienation with their teachers. Additionally, teacher-student relationship quality has been found to vary depending on cultural identities of students. For example, boys and racially/ethnically minoritized youth tend to report poorer relationships with their teachers (Chiu et al., 2012; Gower et al., 2018; Hughes et al., 2012; Koomen & Jellsma, 2015; Murray et al., 2008). Thus, it is important to examine whether students’ perceptions of their teacher-student relationship quality, as assessed by Communication, Trust, and Alienation, differs depending on the gender or race/ethnicity of students. The following questions were used to explore teacher-student relationship quality as reported by students in the current sample:

5. How do students report their relationships with teachers across the domains of Communication, Trust, and Alienation?

6. Are there differences in students reported teacher-student relationship quality (Communication, Trust, or Alienation) across race/ethnicity? What about for gender?

**Teacher-Student Match**

In examining teacher-student relationships, it is important to consider the influence of teachers and students’ cultural identities. Research has shown that students who have a teacher who looks like themselves (i.e., teacher-student match), holding the same cultural identities, perform better in school, experience increased learning, and improves teachers’ perceptions of
students (Civitillo et al., 2023; Rudasill et al., 2023). The impact of teacher-student match on race/ethnicity and gender has been seen in students as young as those in kindergarten (Rudasill et al., 2023). While the positive impact of having a teacher who matches a student’s identities has been documented, it is unclear if this teacher-student match has an impact on perceived cultural humility, teacher-student relationship quality, or academic grit. The current study explored the potential impact of teacher-student match across race/ethnicity, gender, and both race/ethnicity and gender on core variables. The following questions were used to explore the impact of teacher-student match within the sample:

7. How often do students’ identities overlap with their teachers’ identities across gender, race/ethnicity, and both gender and race/ethnicity?

8. Are there differences in students’ reported teacher-student relationship quality (Communication, Trust, and Alienation), cultural humility (positive, negative), academic grit, or academic achievement depending on whether students identities overlap with their teachers in terms of race/ethnicity, gender, and both race/ethnicity and gender?

Relations Across Variables

This study sought to explore and describe the nature of relations among variables to serve as a pilot study for the exploration of the dynamic system between teacher-student relationship quality, cultural humility, academic grit, and academic achievement that was originally intended. Past research has found more positive teacher-student relationship quality to impact students’ success in school, including their academic achievement, school engagement, and motivation (Barile et al., 2012; Bergeron et al., 2011; Lei et al., 2023; Roorda et al., 2017). It is suggested that these positive teacher-student relationships foster a safe environment within which students
may feel more comfortable taking risks as well as feel more motivated to engage and persist in school (Bryce et al., 2022; Lei et al., 2023; Roorda et al., 2017; Zee et al., 2021). While research has found teacher-student relationship quality to predict an increase in students’ motivation (Scales et al., 2020b; Zee et al., 2021) and school engagement (Hughes et al., 2012; Roorda et al., 2017), the impact of teacher-student relationship quality has yet to be examined in relation to academic grit. Currently, to the authors knowledge, research has yet to explore the impact of cultural factors on the relation between grit and teacher-student relationship quality despite the integral influence of differing identities on relationships. Studies utilizing culturally humble practices (e.g., culturally responsive teaching) have found potential links to increased teacher-student relationship quality and achievement outcomes (Fletcher et al., 2011; Gaias et al., 2020; Slaton et al., 2023), which may suggest that perceived cultural humility may be linked to students’ relationships with their teachers and higher grades. Srisarajivakul and colleagues (2023) found a positive relationship between perceived cultural humility and teacher-student relationship quality, suggesting feeling accepted by their teachers promotes positive relationships between teachers and students. However, little research has examined how cultural humility may relate to academic grit or academic achievement outcomes.

The current study explored relations between teacher-student relationship quality (Communication, Trust, Alienation), cultural humility (positive, negative), academic grit, and academic achievement using correlations. To maintain the integrity and severity of the project, instead of exploring the originally proposed models multiple regression was utilized to examine whether positive teacher-student relationships and cultural humility predicted higher academic grit or academic achievement, respectively, as well as whether negative teacher student relationships and cultural humility predicted lower academic grit or academic achievement,
respectively. The following questions were used to explore the relations between key variables in the study:

9. How do cultural humility (Positive and Negative), teacher student relationship quality (Communication, Trust, and Alienation), academic grit, and academic achievement relate to each other?

10. Do Communication, Trust, and Positive Cultural Humility predict higher levels of academic grit and academic achievement in students, respectively?

Do Alienation and Negative Cultural Humility predict lower levels of academic grit and academic achievement in students, respectively?

**Method**

**Participants**

Participants in 9th through 12th grade were recruited from two public high school in the Mid-South region of the United States. A total of 81 students participated from one public (n=47) and one charter (n=34) high school in the Mid-South region of the United States. Students spanned all grades, with 12.3% in 9th grade, 59.3% in 10th grade, 19.8% in 11th grade, and 8.6% in 12th grade. Regarding race / ethnicity, 72.8% identified as Black, not Hispanic, 22.2% as White, not Hispanic, 2.5% Multiracial, 1.2% Hispanic / Latinx, and 1.2% Asian / Pacific Islander. Regarding gender, 75.3% of students identified as young women and, 24.7% identified as male. Students ranged in age from 15 to 18 years old, with a mean age of 15.94 years old (SD = 0.87). To be included in the study, parental consent and students assent were required, and all core measures (teacher-student relationship quality, Cultural Humility, and academic grit) had to be completed. Descriptive statistics for the sample demographics are provided in Table 1.
Table 1.

Demographics of Participants.

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Measures

Academic Grit

The Academic Grit Scale (AGS; Clark & Malecki, 2019) is a self-report measure of an individual’s grit or continued pursuit towards long-term academic goals within the educational context, and encompasses three areas: Determination, Resilience, and Focus. The Determination area contains four items and assesses the student’s continued effort exerted for academic goals, including items such as “I am determined to give my best effort in schoolwork.” The Resilience area contains four items and assesses the student’s ability to bounce back from and maintain interest in goals through setbacks, with items such as “I work toward my academic goals no matter how long they take to reach.” The Focus area contains two items and assesses students’ long-term pursuit towards academic goals. Items include “I am able to balance working hard in school with my other hobbies and interests.” For each question, participants rated the relation of
each statement to oneself using a 5-point Likert scale ranging from 1, *not at all like me*, to 5, *very much like me*. Ratings across all ten items were averaged to identify one total academic grit score, of which higher scores indicate higher levels of academic grit. The AGS has demonstrated very good internal consistency with a Cronbach’s alpha ranging from .92 to .96 across studies (Clark & Malecki, 2019; Kaya & Karakoc, 2022). Factor analytic support for one global factor of academic grit was supported as the single latent factor accounted for about 50% of the variance in an EFA with each item retained holding a factor loading exceeding .60 (Clark & Malecki, 2019). See Appendix A for the full measure.

*Teacher-Student Relationship Quality*

The Inventory of Teacher-Student Relationships (IT-SR; Murray & Zvoch, 2011) is a self-report measure of a student’s perceived relationship with their teacher consisting of three factors: Communication, Trust, and Alienation. As the measure refers to a student’s relationship with a single teacher, students were asked to complete the measure while thinking of their math, English, or science teacher for the year. As each student only completed the measure once, the content-area of the teacher was counterbalanced across students and remained consistent for all measures related to teachers. The Communication factor contains eight items and assesses a student’s level of comfort in talking with their teacher as well as their teacher’s ability to empathize or respond to the student’s needs. Items include “I can count on my teachers when I need to get something off my chest.” The Trust factor contains five items and assesses a student’s feelings of acceptance or respect from their teacher, with items such as “My teachers accept me as I am.” The Alienation factor contains four items and assesses a student’s negative connection with their teacher as conveyed through feelings of emotional detachment from their teacher, with items such as “I feel that no one understands me.” All 17 items were rated on a 4-
point scale ranging from 1, almost never or never true, to 4, almost always or always true. The measure does not yield a total score, but rather three subscale scores calculated by averaging items within each subscale. These scores consist of the Communication, Trust, and Alienation subscales that were each used in the current study.

The IT-SR has demonstrated moderate to strong internal consistency among diverse middle school students with Cronbach’s alpha coefficients ranging from .72 to .89 (Murray & Zvoch, 2011), as well as among diverse and at-risk high school students with Cronbach’s alpha coefficients ranging from .69 to .88 (Pham et al., 2021). Additionally, within a sample of diverse middle school students, the IT-SR demonstrated concurrent validity with three measures of teacher support (i.e., the Child and Adolescent Support Scale, the Network of Relationships Inventory, and the Student-Teacher Relationship Scale; Murray & Zvoch, 2011). For the overall score, correlations ranged from .29 to .70 and for each factor correlations ranged from .31 to .74 (Murray & Zvoch, 2011). See Appendix B for the full measure.

**Cultural Humility**

The Cultural Humility Scale for Students (CHS-S; Srisarajivakul et al., 2023) is a self-report measure of students perceived cultural humility practiced by teachers. Prior to completing the measure, students first completed an introductory exercise aimed at priming students to think about aspects of culture that may be important to their identity. Students then were prompted to identify the aspect of their culture that is most important to their identity, with the option to identify two additional cultures that are central to their identity. Possible identities included skin color, Ethnicity, nationality, gender, age, sexual orientation, religion, disability, body size, neighborhood, and other (with a write in option). Students then rated the importance of each chosen identity on a 5-point scale from 1, not important at all, to 5, very important. After
selecting personal cultural identities, the students were then asked to think about a pre-specified teacher, provide basic demographic information on this teacher (i.e., gender, perceived race/ethnicity, and perceived age range), and to think about this teacher while completing the remainder of the measure. For purposes of this study, the teacher specified was either the student’s math, English, or science teacher. The teacher specified was counterbalanced across participants using Qualtrics.

The measure consists of 11 total items that relate to teachers’ demonstration of cultural humility as perceived by students with two factors: Positive Cultural Humility and Negative Cultural Humility. Of note, teachers’ demonstration of cultural humility relates to all cultural identities of importance to students. The Positive Cultural Humility factor contains seven items and assesses the demonstration of higher levels of cultural humility, acknowledging and recognizing students’ identities. The Negative Cultural Humility factor contains four items and assesses a lower or lack of cultural humility demonstrated by the teacher through more closed-mindedness. All items include the base statement, “Towards this part of my culture, my teacher…” in addition to statements that complete the sentence. For example, one item from the Negative Cultural Humility factor states, “assumes he/she already knows a lot” and one item from the Positive Cultural Humility factor states, “asks questions when unsure.” Students indicated their agreement with each statement provided on a 5-point scale ranging from 1, really disagree, to 5, really agree. While the measure does not yield a total score, items within the Positive Cultural Humility and Negative Cultural Humility subscales were averaged to create subscale level scores that were each used for the current study.

The CHS-S has demonstrated adequate reliability as the positive factor demonstrated good reliability with a Raykov’s rho of .86, and the negative factor demonstrated acceptable
reliability with a Raykov’s rho of .70. Additionally, factor analytic support was found, as the
two-factor model accounted for about 50% of the variance across both EFA and CFAs completed
at measure creation and each item retained possessed a factor loading above .40 (Srisarajivakul
et al., 2023). The CHS-S also demonstrated full invariance across gender (boys and girls) and
partial invariance at the metric level across race/ethnicity (White and Black/African American)
and grade level (middle and high school; Srisarajivakul et al., 2023). See Appendix C for the full
measure.

**Academic Data**

The participating schools provided data regarding students’ academic achievement, in the
form of student grades. Participating students’ numeric grades in core subject areas (i.e., English,
Math, and Science) were collected from school officials using report cards, and were used as an
outcome variable in subsequent analyses.

**Procedure**

This study was approved by the University of Memphis Institutional Review Board
(#PRO-FY2023-462). As the current study intended to look at teacher-student relationships, data
collection was planned for December of 2023 to allow time for the teacher-student relationship
to be established and grades to be completed for the second quarter. Data were collected at
multiple time points; December 2023, January 2024, and April 2024. School A began collecting
data in December 2023 and 11 participants completed the survey following the initial request for
parent consent. A second wave of consent forms were distributed to parents and a second data
collection occurred at school A in January 2024. Four participants were administered the survey
in December and January in error, and the first administration was retained to minimize potential
impacts of repeat exposure to survey measures. The January wave resulted in 36 additional
participants. The final data collection occurred in April 2024 and consisted of 34 participants from school B.

In addition to distributing parental consents via email, both schools requested the use of paper consent forms to garner support. Therefore, consent requests were distributed to parents electronically via email and paper copies were also sent home. Parents could sign and return the hard copy or utilize a QR code provided on the form for electronic submission. At school B, one of the researchers attended a parent teacher conference night at the school to promote the study and boost participation. For students at the age of 18 at the time of data collection, consent was provided by the student themselves. A list of participating students was distributed to teachers. Data were collected via a password protected online survey utilizing Qualtrics software during a class period identified by the school.

At the time of data collection, teachers utilized the list of participating students created from parental consents to distribute survey links for each student. The survey was administered online at each high school during a class period selected by the school that was not one of the academic areas being assessed (e.g., English, Math, or Science). Teachers were instructed to read a script (see Appendix D) prior to providing the survey to students. School A followed the planned procedure; however, school B emailed the survey to students instead of allowing them to complete the survey during the identified class period and did not read the script. At the beginning of the survey, students were provided information on confidentiality and asked for assent prior to beginning the survey. If the student did not assent, then the survey was discontinued. If assent was provided, students were asked to provide demographic information (i.e., racial/ethnic identity, gender, age, grade), as well as their student ID number so that the academic data may be linked to their survey responses. Students were then asked to complete the
survey measures in the following order: the Academic Grit Scale, Inventory of Teacher-Student Relationships, and Cultural Humility Scale for Students. Regarding teacher-related measures (Inventory of Teacher-Student Relationships; Cultural Humility Scale for Students), students were counterbalanced and randomly assigned to complete the measures while thinking about their English, Math, or Science teacher. Students were required to provide a response to each question before moving onto the next, but a “prefer not to answer” option was available for all questions. At the conclusion of the survey, participants were thanked for their time. School A received pizza for their participation (as planned) but participants at school B received a voucher to wear desired footwear to school for a day as well as were entered into a raffle for a gift card (4 Starbucks or 4 Chick-Fil-A; each at a $10.00 value).

To collect information on students’ academic achievement (i.e., English/math/science grades), the school provided student grades. It was originally proposed that students’ grades from the end of the second quarter would be collected, which aligned to the projected December data collection. However, because data at the two schools were collected at different timepoints (December-January and April), each school provided student grades from the marking period closest to the data collection (second and third quarter, respectively). This information was provided using a FERPA compliant OneDrive folder provided by the researchers with student ID numbers and needed subjects for grades to connect grades with survey data. The grades and survey data were merged to create a master file and student ID numbers were deleted from the master file following the merging process.

**Planned Analyses**

Data were screened for univariate outliers, normality, multicollinearity, and missingness. Additionally, regarding missingness, multiple imputation was utilized and imputed values from
the 20 imputed data sets were averaged to create a final data set (Asendorpf et al., 2014; Enders, 2017; Grund et al., 2016). It was necessary for the researcher to create the final data set to allow for mean comparisons containing multiple independent variables (e.g., analyses of variance (ANOVA) and multivariate analyses of variance (MANOVA)), as multiple imputation in SPSS does not support pooled results for these analysis types (Grund et al., 2016). The final data set was then utilized to complete all analyses to maintain consistency. Additionally, findings were cross checked with the original multiple imputation data set, where able, to ensure fidelity of the new data set.

Because data were collected across two schools and were then collapsed for analyses it was important to screen data for differences in key variables across demographic factors through a multivariate analysis of variance (MANOVA). A MANOVA was selected due to the need to test differences among multiple independent variables with more than two levels on several dependent variables which would necessitate a series of ANOVAs. However, conducting multiple ANOVAs raises the family-wise error rate, increasing the risk of detecting an effect when it is not present (Pallant, 2016). It should be noted that ANOVAs were utilized as follow-ups when multivariate tests were significant, as this would indicate further analysis of differences on the independent variable is warranted and may accurately be detecting a significant effect. More specifically for this analysis, independent variables were school, grade level, and teacher’s subject areas (Math, Science, and English). Dependent variables were cultural humility (positive cultural humility and negative cultural humility subscale scores), teacher-student relationship quality (communication, trust, and alienation subtest scores), academic grit, and academic achievement as indicted by numeric grade. Any statistically significant differences were reported. Although these variables represent potential covariates, due to the small sample size
controlling for these variables isn’t feasible. If differences were present, subsequent results were interpreted with extreme caution.

Power was assessed using G*Power 3.1 to assess needed sample sizes for MANOVA and regression analyses. For the MANOVA, the largest MANOVA to be completed was tested first to determine a baseline sample size needed. The special effects and interactions statistical test was used with .25 entered as a medium effect size, .05 significance level, .80 power level, 7 groups, 3 IVs, and 7 DVs. A minimum sample size of 35 was recommended based on these factors. For the Regression, the linear multiple regression statistical test was used with two-tails, .15 entered as a medium effect size, .05 significance level, .80 power level, and 3 predictors. A total sample size of 43 was recommended based on these factors. To this end, the current study now intends to serve as an exploratory study that aims to describe and explore differences in student’s relationships with their teachers as seen in the current sample.

**Cultural Identities (Questions 1 and 2)**

To describe students’ most salient cultural identities, frequency counts were reported for student’s first, second, and third most salient identity. Descriptive statistics, including means, standard deviations (SD) and ranges, were utilized to explore student ratings of importance (1= *not important at all*, to, 5= *very important*) for each salient identity. These importance ratings were reported for the first, second, and third salient identities provided to better understand students’ salient cultural identities.

**Cultural Humility (Questions 3 and 4) and Teacher-Student Relationships (Questions 5 and 6)**

Descriptive statistics were reported on Positive Cultural Humility and Negative Cultural Humility as well as IT-SR Communication, Trust, and Alienation subscales, including means, standard deviations (SD) and ranges, for each variable. To examine differences between gender
(young men, young women) and race/ethnicities (White, Black) across positive and negative cultural humility, a between-subjects multivariate analysis of variance (MANOVA) was completed. For this analysis, independent variables consisted of gender and race/ethnicities of students, while dependent variables consisted of positive cultural humility and negative cultural humility. Of note, for race/ethnicity, groups were condensed into White and Black/African American due to an uneven distribution. This analysis was also completed to examine differences across gender and race/ethnicities for teacher-student relationship quality. For this analysis, the independent variables remained the same, while the dependent variables then consisted of communication, trust, and alienation.

**Teacher-Student Match (Questions 7 and 8)**

Frequency counts were reported regarding teacher-student match for race/ethnicity, gender, and both race/ethnicity and gender. A multivariate analysis of variance (MANOVA) was also employed to explore differences between teacher-student match on students reported relationships with teachers (communication, trust, alienation), perceived cultural humility (positive and negative), academic grit, and academic achievement. In the MANOVA, independent variables of teacher-student match on race and gender were included. A separate one-way between subjects multivariate analysis of variance (MANOVA) was utilized to examine differences between teacher-student match on both race/ethnicity and gender across teacher-student relationship quality (communication, trust, alienation), cultural humility (positive and negative), academic grit, and academic achievement. This variable (match on both race/ethnicity and gender) was analyzed separately because it overlaps with the other two match variables (race/ethnicity match and gender match).
Relations Across Variables (Questions 9, 10, and 11)

Pearson product moment correlations were computed to evaluate relations between communication, trust, alienation, positive cultural humility, negative cultural humility, academic grit, and academic achievement (grades). The magnitude of correlations were determined as follows: .00-.19 negligible, .20-.39 weak, .40-.69 moderate, .70-.89 strong, and .90-1.0 very strong. Questions 10 and 11 align most closely to the original models proposed. While the original models tested potential mediation and moderation effects, the updated questions instead targeted understanding whether the variables of interest relate to each other in expected ways based on the prior literature. Multiple regressions were utilized to assess the impact of student’s teacher-student relationship quality and perceived cultural humility on academic grit and academic achievement, respectively. The first two regressions focused on positive components of teacher-student relationship quality (communication and trust) and cultural humility (positive). The first regression explored the impact of these three positive predictors on academic grit, while the second regression explored their impact on academic achievement. The final two regressions focused on negative components of teacher-student relationship quality (alienation) and cultural humility (negative). Then, the two negative predictors were regressed onto academic grit and academic achievement in separate analyses. The adjusted R Square was utilized as a measure of effect size, which evaluated the amount of variance explained by the dependent variables in the model. Additionally, standardized beta values were used to interpret effects of separate predictors.
Results

Data Screening

Prior to conducting analyses, data were screened for missingness, out of range or unexpected values, univariate outliers, univariate normality, multicollinearity, and heteroscedasticity. First, the data set was screened for students who did not provide assent ($n=16$) and these entries were deleted. The data was then screened for participants who did not complete the survey in full, and a total of 30 participants were identified who completed less than 80% of the entire survey leaving at least one full measure incomplete. These participants were deleted, as retaining them would require estimating at least one out of three key measures for the current study. All other participants appeared as complete data. Data were also screened for repeat administrations of the survey. Four students at school A and one student at school B completed the survey twice. For these instances, the first completion of the survey was retained, and the second was deleted to protect from familiarity or priming of the measures. At the conclusion of these deletions, the final sample consisted of 81 participants.

Of note, 6 participants numerical grades were not received from school A. However, report cards with categorical grades (e.g., A, B, C) were received and assigned subjects grades were linked to the 6 participants. To transfer the letter grade to a numerical format, the range of numerical grades for each letter grade were averaged. For example, if a student received a letter grade of A, which represents a numerical value between 90 to 100, then a 95 was assigned.

Data were then screened for out of range or unexpected values, univariate outliers, and normality. No out-of-range values were identified. However, as participants were given the option to select “Prefer not to answer,” items were identified for which this was selected. A total of 29 out of 38 items across measures contained “Prefer not to answer” responses, and each of
these responses were treated as missing values. Of the 29 items with missing values, 6 items were missing over 5% of their data. The item with the highest percentage of missing values was Inventory of Teacher-Student Relationships item 14 with 18.5% of missingness; “My teacher doesn’t understand what I’m going through.” The next highest item with missingness was

Table 2.

**Missingness on Survey Items.**

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>% Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGS 7 - I am able to balance working hard in school with my other hobbies and interests.</td>
<td>1</td>
<td>1.2%</td>
</tr>
<tr>
<td>ITSR 1 - My teacher respects my feelings</td>
<td>2</td>
<td>2.5%</td>
</tr>
<tr>
<td>ITSR 2 - I feel my teacher is successful as a teacher</td>
<td>1</td>
<td>1.2%</td>
</tr>
<tr>
<td>ITSR 3 - My teacher accepts me as I am</td>
<td>3</td>
<td>3.7%</td>
</tr>
<tr>
<td>ITSR 4 - My teacher can tell when something is upsetting me</td>
<td>4</td>
<td>4.9%</td>
</tr>
<tr>
<td>ITSR 5 - I get upset easily at school</td>
<td>1</td>
<td>1.2%</td>
</tr>
<tr>
<td>ITSR 6 - I get upset a lot more than my teacher knows about</td>
<td>4</td>
<td>4.9%</td>
</tr>
<tr>
<td>ITSR 7 - My teacher trusts my judgment</td>
<td>10</td>
<td>12.3%</td>
</tr>
<tr>
<td>ITSR 8 - My teacher helps me understand myself better</td>
<td>5</td>
<td>6.2%</td>
</tr>
<tr>
<td>ITSR 9 - I tell my teacher about my problems and troubles</td>
<td>3</td>
<td>3.7%</td>
</tr>
<tr>
<td>ITSR 10 - My teacher encourages me to talk about my difficulties</td>
<td>6</td>
<td>7.4%</td>
</tr>
<tr>
<td>ITSR 11 - My teacher understands me</td>
<td>3</td>
<td>3.7%</td>
</tr>
<tr>
<td>ITSR 12 - When angry, teacher tries to be understanding</td>
<td>5</td>
<td>6.2%</td>
</tr>
<tr>
<td>ITSR 13 - I trust my teacher</td>
<td>1</td>
<td>1.2%</td>
</tr>
<tr>
<td>ITSR 14 - My teacher doesn’t understand what I’m going through</td>
<td>15</td>
<td>18.5%</td>
</tr>
<tr>
<td>ITSR 15 - Count on teacher when need to get something off chest</td>
<td>4</td>
<td>4.9%</td>
</tr>
<tr>
<td>ITSR 16 - I feel that no one understands me</td>
<td>4</td>
<td>4.9%</td>
</tr>
<tr>
<td>ITSR 17 - If teacher knows something bothering me, they ask me about it</td>
<td>3</td>
<td>3.7%</td>
</tr>
<tr>
<td>CHS 1 - Shows respect</td>
<td>1</td>
<td>1.2%</td>
</tr>
<tr>
<td>CHS 2 - Is open</td>
<td>2</td>
<td>2.5%</td>
</tr>
<tr>
<td>CHS 3 - Is arrogant</td>
<td>3</td>
<td>3.7%</td>
</tr>
<tr>
<td>CHS 4 - Is considerate</td>
<td>1</td>
<td>1.2%</td>
</tr>
<tr>
<td>CHS 5 - Shows an interest in learning more</td>
<td>3</td>
<td>3.7%</td>
</tr>
<tr>
<td>CHS 6 - Tries to see my perspective</td>
<td>5</td>
<td>6.2%</td>
</tr>
<tr>
<td>CHS 7 - Makes assumptions</td>
<td>1</td>
<td>1.2%</td>
</tr>
<tr>
<td>CHS 8 - Stays open minded</td>
<td>2</td>
<td>2.5%</td>
</tr>
<tr>
<td>CHS 9 - Acts like a know it all</td>
<td>3</td>
<td>3.7%</td>
</tr>
<tr>
<td>CHS 10 - Thinks they know more than they do</td>
<td>4</td>
<td>4.9%</td>
</tr>
<tr>
<td>CHS 11 - Asks questions when unsure</td>
<td>2</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

*Note.* IT-SR = Inventory of Teacher-Student Relationships; CHS = Cultural Humility Scale; AGS= Academic Grit Scale.
Inventory of Teacher-Student Relationships item 7 with 12.3% of missingness; “My teacher trusts my judgment.” The other 5 items had comparable levels of missingness, and included Inventory of Teacher-Student Relationships item 10 (7.4%; “My teacher encourages me to talk about my difficulties”), Cultural Humility Scale item 6 (6.2%; “Tries to see my perspective”), Inventory of Teacher-Student Relationships item 8 (6.2%; “My teacher helps me understand myself better”), and Inventory of Teacher-Student Relationships item 12 (6.2%; “When angry, teacher tries to be understanding”). See Table 2 for percent missingness for each item.

The data were screened for univariate outliers, and 7 values across three different items were identified (z-scores > 3.29; Tabachnick & Fidell, 2019); three outliers for Inventory of Teacher-Student Relationships item 2 (“I feel my teacher is successful as a teacher”; z=-3.46), one outlier for Inventory of Teacher-Student Relationships item 3 (“My teacher accepts me as I am”; z=-3.76), and three outliers for Cultural Humility Scale item 1 ("Shows Respect"; z=-3.36). It appeared that for each of these outliers, participants responded with the lowest possible option while the majority of participants responded with the highest possible option. To retain the integrity of the participants responses, each value was adjusted to the next lowest value (Tabachnik & Fidell, 2019). In other words, the response option selected was increased from 1 to 2 for each of the identified cases for Inventory of Teacher-Student Relationships items 2 and 3, as well as Cultural Humility Scale item 1.

Prior to estimating missing values, Little’s MCAR test, \( \chi^2 (1003, N = 81) = 1,013.33, p = .403 \), was completed to assess whether data was missing completely at random making the use of multiple imputation appropriate for the data (Tabachnik & Fidell, 2019). Data were then estimated using multiple imputation using SPSS version 28.0 (IBM CORP, 2021). Regarding univariate normality, skewness and kurtosis values were in the acceptable range for all items.
Subscale items were then averaged to create a single score for each measure and were re-screened for univariate outliers and normality; all values fell within acceptable limits. Descriptive statistics for the variables used in subsequent analyses are depicted in Table 3.

**Table 3.**

*Descriptive Statistics for Inventory of Teacher-Student Relationships Subscales, Cultural Humility Subscales, Academic Grit Scale, Grades, and Importance of Cultural Identities.*

<table>
<thead>
<tr>
<th>Sub-Scale</th>
<th>M</th>
<th>SD</th>
<th>95% Confidence Interval (LL, UL)</th>
<th>Range</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT-SR Communication</td>
<td>2.62</td>
<td>.83</td>
<td>(2.44, 2.80)</td>
<td>3.00</td>
<td>-.21</td>
<td>-.94</td>
</tr>
<tr>
<td>IT-SR Trust</td>
<td>3.36</td>
<td>.63</td>
<td>(3.22, 3.50)</td>
<td>2.60</td>
<td>-1.32</td>
<td>1.42</td>
</tr>
<tr>
<td>IT-SR Alienation</td>
<td>2.15</td>
<td>.79</td>
<td>(1.98, 2.33)</td>
<td>3.00</td>
<td>.41</td>
<td>-.57</td>
</tr>
<tr>
<td>CHS Positive</td>
<td>4.01</td>
<td>.88</td>
<td>(3.82, 4.21)</td>
<td>3.43</td>
<td>-1.24</td>
<td>1.04</td>
</tr>
<tr>
<td>CHS Negative</td>
<td>2.08</td>
<td>1.06</td>
<td>(1.85, 2.32)</td>
<td>4.00</td>
<td>1.01</td>
<td>.17</td>
</tr>
<tr>
<td>Academic Grit</td>
<td>4.15</td>
<td>.54</td>
<td>(4.03, 4.27)</td>
<td>2.20</td>
<td>-.32</td>
<td>-.80</td>
</tr>
<tr>
<td>Grades</td>
<td>81.95</td>
<td>17.94</td>
<td>(77.98, 85.92)</td>
<td>100</td>
<td>-2.67</td>
<td>8.14</td>
</tr>
<tr>
<td>Importance: Identity 1</td>
<td>4.30</td>
<td>1.04</td>
<td>(3.97, 4.52)</td>
<td>4.00</td>
<td>-1.90</td>
<td>3.43</td>
</tr>
<tr>
<td>Importance: Identity 2</td>
<td>4.18</td>
<td>1.17</td>
<td>(3.85, 4.45)</td>
<td>4.00</td>
<td>-1.54</td>
<td>1.55</td>
</tr>
<tr>
<td>Importance: Identity 3</td>
<td>3.72</td>
<td>1.31</td>
<td>(3.39, 4.04)</td>
<td>4.00</td>
<td>-.74</td>
<td>-.57</td>
</tr>
</tbody>
</table>

*Note. M = Mean; SD = Standard Deviation; IT-SR = Inventory of Teacher-Student Relationships. CHS = Cultural Humility Scale. LL = Lower Limit. UL = Upper Limit.*

**Preliminary Analyses**

A 2 (school) x 2 (grade level) x 3 (subject area) between-groups multivariate analysis of variance (MANOVA) was conducted to screen for potential differences across students reported relationships with teachers, perceived cultural humility, academic grit, and academic achievement. School, grade level (9 to 12) and subject area (math, science, English) served as independent variables and communication, trust, alienation, positive cultural humility, negative cultural humility, academic grit, and academic achievement (as measured by numeric course grade) were included as dependent variables. Of note, due to sample size requirements for this
analysis, grade level was condensed into two groups: lower-division (9th and 10th grade) and upper-division students (11th and 12th grade). Additionally, the Pillai’s Trace statistic was used to interpret multivariate tests due to the small overall sample size (Tabachnick & Fidell, 2019). Levene’s test of equality of error variances was not significant (p < 0.05) indicating equal variances across variables. See Table 4 for full MANOVA results.

Table 4.

**Multivariate Effects of School, Grade Level, and Subject on TSRQ, Cultural Humility, Academic Grit, and Grades (MANOVA).**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pillai’s Trace</th>
<th>F-value</th>
<th>df</th>
<th>p-value</th>
<th>Partial eta²</th>
<th>95% Confidence Interval (LL, UL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>School</td>
<td>.18</td>
<td>1.93</td>
<td>7, 63</td>
<td>.08</td>
<td>0.18</td>
<td>0, 0.26</td>
</tr>
<tr>
<td>Grade Level</td>
<td>.13</td>
<td>1.36</td>
<td>7,63</td>
<td>.24</td>
<td>0.13</td>
<td>0, 0.20</td>
</tr>
<tr>
<td>Subject</td>
<td>.16</td>
<td>.80</td>
<td>14, 128</td>
<td>.67</td>
<td>0.08</td>
<td>0, 0.07</td>
</tr>
<tr>
<td>School * Grade Level</td>
<td>.07</td>
<td>.64</td>
<td>7, 63</td>
<td>.73</td>
<td>0.07</td>
<td>0, 0.09</td>
</tr>
<tr>
<td>School * Subject</td>
<td>.14</td>
<td>.69</td>
<td>14, 128</td>
<td>.79</td>
<td>0.07</td>
<td>0, 0.05</td>
</tr>
<tr>
<td>Grade Level * Subject</td>
<td>.14</td>
<td>.70</td>
<td>14, 128</td>
<td>.77</td>
<td>0.07</td>
<td>0, 0.05</td>
</tr>
<tr>
<td>School * Grade Level * Subject</td>
<td>.14</td>
<td>.70</td>
<td>14, 128</td>
<td>.77</td>
<td>0.07</td>
<td>0, 0.05</td>
</tr>
</tbody>
</table>

*Note. *p<.05. LL = Lower Limit. UL = Upper Limit.

No statistically significant differences were found on school, grade level, or subject assigned for any of the combined dependent variables. These null results support the pooling of data, as no significant differences were found across groups. However, it should be noted that differences based on school approached significance on the combined dependent variable, F (7, 63) = 1.93, p = .08, Pillai’s trace = .18. It is notable that although none of the results were significant, the observed effect sizes for each result ranged from medium to large. Similarly, a review of the confidence intervals revealed that the true value of the effect sizes for each analysis fell between 0 and a medium to large effect. The inclusion of 0 in the confidence interval may
indicate that results are not significant, however the medium to large effects seen in the upper bound of the confidence interval may suggest that a true effect may be present in a larger sample. Additionally, it should be noted that for four of the tests, the observed effect size was outside of the confidence intervals produced. Together, these results suggest that the analyses may have been underpowered due to the small sample size and warrant the need for further research. Of note, while any significant differences would indicate the need to control for these variables in later analyses, due to the small sample size and lack of significance these variables were not included as covariates.

**Cultural Identities (Questions 1 and 2)**

The first research question aimed to explore the first, second, and third most salient cultural identities reported by high school students in this study. Frequencies were tabulated for the first, second, and third most salient identities (see Table 5). For the first salient identity, students most frequently selected skin color \(n=23\), followed by religion \(n=11\), body size \(n=8\), age \(n=6\), ethnicity \(n=6\), gender \(n=5\), nationality \(n=5\), disability \(n=3\), sexual orientation \(n=3\), and neighborhood \(n=1\). Notably, 3 participants selected other but did not provide further information in the space provided. Out of the 81 participants, 7 preferred not to answer.

For the second salient identity, 13 participants selected gender as their most salient identity, followed by body size \(n=9\), nationality \(n=9\), religion \(n=8\), ethnicity \(n=6\), sexual orientation \(n=6\), skin color \(n=6\), age \(n=4\), disability \(n=2\), and neighborhood \(n=2\). Similar to the first identity, 6 participants selected other but didn’t provide further information in the space provided, and 10 preferred not to answer.
For the third salient identity, the number who preferred not to answer increased to 20 participants and it was the most frequent response. This may suggest that these students have two rather than three salient identities. Less variation in terms of frequency was apparent across the other identities, with the next most salient identity selected being age (n=9) and gender (n=9), followed by neighborhood (n=8), ethnicity (n=7), religion (n=7), skin color (n=7), body size (n=5), sexual orientation (n=3), and nationality (n=2). Similar to the first two identities, 5 participants selected other but did not provide further information.

Table 5.

*Frequency Counts for Salient Identities Selected by Participants.*

<table>
<thead>
<tr>
<th>First Salient Identity</th>
<th>Second Salient Identity</th>
<th>Third Salient Identity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin Color</td>
<td>23</td>
<td>6</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Nationality</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Gender</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>Age</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Sexual Orientation</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Religion</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>Disability</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Body Size</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Neighborhood</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Prefer not to Answer</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>81</td>
<td>81</td>
</tr>
</tbody>
</table>

*Note.* All students who selected other did not provide more information in the space provided.

The second research question aimed to explore student’s reported importance of their first, second, and third salient identities on a scale from 1 (*not important at all*) to 5 (*very important*). As there were not enough participants to examine the importance of specific identities, descriptive statistics were utilized to explore the overall importance reported for the
first, second, and third most salient identity (see Table 3). On average, students reported their first salient identity as the most important with a mean rating of 4.30 ($SD = 1.04$). Ratings of importance were lower for each subsequent salient identity, with a mean rating of 4.18 ($SD = 1.17$) for the second identity and a mean rating of 3.72 ($SD = 1.31$) for the third identity. Of note, several students preferred not to answer each of the importance questions including: 2 for the first, 6 for the second, and 15 for the third question.

**Cultural Humility (Questions 3 and 4)**

The third and fourth research questions examined students’ perceptions of their teacher’s cultural humility, both positive and negative, as well as whether differences in reported cultural humility occurred based on students’ gender or race/ethnicity. Descriptive statistics were conducted to explore students’ perceptions of positive and negative cultural humility of teachers. Using a rating scale ranging from 1 (*really disagree*) to 5 (*really agree*), students reported high levels of positive cultural humility with an average score of 4.01 ($SD = 0.88$). Negative cultural humility was assessed using a 1 (*really disagree*) to 5 (*really agree*) scale, with lower ratings reflecting more embodiment of cultural humility. Students reported low levels of negative humility with an average score of 2.08 ($SD = 1.06$). These values suggest that students view their teachers as being culturally humble overall. Overall, students in this sample appear to perceive their teachers as embodying higher levels of positive cultural humility.

To explore differences in positive and negative cultural humility, 2 (gender) x 2 (race/ethnicity) between-groups multivariate analysis of variance (MANOVA) was conducted to screen for potential differences across students reported positive and negative cultural humility. Of note, the race/ethnicity variable was condensed from 5 to 2 groups (White and Black/African American) due to 2 or fewer participants in 3 of the groups. The Pillai’s Trace statistic was used
to interpret multivariate tests due to the small overall sample size (Tabachnick & Fidell, 2019). Levene’s test of equality of error variances was not significant \((p < 0.05)\) indicating equal variances across variables. No statistically significant differences were found on gender or race/ethnicity for any of the combined dependent variables (see Table 6 for full MANOVA results). While none of the results were significant, the observed effect sizes for each result fell within the small effect size range. In looking at the confidence intervals, it appeared that the true value of each effect fell between 0 and a medium effect. It is notable that the observed effect sizes fell towards the lower limit of the confidence interval. The large range produced in the confidence intervals suggests that the analyses were underpowered. This then supports the need for continued research on student’s perceptions of their teacher’s cultural humility based on student’s gender or race/ethnicity.

Table 6.

*Multivariate Effects of Gender and Race/Ethnicity on Positive and Negative Cultural Humility (MANOVA).*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pillai’s Trace</th>
<th>F-value</th>
<th>(df)</th>
<th>(p)-value</th>
<th>Partial (\eta^2)</th>
<th>95% Confidence Interval (LL, UL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.02</td>
<td>.83</td>
<td>2, 72</td>
<td>.44</td>
<td>.02</td>
<td>0, .09</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td>.01</td>
<td>.36</td>
<td>2, 72</td>
<td>.70</td>
<td>.01</td>
<td>0, .06</td>
</tr>
<tr>
<td>Gender * Race / Ethnicity</td>
<td>.01</td>
<td>.45</td>
<td>2, 72</td>
<td>.64</td>
<td>.01</td>
<td>0, .06</td>
</tr>
</tbody>
</table>

*Note.* *p*<.05. LL = Lower Limit. UL = Upper Limit.

**Teacher-Student Relationships (Questions 5 and 6)**

The fifth and sixth research questions investigated students’ perceptions of their relationships with teachers and whether the quality of this relationship differed based on
students’ gender or race/ethnicity. Descriptive statistics were used to depict student’s teacher-student relationship quality through ratings of 1 (*almost never or never true*) to 4 (*almost always or always true*) on the IT-SR Communication, Trust, and Alienation subscales. In considering teacher-student relationship quality, student’s ratings were highest for teacher trust (*M* = 3.36; *SD* = 0.63). This was followed by communication with teachers (*M* = 2.62; *SD* = 0.83) as well as experiencing alienation from teachers (*M* = 2.15; *SD* = 0.79). These results suggest that students, on average, experience relatively high levels of trust with their teachers and low levels of alienation and communication with teachers.

To explore differences among communication, trust, and alienation, 2 (gender) x 2 (race/ethnicity) between-groups multivariate analysis of variance (MANOVA) was conducted to screen for potential differences across students. As mentioned previously, the race/ethnicity variable was condensed from 5 to 2 groups (White and Black/African American) due to 2 or fewer participants in 3 of the groups. The Pillai’s Trace statistic was used to interpret multivariate tests due to the small overall sample size (Tabachnick & Fidell, 2019). Levene’s test of equality of error variances were not significant (*p* < 0.05) indicating equal variances across variables. See Table 7 for full MANOVA results. No statistically significant differences were found on gender or race/ethnicity for any of the combined dependent variables. In reviewing effect sizes and confidence intervals, the observed effect for gender was negligible, and both bounds of the confidence interval were 0. This indicates that it is highly unlikely that the true value of the effect size for gender on teacher-student relationship quality factors is significant. For race/ethnicity and the interaction effect of gender and race/ethnicity, observed effects fell within the small range. However, confidence intervals of effect sizes ranged from 0 to a medium effect. The inclusion of 0 in the confidence interval may suggest that the test is not significant,
but the wide range indicates a potential for a medium effect for these tests if a larger sample is evaluated. Further, this may suggest that the analyses may have been underpowered, supporting the need for continued research on differences in students perceived relationships with teachers based on race/ethnicity.

Table 7.

**Multivariate Effects of Gender and Race/Ethnicity on IT-SR Communication, Trust, and Alienation (MANOVA)**.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pillai’s Trace</th>
<th>F-value</th>
<th>df</th>
<th>p-value</th>
<th>Partial eta²</th>
<th>95% Confidence Interval (LL, UL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.004</td>
<td>.10</td>
<td>3,71</td>
<td>.96</td>
<td>.00</td>
<td>0, 0</td>
</tr>
<tr>
<td>Race / Ethnicity</td>
<td>.02</td>
<td>.40</td>
<td>3,71</td>
<td>.76</td>
<td>.02</td>
<td>0, .05</td>
</tr>
<tr>
<td>Gender * Race / Ethnicity</td>
<td>.05</td>
<td>1.19</td>
<td>3,71</td>
<td>.32</td>
<td>.05</td>
<td>0, .12</td>
</tr>
</tbody>
</table>

*Note. *p*<.05. LL = Lower Limit. UL = Upper Limit.

**Teacher-Student Match (Questions 7 and 8)**

The seventh research question explored how often student’s own identities match with their teachers’ identities in terms of gender and race/ethnicity. Match variables were computed using students reporting on their own identities and their teachers’ identities. Teachers were 43.2% White, not Hispanic, 38.3% Black, not Hispanic, 3.7% Asian or Pacific Islander, and 2.5% Multiracial, and 74.1% women and 22.2% men. Frequency tables were used to report students’ rates of match across gender, race/ethnicity, and both gender and race/ethnicity (see Table 8). Regarding gender, 50 students matched with their teacher’s gender identity, while 31 students did not match with their teacher’s gender identity. This is not surprising given that the student sample (75.3%) and their teachers (74.1%) were predominantly women. Regarding
race/ethnicity, 40 student’s race/ethnicity matched with their teacher’s race/ethnicity, while 41 student’s race/ethnicity did not match with their teacher’s race/ethnicity. In examining match on both race/ethnicity and gender with the selected teacher, 22 students shared the same gender and race/ethnicity with their teacher. Of those that did not match on both, 46 matched on at least one variable (gender or race/ethnicity) and 13 did not match on either variable.

**Table 8.**

*Frequency Counts of Teacher-Student Match.*

<table>
<thead>
<tr>
<th>Teacher-Student Match</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race / Ethnicity Match</td>
<td>40</td>
<td>49.4%</td>
</tr>
<tr>
<td>Race / Ethnicity No Match</td>
<td>41</td>
<td>50.6%</td>
</tr>
<tr>
<td>Gender Match</td>
<td>50</td>
<td>61.7%</td>
</tr>
<tr>
<td>Gender No Match</td>
<td>31</td>
<td>38.3%</td>
</tr>
<tr>
<td>Both Match Both</td>
<td>22</td>
<td>27.2%</td>
</tr>
<tr>
<td>Both Match One</td>
<td>46</td>
<td>56.8%</td>
</tr>
<tr>
<td>Both No Match</td>
<td>13</td>
<td>16.0%</td>
</tr>
</tbody>
</table>

The eighth research question explored the impact of teacher-student match on teacher-student relationship quality, cultural humility, academic grit, and academic achievement using a MANOVA approach. First, the impact of teacher-student match on gender and race/ethnicity was evaluated using a 2 (gender match) x 2 (race/ethnicity match) between-groups multivariate analysis of variance (MANOVA) on teacher-student relationships quality (communication, trust, alienation), cultural humility (positive and negative), academic grit, and academic achievement. The Pillai’s Trace statistic was used to interpret multivariate tests due to the small overall sample size (Tabachnick & Fidell, 2019). Levene’s test of equality of error variances were not significant ($p < 0.05$) indicating equal variances across variables. See Table 9 for full MANOVA
results. No statistically significant differences were found on teacher-student match gender or teacher-student match race/ethnicity for any of the combined dependent variables. It is notable that although none of the results were significant for this analysis, the observed effect sizes for each fell within the small to medium effect size range. In evaluating confidence intervals to examine the potential for the true value of the effect size, values ranged from 0 to a medium or large effect. Again, while the inclusion of 0 in the confidence intervals indicates that analyses were insignificant, the potential for the true value to be a medium or large effect in a larger sample suggests that analyses were underpowered, making continued research into teacher-student match's impact on the explored variables important in the future.

Table 9.

Multivariate Effects of Teacher-Student Match Gender and Teacher-Student Match Race/Ethnicity on Teacher-Student Relationship Quality, Cultural Humility, Academic Grit, and Grades (MANOVA).

<table>
<thead>
<tr>
<th>Effects</th>
<th>Pillai's Trace</th>
<th>F-value</th>
<th>df</th>
<th>p-value</th>
<th>Partial eta²</th>
<th>95% Confidence Interval (LL, UL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-S Match Gender</td>
<td>.10</td>
<td>1.07</td>
<td>7, 71</td>
<td>.39</td>
<td>.10</td>
<td>0, .14</td>
</tr>
<tr>
<td>T-S Match Race/Ethnicity</td>
<td>.08</td>
<td>.85</td>
<td>7, 71</td>
<td>.55</td>
<td>.08</td>
<td>0, .11</td>
</tr>
<tr>
<td>T-S Match Gender * T-S Match Race/Ethnicity</td>
<td>.05</td>
<td>.57</td>
<td>7, 71</td>
<td>.78</td>
<td>.05</td>
<td>0, .06</td>
</tr>
</tbody>
</table>

Note. T-S = Teacher-Student. *p<.05. LL = Lower Limit. UL = Upper Limit.

The intersectional teacher-student match on both race/ethnicity and gender variable was tested separately using a one-way between-subjects MANOVA due to the variable being a product of the prior teacher-student match variables. Thus, a one-way between subjects MANOVA was conducted to examine differences in teacher-student relationship quality
(communication, trust, alienation), cultural humility (positive or negative), academic grit, and academic achievement depending on whether students matched with their teacher on both race/ethnicity and gender, matched on one area (either race/ethnicity or gender), or did not match on both race/ethnicity or gender. No significant differences were indicated at the multivariate or univariate levels (see Table 10). Along with being non-significant, the observed effect size was within the small range. Similarly, in looking at confidence intervals the values ranged from 0 to a small effect size. It is notable that the observed effect size did not fall within the calculated confidence intervals. This may be due to the small sample size or the uneven distribution across teacher-student match on both race/ethnicity and gender. Together, these results suggest that at most a small effect may be present in a larger sample, as the analyses were likely underpowered. Continued research would be recommended.

**Table 10.**

*Multivariate Effects of Intersectional Teacher-Student Match (both Gender and Race/Ethnicity) on Teacher-Student Relationship Quality, Cultural Humility, Academic Grit, and Grades (MANOVA).*

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pillai’s Trace</th>
<th>F-value</th>
<th>df</th>
<th>p-value</th>
<th>Partial eta²</th>
<th>95% Confidence Interval (LL, UL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-S Match Gender and Race/Ethnicity</td>
<td>.11</td>
<td>.58</td>
<td>14, 146</td>
<td>.88</td>
<td>.05</td>
<td>0, .02</td>
</tr>
</tbody>
</table>

*Note. T-S = Teacher-Student. *p<.05. LL = Lower Limit. UL = Upper Limit.*

**Relations Across Variables (Questions 9, 10, and 11)**

The ninth research question examined the relations between key variables of teacher-student relationship quality (communication, trust, and alienation), cultural humility (positive and negative), academic grit, and academic achievement (student grades). To investigate these relations, Pearson product-moment correlations were conducted between each of the above
variables (see Table 11) Correlations were assessed for significance at the .05, .01, and .001 levels and the magnitude of correlations was determined as follows: .00-.19 as negligible, .20-.39 as weak, .40-.69 as moderate, .70-.89 as strong, and .90-1.0 as very strong.

Among the IT-SR subscales, a strong, positive correlation was found between Trust and Communication, $r = .74$, $p < .001$, while a weak, negative correlation was found between Trust and Alienation, $r = -.24$, $p < .05$. The Communication and Alienation subscales were not significantly related to each other, which deviates from what would have been expected based on previous research. As would be expected, a negative albeit weak association was found between Positive and Negative Cultural Humility, $r = -.36$, $p < .001$. Across measures, moderate, positive

Table 11.

Correlations for Cultural Humility Scale, Inventory of Teacher-Student Relationships, Academic Grit Scale, Academic Grades, and Importance of Salient Cultural Identities.

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. IT-SR Communication</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. IT-SR Trust</td>
<td>.74***</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. IT-SR Alienation</td>
<td>-.04</td>
<td>-.24*</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. CHS Positive</td>
<td>.47***</td>
<td>.62***</td>
<td>-.21</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. CHS Negative</td>
<td>-.03</td>
<td>-.34**</td>
<td>.24*</td>
<td>-.36***</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. AGS</td>
<td>.13</td>
<td>.09</td>
<td>-.12</td>
<td>.20</td>
<td>-.05</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>7. Grades</td>
<td>.03</td>
<td>.14</td>
<td>-.36**</td>
<td>.19</td>
<td>-.05</td>
<td>.27*</td>
<td>--</td>
</tr>
</tbody>
</table>

Note. *$p<.05$. **$p<.01$. ***$p<.001$. 

correlations were found between Positive Cultural Humility and Communication, $r = .47$, $p < .001$, as well as Positive Cultural Humility and Trust, $r = .62$, $p < .001$. Weak, negative
correlations were found between Negative Cultural Humility and Trust, \( r = -0.34, p < 0.01 \), as well as between Negative Cultural Humility and Alienation, \( r = -0.24, p < 0.05 \). These findings align with what would be expected in the literature (McPhee, 2020). Significant correlations were not found between Positive Cultural Humility and Alienation or between Negative Cultural Humility and Communication. With regards to the outcome variables of Academic Grit and academic achievement, a weak, negative correlation was found between Alienation and academic achievement (grades), \( r = -0.36, p < 0.01 \). While not significant, a weak, negative correlation approached significance between Academic Grit and Positive Cultural Humility, \( r = -0.20, p = 0.07 \). Additionally, a weak, positive correlation was found between Academic Grit and academic achievement (grades), \( r = 0.27, p = 0.014 \). No other variables returned significant correlations with Academic Grit or academic achievement.

To address the last two research questions, a series regression analyses were planned to explore the impact of positive components (i.e., communication, trust, and positive cultural humility) and negative components (i.e., alienation and negative cultural humility) on academic grit and academic grades. Considering the results seen in correlations among variables of interest, completing the planned regression analyses was not indicated due to a lack of relation between anticipated predictor and outcome variables.

**Discussion**

Teachers have the potential to impact student’s experiences in school, serving as either a protective factor promoting students’ success, or a risk factor hindering student’s trajectories (Woolley & Bowen, 2007). Past research has shown teachers who express more understanding and acceptance of students by fostering connections through their interactions with students leads to positive outcomes (Kiefer et al., 2014; Kincade et al., 2020). These positive relationships have
been suggested to increase students’ commitment to school, self-efficacy, and willingness to persist in school (Bryce et al., 2022; Lei et al., 2023; Roorda et al., 2017). However, as with all relationships where a power imbalance exists, it is paramount to also consider the impact of cultural identities and stereotyping (Blackberry & Kearney, 2021; Civitillo et al., 2021; Fletcher et al., 2011; Rudasill et al., 2023). While much is known about the potential impact of teacher support on student outcomes, much remains unknown about the role of cultural identities and cultural humility on these relationships and their impact on success outcomes (e.g., grades, graduation rates, etc.). The current study aimed to serve as an exploratory study describing student’s relationships with teachers, their perceptions of their teacher’s embodiment of cultural humility, and each factors relation to student outcomes of academic grit and academic achievement.

The first set of research questions explored student’s reported salient identities and the related importance ratings of these identities. Overall, students identified with a range of salient identities, as each identity option provided was selected at least once. Students reported skin color as their most salient identity, followed by religion and body size. When asked to choose additional salient identities, gender was most often selected as the second most salient identity and age as the third most salient identity. The salience of skin color and gender aligns with much of the existing research which tends to focus on the impact of student’s race/ethnicity or gender and identity development (e.g., McPhee, 2020, Schwartz et al., 2013). However, the endorsement of skin color instead of race/ethnicity is unique to the current study. On possibility is that as students are increasingly identifying as multiracial, race/ethnicity no longer fully captures students identities. Thus, students may be turning to other ways of defining their racial/ethnic identity (i.e., skin color). This may be due to the sociocultural context in which students reside.
Participants in this study reside in the Mid-South region of the United States which is predominately Christian and Black (U.S. Census Bureau, n.d.). It is possible that the sociocultural context influenced the identities that were reported as salient by students. Future research should utilize a nationally representative sample from multiple sociocultural contexts to examine potential differences in salient identities depending on the impact of larger societal systems. Additionally, future research should explore students understanding of skin color in relation to the sociocultural context and race/ethnicity to better understand the identity. Further, the endorsement of a range of salient identities in the current study may suggest that it is important to also examine the impact of other identities, such as religious affiliation or body size, when considering identity development.

It is also important to note that students may have struggled in choosing more than one salient identity, as the number of students who selected “Prefer not to answer” increased with each salient identity selected (10 for the second and 20 for third). For these students who did not select a salient identity, it may be that they have not engaged in identity exploration or are in the process of exploring their own identity. The exploration of identity often starts during adolescence and typically extends into early adulthood (Schwartz et al., 2013). It is also common for the exploration of one’s identities within different domains (e.g., gender, sexuality, race/ethnicity) to occur at different times and speeds (Schwartz et al., 2013). Past research has found acceptance and exploration of one’s identity to be linked to positive school outcomes, such as grades, self-efficacy, and academic aspirations, while confusion regarding one’s identity has been linked to heightened aggression and lower self-esteem (Johnson et al., 2023; Meca et al., 2017; Smith et al., 2022; Thomas et al., 2022; Thompson et al., 2016). If these students who struggled to select additional identities present with more confusion regarding their salient
identities, it may be important to consider student’s potential identity exploration when considering academic outcomes. However, it must be noted that in the current school climate, discussing identity exploration within schools is often not promoted. With this in mind, it may be more difficult to continue exploring research in this area.

When exploring student’s rated importance of these salient identities, students tended to rate their first identity as very important, but these ratings decreased with each additional salient identity selected. Currently, little research has examined student’s ratings of importance, and that which has been done explored ratings of importance for student’s race/ethnicity (Sellers et al., 1997; Yip, 2018). It is possible that students who report higher levels of importance may be more accepting of their identity; however, more research is needed to examine the role of importance when evaluating student’s personal identities and identity development. Overall, findings from the current study suggest that students are able to identify multiple salient identities when prompted (usually two or three), but that the importance of each salient identity may vary. Future research should explore student’s ratings of importance related to each salient identity examined.

The next set of questions examined student’s perceptions of their teacher’s cultural humility and differences in student’s ratings based on their gender or race/ethnicity. Findings from the current study suggest that students tended to experience high levels of positive cultural humility with their teachers, indicating that their teachers often exhibit respect for students, an interest in learning about their students’ identities, may be more likely to ask questions and engage in perspective-taking, and tend to be more open minded and open with students. Similarly, many students reported low levels of negative cultural humility, indicating that most students don’t report that their teachers express arrogance, make assumptions, and appear to be a know-it-all. Overall, this may suggest that teachers referred to in the current study may embody
cultural humility most of the time, which is perceived by students. The high levels of positive cultural humility and low levels of negative cultural humility align with past research (McPhee, 2020) as well as another measure of cultural humility developed for counseling (Zhu et al., 2022). This may suggest that students tend to view their teachers as embodying cultural humility most of the time; however, further research is needed to better understand potential nuance in students’ experiences with their teachers display of cultural humility.

It is notable that in the current study student’s perceptions of their teacher’s cultural humility did not differ based on students’ gender or race/ethnicity. These findings are in contrast to past research, which has found significant differences in both positive and negative cultural humility for gender, as well as differences in negative cultural humility for race/ethnicity (Fennimore et al., 2024). In Fennimore and colleagues (2024), girls were found to report higher positive and negative cultural humility and White, not Hispanic students reported the lowest levels of negative cultural humility. These prior results were attributed to potential impacts of stereotyping or bias in the classroom, as well as the potential impact of teacher-student match on gender and race/ethnicity (Fennimore et al., 2024). While the null findings from the current study may suggest that demographic differences in cultural humility were not present among the schools evaluated, the small sample size in the current study may have limited the level of power needed to detect these differences. Even though the results were not significant and the observed effect sizes were small, the confidence intervals ranged from 0 to a medium effect. Thus, it is not clear if these differences were not present or were not detectable. Ultimately, the current study demonstrated the utility of examining cultural humility and potential for variations in cultural humility across studies. As little research has examined cultural humility in the schools, it is integral for future research to continue examining the potential demographic differences in
perceived cultural humility and the potential impact of other demographic factors that may contribute to student’s experiencing variation in perceived cultural humility.

The fourth set of research questions investigated student’s relationships with their teachers more broadly, exploring reported feelings of communication, trust, and alienation, as well as the potential impact of demographic factors (i.e., gender and race/ethnicity) on these relationships. On average, students reported high levels of trust with their teachers, and low levels of communication and alienation. This pattern does not align with previous research which has found communication to be the highest TSRQ subscale, followed by trust and alienation (McPhee, 2020). It is possible that if teachers are utilizing strategies needed to create a safe environment for students (e.g., creating authentic connections with students, using learner-centered instruction, responding to student’s needs), the student’s may experience more trust with their teachers which then leads them to take more risks (Kiefer et al., 2014; Kincade et al., 2020). While high levels of trust are related to high levels of communication, students tended to report relatively low levels of communication with teachers. This may be due to adolescents’ higher likelihood of turning to peers to seek support during this time, leading them to communicate more frequently with peers rather than teachers (Clark et al., 2020).

Differences in student’s reported relationships with their teachers based on student’s gender or race/ethnicity was not found in the current study. This finding differs from previous research that has found girls and White students to report higher levels of trust and communication with teachers compared to boys, gender diverse youth, and racially/ethnically minoritized youth (Chiu et al., 2012; Gower et al., 2018; Hughes et al., 2012; Koomen & Jellsma, 2015; Murray et al., 2008). Results from this study could suggest that for the current sample, demographic differences do not influence the quality of teacher-student relationships as
perceived by students. However, even though the results were not significant and the observed effect sizes were small, the confidence intervals for race/ethnicity and the interaction of gender and race/ethnicity ranged from 0 to a medium or large effect. This suggests that due to limitations in the sample, it is not clear if these differences were not present or merely not detectable due to being underpowered. Additionally, the high rates of teacher-student match on gender and race/ethnicity may have impacted the results. The majority of the sample consisted of young women (74.4%) and identified as Black (73.2%) which aligned with the sample of teachers referred to by students. This connection between teacher-student match on gender and race/ethnicity may have skewed the outcomes seen, as having a teacher similar to oneself often leads to more positive outcomes (Rudasill et al., 2023). The restricted variation within gender and race/ethnicity may have contributed to a lack of significance on gender or racial/ethnic differences among variables of interest. However, considering the mixed findings, more research is needed to explore potential differences in students’ relationships with teachers, the impact of cultural humility on these outcomes, and the pattern of student relationships with teachers (e.g., higher trust than communication).

The fifth set of research questions examined how often students and teachers’ identities match across gender, race/ethnicity, and both gender and race/ethnicity. Students and teachers in the sample experienced high levels of match on race/ethnicity and gender but low rates of match on both race/ethnicity and gender. In other words, at least half of the sample matched with their teacher on at least one identity (i.e., gender or race/ethnicity) but fewer students matched on multiple identities. It is notable that the integration of an intersectional view of match is paramount, as previous research has found intersectional identities to impact teacher-student relationship quality and experiences in school over time (Rudasill et al., 2023). As schools
continue to become increasingly diverse in terms of racial/ethnic identity and the teacher population continues to lag behind the diversity of their students, the need to highlight diversity initiatives, such as culturally responsive teaching or cultural humility, is more important now than ever (Schaeffer, 2021).

This set of research questions also explored whether teacher-student match impacted students’ ratings of their relationships with teachers, perceived cultural humility, academic grit, or grades. Overall, no differences were found between students who did and did not experience match with their teachers on any of the variables examined. Again, these findings differ from previous research which has suggested that having a teacher who holds the same identity results in higher levels of academic achievement and more positive experiences in school (Civitillo et al., 2023; Rudasill et al., 2023). However, as previously noted, this lack of significance may be due to the small sample size and may otherwise be detectable with a larger sample. This is further supported through evaluating effect sizes and confidence intervals, as while the observed effect sizes were small to medium, the confidence intervals ranged from 0 to medium or large effects. This indicates the need for more research exploring the impact of teacher-student match. Additionally, the characteristics of the participating schools may have impacted these results. Of the approximately 14 schools contacted, only a handful were interested in collaborating on this study. Both participating schools appeared to place a strong value on culturally sensitive practices, and it is possible that the climate of each school tends to be more appreciative of initiatives that acknowledge and promote students differing identities. In turn, this may suggest a higher level of openness towards cultural humility within these schools, as well as a more positive school climate. Thus, future research into the impact of teacher-student match should incorporate the impact of school climate on outcomes. Future research may also examine the
perceived importance of culturally relevant practices by administrators/teachers, as if staff are committed to implementing these practices with fidelity their impact may be more pronounced.

The final set of research questions examined the relations across teacher-student relationship quality, perceived cultural humility, academic grit, and grades for students. In first examining relations among subscales of the same measure, variation that is inconsistent with existing literature on teacher-student relationship quality was found. As would be expected, significant positive correlations were found between communication and trust, as well as a significant negative correlation between trust and alienation. However, alienation and communication were not significantly related, which is in contrast to previous research on teacher-student relationship quality (Lei et al., 2023; Roorda et al., 2017). The positive and negative cultural humility scales correlated together as would be expected (Srisarajivakul et al., 2023), with higher levels of positive cultural humility being related to lower levels of negative cultural humility. In evaluating relations across teacher-student relationship quality and cultural humility measures, positive cultural humility was significantly and positively correlated with communication and trust. A significant negative correlation was found between negative cultural humility and trust, and a significant positive correlation was found between negative cultural humility and alienation. These findings align with past research (McPhee, 2020), providing support for connections between teacher-student relationship quality and cultural humility. These results suggest that teacher-student relationship quality and cultural humility may impact each other and that both are important to consider in conceptualizing teacher-student relationships. Thus, further research is needed to continue examining these relations, considering the limited research on cultural humility in the schools.
In examining the outcome variables of interest, academic grit and grades, it is notable that none of the teacher-student relationship quality or cultural humility variables were significantly related to academic grit. As little research has examined academic grit, this contributes to the literature and suggests that academic grit is not related to cultural humility or teacher-student relationship quality. As grit tends to be viewed as either a state or intrinsic trait, it may not capture the ability for motivation to fluctuate based on relational components such as cultural humility or teacher-student relationship quality. All variables but one failed to reach significance in relation to grades as well; a weak, negative relation was found between alienation and grades, such that the more alienation students experienced the lower grades they received. This aligns with the literature that suggests students who feel less connected to their teachers and who experience more strife with teachers tend to struggle more academically in school (Hughes et al., 2012; Roorda et al., 2017). However, the lack of significance between course grades and teacher-student relationship components is inconsistent with past research that has found a connection between these factors (Lei et al., 2023; Roorda et al., 2011; Scales et al., 2020a; Scales et al., 2020b). It is possible that for the current sample the impact of a negative teacher-student relationship provides a more significant impact on student academic achievement than positive teacher-student relationships. However, the lack of consistency of these results to the prior literature is concerning. While it is possible that the findings accurately convey the experiences of students in the current sample, the inconsistent findings and significant methodological flaws suggest that the current findings were impacted by these factors. Thus, these findings should be viewed with extreme caution. In turn, it is suggested that future research continue examining the relation between teacher-student relationships and grades with specific attention to negative components of teacher-student relationship quality. Additionally, considering the lack of
significance with academic grit, other potential mediators (e.g., engagement or motivation) should be considered in future models to best understand the ways in which teacher-student relationships and cultural humility may impact student outcomes.

**Implications**

School psychologists play a unique role in the schools, as they hold a wealth of knowledge regarding mental health and the inner workings of schools which allows them to develop psychoeducation or interventions to best support students and teachers. Based on findings from the current study, school psychologists may share information regarding the range of identities that may be important to students with teachers. It is possible that this may help increase teachers’ awareness of identities that are important to their students and encourage more curiosity among teachers. School psychologists may also foster teacher’s understanding of students varied salient identities and their potential impact on school outcomes through the development of professional development seminars or workshops. It may also be useful to cater these activities to the reported salient identities of the specific school.

Additionally, past research has developed and validated school-based interventions to help support student’s identity development which may be implemented by school psychologists (Ceccon et al., 2024; Duquette et al., 2023). The use of these interventions may help students to engage in identity exploration which has been linked to more positive academic outcomes (Johnson et al., 2023; Meca et al., 2017; Smith et al., 2022; Thomas et al., 2022; Thompson et al., 2016). However, many of these interventions focus on racial/ethnic identity development, and this work needs to examine the utility of these interventions on broader identity development for students. Further, it should be noted that for many schools implementation of such programs may not be feasible due to the current sociopolitical climate. Thus, school psychologists instead
may provide parents and teachers with psychoeducation regarding the identity development process and ways to support adolescents through this process. School psychologists may also focus on promoting culturally relevant practices that help teachers acknowledge missteps and provide trainings on cultural humility for teachers. Results from this study point to the importance of promoting discussions with school personnel around teacher-student relationship quality and its potential impact on students. More specifically, due to the significant relation between alienation and students earning lower grades, facilitating teachers understanding that when students feel more alienated by their teachers that they will not do as well in school will be important. School psychologists may develop materials to share with teachers about this association and potential ways to promote more positive relationships with students, as well as ways to check-in on students who are experiencing feelings of alienation throughout the year to help remediate relationships when this occurs. Through increasing teachers’ awareness, school psychologists may promote more positive relationships between teachers and students, thus improving academic outcomes in the long run.

**Limitations and Future Directions**

Several limitations from the current study warrant further discussion due to their potential impact on the findings and, by extension, potential contribution of this work to the literature. The methodological changes made to the study in response to difficulty with data collection serve as a major limitation of the current study. Namely, it was necessary to utilize multiple schools, data collection occurred at different time points from each school, and the small overall sample size severely limit the conclusions that may be drawn from this study. Students at school B had more time to develop relationships with their teachers due to collecting their data in April rather than January, which may have impacted ratings of teacher-student relationship quality or cultural
humility. Further, the April data collection was in close proximity to the end-of-year state testing, which can be a stressful time of year for both students and their teachers. The use of two different schools also brings in the potential for differences in school climate as well as individual differences in teachers from each school, which may influence student’s perceptions of their relationships with teachers and cultural humility of teachers in the current study. Further, school A only garnered participants from two grades (10th and 11th grade), while school B garnered participants from all four grades. It should also be noted that for 12th grade, all participants identified as young women. As the variability within grades may be impacted by school, grades were collapsed in the current study to upper-division (11th and 12th grade) and lower-division (9th and 10th grade). Doing so, limits the generalizability of findings to all grade levels and further hindered the potential to examine grade level differences. Despite concerns for the influence of these limitations, it should be noted that analyses of differences between schools and teachers produced null results, providing some evidence that differences between the two schools may not have influenced the results of the current study. However, future research would benefit from evaluating the role of school climate in examining the impact of teacher-student relationships and cultural humility on students’ feelings towards school and outcomes using a multilevel model or hierarchical linear modeling, especially when multiple schools are utilized.

Due to the low parental consent response rate, it was necessary to shift analyses from the originally proposed models to more descriptive approaches in order to fit the small sample size and maintain sufficient power. Therefore, the anticipated implications of testing a potential mediator and moderator on the relation between teacher-student relationship quality and academic achievement was not actualized. Instead, the current work served as an exploratory study, using primarily descriptive analyses help to paint a picture of student’s current
experiences with their teachers that may help inform future research. It is recommended that future work revisit the mediated moderation and moderated moderation models that were originally proposed with a larger, more nationally representative sample. Further, results based on participants from two schools located in the Mid-South region of the United States may not generalize to students from other sociocultural contexts.

It should also be noted that no teacher-student relationship quality or cultural humility factors were associated with academic grit, which may suggest the need to re-assess the role motivation plays in the relation between teacher-student relationship quality and academic achievement. As motivation and engagement have been proposed as potential mediators in previous research (Hughes et al., 2012; Roorda et al., 2017; Scales et al., 2020b; Zee et al., 2021), future studies may explore other factors to better understand the way in which teacher-student relationship quality and cultural humility impact students’ academic achievement in school. Some factors of interest may include psychological or behavioral engagement, as these factors assess students’ motivation, connection, interest, effort, and participation in school activities (Woolley & Bowen, 2007). With the inclusion of a different motivation factor or multiple motivation factors, it may be recommended that the originally presented models be explored if associations between teacher-student relationship quality and cultural humility are significantly related with these motivation factors to examine whether motivation impacts students’ academic outcomes, as has been suggested in previous research (Scales et al., 2020b; Zee et al., 2021). Further, it is suggested that in future research the impact of negative teacher-student relationships is explored, as currently little research has explored the impact of negative relationships despite their demonstrated impact on academic outcomes in adolescents (Roorda et al., 2017).
Additionally, it is possible that the developmental context may have impacted survey results. While it was proposed that adolescents are increasingly turning to non-parental adults and may place more value in trusted non-parental adult figures (e.g., teachers), high school teachers may provide a smaller influence on student’s outcomes due to spending a smaller duration of time with teachers. These students may have also already established significant non-parental adult relationships that influence later academic outcomes with individuals outside the school setting. Further, previous research has also shown that peers during adolescence play a significant role in students’ academic outcomes, providing additional support (Clark et al., 2020). If students are more focused on peer relationships in high school and teachers play a less significant role, it may be important to further explore the role of peers on school outcomes and motivation. It may also be important to explore earlier development of teacher-student relationship quality among middle schoolers, who are just beginning to explore other sources of support from non-parental adult figures.

It should be noted that the use of survey data collected from students had the potential to be impacted by social desirability bias. It is also possible that students’ responses may have been aspirational, capturing how they desire their relationships with teachers to be. This may have been particularly true for students who completed these with more time left for relationships to change in the remainder of the year. Despite these concerns, it was important to garner responses directly from students to understand their own reporting of their experiences with teachers. However, gathering survey responses from teachers would provide a more rounded understanding of teacher-student relationships in the future. It is recommended that future research also explore potential differences between teacher and student reports on teacher-student relationship quality and cultural humility. Past research has examined differences on
teacher-student relationship quality with some mixed results, as some teacher’s ratings of their relationships aligned with students’ ratings and others varied significantly (Karamane et al., 2023; Prewett et al., 2019). However, as the construct of cultural humility in the school context remains a fairly new line of inquiry and, to my knowledge, no research has examined comparisons between students perceived cultural humility of teachers and teachers reported cultural humility, it is recommended that future research explore potential differences in reporting.

**Conclusion**

Overall, the current study provides a positive picture of student’s relationships with their teachers, suggesting that participants in this sample generally experienced high levels of trust and positive cultural humility with their teacher. Additionally, while teacher-student relationship quality and cultural humility were not linked to academic grit, students’ ratings of alienation appeared to impact student grades. This may suggest the need to further explore the potential stronger influence of alienation or negative teacher-student relationships on grades in future research, as much of the current research focuses on the impact of positive teacher-student relationships (Roorda et al., 2017). In schools, student’s endorsement of a variety of salient identities suggests the need for increased research on a broader range of identities, as well as the need for increased psychoeducation for teachers to better understand students and ways to best support them. As several limitations were present in the current study, any null findings should not be taken as a non-existent relation and should instead indicate a need for continued research. It is suggested that future research continue to examine the interplay between teacher-student relationship quality and cultural humility, exploring the role of a more flexible motivation construct (e.g., motivation or engagement) on student outcomes and the contextual role of school
climate on these dynamic systems. In summary, more attention should be placed on promoting positive relationships between teachers and students to promote further academic success of students and continuing to explore each of these factors in combination.
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Appendix A
Academic Grit Measure

Academic Grit Scale (Clark & Malecki, 2019)
Please respond to the following items by reading each statement and then selecting on the response that best describes you. There are no right or wrong answers, so please be honest.

1) I push myself to do my personal best in school
2) I work toward my academic goals no matter how long they take to reach.
3) Even when I could do something more fun, I give schoolwork my best effort.
4) I complete my schoolwork no matter how difficult it is.
5) I am determined to give my best effort in schoolwork.
6) Once I set a goal in school, I try to overcome any challenges that arise.
7) I am able to balance working hard in school with my other hobbies and interests.
8) Even if I am struggling in school, I keep trying my best.
9) When it comes to completing work in school, I always try my hardest.
10) In school, I work hard to achieve challenging goals.

The mean score of ratings on the 10 AGS items indicates the level of academic grit, when 1=Not at all like me and 5=Very much like me. Higher mean scores reflect higher academic grit.
Appendix B
Teacher-Student Relationship Quality Measure

Inventory of Teacher-Student Relationships Scale (Murray & Zvoch, 2011)

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

Communication: 4, 8, 9, 10, 11, 12, 15, 17
Trust: 1, 2, 3, 7, 13
Alienation: 5, 6, 14, 16

The mean score of ratings on each of the 3 subscales of the ITSR indicate the level of each subscale (i.e., communication, trust, alienation), when 1=Almost never or never true and 4=Almost always or always true. Higher mean scores reflect higher levels of each subscale.
Appendix C
Cultural Humility Measure

Cultural Humility Scale for Students (Srisarajivakul et al., 2023)
There could be parts of your cultural background that are important to you. Parts of your cultural background could include your skin color, ethnicity, nationality, gender, age, sexual orientation, religion, disability, body size, and the neighborhood you’re from. There might be other parts of your cultural identity that are important to you that we did not put on the list. Also, some things may be more important to you, and other things may be less important to you:

- Please pick the part of your cultural background that is most important to you:
  - How important is this part of your cultural background? (1, not important at all, to 5 very important)
- If there is a 2nd part of your cultural background that is important to you, please pick:
  - How important is this part of your cultural background? (1, not important at all, to 5 very important)
- If there is a 3rd part of your cultural background that is important to you, please pick:
  - How important is this part of your cultural background? (1, not important at all, to 5 very important)

Please think about your third period teacher and answer the questions below:
Towards this part of my culture, my teacher...
1) Shows respect
2) Is open
3) Is arrogant
4) Is considerate
5) Shows an interest in learning more
6) Tries to see my perspective
7) Makes assumptions
8) Stays open minded
9) Acts like a know it all
10) Thinks they know more than they do
11) Asks questions when unsure

Positive: 1, 2, 4, 5, 6, 8, 11
Negative: 3, 7, 9, 10

- This teacher’s race is
- This teacher’s age is
- This teacher’s gender is

The mean score of ratings on each of the 2 subscales of the CHS indicate the level of each subscale (i.e., positive cultural humility or negative cultural humility), when 1=Really Disagree and 5=Really Agree. Higher mean scores reflect higher levels of positive or negative cultural humility.
Appendix D
Information and Script Shared with Teachers

Teacher Script

Read before consent forms are sent out: Students, you are being invited to participate in a survey online that will ask you questions about yourself, your school, and your feelings about your grades, school, and teachers. These answers will help your teachers and school know how to best support you and encourage your academic success at school. Altogether, it should take you about 25 minutes. You only will be asked to answer these questions once.

A consent form is being sent home with you or emailed to your parents to read, sign, and return by the end of the week. If you are 18 years old, you will be able to complete the consent form for yourself. This will be done when the survey is completed. If your parents return your form, our class will be entered into a drawing for a pizza party (or for gift cards).

Do you have any questions?

Email to parents: Good afternoon/morning,

Your child has been invited to participate in an online survey exploring different factors that help students become successful learners. The survey will ask questions regarding their demographic information and their feelings about school, grades and teachers. Attached is a consent form with more information and a place for you to sign indicating your permission for your child to participate or not to participate. Classes who return consent forms will be entered into a drawing for a pizza party (or for gift cards).

Please fill out and return it to me via email or your student by the end of the week.

Thank you,
Teacher’s name

Read before given/emailed Qualtrics link: Students, you are being invited to participate in a survey online that will ask you questions about yourself, your school, and your feelings about your grades, school, and teachers. Your parents returned their consent forms signed and know you are participating. If you are 18, you have the option to participate and provide your own consent.

These answers will help your teachers and school know how to best support you and encourage your academic success at school. Altogether, it should take you about 25 minutes. You only will be asked to answer these questions once.

Your part in the project is voluntary, meaning it’s up to you and you can decide to stop at any time. As a student, if you decide not to take part in this study your choice will not affect your
academic status or grade in your class. However, if you do participate, our class will be entered again into a drawing for a pizza party (or for gift cards).

Do you have any questions?