The Gender Achievement Gap: Do Teacher–Student Relationships Matter?

Peter D. Goldie1 and Erin E. O’Connor2*
1Graduate School of Education, University of Pennsylvania
2Steinhardt School of Culture, Education, and Human Development, New York University

ABSTRACT. Low academic performance in middle childhood/early adolescence has long-term negative implications. The link between early performance and later outcomes is of special concern for boys, who tend to evidence lower levels of achievement than girls by early adolescence. Scholars have demonstrated that variations by gender in quality of teacher–student relationships may partly explain this achievement gap. That is, girls tend to have higher quality teacher–student relationships (i.e., higher levels of closeness and lower levels of conflict) than boys. Centering low-income early adolescents of color, the present analyses found that girls outperformed boys in both English Language Arts (ELA; \( p < .001 \)) and math (\( p = .009 \)).

Teacher–student closeness fully and significantly mediated the association between gender and ELA (\( p = .05 \)) and partially mediated the association between gender and math achievement (effects were nonsignificant). Teacher–student conflict partially mediated associations between gender and ELA and math achievement, although effects similarly did not reach significance. Results have the capacity to inform future interventions aiming to increase the utility of education and decrease school dropout among low-income boys of color.

Keywords: gender, academic achievement, teacher-student relationships

In the United States, about 57% of college degrees are conferred to women (Snyder et al., 2018), who tend to consistently and significantly outperform their male counterparts academically (e.g., Conger & Long, 2010). Substantial evidence has suggested that this gender gap in academic achievement begins at a young age, with some studies showing that, by early adolescence (i.e., ages 10 to 14), girls significantly outperform boys (e.g., Hamre & Pianta, 2001; Malinauskiene et al., 2011) on both standardized tests and school grades. The lower levels of academic achievement that boys, relative to girls, commonly demonstrate are alarming because they have lasting negative implications for both individuals and society at large (Henry et al., 2012). For example, academic underachievement is associated with school dropout, which is, in turn, associated with lower income levels (Levin, 2005). It is, therefore, imperative to identify the factors that lead boys to underperform academically. Investigating this topic is especially important for Black and African American boys because they tend to demonstrate the lowest levels of achievement relative to other groups (Lewis et al., 2010) as a result of systemic oppression (e.g., criminalization).

Research has suggested that early adolescent boys and girls (ages 10–14) both benefit from high-quality teacher–student relationships (Uslu & Gizir, 2016), characterized by high levels of closeness and low levels of conflict. The literature has indicated that, relative to boys, girls tend to have higher quality relationships with teachers (e.g., Hamre & Pianta, 2001). One key benefit associated with students having high-quality relationships with teachers is increased academic achievement (of both genders; Valiente et al., 2019).

Although a wide body of research has investigated gender, teacher–student relationships, and achievement among young children, early
adolescents (and specifically early adolescents of color) have been underrepresented. In one of the only studies examining this topic in a racially diverse sample of early adolescents, Hamre & Pianta (2001) found that high-quality teacher–student relationships predicted increased academic achievement. They reported that closeness and conflict with teachers were important for both male and female students and that conflict was more highly associated with students’ achievement levels. Additionally, they found that girls tend to have significantly higher levels of closeness and lower levels of conflict relative to boys. Society at large values aggression (Ewing & Taylor, 2009) and dominance (Bem, 1981) in boys, which offers a possible explanation for this discrepancy. Nonetheless, because achievement in early adolescence has been related to later achievement (Rimfeld et al., 2018) and, consequently, other life outcomes (e.g., income level; Levin, 2005), this body of research must be expanded and specifically center students of color who have been understudied in this domain and in the field of psychology as a collective.

It is clear from prior work that boys generally have lower quality relationships with teachers compared to girls, and that early childhood teacher–student relationships predict later achievement (Hamre & Pianta, 2001). Extant research has not, however, investigated the potential mediating effects of teacher–student closeness and conflict on the association between gender and achievement. The little research in this area tends to have focused on White middle- and upper-class young children (e.g., Hajovsky et al., 2017), providing an incomplete understanding of the topic and misrepresenting many individuals’ experiences (e.g., low-income, Black and African American adolescents). To address these gaps in the current understanding, the present study examined the gender achievement gap among a sample of predominantly Black and African American early adolescents as well as the mediating role of teacher–student relationships on the association between gender and achievement.

**Teacher–Student Relationships**

Attachment theory (Ainsworth & Bowlby, 1991) offers a useful theoretical framework for examining teacher–student relationships. According to attachment theory, many children form strong, secure attachment relationships with caregivers (Ainsworth et al., 1971). These relationships instill a sense of safety in the child, supporting their exploration of the world and providing comfort in times of distress (Blatz, 1966). Children may instead form insecure relationships, characterized by rejection in their attempts to attain proximity to attachment figures (Fearon et al., 2010). Insecure relationships lead children to doubt their caregiver’s support (O’Connor & McCartney, 2007) and, consequently, children must utilize alternative coping mechanisms to deal with challenges (Fearon et al., 2010). Further, youth with insecure attachments to caregivers tend to lack social competence and self-esteem (Hamre & Pianta, 2001) which likely negatively affects their later relationships.

Scholars have previously extended the attachment framework to relationships between teachers and students, conceptualizing teacher–student relationships as attachment relationships (Pianta & Nimetz, 1991). Relying on attachment theory (O’Connor & McCartney, 2007), teacher–student relationships are frequently evaluated in two key areas, which are closely related to attachment constructs: closeness and conflict (e.g., Collins & O’Connor, 2016). Closeness refers to the degree to which the teacher represents a safe haven as well as the warmth and closeness within the teacher–student relationship, whereas conflict refers to the resistance that is present in the relationship (Verschueren & Koomen, 2012). The most positive and beneficial teacher–student relationships have high levels of closeness and low levels of conflict, whereas negative teacher–student relationships entail low levels of closeness and high levels of conflict. Secure attachments can be viewed as analogous to teacher–student relationships with high levels of closeness. Conversely, insecure attachments can be viewed as analogous to teacher–student relationships with high levels of conflict.

Children who maintain high-quality relationships with teachers often exhibit various positive characteristics in the classroom (e.g., the ability to transition between activities smoothly; Howes & Ritchie, 1999). High-quality teacher–student relationships are essential for adolescent populations as they foster social-emotional growth (Murray & Pianta, 2007) during a developmentally challenging time period.

**Gender, Teacher–Student Relationships, and Academic Achievement**

Research has widely documented associations between gender and teacher–student relationships. That is, scholars have consistently found that boys generally have higher levels of conflict...
and lower levels of closeness with teachers relative to their female peers (e.g., Hamre & Pianta, 2001; McKinnon et al., 2018).

A cohesive breadth of literature has also associated early adolescents’ high-quality teacher–student relationships with academic success (e.g., Hamre & Pianta, 2001; Roorda et al., 2017). That is, closeness with teachers fosters students’ academic growth, whereas conflict inhibits it (Hamre & Pianta, 2001). The research on these topics, however, remains underdeveloped. There are inconsistent findings around gender differences in teacher–student closeness, and many studies have reported only correlational data, which does not allow for causal conclusions. Additionally, the extant research has tended to utilize predominantly White samples (e.g., Hamre & Pianta, 2001; Rhoad-Drogalis et al., 2018) despite prior research finding that African American boys and girls have lower quality (teacher-reported) relationships with teachers (McKinnon et al., 2018).

Previous scholars’ gender socialization work provides a helpful lens through which teacher–student relationships can be examined. Although possibly specific to Western cultures, a gender socialization perspective proposes that the divergent roles society prescribes for boys and girls tend to be reflected in their behaviors and the ways in which they relate to others (Ewing & Taylor, 2009). Boys and girls receive messages about behaviors that are appropriate for them to exhibit in the classroom (Koch, 2003). It follows that children are treated differently by others (e.g., teachers) based on their gender. Girls’ roles encourage them to be sympathetic, gentle, and emotionally sensitive (Diekmann & Eagly, 2000), likely contributing to the development of closer and less conflictual relationships with their teachers. Conversely, societal expectations for boys include aggression (Ewing & Taylor, 2009), leadership, and dominance (Bem, 1981), traits that almost certainly hinder their development of high-quality relationships with teachers. It is therefore likely that the ways in which boys are socialized contribute to higher rates of conflict with teachers. Given the empirically demonstrated negative relations between teacher–student conflict and achievement (Hamre & Pianta, 2001), gender socialization might inhibit boys’ achievement while supporting girls’ achievement.

It is also possible that the pervasive stereotype that boys are inherently more conflictual or disruptive is internalized by many teachers and reflected in the ways they treat male students, especially boys of color. Given that teachers’ expectations play a key role in determining students’ academic achievement (Friedrich et al., 2015), such biases might be a factor limiting boys’ achievement. Additionally, as Good (1981) described, teachers tend to provide less accurate or thorough support and feedback to lower achieving students; this likely disproportionately affects boys (e.g., Hamre & Pianta, 2001; Malinauskiene et al., 2011), and specifically Black and African American boys who may therefore have lower levels of academic achievement (Lewis et al., 2010). It is also possible that boys internalize their teachers’ negative expectations for their academic achievement or society’s expectations for them to have conflictual interactions with their teachers. These expectations might hinder both boys’ academic achievement directly or negatively impact their relationships with teachers, thereby weakening their academic achievement.

A substantial portion of the literature surrounding gender and academic achievement has studied White middle- and upper-class children under the age of 10, which has left early adolescents (ages 10–14), low-income students, and students of color understudied. Low-income students and Black students, however, often develop lower quality relationships with teachers (Hartz et al., 2017), which may be connected to their lower academic achievement than their peers (Hemphill et al., 2011; Owens, 2018). Pertinently, low-income families likely have limited funds for academic resources (Reardon, 2011), which sets children on trajectories for lower long-term achievement as compared to better-resourced children. It must be considered that there is an association between race/ethnicity and socioeconomic status such that Black and African American people are more often economically disadvantaged relative to other racial and ethnic groups (Bond Huie et al., 2003). Consequentially, economic disparities, rather than racial disparities per se, appear to play an important role in upholding educational disparities.

**Current Study**

Although considerable research has examined the association between gender and achievement, wide gaps remain. Most extant literature has suggested that girls outperform boys academically, but there are some mixed findings regarding the academic subjects in which the gender achievement gap persists. A wide body of research has suggested that girls outperform boys in both English Language Arts (ELA) and math achievement (e.g., Voyer & Voyer, 2010). However, some research instead has reported that girls outperform boys only in ELA and
The Gender Achievement Gap | Goldie and O'Connor

that boys outperform girls in math (e.g., Cimpian et al., 2016) or a minimal discrepancy in math achievement between boys and girls (e.g., Snyder et al., 2018). It is possible that the more pronounced and consistently documented gender achievement gap in ELA can be explained by gender socialization or societal expectations for girls to excel in “softer” subjects, whereas boys are expected to excel in math and science-related fields. Nonetheless, the inconsistency in findings in the current literature warrants further investigation.

Additionally, there is a lack of knowledge surrounding the factors that impact differential gender achievement (Voyer & Voyer, 2014). Previous scholars have found both that gender is associated with teacher–student relationships and that teacher–student relationships are associated with achievement (Hamre & Pianta, 2001). However, research has not investigated the specific mediating effect of teacher–student relationships on the association between gender and academic achievement. Finally, low-income Black and African American early adolescents have not been sufficiently represented in the literature surrounding the topic of gender and academic achievement at large.

Aiming to fill these gaps, the current study examined the gender achievement gap and considered teacher–student relationships as a potential mediating factor in the association between gender and achievement among low-income, predominantly Black/African American early adolescents. Examining this topic will potentially inform interventions aiming to increase the utility of early adolescent education and reduce school dropout. The following two research questions and hypotheses were proposed:

1. Does gender predict math and English Language Arts (ELA) achievement in early adolescence? Consistent with most extant literature, we expected to see a strong association between gender and both math and ELA achievement with girls outperforming boys in both subjects.

2. Do teacher–student relationships (i.e., closeness and conflict) mediate associations between gender and achievement? We expected that teacher–student closeness and conflict would mediate the association between gender and achievement in both math and ELA. More specifically, we anticipated that boys’ lower levels of closeness and higher levels of conflict with teachers would limit, and explain, their lower achievement. We believed this would be the case given previous research reporting strong associations between gender and teacher–student relationship quality as well as between teacher–student relationship quality and academic achievement.

**Method**

**Procedure**

The study data are derived from an intervention study of an early childhood temperament-based learning intervention, INSIGHTS Into Children’s Temperament (INSIGHTS; McClowry et al., 2005). Recruitment for the INSIGHTS intervention, which was approved by university and school system research boards, consisted of contacting principals serving low-income students in three districts. All schools served families with similar sociodemographic characteristics. Twenty-three schools were invited and agreed to participate, and one school withdrew as a result of a principal’s transition. Thus, the intervention was implemented in 22 qualifying low-income schools in a large metropolitan city; schools were randomly assigned to either INSIGHTS or an attention-control condition. Students in the INSIGHTS condition completed a temperament-based program that aims to increase social-emotional learning, whereas those in the attention-control condition completed a supplemental reading program. The initial intervention and data collection were carried out when students were in kindergarten or first grade (K/1; Mage = 5.68 years; SD = 0.69) and a follow-up data collection was conducted when students were in sixth grade.

The present study included all participants for which the INSIGHTS team had teacher–student relationship (first grade), academic achievement (sixth grade), and demographic (i.e., gender) data. Eligible student participants were 238 students (122 boys, 116 girls) who attended schools throughout a large metropolitan city at sixth grade follow-up data collection. Two hundred twenty-two of these students’ parents provided information about their income levels; 92% of students came from low-income families (i.e., those students who qualified for free or reduced-price lunch at the beginning of the study). The sample for this study is composed of students who were identified by their parents as Black/African American (76%), bi/multiracial Black (3%), or another race (e.g., Latino; 21%). Racial identity information was not provided to the INSIGHTS team for two participants. Non-Black/African American students are not excluded to increase power, and students were not analyzed separately by race because
such analyses would have had very low power. One parent from each family participated, providing demographic information (i.e., child’s gender, child’s race, and family income status) when children were in kindergarten or first grade. Additionally, students’ first-grade homeroom teachers (N= 238) completed a paper or online survey about their relationship with each respective student.

Measures

Demographics
Demographic information was collected during the initial INSIGHTS study (i.e., when students were K/1) by parent report. Relevant demographic variables included child’s gender, child’s race, and family socioeconomic status (identified based on each child’s eligibility for free or reduced-price lunch). Gender is treated as a dichotomous variable (i.e., male and female gender identities as reported by parents).

Academic Achievement
Academic achievement was measured using standardized test scores administered by and obtained from the New York City Department of Education. Achievement scores for student participants were converted into z-scores, which were then normed relative to the school district; this allowed for the comparison of students to others who have had similar school experiences. The math test has questions probing number sense and operations whereas the ELA test includes questions surrounding students’ literary responses and critical analysis skills (Dobbie & Fryer, 2011). The present analyses include students’ sixth grade Math and ELA test scores.

Teacher–Student Relationship Quality
Teacher–student relationship quality was captured with a shortened version of the Student–Teacher Relationship Scale (STRS; Pianta, 2001). There are two subscales, which are completed by participants’ first-grade homeroom teachers. The 8-item Closeness subscale assesses warmth and communication, and the 7-item Conflict subscale measures antagonistic interactions (McCormick et al., 2015) and/or resistance present in the teacher–student relationship (Verschueren & Koomen, 2012). Students’ homeroom teachers rated the degree to which statements accurately described their relationship with students using a Likert-type scale ranging from 1 (definitely does not apply) to 5 (definitely applies; Pianta, 2001). The STRS has been widely used in work centering elementary school-aged children, and INSIGHTS data shows that it yields excellent reliability (α = .91; McCormick et al., 2015).

Data Analytic Plan
All analyses were conducted with SPSS statistical software. We addressed the first research question using an Ordinary Least Squares regression, which assesses the association between gender and ELA/math achievement respectively, controlling for the INSIGHTS treatment condition because these conditions are not relevant to the present study. We investigated the second research question using linear regressions, specifically utilizing mediation models following the Baron and Kenny (1986) method. Mediation aims to assess whether the association between a predictor and outcome variable can be explained through a third variable (i.e., the mediating variable). These analyses assess the mediating effect of teacher–student closeness/conflict on the association between gender and ELA/math achievement respectively. Partial mediation is detected when the standardized beta weight of the initial association between the predictor and outcome variables is reduced when adding a mediating factor. Further, to assess the significance of mediation effects, we utilized the Sobel (1982) test. These analyses similarly control for the INSIGHTS treatment condition. Regressions are run separately for ELA and math achievement as well as teacher–student closeness and conflict to capture variability between relationship dimensions and academic subjects. Figure 1 shows a conceptual model for the mediation analyses. Throughout the study, gender is dummy coded (i.e., male = 0; female = 1).

Results
Prior to addressing the research questions, descriptive statistics and correlations were conducted to provide initial information. A correlation matrix including descriptive statistics (i.e., means, standard deviations) of study variables (aside from gender) can be found in Table 1.
The initial correlations yielded potentially meaningful preliminary findings. There was a significant, moderate, and negative correlation between teacher–student closeness and conflict. Given the findings of previous scholars (Hamre & Pianta, 2001), it was unsurprising that highly significant, moderate, and negative correlations were found between K/1 teacher–student conflict and both sixth grade math and ELA achievement. K/1 teacher–student closeness, conversely, was positively, weakly, and significantly correlated with both sixth grade ELA and math achievement. Finally, a strong, significant, and positive correlation was found between sixth grade math and ELA achievement, which was anticipated because previous research has indicated that achievement tends to remain stable across academic subjects (Ma, 2001).

**Gender and Academic Achievement**

To address the first research question, we ran Ordinary Least Squares regressions between gender and both ELA and Math achievement, controlling for the INSIGHTS treatment condition. The first analysis showed that the model explained 5.5% of the variance in ELA achievement. Moreover, it yielded a statistically significant difference between boys’ and girls’ ELA achievement, $b = .25, t(2, 235) = 3.93, p < .001$, such that girls ($M = 0.08$) outperformed boys ($M = -0.40$). The second analysis found a similar discrepancy in math achievement based on gender, $b = .17, t(2, 235) = 2.63, p = .009$, such that girls ($M = -0.07$) significantly outperformed boys ($M = 0.39$). This model explained less of the variance (2.3%) than the prior model examining ELA achievement. Results of these analyses aligned with various previous scholars’ work (e.g., Voyer & Voyer, 2014), as well as the initial correlations between gender and ELA/math achievement (see Table 1).

**The Mediating Role of Teacher–Student Relationships on the Gender Achievement Gap**

Aiming to investigate the impact of teacher–student relationships on the gender achievement gap, we conducted four mediation analyses. Each mediation analysis controlled for the INSIGHTS treatment condition. A broad conceptual model can be found under Figure 1, and specific models including statistics can be found for each analysis under Figures 2, 3, 4, and 5, respectively. The first mediation analysis included gender as the predictor, teacher–student conflict as a mediator, and math achievement as the outcome. The first pathway within this analysis showed an association between gender and

---

### TABLE 1

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teacher–Student Conflict</td>
<td>1.80</td>
<td>0.93</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Teacher–Student Closeness</td>
<td>4.11</td>
<td>0.73</td>
<td>-31&quot;</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. ELA Achievement$^*$</td>
<td>-0.17</td>
<td>0.95</td>
<td>-28&quot;</td>
<td>.15&quot;</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4. Math Achievement$^*$</td>
<td>-0.23</td>
<td>0.95</td>
<td>-31&quot;</td>
<td>.18&quot;</td>
<td>.68&quot;</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: Gender: Girls = 1, Boys = 0

$^*$Achievement scores were converted into z-scores, which were normed relative to similar school experiences.
teacher–student conflict, which indicates that boys had higher levels of conflict with their teachers than did girls. The second pathway showed that teacher–student conflict significantly predicted lower math achievement. Results indicated that teacher–student conflict partially mediated the association between gender and math achievement, such that including teacher–student conflict as a mediator in the model shifted the direct association between gender and math achievement to be weaker than its initial direct association. Based on Sobel’s (1982) test, mediation effects did not reach significance. This suggests that early adolescent boys had overall higher levels of conflict with teachers relative to their female peers, which was, in turn, related to boys’ weaker math achievement in sixth grade.

The second mediation analysis included gender as the predictor, teacher–student conflict as a mediator, and ELA achievement as the outcome. The first pathway in this analysis, identical to the one described above, showed an association between gender and teacher–student conflict such that boys had higher levels of conflict with their teachers. The second pathway showed that teacher–student conflict was highly associated with lower ELA achievement. The significance of the initial pathway between gender and ELA achievement was reduced when adding teacher–student conflict as a mediator. Teacher–student conflict, therefore, partially mediated the association between gender and ELA achievement. Sobel’s (1982) test showed that mediation effects did not reach significance. Results of this analysis suggest that early adolescent boys, overall, have relationships with teachers characterized by higher levels of conflict, which predicts lower math achievement relative to girls.

The third mediation analysis included gender as the predictor, teacher–student closeness as a mediator, and math achievement as the outcome. The first pathway within this analysis showed that gender significantly predicted teacher–student closeness such that boys had lower levels of closeness with teachers than did girls. The second pathway showed that teacher–student closeness had associated with higher math achievement. Results indicated that teacher–student closeness fully mediated the association between gender and math achievement, such that including teacher–student closeness as a mediator in the model resulted in the effect of gender on math achievement being nonsignificant although it was previously highly significant. Sobel’s (1982) test indicated that mediation effects are significant ($p = .05$). This finding suggests that early adolescent boys’ lower levels of teacher–student closeness has indirect effects that predict their underperformance in math relative to girls.

The fourth mediation analysis included gender as the predictor, teacher–student closeness as a mediator, and ELA achievement as the outcome. The first pathway in this analysis was identical to the one described in the third mediation analysis; this showed that gender was highly associated with teacher–student closeness such that boys had lower levels of closeness with teachers than did girls. The second pathway showed that teacher–student closeness did not significantly predict ELA achievement. Including teacher–student closeness as a mediator in the model made the direct association between gender and math achievement weaker than the initial direct association, indicating partial mediation. However, Sobel’s (1982) test revealed that mediation effects were nonsignificant.

Although only one of our mediation models reached significance, all four showed partial mediation effects. In context, findings of these analyses provide preliminary evidence that the indirect effects of teacher–student relationships lead female students to outperform their male peers. More specifically, girls’ lower levels of conflict with teachers in first grade predicted their outperformance of boys in both math and ELA. Girls’ higher levels of closeness with teachers in first grade predicted their outperformance of boys in math and ELA, with effects reaching significance in math.

**Discussion**

The purpose of the present study was to investigate the gender achievement gap in math and ELA using standardized test scores and examine whether teacher–student relationships mediate the gender achievement gap among low-income, predominantly Black/African American early adolescents. Prior research has suggested that closeness and conflict within teacher–student relationships may contribute to the gender achievement gap (Hamre & Pianta, 2001), yet has not examined this specific mediated pathway. Relative to girls, boys often underperform academically (Hamre & Pianta, 2001; Malinauskiene et al., 2011), and Black early adolescent boys often show lower academic performance as compared to other groups (Lewis et al., 2010). These differences are not products of the groups themselves, but rather structural and systemic barriers. This is a key topic of interest because academic underachievement is associated...
with school dropout and, consequently, depressed income levels (Levin, 2005). Results of the present study showed that girls significantly outperformed boys in both ELA and math. Further, to varying degrees, teacher–student closeness and conflict mediated the association between gender and both ELA and math achievement.

Findings of the present study corroborate those in extant literature pertaining to the gender achievement gap. That is, a wide body of research has suggested that girls significantly outperform boys in both ELA and math. Perhaps most notably, Voyer & Voyer (2014) conducted a meta-analysis examining studies with various racial/ethnic breakdowns and found that girls outperform boys across academic subjects. It was, therefore, unsurprising that girls in the present study demonstrated higher academic achievement than boys. Prior literature has additionally drawn a somewhat clear association between gender and teacher–student relationship quality, such that boys tend to have more conflictual and less close relationships with teachers relative to girls (Hamre & Pianta, 2001; McKinnon et al., 2018). Lastly, research has demonstrated the importance of teacher–student closeness and conflict in determining students’ achievement (Hamre & Pianta, 2001; Roorda et al., 2017). Extant literature drew a clear and logical mediation pathway, yet one which had not specifically been investigated.

Previous work has also reported some contrasting findings to those in the present study. Snyder et al. (2018), for instance, found that adolescent girls outperformed boys in ELA but that boys’ slightly outperformed girls in math. Similarly, in a sample of predominantly Black adolescents, Conger & Long (2010) indicated that girls outperformed boys only in ELA. Thirdly, in a similar sample of predominantly African American early adolescents, researchers found that girls no longer outperformed boys in math by eighth grade (Diemer et al., 2016). It is somewhat surprising that the current study found different results as compared to Diemer et al. (2016) given the demographic similarities in our samples. However, these scholars examined slightly older populations than did the present study and used a different index of achievement (i.e., GPA), which may explain discrepancies. There is a clear need for further research in this domain to provide a more comprehensive understanding of the gender achievement gap specifically among Black/African American early adolescents.

The present study made significant and unique contributions to the existing literature. It examined the gender achievement gap, a pressing issue, among a population that is highly underrepresented in the general literature and in psychology specifically. Early adolescents of color were centered in this work to increase knowledge about their experiences, thereby creating a more comprehensive and inclusive understanding of the gender achievement gap. Relatedly, this study extended previous research that has examined gender, teacher–student relationships, and achievement in predominantly White (e.g., Hajovsky et al., 2017) and racially diverse populations (e.g., Hamre & Pianta, 2001) as well as participants from diverse socioeconomic backgrounds (e.g., Caputi et al., 2017). Although utilizing diverse sets of participants is essential, cultural differences necessitate that research in this domain examines differences in results based on cultural identity, ethnicity, and/or race. Doing so will help to prevent generalizations that misrepresent individuals’ experiences.

The present study was the first to investigate the mediating impact of teacher–student relationships on the gender achievement gap. Hamre & Pianta (2001) provided preliminary evidence for kindergarten students’ teacher–student relationships impacting their achievement as they enter adolescence. They found that boys had lower levels of closeness and higher levels of conflict with teachers as well as lower math and reading achievement than girls in adolescence. Despite only one mediation analysis reaching statistical significance, our work provided preliminary evidence that closeness and conflict have indirect effects that predict that girls sustain higher ELA and math achievement than boys.

Given that adolescents’ relationships with teachers can be conceptualized as attachment relationships (Bergin & Bergin, 2009), it is integral to consider attachment theory as a framework when examining teacher–student relationships. Children who have high-quality relationships with teachers, similar to secure relationships with caregivers, often exhibit positive characteristics in the classroom (Howes & Ritchie, 1999). Similarly, it is useful to adopt a gender socialization perspective, as divergent social norms for boys and girls appear to play a role in the development of teacher–student relationships. Results of the present study, in line with gender expectations for boys (Bem, 1981; Ewing & Taylor, 2009), found that boys have substantially higher levels of conflict and lower levels of closeness with teachers. Further, these findings support the notion that societal expectations
might negatively affect boys’ relationships with teachers and consequently, lead to long-term lower academic performance.

The present study has key implications beyond expanding the diversity of the literature surrounding gender and achievement. Firstly, results have the capacity to inform practice. Given the demonstrated impact of teacher–student closeness and conflict on achievement, it is integral for future interventions in schools to focus on cultivating close teacher–student relationships as well as working to reduce negative relational patterns. This can be done in myriad ways. First, it is essential that teachers understand the importance of their willingness to provide time and assistance to students and remain emotionally available to them (Whitlock, 2006). Relatedly, it would be useful for schools to implement individual meetings between students and teachers to establish open communication, address any additional needs and/or issues that have arisen, and foster a sense of emotional security and support. This is especially important for boys, who tend to have lower quality relationships with teachers (Hamre & Pianta, 2001). The implementation of social-emotional learning programs on a large scale might be useful because they have been shown to increase positive social behaviors (Taylor et al., 2017) and decrease disruptive behaviors among youth (McCormick et al., 2015). SEL interventions, therefore, can improve teacher–student relationships, thereby likely bolstering boys’ academic achievement. Lastly, it would be beneficial for preservice teachers to receive education around the importance of building positive relationships with students and being reflective about potential gender, racial, and intersectional biases that negatively impact such relationships and perpetuate oppression at large. Many training modules surrounding this topic exist, and schools could include such training(s) as a part of annual teacher education.

The present study similarly has implications pertaining to theory. Gender socialization theorists have proposed that boys and girls are treated differently, which is reflected in their relational behaviors (Ewing & Taylor, 2009). Our results support this, suggesting that this differential treatment based on gender might be meaningful in determining the quality of teacher–student relationships; this is evidenced by boys demonstrating lower levels of closeness and higher levels of conflict relative to girls. That is, there appear to be differences in the ways early adolescent boys and girls are socialized, which lead to discrepancies in their relationships with teachers. This highlights the importance of expanding research that focuses on mitigating the prevalent and problematic societal norms surrounding gender; they not only prescribe strict roles for boys and girls but seem to inhibit boys’ academic achievement.

Our findings must also be considered in light of a few limitations. First, teacher–student relationships were captured from only the teachers’ point of view; this raises concerns regarding biases (e.g., some male teachers may consciously provide more favorable reports of their relationships with male than female students). It would be useful for research in the future to obtain multidimensional data, perhaps from multiple teachers or students themselves. Multiple measures have been developed for this purpose. Most participants in the current study were identified by their parents as Black/African American; cultural differences may limit the generalizability of findings to other populations (e.g., Asian students). However, the diversity of the sample also limits claims that can be made specifically about Black or African American students. Findings must instead be viewed as preliminary data on the present topic and a potential catalyst for further investigation in this domain. Due to low power, we were unable to examine racial/ethnic differences within our sample. Lastly, it is of note that teacher–student relationship data were obtained only when students were in first grade. This, unfortunately, provides no clarity about trends in teacher–student relationships nor whether teacher–student closeness and conflict remain meaningful mediators throughout adolescence.

Future research should aim to add to the literature surrounding the gender achievement gap in early adolescents of color. More specifically, scholars must work to identify additional factors that are pertinent to the gender achievement gap and work to create sustainable and effective interventions to support the achievement of boys of color. Further research should utilize longitudinal data with multiple time points to develop a more comprehensive understanding of developmental trends in achievement between boys and girls over time. Relatedly, it would be beneficial for scholars to collect data about teacher–student relationships in adolescence to determine whether they remain a meaningful mediator in determining concurrent academic achievement. Additionally, it would be beneficial to utilize experimental data when studying factors affecting the gender achievement gap to draw stronger, causal conclusions. Finally, future research should aim to add to the literature surrounding the gender achievement gap in early adolescents of color.
The Gender Achievement Gap

Goldie and O'Connor

The present study fills a key gap in the literature by investigating the gender achievement gap among predominantly Black/African American early adolescents. Although the gender achievement gap at large has been widely documented, it has been investigated less often among students of color and when studied, has found mixed results. This study added to this body of knowledge, finding that girls significantly outperformed boys in this sample of predominantly Black and African American students. Additionally, we identified teacher-student closeness and conflict as factors through which the gender achievement gap is sustained among these students. Although there are certainly other factors upholding this achievement gap, this finding highlights the importance of working to support early adolescent Black and African American boys’ relationships with their teachers to foster academic growth. This is one key way to combat the structural barriers that impair their academic success.

References


relationships for adolescents with high incidence disabilities. Theory Into Practice, 46(2), 105–112. https://doi.org/10.1080/00405840701232943


Author Note. Peter D. Goldie @ https://orcid.org/0000-0003-1944-7454

We have no known conflict of interest to disclose. This study was supported by the Institute for Education Sciences.

When this manuscript was drafted, the first author identified as a White man and the second author identified as a White woman. We would like to thank Dr. Gigliana Melzi for her generous feedback on this manuscript.

Correspondence concerning this article should be addressed to Peter D. Goldie. Email: pgoldie@upenn.edu
Find your career.
Eight graduate degree programs and four certificates in Educational Psychology

PhD in Educational Psychology
Engage in the science of learning. Prepare for a career where you can use your knowledge of human learning and development to help shape the school environment and public policy. Core program areas include learning, motivation, and research design.

MS or MA in Educational Psychology*
Broaden your ability to apply psychological principles to a variety of professional contexts or prepare for your future doctorate in social science.

MS in Quantitative Psychology*
Do you like numbers, statistics, and social science? Prepare for a career in research, assessment, and data analysis. Develop proficiency in advanced statistical techniques, measurement theory, and data analytics.

PhD in School Psychology (five-year program)
Prepare for a career as a licensed psychologist. Gain competencies in health service psychology to work in schools, private practice, or hospital settings. Accredited by the American Psychological Association (APA)** and approved by the National Association of School Psychologists (NASP). Scientist-practitioner model with advocacy elements. Specializations available.

MA/EdS in School Psychology (three-year program)
Be immersed in community engaged, real-world field experiences and intervention opportunities in our scientist-practitioner-advocate program. Leads to licensure as a school psychologist. Approved by NASP and the National Council for Accreditation of Teacher Education (NCATE).

MA in School Counseling (two-year program)
Be a leader and advocate for educational equity for all students in PK–12 schools. Leads to licensure as a school counselor. The program adheres to the Council for Accreditation of Counseling and Related Educational Programs (CACREP) standards and is nationally recognized by The Education Trust as a Transforming School Counseling program.

Certificates
High Ability/Gifted Studies,* Human Development and Learning,* Identity and Leadership Development for Counselors,* Neuropsychology*
Graduate assistantships and tuition waivers are available.

bsu.edu/edpsy

*Online programs are available.
**Questions related to the PhD in school psychology’s accreditation status should be directed to the Office of Program Consultation and Accreditation, American Psychological Association, 750 First St. NE, Washington, D.C. 20002; (202) 336-5979; apaaccred@apa.org; or apa.org/ed/accreditation.
PARTNER IN Research

Our M.A. and Ph.D. students collaborate with expert faculty to discover new knowledge in cognitive, engineering and social psychology. Experience the value of high-quality labs and low tuition.

LOOKING FOR COLLABORATIVE RESEARCH EXPERIENCE?

Join the Psi Chi CROWD!

Students and faculty within the United States and beyond are invited to participate in the CROWD, which is Psi Chi’s annual, guided cross-cultural research project. Specific benefits of joining the CROWD include:

- a reduced burden of having to solicit large numbers of participants,
- increased diversity of student samples,
- accessible materials and protocols for participating researchers, and
- a convenient platform to engage students in the scientific research process.

Contributing to the CROWD provides unique data collection and publication experiences that can be used to strengthen any student’s CV.

For more information, visit https://www.psichi.org/Res_Opps or contact the NICE Chair at nicechair@psichi.org
Earn Your Master of Science in Experimental Psychology

where comprehensive skills in scientific inquiry and research methodology will give you that NSU edge.

nova.edu/dra
Find Your Next Job in Psychology

Thousands of psychology-related jobs are waiting for you on Psi Chi’s unique Career Center.

WHAT NEW OPPORTUNITIES WILL YOU UNCOVER?
Create an account so that you can manage your résumé, receive email alerts when relevant positions are submitted, and ask our experts your career questions. As a special membership benefit, all career center features are totally free to our job seekers. View and apply to as many jobs as you desire.

GET STARTED AT
http://jobs.psichi.org
Publish Your Research in *Psi Chi Journal*

Undergraduate, graduate, and faculty submissions are welcome year round. Only one author (either first author or coauthor) is required to be a Psi Chi member. All submissions are free. Reasons to submit include

- a unique, doctoral-level, peer-review process
- indexing in PsycINFO, EBSCO, and Crossref databases
- free access of all articles at psichi.org
- our efficient online submissions portal

View Submission Guidelines and submit your research at www.psichi.org/?page=JN_Submissions

---

Become a Journal Reviewer

Doctoral-level faculty in psychology and related fields who are passionate about educating others on conducting and reporting quality empirical research are invited to become reviewers for *Psi Chi Journal*. Our editorial team is uniquely dedicated to mentorship and promoting professional development of our authors—Please join us!

To become a reviewer, visit www.psichi.org/page/JN_BecomeAReviewer

---

Resources for Student Research

Looking for solid examples of student manuscripts and educational editorials about conducting psychological research? Download as many free articles to share in your classrooms as you would like.

Search past issues, or articles by subject area or author at www.psichi.org/journal_past

---

Add Our Journal to Your Library

Ask your librarian to store *Psi Chi Journal* issues in a database at your local institution. Librarians may also email to request notifications when new issues are released.

Contact PsiChiJournal@psichi.org for more information.