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Gender minoritized students and academic engagement in Brazilian adolescents: Risk and protective factors

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**Keywords:** Gender minoritized students, Academic engagement, Peer victimization, Student-teacher relationship, School-wide engagement, School rule fairness and clarity

**Abstract**

Gender minoritized students experience unique challenges in their school environments that may have consequences for their educational outcomes, including academic engagement. The goal of the current study was to understand the association between gender identity and academic engagement among adolescents attending public high schools in Paraná, Brazil (N = 10,828). In particular, student perceptions of student-teacher relationships, school rule fairness and clarity, school-wide academic engagement, and peer victimization were examined as four facilitator/barrier factors that may account for lower levels of academic engagement for gender minoritized students as compared to their cisgender peers, and these
processes were tested for differences across race/ethnicity. Public high school
students (ages 12–18 years) completed an in-class survey assessing their
gender identities, perceptions of the school environment, and academic
engagement. Gender minoritized students reported significantly lower levels of
academic engagement as compared to their cisgender peers. They also
reported less clear and fair school rules, lower levels of school-wide academic
engagement, and higher levels of victimization. These facilitator/barrier
variables partially accounted for the lower levels of academic engagement
reported by gender minoritized students. No significant differences were
observed for gender identity according to race/ethnicity. These findings
suggest that facilitators/barriers that account for academic engagement for
students in general partially explain gender identity-related disparities, and
the implications for school psychologists are discussed.

For gender minoritized individuals, or individuals whose gender identity
diffs from the sex they were assigned at birth (i.e., transgender and/or non-
binary individuals), adolescence may be particularly important for understanding
longitudinal outcomes. This period is associated both with an increased
likelihood of exploring gender identity (Martin-Storey & Baams, 2019) and with
increased peer inflexibility regarding gender-based stereotypes (Alfieri et al.,
1996; Bartini, 2006). Existing research suggests that gender minoritized
students face more challenges in their school environments as compared with
their cisgender peers, or youth whose gender identities are the same as their sex
assigned at birth (Connolly et al., 2016; Eisenberg et al., 2017; McGuire et al.,
2010; Pampati et al., 2020). However, these studies are limited in terms of the
educational outcomes that they address, their consideration of factors that
account for disparities in school outcomes, and the contexts in which these
disparities have been explored. In particular, previous research has been limited
by a lack of focus on academic engagement, defined as a students’ active, constructive, and cognitively focused participation in school life (Audas & Willms, 2002; Fredricks et al., 2004; Skinner & Pitzer, 2012). This construct is a key predictor of outcomes, such as academic achievement and retention (Archambault et al., 2009; Wang & Eccles, 2012), and has also been identified as an inflection point for the promotion of positive school outcomes (Shoshani et al., 2016). Although much of the work on gender minoritized adolescents has occurred within North American and European contexts, Brazil has large and culturally important gender minoritized communities (Spizzirri et al., 2021). Employing data from a comprehensive sample of public school-attending adolescents in Paraná, Brazil, the link between gender identity and academic engagement was examined within the present study.

Theoretical framework

Poteat et al. (2014) proposed two theoretical frameworks that together explain why gender minoritized students are more likely to experience adverse academic outcomes as compared to their cisgender peers. First, minority stress theory (Meyer, 2003) suggests that the stigmatization of socially devalued groups (in this case, gender minoritized students) increases the likelihood of discrimination, as well as fear of discrimination and internalized stigma, and that these stressors increase vulnerability to poorer mental health and wellbeing. Although minority stress theory was developed for sexual minority populations, the minority stress framework is also relevant to gender minoritized populations who experience high levels of stigma and associated discrimination and subsequent poorer psychosocial functioning as compared to cisgender populations (Reisner et al., 2015; Timmins et al., 2017). Typically applied to North American and European populations, the minority stress theory may also be germane to the Brazilian context. Gender minoritized individuals in Brazil are more vulnerable to negative health and psychosocial outcomes than cisgender individuals (Grinsztejn et al., 2017; Poteat & Wirtz, 2017), with some research suggesting that Brazil has the highest homicide levels of transgender individuals.
in the world (Balzer et al., 2012; Transgender Europe & Balzer, 2019).

Whereas minority stress theory explains how stigma influences wellbeing, Social Cognitive Career Theory (SCCT) provides a framework for understanding why minority stressors shape academic outcomes in particular (Lent et al., 2000; Poteat et al., 2014). Although there are many elements of the SCCT, those most germane for understanding the school outcomes of gender minoritized students underscore how barriers, and the individual’s subjective experiences of these barriers, shape the ways that individual-level factors such as demographic characteristics (e.g., gender identity) link to academic outcomes (Lent et al., 2000). Poteat et al. (2014) highlighted the overlap between barriers as outlined by the SCCT and minority stressors (e.g., victimization, discrimination) for gender minoritized students.

Finally, whereas minority stress and SCCT theories provide frameworks for understanding how minority stressors shape school outcomes for gender minoritized students, existing theoretical models of academic engagement identify factors associated with variability in this important outcome (Eccles & Roeser, 2009; Skinner & Pitzer, 2012). Academic engagement is a complex, multi-level process in which students engage in constructive, enthusiastic, and cognitively focused participation in school activities and is shaped by factors at the individual, classroom, school, and societal level (Eccles & Roeser, 2009). Skinner and Pitzer (2012) proposed that teachers and peers both contribute to the development of academic engagement, such that interactions characterized by warmth, structure, and support of autonomy are likely to facilitate academic engagement, whereas interactions characterized by hostility, chaos, or coercion act as barriers to engagement (Furrer et al., 2014).

**Academic outcomes of gender minoritized students**

Although gender minoritized students in the school context have been a focus of increased research interest (e.g., Connolly et al., 2016; Eisenberg et al., 2017; Hatchel et al., 2019; Pampati et al., 2020), the literature comparing school outcomes of cisgender and gender minoritized students remains limited.
Gender minoritized status has been linked with constructs associated with academic engagement, including higher levels of absenteeism or truancy (Day et al., 2019; Pampati et al., 2020), single items capturing less positive feelings about the school environment (Clark et al., 2014; Pampati et al., 2020), lower academic achievement (Day et al., 2019; Fenaughty et al., 2019; Wernick et al., 2017), lower levels of school belonging (Fenaughty et al., 2019), and lower levels of college attendance as compared with cisgender individuals (Crissman et al., 2017). Furthermore, research with combined samples of cisgender sexual minoritized students, as well as gender minoritized students, has documented low levels of academic engagement, but the percentage of gender minoritized students included in these studies is generally small (Kosciw et al., 2013; Seelman et al., 2015). Despite the importance of academic engagement, a paucity of research compares the academic engagement of gender minoritized and cisgender students, in line with a broader literature which has focused more on mental health and less on educational outcomes for this population (Poteat et al., 2014).

Facilitators and barriers of academic engagement and their pertinence to gender minoritized students

The model for academic engagement outlined by Skinner and Pitzen (2012) provided a framework for identifying facilitators and barriers that promote or prevent academic engagement. In the current study, we focused on (a) student-teacher relationships, (b) school rule fairness and clarity, (c) school-wide academic engagement, and (d) victimization as facilitators (or barriers) of academic engagement in general and discuss how these processes may matter specifically for gender minoritized students.

Student-teacher relationships

Teachers are central to developing learning environments that facilitate academic engagement (Furrer et al., 2014). Adolescents’ positive views of student-teacher relationships are also associated with higher levels of academic
engagement (Martin & Collie, 2018; Vollet et al., 2017), including in Brazil (Alexander et al., 2011; Bear et al., 2016). Perceptions of student-teacher relationships may be particularly important for gender minoritized students, as these students report less connection to and less caring relationships with adults at school as compared to their cisgender peers (Day et al., 2018; Eisenberg et al., 2017; Pampati et al., 2020). Furthermore, previous research with combined samples of sexual and gender minoritized students has suggested that students who reported supportive adults in school had better academic outcomes, including academic engagement (Kosciw et al., 2013; Seelman et al., 2015). Having teachers who were supportive or who had high expectations were associated with better school connection among samples exclusively consisting of gender minoritized students (Fenaughty et al., 2019; Ullman, 2017). Conversely, some previous research has suggested that although positive student-teacher relationships are protective for cisgender students, these relationships were not protective for gender minoritized students (Dessel et al., 2017), suggesting the importance of better understanding this facilitating variable.

**School rule fairness and clarity**

Although less studied, another facilitator of academic engagement is the fairness and clarity of school rules, or the extent to which a student feels that the rules of their school apply to everyone, are clearly stated, and are reasonable. Perceived school rule fairness and clarity have been linked to higher levels of academic engagement and greater feelings of in-school safety, including in Brazil (Bear et al., 2016; Ripski & Gregory, 2009; Thomas et al., 2018; Williams et al., 2018), but have not been extensively studied for gender minoritized students. Some research has suggested that gender minoritized students are less likely than cisgender students to report that school staff treat students fairly (Pampati et al., 2020) and that fairness and clarity of school rules are protective for mental health outcomes among same-sex attracted students (Sandfort et al., 2010). These findings suggest the relevance of understanding clarity and
fairness of school rules disparities in academic engagement across gender identity.

**School-wide academic engagement**

School-wide academic engagement, or the overall level of academic engagement of students within the school, is linked with individual-level engagement, including among Brazilian students (Bear et al., 2016; Lynch et al., 2013; Upadyaya & Salmela-Aro, 2013; Vollet et al., 2017). Indeed, having peers that actively and constructively engage in the classroom may be important for creating the kinds of environments in which students feel supported and motivated with regards to their own engagement (Furrer et al., 2014). Given the ways in which gender minoritized students may be marginalized within the school environment (McGuire et al., 2010; Snapp et al., 2015), their experiences of school-wide engagement may be anticipated to differ from their cisgender peers, which in turn may have consequences for their own engagement.

**Peer victimization**

Although the relatively limited literature focuses on how positive peer relations are protective for gender minoritized students outcomes, a much larger literature has focused on peer victimization as a barrier for gender minoritized students in school contexts. Peer victimization, or the experience of being the recurrent target of aggression or bullying in the context of a power differential (Olweus, 2013), is associated with lower levels of academic achievement and engagement among both North American (Ladd et al., 2017; Schwartz et al., 2005) and Brazilian adolescents (Alexander et al., 2011; Bear et al., 2016). Self-reports of victimization are particularly linked with deleterious mental health and teacher-rated classroom outcomes (Dawes et al., 2019; Scholte et al., 2013). Moreover, the higher rates of victimization experienced by gender minoritized students, as compared to cisgender students, are well documented (e.g., Eisenberg et al., 2017; Pampati et al., 2020). A more limited body of work underlines the consequences of this victimization for poorer academic outcomes
such as lower academic engagement, lower grades, and more absenteeism among samples of gender minoritized students (Hatchel et al., 2019; Pampati et al., 2020; Peter et al., 2017), but has not examined if victimization accounts for differences in school outcomes between gender minoritized and cisgender students.

**Variation by race/ethnicity and other demographic factors**

Intersectional approaches suggest that different identities, including race/ethnicity and gender, and the ways that these identities position individuals within existing power hierarchies condition the consequences of each of these identities for individual outcomes (Crenshaw, 1989). Previous research has illustrated the importance of this approach when examining how race/ethnicity, and the barriers associated with race/ethnic minoritized status, shape school outcomes, including academic engagement for boys and girls (Chavous et al., 2008; Nelson et al., 2015). Specific to gender minoritized students, the association between gender identity and academic engagement may differ according to race/ethnicity. Gender minoritized individuals of color, and specifically gender minoritized individuals of African descent, are particularly vulnerable to the consequences of stigma due to gender minoritized status in Brazil as well as elsewhere (Grinsztejn et al., 2017; Poteat & Wirtz, 2017; Seelman et al., 2017; Singh, 2013), likely reflecting the impact of the overlap in stigmatized identities. Moreover, in Brazil, when compared to *branco* (i.e., White) students, *preto* or *pardo* students (i.e., students of African descent) experience poorer academic outcomes (Marteleto, 2012). For these reasons, gender minoritized students of African descent may be particularly vulnerable to negative school outcomes.

Finally, controlling for other demographic factors is important for understanding the association between gender identity and academic engagement. Socioeconomic status, of which parental education is an important indicator (De Castro Ribas Jr et al., 2003), is linked to educational outcomes in Brazil (Guimarães & Sampaio, 2013; Valente, 2016). A second confounding
variable that is particularly important for gender minoritized youth is where they live. Gender minoritized youth are often forced out by their families and experience high rates of homelessness (Corliss et al., 2011; Fontanari et al., 2019; Seibel et al., 2018), which is associated with poorer academic outcomes (Cutuli et al., 2020). Finally, sex assigned at birth is another important control variable to consider, as poorer academic outcomes, including lower academic engagement, have been observed among cisgender boys as compared to cisgender girls (Johnson et al., 2006; Marteleto & Andrade, 2014).

The current study

The importance of academic outcomes for individual health and wellbeing supports better understanding of the school contexts of gender minoritized students. However, much of what we know about gender minoritized students focuses on mental health outcomes in North American samples (McGuire et al., 2010; Reisner et al., 2015). As is the case many other countries, prejudice and institutional barriers are common for gender minoritized individuals in Brazil (Costa et al., 2015, 2018). A better understanding of how gender identity is associated with academic engagement among Brazilian students is crucial to support targeted prevention and intervention efforts and to contribute to a global portrait of the in-school experiences of gender minoritized populations.

The current study focused on adolescents within a comprehensive sample of public school students in Paraná, Brazil, and included three research questions. Following from the literature suggesting vulnerability to negative school outcomes for gender minoritized students as compared to cisgender students, we were first interested if differences in academic engagement were observed between gender minoritized and cisgender student. We anticipated that as compared to their cisgender peers, gender minoritized students would report lower levels of academic engagement. Following from the literature linking academic engagement with (a) adolescent perceptions of student-teacher relationships, (b) school rule fairness and clarity, (c) school-wide academic engagement, and (d) peer victimization, the second research question
addressed whether these factors accounted for variance in the association between gender minoritized status and academic engagement and tested whether indirect effects could be observed between gender minoritized identity and academic engagement via these constructs. We anticipated that student perceptions of these facilitator/barriers would partially account for differences between gender minoritized and cisgender students. Finally, following from the literature suggesting both greater vulnerability for gender minoritized individuals of African descent as compared to other gender minoritized individuals, and vulnerability to worse academic outcomes among preto and pardo students in Brazil as compared to their branco peers, the third research question examined whether the associations between gender identity, perceptions of facilitator/barriers, and academic engagement were moderated by race/ethnicity. We expected that the association between gender minoritized status and lower academic engagement would be stronger for preto and pardo students as compared with branco students.

**Method**

Participants were drawn from a larger study of school climate in Paraná, Brazil. The Ministry of Education in this state funded the associated data collection. This study received ethical approval from the Research Ethics Committee at the Federal University of Paraná. As is commonly practiced in school-based studies in Brazil, written informed consent was obtained from school principals for the students in their school prior to data collection (Bass et al., 2018; DeLay et al., 2013) and oral assent was obtained from students with a standardized script prior to administration of the classroom survey. All data were collected during class time, and the surveys took 40 min to administer and complete. Students who did not assent were provided with a word puzzle to complete as an alternative activity.
Table 1
Sample descriptive statistics by gender identity ($N = 10,828$).

<table>
<thead>
<tr>
<th></th>
<th>Gender minoritized youth $n = 272$</th>
<th>Cisgender youth $n = 10,556$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Academic engagement</td>
<td>21.55*</td>
<td>6.10</td>
</tr>
<tr>
<td>Contextual variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student-teacher relationship</td>
<td>6.94*</td>
<td>2.77</td>
</tr>
<tr>
<td>School rule fairness or clarity</td>
<td>14.96**</td>
<td>3.63</td>
</tr>
<tr>
<td>School-wide academic engagement</td>
<td>7.47**</td>
<td>3.24</td>
</tr>
<tr>
<td>Peer victimization</td>
<td>1.96*</td>
<td>2.00</td>
</tr>
<tr>
<td>Control variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>14.90</td>
<td>1.61</td>
</tr>
<tr>
<td>Parent education (% with high school or higher)</td>
<td>67.5</td>
<td></td>
</tr>
<tr>
<td>Sex assigned at birth (% female)</td>
<td>66.5**</td>
<td></td>
</tr>
<tr>
<td>Race/ethnicity (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Branco</td>
<td>47.0*</td>
<td></td>
</tr>
<tr>
<td>Preto or Pardo</td>
<td>43.9</td>
<td></td>
</tr>
<tr>
<td>Amarelo</td>
<td>5.7**</td>
<td></td>
</tr>
<tr>
<td>Indígena</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>Lives with parents</td>
<td>78.1**</td>
<td></td>
</tr>
</tbody>
</table>

* = $p < .05$; ** = $p < .01$, for comparisons between gender minority and cisgender youth.

Middle and high school students from 122 public schools completed in-school surveys designed to assess school climate. At each school, classes were selected at random for participation by the researchers from the list of classes available. A total of 22,480 students were surveyed. Given the focus on adolescence, participants were eligible for the analytic sample if they were between the ages of 12 and 18 years (2347 removed for not reporting age, 6856 removed for being age 11 or younger, 900 removed for being 19 or older).
Participants also had to have responded to questions regarding sex assigned at birth (336 participants removed from the sample, including 23 reported other as their sex assigned at birth), and current gender identity (592 participants removed from the sample). The final question of the questionnaire asked students “I told the truth in this questionnaire” (options were strongly disagree, disagree, agree, strongly agree). Participants were also omitted from the analytic sample if they disagreed or strongly disagreed that they had told the truth (621 participants removed from the sample). Thus, analyses were conducted on a sample of 10,828 adolescents (descriptive statistics presented in Table 1). As anticipated based on the variables used to determine the final sample (i.e., age, truthfulness), significant differences in key variables were observed between students who were retained as compared to participants who were not retained for the current study (reflecting age effects on perceptions of school climate). The association between gender minoritized status and school engagement, however, was comparable across both the analytic sample ($r = -0.05, p < .01$) and the total sample ($r = 0.05, p < .01$; See Fig. 1).

**Measures**

**Gender identity**

Gender identity was assessed using two questions (presented in Table 2). This two question approach for assessing gender identity has been previously validated with Portuguese speaking populations (Reisner et al., 2014). First, students were asked “What was your sex assigned at birth?” with the options of male, female, or other. Given that legally all infants in Brazil were assigned as either male or female at the time of the current study, students who reported having been assigned as “other” at birth were removed from the sample ($n = 23$) due to concerns that these students may have misunderstood the question. Students were then asked “What is your gender identity?” Their four response options included (a) male, (b) female, (c) travesti or transexual, or (d) other. In the Iberio-American context, travesti is a gender identity term indicative of individuals who were assigned male at birth, but present as girls or women.
Many gender minoritized Brazilians embrace this term as a non-medicalized culturally appropriate gender identity term (Campuzano, 2006; Silva & Ornat, 2016) and this term has appeared as a write-in answer in previous research validating assessments of gender minoritized status in studies including Iberio-American participants (Reisner et al., 2014). Within the Brazilian context, transexual is also a frequently employed term that gender minoritized populations use to self-identify and can be used by individuals who were assigned either male or female at birth (Silva & Ornat, 2016). Students were classified as gender minorities in the current study if they (a) indicated that the sex they were assigned at birth was different than their current gender identity (e.g., students who were assigned male at birth but now identify as a girl) or (b) chose an option other than male or female for their current gender identity (i.e., other, travesti, or transexual). If their current gender identity was the same as sex assigned at birth, they were classified as cisgender. In the analytic sample, 272 students were classified as gender minorities and 10,566 students were classified as cisgender.

**Academic engagement**

Academic engagement was assessed using the Delaware Student Engagement Scale (Bear et al., 2014) that has been previously employed with Brazilian samples (Bear et al., 2016; Holst et al., 2016). The scale used in the current study contained the original 12 items and had an alpha of 0.82 in the current sample. Participants were asked questions about their attitudes and efforts towards school on a 4-point scale, with options ranging from *I strongly disagree* (coded as 0) to *I strongly agree* (coded as 3), with higher scores indicating higher levels of academic engagement (example items: “I work hard at school”, “I like my school”). Although this scale includes subscales assessing cognitive, behavioral, and emotional engagement, the total scale was employed as these subscales were all correlated with each other at $r = 0.90$ or above in the current sample, precluding their use as separate outcomes in the same model.
Fig. 1. Final sample selection.

Table 2
Current gender identity by sex assigned at birth (N = 10,828).

<table>
<thead>
<tr>
<th>Gender identity</th>
<th>Male</th>
<th>Female</th>
<th>Travesti or transexual</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex assigned at birth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>5324</td>
<td>25</td>
<td>22</td>
<td>44</td>
<td>5415</td>
</tr>
<tr>
<td>Female</td>
<td>62</td>
<td>5232</td>
<td>24</td>
<td>95</td>
<td>5413</td>
</tr>
<tr>
<td>Total</td>
<td>5386</td>
<td>5257</td>
<td>46</td>
<td>139</td>
<td>10,828</td>
</tr>
</tbody>
</table>

Student-perceived facilitators/barriers

The current study assessed three student-perceived facilitators of academic engagement consisting of (a) student–teacher relationships, (b) school rule fairness and clarity, and (c) school-wide student engagement. These three facilitators were all assessed using subscales of the student version of the Delaware School Climate Survey (DSCS-S; Bear et al., 2014), versions of which have been previously translated and validated with Brazilian students (Bear et al., 2016; Holst et al., 2016). For each subscale, response options included a Likert
scale ranging from strongly disagree to strongly agree (coded as 0–3, respectively), with higher scores indicating higher levels of the student-perceived facilitator. Four of the five items of the student-perceived Student-Teacher Relations subscale were retained for the current study, and this scale had an alpha of 0.76 in the current sample. An example of an item on this scale is “Teachers listen to students when they have problems.” The item “Teachers treat students of all races with respect” was removed from the scale to be consistent with previous work using this measure with Brazilian students (Bear et al., 2016). Student-perceived school rule fairness and clarity was assessed using eight items from the DSCS-S Fairness and Clarity subscales (Bear et al., 2014) that have been combined based on previous work with Brazilian students (Bear et al., 2016). These scales assessed how fair and clear students found school rules. Example items included “School rules are fair” and “It is clear to students how this school thinks they should act.” In the current study, the scale had an alpha of 0.77, with higher scale scores indicating greater belief in the fairness and clarity of school rules. Student-perceived school-wide academic engagement was assessed with a subscale of the DSCS-S that contained six items (Bear et al., 2014) and had an alpha of 0.71 in the current study. This scale captured the extent to which the participant perceived other students in their school as being academically engaged; an example item was “Most students work hard to get good grades.”

Peer victimization

Peer victimization was assessed using four items from the Escala de vitimização e agressão entre pares (Scale of Victimization and Peer Aggression; Cunha et al., 2009). This four-item scale asks students about experiences with their peers at school during the past 30 days and was previously validated among Brazilian adolescents (Cunha et al., 2009). Response options ranged from never to always (coded as 0–3, respectively; Cronbach’s alpha = 0.71). The items consisted of “Others hit or kick me,” “Others say things about me to make others laugh,” “Others curse me,” and “Others threatened to hurt me, hit me or made other types of threats” with higher scores indicating higher levels of
victimization.

Control variables

Four additional control variables, along with sex assigned at birth (described above), were included in this study. First, students were asked about their age in years, via a fill in the blank. Second, parent education was assessed by asking students about their mothers’ and fathers’ respective completed years of education and were given six choices ranging from 1 (never studied) to 6 (completed college) for each parent. Mother’s and father’s levels of education was operationalized to reflect whether one or more parents had completed high school or higher in the subsequent analyses. Third, students were also asked about their race. They were presented with five options corresponding to the major race/ethnicity categories employed in Brazil: branco (White), preto (Black), pardo (mixed-race), amarelo (Asian), or indígena (Indigenous). For subsequent analyses, students who reported either preto or pardo identities were combined based on research suggesting that the educational disadvantages experienced by preto and pardo adolescents, as compared to branco students, are similar in Brazil (Marteleto, 2012). Finally, students reported their current living situation; response options included (a) living with their parents, (b) living with their family (i.e., relatives who were not parents), (c) living by themselves, or (d) having another living situation. For the purposes of the analyses, responses were dichotomized according to whether students lived with their parents or not, as the data were not normally distributed.

Analytic plan

Following preliminary bivariate analyses (presented by gender identity in Table 1), multivariate analyses were employed to assess if gender minoritized students reported significantly lower levels of academic engagement as compared to their cisgender peers, controlling for race, sex assigned at birth, age, parental education, and living situation. Given the dependent nature of the variables, we used a multilevel modeling approach to address the nesting of
students within schools. Structural equation models using MPlus 7.4 were employed for several reasons (Muthén & Muthén, 2008-2015). First, structural equation modeling provides indicators of model fit, along with standardized and unstandardized coefficients indicating the association between different variables. Second, a main goal of the current study was to understand if facilitators of academic engagement (i.e., student perceptions of student-teacher relationships, school rule fairness and clarity, and school-wide academic engagement) and barriers (i.e., victimization) accounted for the shared variance between gender minoritized status and academic engagement. Mplus can be used to calculate indirect effects using the product of the coefficient approach (Preacher & Hayes, 2008). Bootstrapping (done 1000 times) was employed (Bollen & Stine, 1990; Shrout & Bolger, 2002). MPlus also allows for pathways in structural equation models to be constrained to compare model fit across different groups (i.e., the ability to test if models differ according to race). Third, Mplus allows data to be clustered in order to account for school-level effects. The interclass correlation (ICC) for school-level effects for individual academic engagement was significant (ICC = 1%, \( p < .01 \)), suggesting the importance of clustering according to school. Finally, Mplus uses full information maximum likelihood, which calculates missing data using existing correlation matrices (Allison, 2001). Although 94% of the data were available for the analytic sample overall, only 62% of the sample would have been retained if case-wise deletion had been used to address missing data.

Consistent with the first research question, the first structural equation model tested the association between gender identity and academic engagement, controlling for age, sex assigned at birth, race, parental education level, and living situation. The second model tested the second research question that was focused on how students’ perceptions of peer victimization, student-teacher relationships, school-wide academic engagement, and school rule clarity and fairness accounted for variance in the association between gender minoritized status and academic engagement. In this model, we tested (a) the paths between gender minoritized status and each of the
facilitator/barrier variables and (b) each of the facilitator/barrier variables and academic engagement, while controlling for demographic factors for each of these pathways. Finally, in line with research question 3, both the first and second models were tested for differences according to race/ethnicity by constraining the paths to be equal across groups and using $\chi^2$ difference tests to see if the constrained models were significantly different.

Table 3
Standardized Coefficients in the Associations Between Gender Identity, Contextual Factors, and Academic Engagement (N = 10,828).

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Academic engagement</td>
<td>Student-teacher relationship</td>
</tr>
<tr>
<td>Gender minoritized status</td>
<td>-0.04**</td>
<td>-0.02</td>
</tr>
<tr>
<td>Facilitators &amp; Barriers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship with teacher</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School rule fairness and clarity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School-wide engagement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victimization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parent education</td>
<td>0.03**</td>
<td>-0.04**</td>
</tr>
<tr>
<td>Age</td>
<td>-0.12**</td>
<td>-0.18**</td>
</tr>
<tr>
<td>Sex assigned at birth</td>
<td>0.00</td>
<td>-0.08**</td>
</tr>
<tr>
<td>(male referent)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lives at home</td>
<td>0.03*</td>
<td>0.00</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Branco (referent)</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td>Preto or pardo</td>
<td>-0.02</td>
<td>-0.01</td>
</tr>
<tr>
<td>Amarelo</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td>Indígena</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.02**</td>
<td>0.04**</td>
</tr>
</tbody>
</table>

* = p < .05; ** = p < .01. Fit indices: Models are fully identified.

Results
Initial bivariate statistics, presented in Table 1, suggested a number of significant differences according to gender identity. Gender minoritized students reported significantly lower levels of academic engagement, as well as poorer student-teacher relationships, lower levels of belief in the fairness and clarity of school rules, lower levels of school-wide academic engagement, and higher levels of victimization as compared to cisgender students. However, with the exception of victimization, sensitivity analyses (see the Appendix) suggested that
mean levels of these variables did not differ among gender minoritized students based on current gender identity (i.e., students who identified as girls, boys, travesti or transexual, or other did not differ from one another). Also, gender minoritized students were (a) less likely to identify as branco, (b) more likely to identify as amarelo, and (c) less likely to live with their parents than cisgender students.

The first multivariate model (Model 1) assessed the association between gender identity and academic engagement and controlled for age, sex assigned at birth, race, parental education, and living situation. The results of Model 1 (see Table 3) indicated that as compared to their cisgender peers, gender minoritized students reported significantly lower levels of academic engagement when controlling for demographic features, such that gender minoritized identity was associated with 27% of a standard deviation (approximately 1.45 points on the scale) lower academic engagement score. Fit indices are not presented for this or subsequent models, as models were fully identified.

Model 1 was subsequently constrained to assess for differences according to race. The initial model was compared for branco adolescents and preto or pardo adolescents. A total of 116 gender minoritized and 4262 cisgender students were preto or pardo, and 124 gender minoritized and 5490 cisgender students were branco. When the total model was constrained, no significant differences were observed ($\chi^2 (5) = 6.02, p = .30$). The number of students with other racial identities was insufficient for comparisons involving these subgroups.

The subsequent model, presented as Model 2 in Table 3, examined the variance shared between gender identity and academic engagement accounting for the four facilitating/barrier variables: (a) student-teacher relationships, (b) school rule fairness and clarity, (c) school-wide academic engagement, and (d) peer victimization. When these variables were included in the model, the association between gender identity and academic engagement diminished, but remained significant, such that gender minoritized status was associated with 16% of a standard deviation decrease in academic engagement (as
compared to a 27% decrease when these variables were not included in the model. In describing the associations observed, starting from the left and moving towards the right in Table 3, gender minoritized students (a) did not see their relationships with teachers differently but saw their school rules as being less clear and less fair (18% of a standard deviation), (b) saw others at their school as being less academically engaged (19% of a standard deviation), and (c) reported higher levels of victimization (21% of a standard deviation) as compared to their cisgender peers. All four facilitator/barrier variables were associated with academic engagement; effect sizes were calculated to assess how each unit of increase in the facilitator/barrier variable was associated with an increase in academic engagement (student-teacher relationships: 7% of a standard deviation; school rule fairness and clarity: 7% of a standard deviation; school-wide engagement: 11% of a standard deviation; and lower peer victimization: 6% of a standard deviation). Gender identity was indirectly associated with academic engagement via perceived fairness and clarity of school rules, $\beta = -0.01$, $p < .05$, 90% CI [-0.01, -0.001], school-wide academic engagement, $\beta = -0.01$, $p < .05$, 90% CI [-0.01, -0.001], and victimization, $\beta = -0.003$, $p < .05$, 90% CI [-0.006, -0.001], suggesting that differences between gender minoritized and cisgender students regarding academic engagement could be partially explained via the differences between groups in these three facilitating/barrier variables.

Finally, the model was constrained to compare preto or pardo adolescents with branco adolescents. Constraining all pathways in the model resulted in a significantly worse fit, $\chi^2 (35) = 52.16$, $p = .03$. When only the pathways between gender identity and the facilitator/barrier variables and academic engagement were constrained (i.e., not the links between facilitator/barriers and academic engagement, or the associations with the control variables), no significant difference was observed ($\chi^2 (5) = 4.65$, $p = .59$).

**Discussion**
Research is increasingly documenting greater vulnerability for gender minoritized students within school contexts (Connolly et al., 2016; Eisenberg et al., 2017; McGuire et al., 2010; Pampati et al., 2020), underscoring the importance of better understanding the facilitators and barriers for positive academic outcomes for these students. The current findings indicated that gender minoritized students (a) reported lower levels of academic engagement compared to cisgender students, (b) were less likely to report school rules as being clear and fair, (c) perceived their schoolmates as having lower levels of academic engagement, and (d) reported experiencing higher levels of victimization when confounding variables were controlled for, although effect sizes were generally modest. Consistent with minority stress theory (Meyer, 2003), these findings support prior research that has identified various challenges that gender minoritized students experience at school, both in terms of academic engagement and the processes that support or impede this engagement.

Minority stress theory is pertinent for understanding the general vulnerability to poorer academic engagement, lower levels of perceived facilitators, and higher levels of perceived barriers for gender minoritized students in the current study. However, the way in which student perceptions of school rule fairness and clarity, school-wide academic engagement, and peer victimization partially accounted for lower academic engagement may be explained by student engagement and SCCT frameworks (Lent et al., 2000; Skinner & Pitzer, 2012). Starting with school rule fairness and clarity, gender minoritized students reported that school rules were less clear and fair, thus reflecting either structural barriers or the way that gender minoritized students experienced institutional rules (White Hughto et al., 2015) as compared with cisgender peers. Experiencing school rules as unfair or arbitrary is associated with decreased motivation and poorer academic outcomes (Ripski & Gregory, 2009; Williams et al., 2018) and may have specific consequences for gender minoritized students. Gender minoritized students often report specific types of unfairness, such as being disciplined when they dress in accordance with their
gender, or when they retaliate in the face of persistent victimization (Bellinger et al., 2016; Snapp et al., 2015). More research is needed to understand when and why gender minoritized students experience school rules as being unclear or unfair (i.e., are school rules generally perceived as unfair and unclear, or are specific rules related to gender identity perceived as unclear or unfair?).

The two peer-related processes of (a) perceived peer victimization and (b) school-wide academic engagement also partially accounted for variance between gender identity and academic engagement. The findings for peer victimization were consistent with the role of minority stressors as shaping outcomes for gender minoritized youth more broadly (Hatchel et al., 2019; Reisner et al., 2015). The findings of the present study suggest that, as has been observed among youth in general (Espelage et al., 2013), victimization has consequences for academic outcomes for gender minoritized students. The finding that gender minoritized students reported lower levels of school-wide academic engagement than cisgender students is a new finding and may reflect how gender minoritized students are marginalized from peer groups supportive of positive academic outcomes (Snapp et al., 2015). Moreover, perceived school-wide engagement partially accounted for the association between gender identity and individual academic engagement and may reflect the importance of peers for supporting competence and autonomy in the school environment (Furrer et al., 2014).

Somewhat surprisingly, when control variables were included in the analyses, gender minoritized status was not associated with student perceptions of student-teacher relationships, and thus these relationships, in turn, did not explain variance shared between gender minoritized status and academic engagement. The non-significant findings for teachers may reflect previous research suggesting that positive student teacher relationships are protective for cisgender, but not gender minoritized students (Dessel et al., 2017). Indeed, although teachers are central for fostering school climate (i.e., school-wide student engagement, school rule fairness and clarity, victimization; Furrer et al., 2014), gender minoritized students may not appreciate the
contribution of teachers to these processes, or teachers may be less adept at improving school climate for these students.

However, school-wide facilitators and barriers did not completely account for differences observed between gender minoritized and cisgender students regarding academic engagement. This suggests the importance of examining more gender minoritized-specific variables (e.g., internalized transphobia, visibility of gender minoritized status) or other broader factors, such as parental support, that are associated with variation in psychosocial functioning for gender minoritized populations in future studies (Austin & Goodman, 2017; Seibel et al., 2018; White Hughto et al., 2015). Future research examining how school-based facilitators and barriers interact with family (i.e., family support, family resources) or service-usage related facilitators or barriers (i.e., access to safe and medically supported gender affirming interventions) may provide a more complete picture of academic engagement among gender minoritized students.

No significant differences were observed between students who identified as branco and students who identified as preto or pardo regarding the association between gender minoritized identity and either facilitator or barrier variables or academic engagement. Indeed, while previous work has highlighted the vulnerability of gender minoritized populations of African descent (Grinztejn et al., 2017; Poteat & Wirtz, 2017), the majority of this work in the Brazilian context has focused on health rather than academic outcomes. Finally, Parana´ has more people who identify as branco as compared to other parts of Brazil, which may influence how race/ethnicity moderates outcomes of gender minoritized students in the current study.

**Limitations**

Using a large-scale sample of public-school students in Parana´, Brazil, the current study provides new information on the association between gender identity and academic engagement and points to risk and protective factors regarding this association. Several limitations, however, should be considered when interpreting these findings. First, participants were drawn from public
schools in Paraná, and although over 80% of youth in Brazil attend public schools (Organisation for Economic Co-operation and Development, 2019), neither private school students, nor adolescents who were no longer attending school, were included. As gender minoritized students are at particular risk for school push out (Snapp et al., 2015), focusing on a student sample may reduce disparities observed between gender minoritized and cisgender youth more broadly. Second, the data were correlational and cross-sectional, such that it is not possible to draw causal inferences about the directionality of the findings. Third, cell sizes were not sufficient to examine some of the more nuanced differences between gender identities (i.e., differences between students with travesti compared to other identities), and effect sizes in general were small. Fourth, gender identity, but not sexual identity, was measured the current study. Although sexual and gender identity are different constructs, a review of attitudes towards sexual minorities in Brazil underscores the role of negative attitudes towards gender diversity in informing negative attitudes towards sexual minorities (Costa et al., 2013). Future work may wish to include measures of sexual identity to understand how this construct shapes the experiences of gender minoritized students. Fifth, we relied on students reports of academic engagement as well as the facilitators/barriers of this engagement. It may be useful for future work to include school-level assessments of these constructs. Finally, although we controlled for parent education in the current study, other measures of socioeconomic status (i.e., income, parental employment) were not available.

**Future directions and implications for school psychology**

Although the results of this study should be considered preliminary, the current findings offer new insights into the academic engagement of gender minoritized students, and should these findings be replicated, there are implications for school psychologists. Indeed, school psychologists are often involved in school-wide practices, such as (a) policies supportive of gender minoritized students, and (b) staff education and student activities (e.g., gender
and sexuality alliances) that promote positive school environments for gender minoritized students (Heck et al., 2014; Poteat et al., 2020). In particular, these findings support previous research highlighting the importance of reducing victimization experienced by gender minoritized students (Reisner et al., 2015; White Hughto et al., 2015). School psychologists play an important role in selecting and implementing empirically supported systems-level interventions that improve school climate and reduce victimization in general, and victimization against gender minoritized students in particular (National Association of School Psychologists, 2020). Although current research suggests declines in efficacy for anti-bullying interventions across adolescence (Yeager et al., 2015), school psychologists are well positioned to adapt and evaluate social-emotional learning approaches that are increasingly being explored as appropriate for addressing bullying in this age range and also improve school-wide academic engagement and other academic outcomes (Swearer et al., 2017).

These are the first findings to suggest the importance of school rule clarity and fairness for gender minoritized students, and if replicated, underscore how structural changes that enhance fairness and clarity may help improve the school environment for these vulnerable students. More specifically, because of their daily interactions with both school administration and students, school psychologists can be essential in ensuring that school-wide disciplinary practices do not create systemic barriers for particular groups of students. School psychologists are well positioned to assess and advocate potential contributors to perceived unfairness, such as dress code policies, policies around the use of chosen names, or zero-tolerance bullying policies that may have particular consequences for gender minoritized students (Russell et al., 2018; Snapp et al., 2015). Ultimately, these preliminary findings suggest greater vulnerability for gender minoritized students for poorer school outcomes as compared to their cisgender peers, but also point to potential levers for intervention (i.e., victimization, school-wide engagement, and school rule fairness and clarity) as the focus of future research.
Declaration of Competing Interest
The authors have no conflicts of interests to declare. The authors have no conflicts of interests to declare.

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Appendix
A potential concern in the current analyses was the potential for differences in key study variables within the group of gender minoritized students. More specifically, we were concerned that differences within the gender minoritized groups of students were sufficiently large that combining these groups would be unadvisable. As is presented in Table A1, no significant differences were observed in the mediating variables of school-level engagement, student-teacher relationships, school rule fairness and clarity, or the outcome variable (academic engagement) according to gender identity. A significant difference was observed, however, for victimization.

Table A1 Mean differences in study variables according to gender among gender minoritized students.

<table>
<thead>
<tr>
<th></th>
<th>Boys</th>
<th>Girls</th>
<th>Travesti or Transexual</th>
<th>Other gender</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Student-teacher relationship</td>
<td>7.38</td>
<td>2.71</td>
<td>7.83</td>
<td>2.31</td>
</tr>
<tr>
<td>School rule fairness or clarity</td>
<td>14.10</td>
<td>4.71</td>
<td>15.67</td>
<td>4.93</td>
</tr>
<tr>
<td>School-wide academic engagement</td>
<td>7.30</td>
<td>2.93</td>
<td>7.70</td>
<td>3.85</td>
</tr>
<tr>
<td>Peer victimization</td>
<td>1.36</td>
<td>1.59</td>
<td>1.35</td>
<td>1.61</td>
</tr>
<tr>
<td>Student-level academic engagement</td>
<td>24.13</td>
<td>4.74</td>
<td>21.13</td>
<td>6.24</td>
</tr>
</tbody>
</table>

* = p < .05; ** = p < .01.
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