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# School (socie)ties: individual and school level differences in the association between ethnic/racial victimization and academic functioning

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**Introduction:** The current study aimed to expand on the existing literature by examining the effect of race-based victimization on academic functioning in a nation-wide sample of Brazilian youth.

**Methods:** The ENEM 2009 dataset contained academic functioning scores of 795,924 Brazilian students from 25,488 schools.

**Results:** Above and beyond the effect of general victimization, ethnic/racial victimization was significantly negatively related to academic functioning with differences across ethnic/racial groups in the effects. More interesting is that diversity climate at the school level buffered the association between ethnic/racial victimization and academic functioning. The effects were further qualified by school level ethnic/racial diversity and victimization.

**Discussion:** The current findings illustrate the pernicious effects of ethnic/racial victimization even after controlling for other forms of victimization. Moreover, differences in these associations across schools were accounted for using a combination of school level racial diversity and victimization with school level diversity climate emerging as a buffer of the effects of ethnic/racial victimization.

## KEYWORDS

academic functioning, discrimination, ethnic victimization, racial victimization, diversity education

## 1. Introduction

A growing number of studies have aimed to better understand factors that explain individual differences in academic functioning of adolescents (Hattie, 2008). Interest in this area stems from several reports indicating how important adolescent's academic functioning is related to overall adjustment. Adolescents who are successful in school report higher self-esteem (Aryana, 2010), better mental health (McLeod et al., 2012) and positive peer relationships (Gallardo et al., 2016). However, the opposite has also been observed with lower academic functioning among those with poor self-esteem (Alves-Martins et al., 2002), internalizing symptoms (Masten et al., 2005) and those victimized by their peers (Adams et al., 2021). In fact, school-based victimization during adolescence has also been associated with lower academic attainment (Nakamoto and Schwartz, 2010) and even lower wages into adulthood (Wolke et al., 2013). The reasons for these

effects are not a mystery in that adolescents who are victimized in school, avoid being in school thus creating a cascade of effects that can span years.

The detrimental impact of victimization can be better understood by examining the diverse types of victimization linked to personal or group characteristics, such as sexual orientation, body shape, and ethnicity/race (Salmon et al., 2018). Prior research suggests that victimization linked to discriminatory harassment can have a stronger impact on academic functioning above and beyond more general forms of peer victimization (Alexander et al., 2011). Past research on ethnic/racial victimization has pinpointed the role that diversity plays in the consequences of peer harassment (Juvonen et al., 2006; Graham et al., 2009; Juvonen et al., 2018). These suggest that the ethnic/racial diversity in the school can buffer the effect of ethnic/racial victimization on academic functioning, although few studies have explored both the effect of school's ethnic/racial diversity and diversity education (Bellmore et al., 2012). Whereas students attending schools which foster respect of those from various backgrounds and ethnicities/races fare better overall (Chang and Le, 2010), they are also protected against the effects of peer victimization (Lee et al., 2015). The current study aimed to test for the moderating effect of school diversity and diversity education on the association between ethnic/racial victimization and academic function among a nationally representative sample of Brazilian adolescents.

## 1.1. Academic functioning during adolescence

Given that academic functioning in adolescence plays an important role in concurrent academic engagement (Lei et al., 2018), later academic attainment and subsequent income as adults (Pallas, 2000), there's been an abundance of studies that have highlighted its importance (Berkowitz et al., 2017). Separate from intellectual functioning, academic functioning refers to an individual's ability to successfully navigate the demands of their school environment and as a result score higher in measures of reading, math, sciences and/or languages (Best et al., 2011). Higher academic functioning has been associated with a range of indices of overall adjustment including improved subjective well-being (Bücker et al., 2018) and health behaviors (Bradley and Greene, 2013). On the other hand, poor academic functioning has been linked with increased drug use (Henry, 2010) and peer victimization (Nakamoto and Schwartz, 2010).

## 1.2. Victimization and its effect on academic functioning

Peer victimization reflects harassment that adolescents receive from their peers which can include but is not limited to physical, verbal, or psychological abuse (da Cunha et al., 2021). Not surprisingly, peer victimization has also been associated with lower self-esteem (van Geel et al., 2018), aggressive behavior (Bass et al., 2018) and poor overall adjustment (Gini et al., 2018). Interestingly though, peer victimization is the result of factors that relate to the individual, the overall group context, schools and broader level factors (Hong and Espelage, 2012). This makes the study of the effects of peer victimization require a nuanced examination beyond main effects. In

the current study, we aim to show how the school context plays a moderating role in the association between peer victimization and academic functioning.

The specific association between peer victimization and academic functioning has been carefully examined in a number of studies (for a review, see Espelage et al., 2013). One of the most illuminating reports employed a meta-analytic approach (Nakamoto and Schwartz, 2010). By compiling the findings from 33 separate studies, Nakamoto and Schwartz were able to provide a robust description of the impact peer victimization has on academic functioning. While the overall effect size is not large ( $d = -0.10$ , considered small), the effect of peer victimization on academic functioning was consistently negative. It is worth noting that the studies using school records of academic functioning showed stronger decreases in association with peer victimization. Unfortunately though, Nakamoto and Schwartz were not able to delineate the difference between general victimization and ethnic/racial victimization.

The potential differences between general victimization and ethnicity/race related victimization faces particular challenges, when considering the context level effects of diversity in such differences, such that the diversity of schools has an impact above and beyond individual level ethnicity/race (Graham, 2006). A meta-analysis on ethnic/racial differences in peer victimization highlighted how different methodologies to compare peer victimization between ethnic/racial groups yielded only small effects of ethnicity/race (Vitoroulis and Vaillancourt, 2015). However, the authors explain that the lack of differences may be due to the methodological issues on the assessment of ethnicity/race, pointing out that studies that considered contextual level aspects such as the ethnic/racial composition of schools have been more successful in examining the specific effects of ethnic/racial victimization and general victimization.

## 1.3. Ethnic/racial differences and academic functioning in Brazil

Ethnic/racial differences in education in Brazil are deeply influenced by its unique conception of ethnicity and race and a history of structural racism that dictates access and quality of education. In Brazil, race and ethnicity are often defined more fluidly than in many other countries, relying on a spectrum of skin tones rather than rigid categories. The terms "black," "brown" (or "pardo" in Portuguese), indigenous, "white" and "yellow" (person who claims to be of Asian descent) are classifications used in official statistics (Dos Anjos, 2013), such as those produced by the Brazilian Institute of Geography and Statistics (IBGE). "Pardo" is a particularly Brazilian ethnic/racial identification that falls between the white and black categories. Some argue that, together with other euphemisms such as "moreno," 'pardo' is used by respondents as an ambiguous and "whitened" ethnic/racial classification that downplays their identification with the black ethnicity/race (Telles, 2002; Loveman et al., 2012). The use of these official Brazilian classifications of ethnicity/race can contribute to the comparability of the results with other studies on ethnic/racial differences in Brazil.

As Brazil saw renovated investments in public policies to advance the universalization of access and persistence on secondary education in Brazil (Kuenzer, 2010), the analysis of indicators regarding students' perception of their high school experience could lend support to

advance these goals, and address issues such as the ethnic/racial gap still evident in indicators of access, persistence, and attainment (Ferreira et al., 2012). Despite constitutional mandates, Brazil grapples with pronounced ethnic/racial disparities in education. Black, indigenous, and *pardo* Brazilians consistently achieve lower educational attainment, display lower test scores, and experience higher dropout rates than their white counterparts (Marteleto and Dondero 2016; OECD, 2021). The ethnic/racial gap in education has been the object of renewed debate in Brazil, especially since the early 2000's (Coelho and de Nazaré Silva, 2013), and while this educational gap has been narrowed in the period between 1990 and 2009 (Ferreira et al., 2012), it still affects a large proportion of black, indigenous and *pardo* Brazilians. For example, black and brown students constitute 71.7% of the youth aged 14 to 29 who are out of school (IBGE, 2020). Brazil basic education also lags in large scale international assessments (e.g., Program for International Student Assessment, PISA), and although the dividends of public policies to improve education demonstrate gains to disadvantaged students (Carnoy et al., 2015), ethnic/racial inequalities in educational indicators persist (Nogueira and da Silva, 2016; Ferrão, 2022).

In the face of this challenge education systems and educational institutions have an important role and responsibility in addressing and eliminating racism through supporting schools to implement education policies that support developing anti-racist curricula and pedagogies, intercultural dialog and respect for diversity, empower students and teachers to challenge racism and discrimination while advancing equity in education (Barbieri and Ferede, 2020; Gomes et al., 2021). Given these disparities, there is need for further research to examine educational gaps rooted in ethnic/racial differences in Brazil.

It is relevant to note that disentangling ethnic/racial differences in academic functioning requires a closer look at the diverse pathways and challenges faced by different ethnic/racial groups (Lee, 2002; Paschall et al., 2018), which may be attained by looking beyond student level aspects of attainment and considering school level outcomes on educational attainment.

#### 1.4. Ethnic/racial differences in the effect of victimization

Whereas a number of quantitative studies have outlined the deleterious impact of ethnic/racial victimization on academic outcomes (Espelage et al., 2013; Sapouna et al., 2023), qualitative research has provided additional context to the impact of ethnic/racial victimization. Using semi-structured interviews of Brazilian youth, Silva and colleagues (2016) highlighted that the various reasons behind victimization often intersected with ethnicity/race. It's not surprising then that the wide-ranging consequences of victimization were also related to students' overall quality of life. Focus group research on the social determinants of victimization among afro-Brazilian women revealed additional considerations (Hogan et al., 2018). Namely, those who experience intersecting forms of oppression (such as ethnic/racial victimization in academic settings) report fewer life course opportunities based on nuanced stressors in their social context.

Disentangling the contextual reasons for victimization, may provide a clearer understanding of how to prevent and reduce its harm

to both to victims but also to bystanders, who are adversely affected by episodes of victimization (Janson and Hazler, 2004). Peer victimization can also provide a context that reinforces ethnic/racial stereotypes, so that students who break the 'glass ceiling' implied by their ethnic/racial group belonging may be at a greater risk for victimization (Peguero and Williams, 2013), while the effects of victimization can be amplified when linked to ethnic/racial group membership (Verkuyten and Thijs, 2001). And while racism has a broad and persistent impact on the lives of children and adolescents (Trent et al., 2019), the specific context of schools may provide an avenue to prevent racism while also reducing its impacts.

#### 1.5. Ethnic/racial diversity, diversity education and student perceptions

Prior research has demonstrated the positive effects of ethnic/racial diversity in schools (Juvonen et al., 2018; Nishina et al., 2019; Schneider et al., 2022). An analysis of data from 4,302 students in 26 middle schools in the United States found that students who experienced more diversity in their classrooms throughout the day reported higher levels of feelings of safety, while also reporting less victimization (Juvonen et al., 2018). Similarly, a study involving several school districts in the United States investigates how school diversity affects the social and emotional outcomes of students, such as engagement, belonging, and self-efficacy (Schneider et al., 2022). The authors use survey data from about 26,000 students in six districts that have implemented ethnic/racial integration policies, and found that students who attend ethnically/racially diverse schools report more positive outcomes than those who attend more homogeneous schools, regardless of their ethnicity/race.

However, research on the advantages of ethnic/racial diversity in schools presents mixed outcomes, especially when comparing the findings from studies conducted in the United States and research in more ethnically/racially homogeneous populations (Nishina et al., 2019). Due to the limited school diversity in studies conducted in certain global settings (e.g., Madsen et al., 2016), it's relevant to further investigate whether the positive findings regarding school diversity and student outcomes reported in the literature can be replicated in other countries. To the best of the author's knowledge, no prior study has examined the effects of school's ethnic/racial diversity in Brazilian schools.

Considering the benefits of ethnically/racially inclusive school environments, Nishina et al. (2019) recommend specific strategies to promote ethnic/racial diversity in schools to reduce prejudice and foster positive relations between groups. These include nurturing a strong ethnic/racial identity in minority students, boosting their self-esteem and academic engagement; integrating multicultural training and cooperative learning, enhancing students' intercultural skills and empathy. In addition, emphasizing social competence and prosocial behaviors, which can facilitate cross-ethnic/racial friendships.

Central to these practices is understanding the school's diversity climate, which refers to the degree to which the school environment is shaped by ethnic and racial dynamics, including fair and supportive practices that affirm students' ethnic and racial identities and perspectives. Relatedly, positive perceptions of the diversity climate of schools has been linked with higher academic achievement (Mattison and Aber, 2007; Wells et al., 2016; Griffin et al., 2017), and it can

potentially be a core component of programs aimed at preventing issues such as peer victimization (Polanin and Vera, 2013). As the Brazilian educational systems address barriers of access to schooling, it is simultaneously challenged with providing educational services to an increasingly diverse student population. Considering the challenge to foster a positive context for the schooling of a diverse population, Brazil enacted the Law 10.639 (Brasil, 2003), introducing the compulsory teaching of African and Afro-Brazilian history and culture in schools, while also opening the debate on the inclusion antiracist educational practices (Da Costa, 2016). This provided the context for several initiatives aimed at introducing diversity education in Brazilian schools.

Diversity education has the broad goals of incorporating educational practices that foster awareness and respect for diversity in the daily school lives (Gomes, 2003). In order to advance the incorporation of several faces of diversity in education, a number of public policies were enacted in the 2000's, including the creation of the Secretariat of Continuing Education, Literacy, Diversity and Inclusion (SECADI) in 2004, which spearheaded the implementation of diversity education in Brazil (Kadlubitski and Junqueira, 2009). The approaches to diverse education in Brazil have often been informed by intercultural and critical pedagogies (Oliveira and Candau, 2010), but there is a dearth of empirical studies examining the specific impacts of perceptions of diversity education in Brazilian students and their schools.

## 1.6. Current study

In 1998, the National Exam for Secondary Education (Exame Nacional do Ensino Medio, ENEM) was introduced in Brazil, and is a Brazilian large-scale educational assessment focused on the knowledge and skills of students concluding their secondary education. Over the years, ENEM has transitioned into a pivotal university entrance examination and that, coupled with the publicization of school rankings on the exam, expanded its influence on aspects such as curriculum guidelines (Schwartzman and Knobel, 2016). Because of its expansive reach, which includes students from both urban and rural backgrounds and from both public and private sectors, ENEM provides a detailed and representative overview of Brazil's secondary education. Notably, between 2009 and 2013, the ENEM's sociodemographic questionnaire featured an extensive set of items about students and educational contexts, including items on victimization and educational practices, in addition to measures of adolescents functioning in Natural Sciences, Humanities, Language and Codes, Math and Writing.

The current study capitalized on the representative nature of the 2009 ENEM dataset to better elucidate the associations between general and ethnic/racial victimization on academic functioning within a comprehensive sample of Brazilian adolescents. Moreover, our goal was to disentangle the role that factors of the school context (namely school ethnic/racial diversity and diversity climate) can play in shaping these effects. We employed a multilevel modeling approach to examine individual level associations and accounted for variability in those associations at the level of the schools. The principal research questions that the current study aimed to address are (1) what is the impact of ethnic/racial victimization on Brazilian youth's academic functioning and (2)

what aspects of the school's environment (from ethnic/racial diversity and perceptions of respect for diversity) serve to mitigate the effect of ethnic/racial victimization.

We hypothesized that school-based general victimization would be associated with decreased academic functioning. More importantly, ethnic/racial victimization would be associated with decreased academic functioning above and beyond any effects of general victimization. We also tested for differences in the effects of ethnic/racial victimization across ethnic/racial groups. At the school level, we hypothesized that both ethnic/racial diversity and perceptions of diversity climate would moderate the association between individual ethnic/racial victimization and academic functioning such that schools that were more diverse and provided a more inclusive diversity climate would buffer the negative effects.

## 2. Method

The dataset contained academic functioning scores of 4,414,721 students. We filtered out all students not attending a regular school (i.e.: trade schools or special education, etc.). Moreover, only students finishing school that academic year were kept in the analyses. Lastly, only students 21 years old and below were included in the current study. This provided us with a sample of 1,063,828 students, of whom 795,924 had academic functioning data. All told, we had information from 25,488 schools (with 1 to 1,124 students within the schools,  $\bar{X} = 39.40$  students, S.D. = 50.70).

### 2.1. Individual level variables

In our sample, the mean age was 18.67 (S.D. = 1.03) with 39.9% being male and 60.1% being female. Parent education (mother and father) was used as a proxy for socio-economic status (SES). SES was measured using whichever parent had higher educational attainment (with 'No schooling' coded as "1," '1<sup>st</sup>–4<sup>th</sup> grade' coded as "2," '5<sup>th</sup>–8<sup>th</sup> grade' coded as "3," 'High School – Incomplete' coded as "4," 'High School–Complete' coded as "5," 'University – Incomplete' coded as "6" 'University – Complete' coded as "7," 'Post Graduate' coded as "8"). In our sample, 43.9% of students had a parent who did not complete high school, 29.2% of whom had a parent with a high school diploma with the remaining 26.9% having a parent with at least some University education.

Moreover, in our sample 47.2% of students were white, 39.6% were of mixed ethnicity/race (*pardos*), 9.3% black, 3.2% Asian and 0.70% were Indigenous. Ethnic/Racial differences were tested using four orthogonal contrast codes. The first compared white students to the other groups. The second compared black students to those remaining. Next, mixed ethnicity/race students were contrasted to indigenous and Asian students. Lastly, indigenous students were compared to Asian students.

General victimization ( $\alpha = 0.62$ ) was created based on the sum of six different forms of victimization. These included whether the student was victimized based on economic reasons, their religion, their birthplace, their age, their physical appearance and where they live (with no coded as "0" and yes coded as "1"). On average, students had been victimized for 1.07 of the reasons above (S.D. = 1.33, scores ranging from 0 to 6).

Ethnic/racial victimization was a binary variable reflecting whether the students had been victimized based on ethnic/racial reasons (No coded as “0” and yes coded as “1”). In our sample, 13.10% of the students reported being victimized for ethnic/racial reasons.

Academic functioning was measured using the scholastic exams completed by students completing their secondary education, including four areas: Natural Sciences, Humanities, Language and Codes, Math and Writing. The reliability values for these disciplines ranged from 0.59 for Mathematics to 0.85 for the Languages exam (For a detailed analysis of ENEM 2009 exams, see [Travitzki, 2017](#)). The scores across these four areas were combined into a single average, with adequate reliability ( $\alpha=0.84$ ). The scores were then standardized to improve the interpretation of the model results (detailed further below).

### 2.1.1. School level variables

The schools were either public (coded as “0”) or private (coded as “1”). Public schools made up 71.1% of the sample with the remaining 28.9% being private schools. School level ethnic/racial victimization was simply based on the aggregated percentage of students who reported being victimized for ethnic/racial reasons (mean=0.13, S.D.=0.34, scores ranging from 0 to 1).

School diversity was calculated using a diversity index ([Simpson, 1949](#)). For each school, we subtracted the sums of the squared percentages of every ethnic/racial group from 1. This provided us with a score that reflects the degree of diversity in each school. As such, values of schools’ ethnic/racial diversity ranged from 0 (no diversity at all) to 1 (very diverse). The mean score of school ethnic/racial diversity in this sample was 0.70 (S.D.=0.23).

Perceptions of school’s diversity climate ( $\alpha=0.80$ ) was measured using students’ assessment of the “school and the freedom to express ideas,” “the school and to respect students without discriminating against them” and “the school and the recognition and appreciation of ethnic identity of students.” The scores were recorded on a three-point Likert scale reflecting whether it was “insufficient” (coded as “0”), “average” (coded as “1”) or “excellent” (coded as “2”). On average, students rated their schools as slightly above average (mean = 1.17, S.D. = 0.28, with scores ranging from 0 to 2). The intra-class correlation revealed that 10.00% of the variability in diversity climate perceptions were at the school level, justifying its use as a school level predictor.

### 2.1.2. Analytic strategy

Multilevel modeling was performed using HLM (ver. 7.30; [Raudenbush et al., 2004](#)) with individual academic functioning scores nested within schools. We started with an unconditional model using only the dependent variable, academic functioning. We then added individual level predictors in a stepwise manner. First, we included the covariates (age, gender and SES), then general victimization followed by ethnic/racial victimization. The main effects of the ethnicity/race contrasts were tested next along with the interactions between the ethnicity/race of the participant and ethnic/racial victimization. It’s important to note that since the focus of the current paper is on the effects of ethnic victimization on academic functioning, only academic functioning overall (the intercept) and the effect of ethnic/racial victimization was set to be random across schools (i.e.: allowed to vary) while all of the other effects were fixed (i.e.: assumed to be uniform).

School level variables were then added, again on academic functioning overall and the effect of ethnic/racial victimization. We began with whether the schools were private or public (as a covariate). Next, the school level percentage of ethnic/racial victimization was added followed by school level diversity index scores and then school level diversity climate. Lastly, we tested for all two-way interactions between the key predictors and the three-way interaction. [Figure 1](#) illustrates the conceptual model we tested.

The outcome and predictors were standardized such that the effects ( $b$  values) represent standard deviation differences in academic functioning. Moreover, given the large sample size in the current study, even the smallest of effects were likely to be statistically significant ( $\alpha=0.05$ ). As such, the interpretation of significant effects was paired with estimates of effect size (as measured using proportional reductions in the variance of the prediction errors, PRPE) and significant improvements to the estimation of the models (based on a  $\chi^2$  test). Based on [Cohen \(1988\)](#) recommendation,  $b$  values  $<0.1$  were considered small effects, between 0.1 and 0.5 as medium and  $>0.5$  large.

## 3. Results

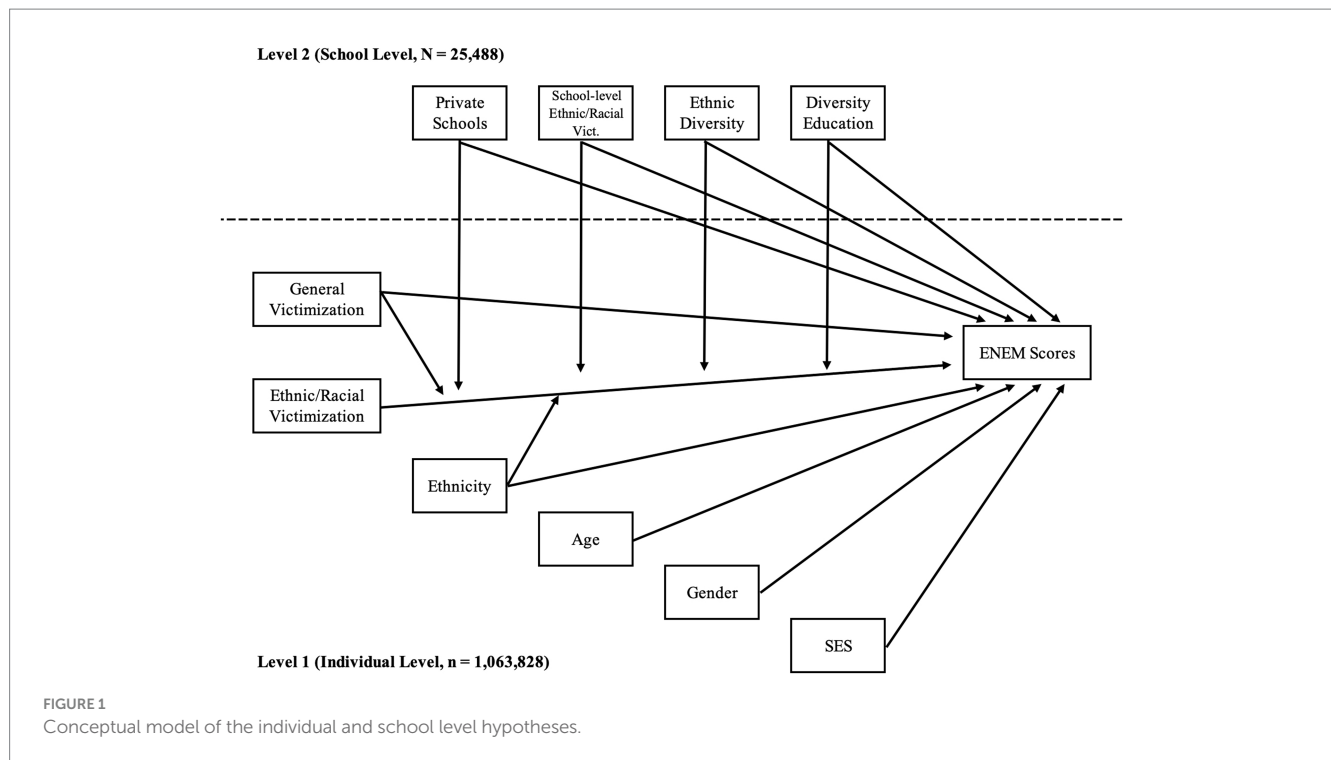
Hypothesis testing began by first creating a model with only the dependent variable, meaned academic functioning. This unconditional model revealed that 39.97% of the variability in academic functioning is at the school level. Not surprisingly, this reflected a significant amount of variability ( $\chi^2_{(2)}=1,637,949.18, p<0.05$ ). We then began regressing predictors onto the outcome first at the individual level.

### 3.1. Level 1 hypothesis testing (individual level effects)

The covariates (age, gender and SES) were added as correlates of academic functioning first with their effects as fixed, constrained not to vary at the school level. Age was associated with decreased academic functioning ( $b=-0.120, S.E.=0.001, t_{(539,624)}=103.34, p<0.05$ ), as was gender ( $b=-0.138, S.E.=0.002, t_{(539,624)}=68.24, p<0.05$ ), though SES was positively tied to higher academic functioning ( $b=0.051, S.E.=0.001, t_{(539,624)}=81.46, p<0.05$ ). In other words, older students taking the tests fared worse as did women while students whose parents were more educated scored higher. The addition of the covariates reduced prediction error in academic functioning by 5.93%, significantly improving the model ( $\Delta\chi^2_{(3)}=551,520.37, p<0.05$ ).

Next, general victimization was included in the model, also fixed. Interestingly, general victimization was associated with higher academic functioning ( $b=0.054, S.E.=0.001, t_{(534,228)}=58.09, p<0.05$ ). The addition of general victimization reduced prediction error in academic functioning by 0.84%, further significantly improving the model ( $\Delta\chi^2_{(1)}=566,046.19, p<0.05$ ).

We could then add ethnic/racial victimization and examined its effect on academic functioning above and beyond the effects of general victimization and the covariates overall. As expected, ethnic-related victimization was negatively associated with academic functioning ( $b=-0.056, S.E.=0.003, t_{(24,942)}=20.49, p<0.05$ ). Ethnic/race-related victimization reduced prediction error by an additional 0.18%, also significantly improving the model ( $\Delta\chi^2_{(1)}=8,927.77$ ,



$p < 0.05$ ). To explain, students who reported being victimized because of their ethnicity/race had academic functioning scores that were 0.06 standard deviations lower than average ( $b = -0.056$ ) regardless of how much they experienced general victimization.

It's worth noting that the interaction between general and ethnic/racial victimization was also explored ( $b = -0.008$ , S.E. = 0.001,  $t_{(530,013)} = 10.14$ ,  $p < 0.05$ ). When the interaction term was added to the model, there was an additional decrease in the model's prediction error (of 0.21%), significantly improving the model ( $\Delta\chi^2_{(1)} = 9,020.99$ ,  $p < 0.05$ ). Not surprisingly, academic functioning scores of those who reported being victimized for their ethnicity/race and being above average in general victimization were even lower (by 0.062 standard deviations).

### 3.2. Group differences in the effects of ethnic/racial victimization

To test for ethnic/racial differences in academic functioning overall, the orthogonal ethnicity/racial contrast codes were included in the model, also fixed in that they were not allowed to vary across schools. There were a number of significant effects. White students had higher scores than their counterparts ( $b = 0.025$ , S.E. = 0.001,  $t_{(526,126)} = 35.71$ ,  $p < 0.05$ ) whereas black students were not significantly lower than the remaining non-white students ( $b = -0.002$ , S.E. = 0.001,  $t_{(526,126)} = 1.28$ ,  $p > 0.05$ ). Mixed race students had significantly higher academic functioning ( $b = 0.017$ , S.E. = 0.002,  $t_{(526,126)} = 8.70$ ,  $p < 0.05$ ) than indigenous and Asian students. Lastly, Indigenous students scored lower ( $b = -0.088$ , S.E. = 0.006,  $t_{(526,126)} = 15.32$ ,  $p < 0.05$ ) than Asian students. It is worth noting that the strongest ethnicity/racial effect (as reflected in standard deviations from the mean) was at the detriment of the indigenous students ( $b = -0.088$ , when compared to

Asian students) while the white students benefited from the second strongest effect ( $b = 0.025$ , compared to everyone else in the data).

As we were more interested in differences between groups of students in the effect of ethnic-related victimization, the ethnic-related victimization by ethnicity interaction terms were also included in the next block of predictors. The ethnicity contrast codes and interactions reduced prediction error an additional 0.27%, again significantly improving the model ( $\Delta\chi^2_{(9)} = 9,770.62$ ,  $p < 0.05$ ). Figure 2 illustrates group differences and more importantly, the effect of ethnic/racial victimization across the various groups. For all but Asian students, ethnic/racial victimization was associated with lower academic functioning. The sharpest decrease was observed in mixed race students (dropping 0.073 standard deviations).

### 3.3. Level 2 hypothesis testing (school level effects)

At this point, we could test for the effects of school level variables on the variability between schools in academic functioning overall but more importantly on the effect of ethnic/racial victimization. The first variable included at this level was whether the school was private or not. Again, this was to control for any differences based on the predictors added next. There was a strong main effect of attending a private school on academic functioning overall ( $b = 0.743$ , S.E. = 0.007,  $t_{(24,928)} = 109.83$ ,  $p < 0.05$ ). In other words, students attending private schools tended to score on average 0.74 standard deviations higher on academic functioning. The addition of this variable on the estimation of academic functioning reduced prediction error by 50.26%, significantly improving the model ( $\Delta\chi^2_{(1)} = 130,304.08$ ,  $p < 0.05$ ). There was however no significant difference based on attending a private school on the effect of ethnic/racial victimization.

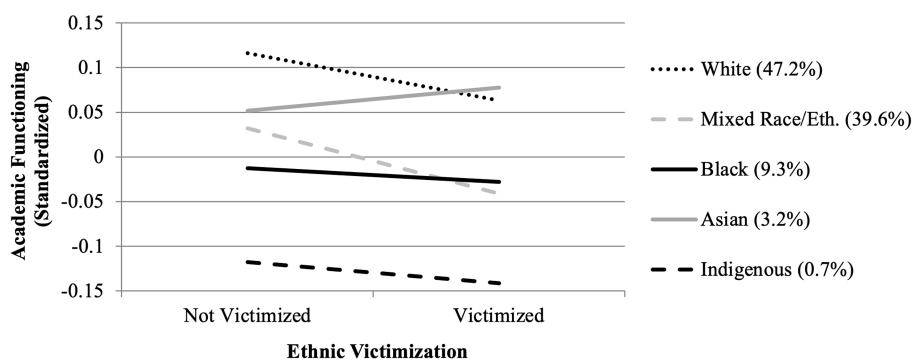


FIGURE 2  
Differences in the effect of ethnic victimization as a function of ethnicity/race.

Next, we added school level percentages of ethnic/racial victimization on academic functioning overall and the effect of ethnic/racial victimization. Again, there was a main effect on academic functioning overall. As might have been expected, schools where more students reported being victimized for their ethnicity/race had lower academic functioning overall ( $b = -0.346$ , S.E. = 0.021,  $t_{(24,927)} = 16.10$ ,  $p < 0.05$ ). The addition of this variable on the estimation of academic functioning reduced prediction error by an additional 1.68%, significantly improving the model ( $\Delta\chi^2_{(1)} = 3,014.92$ ,  $p < 0.05$ ). Here too, there was no significant influence of school-level ethnic/racial victimization on the effect of ethnic/racial victimization.

We then added the index of diversity on academic functioning overall and the effect of ethnic/racial victimization. Yet again, there was a main effect on academic functioning overall. Consistent with the ethnicity/race main effects, more diverse schools had lower academic functioning overall ( $b = -0.125$ , S.E. = 0.016,  $t_{(24,926)} = 16.10$ ,  $p < 0.05$ ). The addition of this variable on the estimation of academic functioning reduced prediction error by an additional 0.68%, significantly improving the model ( $\Delta\chi^2_{(1)} = 990.59$ ,  $p < 0.05$ ). Once more, there was no significant effect of diversity on school level differences in the slope of ethnic/racial victimization.

At this point, diversity climate was included in the model on academic functioning overall and the effect of ethnic/racial victimization. Not only was diversity climate associated with higher academic functioning at the school level overall ( $b = 0.098$ , S.E. = 0.003,  $t_{(24,925)} = 29.63$ ,  $p < 0.05$ ), reducing prediction error by an additional 5.87%, significantly improving the model ( $\Delta\chi^2_{(1)} = 9,424.63$ ,  $p < 0.05$ ) there was also an effect on the ethnic/racial victimization slope. To explain, the negative association between ethnic/racial victimization and academic functioning was weaker among schools high in diversity climate ( $b = -0.004$ , S.E. = 0.001,  $t_{(24,925)} = 2.69$ ,  $p < 0.05$ ), reducing prediction error by 4.17%, significantly improving the model ( $\Delta\chi^2_{(1)} = 20.92$ ,  $p < 0.05$ ).

In the end though, the effects of school level ethnic/racial victimization, diversity and diversity climate were qualified when we introduced the two-way interactions and the three-way interaction. The interactions reduced prediction error on academic functioning overall by an additional 1.46%, significantly improving the model ( $\Delta\chi^2_{(4)} = 1,977.16$ ,  $p < 0.05$ ) and further reduced prediction error in the effect of ethnic/racial victimization by an additional 4.35%, also significantly improving the model ( $\Delta\chi^2_{(4)} = 9.52$ ,  $p < 0.05$ ). Table 1

includes all of the effects from the final model. All of the model outputs are available for download<sup>1</sup>.

Figure 3 illustrates how the variables explain school level differences in academic functioning overall and more importantly, on the effect of ethnic/racial victimization. The right panels show how that in high diversity schools (i.e.: schools with an index of 0.93; mean + 1 S.D.), high diversity climate (i.e.: mean + 1 S.D.) buffers the negative effect of ethnic/racial victimization. Even in schools high in racial victimization (i.e.: schools where 30% of the students report racial victimization; mean + 1 S.D.), a high diversity climate serves as a buffer of the effect of individual ethnic/racial victimization even though the scores are generally lower. On the other hand, the left panels show the effect of diversity climate on the negative association between ethnic/racial victimization and academic functioning among schools low in diversity (i.e.: schools with an index of 0.47; mean - 1 S.D.). While in these schools, a higher diversity climate is associated with higher academic functioning overall, the negative effect of ethnic/racial victimization is stronger. One interpretation for this counter-intuitive finding is that experiencing ethnic/racial victimization in schools where there is less diversity but high diversity climate is more of a violation of expectations and thus results in a stronger depressive effect on academic functioning.

## 4. Discussion

The main findings of the current study replicated previous research showing ethnic/racial peer victimization is associated with decreased academic functioning, and the use of a multilevel modeling approach highlighted individual and school level variability in this association (see Figure 1). These effects emerged after controlling for age, gender and SES. We also showed that the effect of ethnic/racial victimization differed across ethnic/racial groups such that the effect was strongest among those of mixed ethnicity/race (see Figure 2). The pattern of findings generally conformed to previous research on the issue (Marteleto and Dondero 2016; Nogueira and da Silva, 2016;

<sup>1</sup> <https://osf.io/aks5m/>

TABLE 1 Final model results.

Predictor	<i>b</i>	S.E.	<i>t</i> (df) <sup>p</sup>
<i>Intercept</i>	-0.8822	0.0481	-18.34 (24930)*
Private school (dummy)	0.6457	0.0073	88.62 (24930)*
School level ethnic/racial victimization	-0.2663	0.0917	-2.90 (24930)*
School level ethnic/racial diversity	-0.0410	0.0184	-2.23 (24930)*
Diversity climate	0.5551	0.0397	13.97 (24930)*
Ethnic/racial victimization x diversity	-0.0149	0.1172	-0.13 (24930) <sup>n.s.</sup>
Ethnic/racial victimization x diversity climate	0.4821	0.1017	4.74 (24930)*
Diversity climate x diversity	-0.0611	0.0154	-3.97 (24930)*
Threeway interaction	-0.8415	0.1284	-6.55 (24930)*
Student age	-0.1154	0.0012	-99.73 (476250)*
Student gender	-0.1439	0.0020	-70.75 (476250)*
Student Socioeconomic Status (SES)	0.0447	0.0006	71.64 (476250)*
White vs. other groups (contrast)	0.0250	0.0007	35.54 (476250)*
Black vs. remaining groups (contrast)	-0.0005	0.0013	-0.35 (476250) <sup>n.s.</sup>
Mixed ethnicity vs. remaining groups (contrast)	0.0183	0.0020	9.16 (476250)*
Indigenous vs. Asian (contrast)	-0.0867	0.0058	-15.03 (476250)*
General victimization	0.0622	0.0010	63.57 (476250)*
Ethnic/racial Vic. X white	-0.0024	0.0006	-4.05 (476250)*
Ethnic/racial Vic. X black	0.0010	0.0008	1.18 (476250) <sup>n.s.</sup>
Ethnic/racial Vic. X mixed	-0.0085	0.0015	-5.77 (476250)*
Ethnic/racial Vic. X indigenous	-0.0051	0.0042	-1.22 (476250) <sup>n.s.</sup>
Ethnic/racial Vic. X general Vic.	-0.0090	0.0008	-11.62 (476250)*
<i>Ethnic/racial victimization</i>	-0.2299	0.0442	-5.20 (24930)*
Private school (dummy)	-0.0007	0.0030	-0.23 (24930) <sup>n.s.</sup>
School level ethnic/racial victimization	-0.0177	0.0408	-0.43 (24930) <sup>n.s.</sup>
School level ethnic diversity	0.0128	0.0124	1.03 (24930) <sup>n.s.</sup>
Diversity climate	0.1953	0.0355	5.50 (24930)*
Ethnic/racial victimization x diversity	0.0036	0.0536	0.07 (24930) <sup>n.s.</sup>
Ethnic/racial victimization x diversity climate	-0.3111	0.0451	-6.90 (24930)*
Diversity climate x diversity	-0.0795	0.0133	-5.99 (24930)*
Threeway interaction	0.4186	0.0579	7.23 (24930)*

\*denotes  $p < 0.05$ . The *b* values can be interpreted in standard deviation differences of each effect wherein *b* values < 0.1 are considered small effects, between 0.1 and 0.5 are medium and > 0.05 large (Cohen, 1988). Left-aligned effects were at the individual level while indented effects were at the school level. Finally, effects in italics were set as random (at the school level). "n.s." means non-significant.

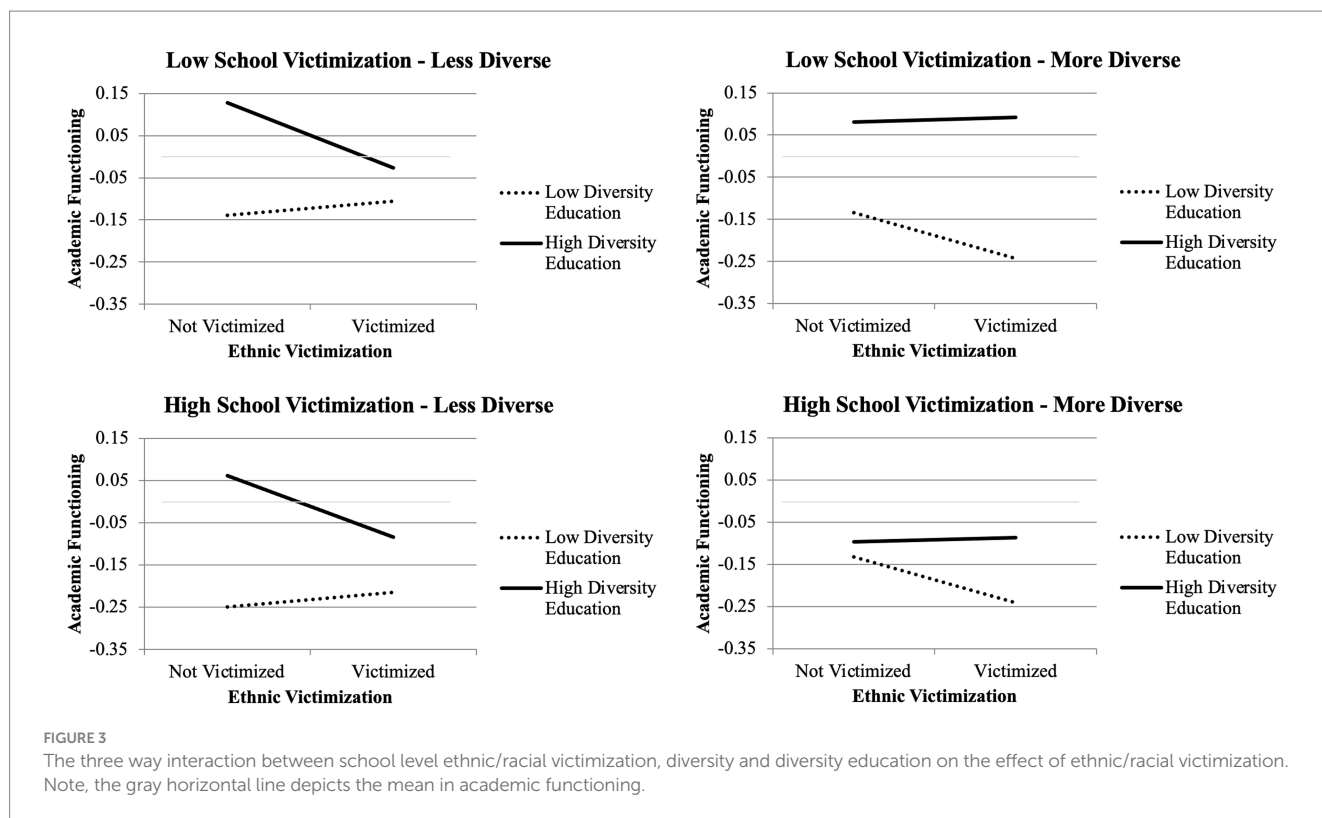
Ferrão, 2022), with white students generally exhibited higher academic performance compared to their peers.

The interactions of academic functioning and ethnic/racial victimization provided interesting and novel results. Students who identified themselves as mixed-race showed a more pronounced decline in academic functioning as a result of ethnic/racial victimization. The heightened sensitivity of mixed-race students to ethnic/racial victimization could be attributed to their unique positioning at the intersection of black and white ethnic/racial categories, potentially making them more vulnerable to ethnic/racial stressors (Hogan et al., 2018), such as ethnic/racial victimization. On the other hand, the milder impact of such victimization on other groups, might stem from a range of factors which, including the

normalization of certain discriminatory experiences. While black students might often encounter ethnic/racial victimization as a normalized experience in school settings, for those who identify as mixed-race (pardo), such experiences might starkly underscore their divergence from “whiteness.”

The largest differences however were at the school level, revealing that the relationship between school ethnic/racial diversity and academic functioning is multifaceted and influenced by the presence and quality of diversity education within schools. It’s worth noting that the intra-class correlation revealed that only 10% of the variability was at the school level. Traditionally, more than 5% is considered justification for aggregating a variable at a higher level (Kline, 2023). As such, the findings in the current study that diversity





climate buffers the effect of ethnic victimization are especially noteworthy.

Schools characterized by higher diversity levels, as quantified by the diversity index (Simpson, 1949), demonstrated lower overall academic functioning. However, when considering the role of diversity education in this process, diversity's role becomes more nuanced. Specifically, the effect of racial victimization was completely buffered among ethnically/racially diverse schools where students report more diversity education (Figure 3). Such an environment seems to create a buffer, indicating the potential of diversity education to cultivate a supportive and inclusive academic setting amidst diversity. Counterintuitively, while increased diversity climate in less diverse schools enhances general academic functioning, the consequences of ethnic/racial victimization seem to be amplified, suggesting that in these settings such incidents deviate dramatically from student expectations given the contrast with the inclusive values being emphasized, leading to stronger negative impacts on their academic outcomes. Thus, while school diversity poses its unique set of benefits and challenges, a comprehensive approach to diversity within these environments can play a pivotal role in understanding students' experiences in the face of ethnic/racial diversity in their schools.

The effects of ethnic/racial victimization on the psychological and emotional well-being of Brazilian youth are multifaceted and profound. These negative psychological consequences can hinder educational attainment, impede social integration, and perpetuate cycles of poverty and marginalization. Ethnic/racial victimization among Brazilian youth also has significant social and interpersonal implications. Discrimination can lead to a lack of trust in social institutions, strained intergroup relations, and limited social opportunities. The perpetuation of prejudice and exclusionary practices can impede the formation of diverse and inclusive social

networks, hindering social mobility and perpetuating disparities in areas such as education, employment, and healthcare. Understanding these consequences is crucial for fostering social cohesion, promoting multiculturalism, and ensuring equal opportunities for all Brazilian youth.

These results reinforce the conclusions of past research that ethnic/racial victimization is associated with worse outcomes (Verkuyten and Thijs, 2001). Unfortunately, we also found similar differences in academic functioning among ethnic/racial groups in Brazil (Ferreira et al., 2012). On a more positive note, the key takeaway from this study replicates the findings of others in that ethnic/racial diversity (Graham et al., 2009) and diversity climate/education (Gomes, 2003) might serve as a buffer of effects of victimization. While policies aimed at reducing individual peer victimization may have a modest impact, it would behoove schools to reflect the ethnic/racial diversity of the populations they serve and foster among their student body a sense that this diversity is a benefit for all. Studying the effects of ethnic/racial victimization among Brazilian youth has important implications for policy development and intervention strategies. The findings of this research can inform the creation of anti-discrimination legislation, educational curricula that promote tolerance and respect, and targeted interventions to support affected youth. By addressing the direct impact of ethnic/racial victimization on academic functioning and implementing evidence-based policies, Brazil can work toward creating a society that values diversity, promotes social justice, and provides equal opportunities for all its citizens.

The principal strength of the current study lies in the use of a comprehensive sample of adolescents. This comprehensive nature of the data ensured that our findings reflect the experiences of the ecological systems of Brazilian youth. It's also worth noting that the ENEM data uses a standardized measure of academic functioning

strengthening the ecological validity of our results. To that point, the effect of ethnic/racial victimization in this study was tested above and beyond any effect of general victimization. Moreover, to our knowledge, this is the first study of this kind to examine ethnic/racial victimization on academic functioning among adolescents in Brazil. Lastly, we took care to delineate individual level effects from school level effects so as to elucidate the complex relations between our variables.

Nevertheless, the current study is not without limitations. Unfortunately, due to our use of the ENEM dataset for secondary analysis, the individual measures were less than ideal. Ethnic/racial victimization for example was measured using a dichotomous variable. Were it to have been measured based on a Likert scale (reflecting the proportion of recent ethnic/racial victimization) our effect sizes would likely have been stronger. In addition, our study would have benefitted from having asked multiple questions related to ethnic/racial victimization as opposed to just one. Lastly, the results from the current study are correlational in nature and thus caution must be taken in interpreting the school level effects, especially that of diversity climate.

Future studies would benefit from disentangling the directional nature of the associations identified herein. The answer as to why ethnic/racial victimization was associated with worse academic functioning in schools with a high diversity climate but low diversity is the most persistent question that remains to be addressed based on this study. On that note, future studies should measure norms (injunctive and descriptive) of ethnic/racial diversity. It may be that in this study, the distinction between the two was muddled thus clouding our ability to make definitive interpretations of the positive role of diversity climate.

To conclude, the educational impacts of racism, expressed through processes such as ethnic/racial victimization in schools, have detrimental effects on the quality schooling trajectories and, as seen in this analysis, this is evident both at the individual and aggregated level, with promising results coming from those schools with a positive diversity climate. Continued efforts to enable schools to implement diversity education are needed, given its potential contribution to the quality of education, not only in cognitive indicators, but more broadly in the social quality of education. Events such as the closure of SECADI in 2019, which had been in charge of advancing diversity education in basic education (Kadlubitski and Junqueira, 2009), bring concern on the continuation of policies that enabled schools to implement diversity education programs. This measure takes place in the context of the withdrawal of state provisions aimed at guaranteeing minority rights and addressing social inequalities. Thus, advancing scholarship regarding the specific mechanisms through which policies such as the implementation of diversity education are particularly necessary in Brazil, demonstrating how such policies

can contribute to improve the quality of education overall, while also reducing inequalities in attainment.

## Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## Ethics statement

Ethical approval was not required for the study involving humans in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was not required from the participants or the participants' legal guardians/next of kin in accordance with the national legislation and the institutional requirements.

## Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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