Axes of oppression in the classroom: A statewide analysis investigating disparities in academic outcomes among students with intersectional identities in alternative learning centers

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Abstract

Introduction: Racial-ethnic minority (REM) and sexual and gender minority (SGM) students have been found to report lower academic attainment with lower rates of school engagement, attendance, and grades, compared to non-REM and non-SGM students, respectively. Most studies have investigated academic disparities in public school settings rather than in alternative learning centers (ALCs), which are designed for students who are deemed at-risk of educational failure in traditional public school settings. Further research investigating disparities in academic outcomes and school environment experiences for students with intersectional identities is needed to improve interventions for at-risk marginalized youth in educational environments, a critical location for youth development.

Objectives: To examine magnitude of disparities in self-reported academic outcomes (i.e., attendance, classroom engagement, grades) between students with REM and SGM identities in ALCs compared to their non-REM, non-SGM peers; and to determine whether school environment factors (i.e., bullying, discipline, support, safety) might worsen or improve these disparities.

Sample and Methods: The current study used data from the 2019 Minnesota Student Survey (MSS) from students in ALCs (N=2,139, M_{age}=16.6 years). In overall and sex-stratified samples, we used descriptive statistics and crude and multivariable adjusted logistic regression models to investigate disparities in measured academic outcomes (i.e., low engagement, low attendance, and low grades). All models adjusted for age, assigned sex at birth, and receiving free or reduced-price lunch as a proxy for socioeconomic status. Our primary independent variable was a four-level measure denoting students across axes of identity: non-REM/non-SGM (reference), REM/non-SGM, non-REM/SGM, and REM/SGM. To test interactions with school environment

factors, this variable was expanded to an eight-level variable denoting the intersection between students across these axes of identity and the presence or absence of school environment factors (i.e., school bullying, school discipline, teacher support, and school safety).

Results: Overall, there were disparities in academic outcomes disproportionately affecting students with intersectional identities, such as that compared to non-REM, non-SGM youth, students with at least one minoritized identity had poorer academic outcomes. These effects were magnified in sex-stratified model among students assigned female sex at birth. In general, models with interactions showed that negative school environment factors worsened the observed academic disparities, findings also magnified among students assigned female sex at birth. The strongest effect size for an academic disparity was observed for the outcome of low engagement among REM, SGM students assigned female sex at birth who reported not receiving support from teachers or adults at school (adjusted odds ratio = 4.86; 95% CI = 2.26-10.44) as compared to their non-REM/non-SGM counterparts assigned female sex at birth who received support.

Discussion: Students in ALCs and students with intersectional identities represent high priority populations for interventions targeting academic outcomes. Students assigned female sex with multiple minoritized identities face increased disparities across academic outcomes and in their interactions with negative school environment factors. These results demonstrate the necessity of a multi-pronged approach to expanding theory, advancing research, and developing interventions, particularly regarding academic attainment for students assigned female sex with multiple minoritized identities who are excluded from the public school environment.

Introduction

Academic Outcomes, School Environment Factors, and Positive Youth Development

Schools are critical to the positive development of students throughout their youth. Wigfield and colleagues (2006) find that in-school experiences are associated with various aspects of youth development, from mental health to peer and adult relationships. Existing literature additionally reveals that support from teachers leads to positive outcomes (Civitillo et al., 2023), and positive teacher-student relationships are associated with higher student achievement and engagement (Hamre et al., 2013; Roorda et al., 2011). As a result, academic outcomes and school environment factors are important measures of well-being in youth generally and positive youth development. Based on this literature, it is evident that schools in general are a key place for youth development and important for analyzing academic outcomes.

Disparities in Academic Outcomes and School Environment Factors Among REM Youth

Previous research has documented disparities in academic outcomes and experiences of various school environment factors for racial-ethnic minority (REM) students, compared to their non-REM peers. REM youth refer to young people who have a race or ethnicity that is minoritized within the population, which typically consists of those who are not non-Hispanic, white people in the United States. In the existing literature, REM students, particularly those who are Black or African American, Hispanic or Latinx, and Native American or Indigenous, report significantly higher rates of school dropout compared to non-REM students (Nitardy et al., 2015). REM students, when compared to non-REM students, have a greater prevalence of low engagement (Konold et al., 2017). Further, REM students report higher rates of low attendance and higher truancy (Weathers et al., 2021). REM students are also more likely to report a lower

grade point average (GPA; Nitardy et al., 2015) and scores in subjects like mathematics (Mickelson et al., 2013).

An additional element of schools must be considered when attempting to understand academic outcomes: school environment factors. Several aspects of the school environment have historically been reported by REM students at greater rates than their non-REM peers, and they have also been found to be associated with worse academic outcomes. A meta-analysis by Xu and colleagues (2020) finds that REM students face disproportionate risks of bullying compared to non-REM students. REM students are also more likely to experience increased disciplinary action and escalated consequences, such as a lower likelihood of receiving a warning (Wegmann & Smith, 2019). REM students report greater probability of feeling unsafe at school (Lacoe, 2015; Yang et al., 2021). In addition, REM students, when compared to non-REM students, are more likely to report less support from and worse relationships with their teachers, particularly for different subjects across REM groups, such as English teachers with Asian American students and mathematics teachers with Latino students (Cherng, 2017). Notably, most existing studies have predominantly examined differences in academic outcomes and school environment factors for REM students in traditional public school settings.

Disparities in Academic Outcomes and School Environment Factors Among SGM Youth

Similar to REM students, existing research has found disparities in academic outcomes and reports of school environment factors for sexual and gender minority (SGM) students. SGM students includes, but is not limited to, an umbrella of those who identify as lesbian, gay, bisexual, transgender, gender-diverse, non-binary, and/or queer. For example, SGM students have often been found to report lower engagement compared to non-SGM students (Seelman et al., 2012). SGM students, when compared to non-SGM students also report lower academic

attainment with statistically higher truancy and lower attendance (Aragon et al., 2014; Seelman et al., 2012). Existing studies also find that SGM students typically report lower GPAs compared to non-SGM students (Aragon et al., 2014).

Likewise, various negative school environment factors have been reported by SGM students at increased rates compared to their non-SGM peers. SGM students report greater rates of in-school victimization (e.g., bullying) (Kosciw et al., 2013) than their non-SGM peers. SGM students also report increased rates of receiving discipline compared to non-SGM students (Mittleman, 2018). Russell and colleagues (2021) found that SGM students, when compared to their non-SGM peers, are additionally more likely to report a lack of support at school (e.g., from teachers). Furthermore, studies have found that SGM students are more likely to report not feeling safe at school compared to non-SGM students (Rose et al., 2018; Russell et al., 2021).

Intersectionality Theory

Intersectionality theory, originally posited by Crenshaw (1989), emphasizes a framework that analyzes the interactions between different forms of oppression. Crenshaw (1989) focuses on race and gender and the employment experiences of Black women. Notably, there is some existing literature about the intersections of gender and race or ethnicity, following Crenshaw's original work, related to academic outcomes and in-school experiences. For example, studies have found that Black girls report increased disparities in academic achievement (Bécares & Priest, 2015), such as mathematics (Young et al., 2017) and lower academic aspirations (Cooper et el., 2022), but also school environment factors. In particular, Black girls are overrepresented in receiving exclusionary and extraneous disciplinary measures (Annamma et al., 2019; Apugo et al., 2023). To explain these disparities, a systematic review finds that Black girls face multiple forms of systemic oppression and the negative effects of prevailing narratives that they are

disruptive and hostile (Apugo et al,. 2023). Further, another systematic review suggests that Black girls are in the unique position of dealing with pressure for being both Black and smart, sometimes having to choose one part of their identity versus academic success (Davis, 2021). Similarly, Latina students report disparities in academic assessments (Bécares & Priest, 2015). Guyll and colleagues (2010) suggest that these disparities are a product of Latina students facing potential threats of self-fulfilling prophecies, stigma consciousness, and stereotypes of Latinas. In other words, they might be facing individual or systemic effects of narratives and perceptions about Latinas (e.g., promiscuous, more likely to have teen pregnancies) on their academic outcomes and school experiences.

Despite this existing literature related to the experiences of students with intersectional identities along the axes of gender and race, there remains a gap with the axes of SGM identity. In the case of educational inequities, intersectionality theory can be applied to the overlapping experiences between REM and SGM students in schools and their academic outcomes because they face similarly interlocking forces of oppression (e.g., racism, anti-LGBTQ+ stigma). Many of the studies discussed in the previous sections related to academic outcomes and the effects of school environment factors on marginalized youth focus on either REM or SGM students, leaving a gap for the experiences of students holding both REM and SGM identities. As a result, there is a need for additional research for a wider range of students, particularly those with intersectional identities along different axes, such as SGM identity, who have often fallen into these gaps in existing research.

Alternative Learning Centers: An Important but Understudied Educational Setting

Alternative learning centers (ALCs) are an understudied place of learning for student well-being and academic attainment, particularly among students with minoritized identities.

ALCs refer to "a program that provides educational options to students who are at risk of experiencing failure or already have been unsuccessful in a traditional school setting" (Dorniden, 2009, p. 1188). Importantly, REM and SGM students are more likely than their peers to be diverted into different educational environments outside of traditional public schools (Dunning-Lozano, 2014; Himmelstein & Brückner, 2011; Verdugo & Glenn, 2006). These alternative educational environments meant to replace public schools for students who need additional assistance include ALCs, making them an ideal setting for equity-focused educational research to all students.

There is some existing research about REM students' well-being and academic outcomes in ALCs. There is preliminary evidence that disparities may persist in ALC—or similar—environments for REM students. For example, REM students are significantly overrepresented in ALCs (Dunning-Lozano, 2014; Henderson & Barnes, 2016), but ALCs are provided fewer or worse resources for academic success (Dunning-Lozano, 2014) and fewer opportunities to access beneficial school structures (e.g., extracurricular activities; Henderson & Barnes, 2016). However, to my knowledge, no studies have investigated disparities in academic outcomes for SGM students in the educational setting of ALCs. Since ALCs are designed for students who are at-risk of "educational failure" in traditional public schools, it can be theorized that there might be a pathway between public schools and ALCs for SGM students, who face worse academic outcomes, as described above. Due to the intersecting forces of oppression faced by REM and SGM students, there may also be unique impacts for REM, SGM students in ALCs, where they are already at increased risk. Thus, the analysis will focus on ALCs with the goal of developing a better understanding of the effects of these institutions for students with intersectional identities.

Academic Outcomes, School Environment, and the School-to-Prison Pipeline

The existence of the school-to-prison pipeline demonstrates a necessity for intervention in schools that prevent student from receiving extraneous punishments and being pushed into systems of incarceration. This issue is particularly exacerbated for REM (e.g., Marchbanks et al., 2018; Welch et al., 2022) and SGM (e.g., Palmer & Greytak, 2017; Snapp et al., 2015) students. The school-to-prison pipeline, also known as the "school pathways to the juvenile justice system," refers to the increasingly strengthened partnership between schools and juvenile courts, ultimately producing policies and practices in schools that increase the likelihood of students facing criminal involvement with the juvenile courts than attain a quality education, often to the detriment of marginalized populations (Advancement Project et al., 2011; Insley, 2001; Kang-Brown et al., 2013). Through a systematic review, Mallett (2016) emphasizes that the school-to-prison pipeline, including the increase of disciplinary measures and the criminalization of education, does not improve school or community safety. For example, various studies have found that schools increasing their suspension and expulsion rates have actually resulted in declining academic achievement (Insley, 2001). Schools have also attempted to use disciplinary exclusion in schools to incentivize students to avoid involvement in school violence. However, research suggests that out-of-school suspension and expulsion are risk factors for various negative developmental outcomes (Skiba et al., 2014), and may actually increase criminal behavior (Cuellar & Markowitz, 2015). Ultimately, research on the school-to-prison pipeline suggests that students who are suspended or expelled from school or subsequently held in juvenile justice facilities, typically report poor long-term outcomes (Advancement Project et al., 2011). Additionally, as described by Mallett (2016), it is difficult for students to escape the school-to-prison pipeline.

Understanding this pipeline is critical to examining ALCs because of its two-pronged application to alternative learning. The first application is that the diversion of students from public schools to ALCs essentially acts as another iteration of the school-to-prison pipeline. Through ALCs, the students are sent to an external environment—one that often lacks the same resources and opportunities as public schools (Lange & Sletten, 2002). This diversion occurs as a result of a student's educational failure, such as receiving disciplinary measures (e.g., expulsion, multiple suspensions). Thus, on one hand, using ALCs as a location of disciplinary action with limited resources ultimately maintains barriers to education in parallel to the school-to-prison pipeline. On the other hand (and arguably the more important application), ALCs also have the potential to provide a place of intervention along the school-to-prison pipeline. Students are diverted to ALCs to provide education outside of public school environments, where they likely faced increased or extraneous discipline, especially if they have REM and/or SGM identities as discussed in the literature (e.g., Marchbanks et al., 2018; Palmer & Greytak, 2017; Snapp et al., 2015; Welch et al., 2022). ALCs should theoretically help prevent students who are already on the path of disciplinary consequences and at increased risk of incarceration from participating in activities that could lead to facing the juvenile system or other legal punishments. Therefore, ALCs could be a location of re-diverting at-risk students, especially those with REM and/or SGM identities, along the school-to-prison pipeline.

In sum, decades of educational research have shown that academic outcomes are an important measure of youth development. While studies conducted primarily in public school settings have shown that REM and SGM youth each face disparities in academic outcomes compared to their non-REM and non-SGM peers, respectively, to our knowledge few studies have utilized an intersectional lens to investigate disparities across axes of oppression and none

have done so in ALCs despite the setting being comprised of at-risk students. Capitalizing on a statewide, school-based survey administered to students attending different school environments, the current study sought to: (1) measure the magnitude of disparities in self-reported academic outcomes between students with intersectional (REM and SGM) identities in ALCs, and (2) determine whether school environment factors might improve or exacerbate these disparities in academic outcomes.

Methods

Data

The current paper used data from the 2019 Minnesota Student Survey (MSS). The MSS is a statewide, school-based survey that is administered online to students in public schools, as well as ALCs and correctional facilities (Minnesota Student Survey Interagency Team, 2019). The survey is conducted triennially and distributed to school districts by the Minnesota Department of Education, and 70 percent of school districts participate, with most having participation from all of the possible grades. In public schools, students in grades 5, 8, 9, and 11 take the survey, and in ALCs, students in grades 5 through 12 take the survey. The MSS overcomes some gaps in previous literature due to availability of data regarding SGM students and ALCs. Specifically, the MSS assesses questions on racial and ethnic identity, sexual orientation, and gender identity, as well as obtaining information from students in ALCs.

For the purposes of this analysis, we restricted data to students in ALCs. This decision was based on a previous analysis of the demographic characteristics between traditional public schools and ALCs, where it was evident that SGM students are overrepresented in ALCs, as 20.2 percent of public-school students identified as SGM whereas 33.1 percent of students in ALCs identified as SGM (Park & Clark, 2023). Only students in grade 9 and above were included in

the sample because those in lower grades were not asked questions regarding sexual orientation and gender identity. The sample was further restricted to exclude students who did not respond to questions about race and ethnicity and the designated academic outcome questions. The final analytic sample consisted of 2,139 students.

Measures

Demographic Characteristics

To measure demographic characteristics, the following variables were used: age, sex assigned at birth, race and ethnicity, sexual orientation, gender identity, transgender, genderqueer, or genderfluid gender identity, and receiving free or reduced-price lunch. The question for age was, "How old are you?" with the response options of "9 or younger," "10 or younger," "11," "12," "13," "14," "15," "16," "17," "18," "19-20," and "21 or older." The question for sex assigned at birth was, "What is your biological sex?" with the response options of "Male" or "Female." The question for race and ethnicity is described below under "REM Identity." The question for gender identity is described below under "SGM Identity." The transgender, genderqueer, or genderfluid gender identity question, which was asked to those who identified as such in the previous question, was, "How do you describe yourself?" with the response options of "Male, trans male, trans man, or trans masculine," "Female, trans female, trans woman, or trans feminine," "Non-binary, genderqueer, or genderfluid," or "I prefer to describe my gender as something else." The question for free or reduced-price lunch was, "Do you currently get free or reduced-price lunch at school?" with the response options of "Yes," "No," and "Not sure." This variable was used as a proxy for socioeconomic status, which was not otherwise measured in the original survey.

REM Identity

To measure SGM identity from the data, the variable was dichotomized using questions about gender identity and sexual orientation. The question for race and ethnicity was, "How do you describe yourself?" with the response options of "American Indian or Alaskan Native," "Asian or Asian American," "Black, African, or African American," "Hispanic or Latino/Latina," "Native Hawaiian or Other Pacific Islander," or "White," which was answered as select all that apply. If the student responded with any of the options besides "White," they were coded as REM (=1). All others were coded as non-REM (=0).

SGM Identity

To measure SGM identity from the data, the variable was dichotomized using questions about gender identity and sexual orientation. The question for gender identity was "Are you transgender, genderqueer, or genderfluid?" with the following response options: "Yes," "No," "I am not sure about my gender identity," and "I am not sure what this question means." The question for sexual orientation was "How do you describe yourself?" with the following response options: "Heterosexual (straight)," "Bisexual," "Gay or lesbian," "Questioning/not sure," "Pansexual," "Queer," "I don't describe myself in any of these ways," and "I am not sure what this question means" for sexual orientation. If the student responded with "Yes" or "I am not sure about my gender identity" to the first question and/or "Bisexual," "Gay or lesbian," "Questioning/not sure," "Pansexual," "Queer," or "I don't describe myself in any of these ways," they were coded as SGM (=1). All others were coded as non-SGM (=0).

REM/SGM Identity

A four-level variable was created using the REM and SGM identity variables describe above. The four levels were non-REM/non-SGM, REM/non-SGM, non-REM/SGM, and

REM/SGM. Students coded as non-REM for REM identity and non-SGM for SGM identity were coded as non-REM/non-SGM (=0). Students coded as REM for REM identity and non-SGM for SGM identity were coded as REM/non-SGM (=1). Students coded as non-REM for REM identity and SGM for SGM identity were coded as non-REM/SGM (=2). Students coded as REM for REM identity and SGM for SGM identity were coded as REM/SGM (=3).

Academic Outcomes

To measure academic outcomes, three variables were dichotomized using questions about attendance, engagement, and grades. For engagement, the following question was used: "How often do you care about doing well in school?" This question had the following response options: "All of the time," "Most of the time," "Some of the time," and "None of the time." The engagement variable was dichotomized so that those who answered, "All of the time" or "Most of the time" were coded as having low engagement (=1), and all others were coded high engagement (=0). For attendance, the following question was used: "During the last 30 days, how many times did you miss a full day of school? (Do not include school-sponsored activities like field trips, sports, academic or music events)." This question had the following response options: "None," "Once or twice," "3 to 5 times," "6 to 9 times," and "10 or more times." The attendance variable was dichotomized so that those who answered, "3 to 5 times," "6 to 9 times," or "10 or more times" were coded as having low attendance (=1) versus higher attendance (=0). For grades, the following question was used: "How would you describe your grades this school year?" This question had the following response options: "Mostly A's," "Mostly B's," "Mostly C's," "Mostly D's," "Mostly F's," "Mostly Incompletes," and "None of these letter grades." The grades variable was dichotomized so that those who answered, "Mostly C's," "Mostly D's,"

"Mostly F's," "Mostly Incompletes," and "None of these letter grades" were coded as having low grades (=1), and all others were coded as having high grades (=0).

School Environment Factors

To measure school environment factors, four variables were dichotomized using questions about bullying, discipline, support, and safety. For bullying, the original questions were: "During the last 30 days, how often have other students harassed or bullied you for any of the following reasons? Your race, ethnicity or national origin; Your gender (being male or female); Your gender expression (your style, dress, or the way you walk or talk); Because you are gay, lesbian, or bisexual or because someone thought you were." The response options were "Never," "Once or twice," "About once a week," "Several times a week," and "Every day." The bullying variable was dichotomized so that the students who responded, "About once a week," "Several times a week," or "Every day" for any of the original questions about SGM-related bullying were coded as getting bullied (=1), and all others were coded as not getting bullied (=0). For discipline, the original question was: "During the last 30 days, how many times did you get sent out of the classroom for discipline?" The response options were: "None," "Once or twice," "3 to 5 times," "6 to 9 times," and "10 or more times." The discipline variable was dichotomized so that the students who responded, "Once or twice," "3 to 5 times," "6 to 9 times," or "10 or more times" were coded as receiving discipline (=1), and all others were coded as not receiving discipline (=0). For support, the original question was: "How much do you feel teachers/other adults at school care about you?" The response options were: "Not at all," "A little," "Some," "Quite a bit," and "Very much." The support variable was dichotomized so that those who responded, "Not at all" or "A little" were coded as not receiving support (=1), and all others were coded as receiving support (=0). For safety, the original question was: "I feel safe at school." The

response options were: “Strongly agree,” “Agree,” “Disagree,” and “Strongly disagree.” The safety variable was dichotomized so that those who responded “Disagree” and “Strongly disagree” were coded as not feeling safe (=1) and all others were coded as feeling safe (=0).

REM/SGM Identity and School Environment Factors

Four eight-level variables were created using the REM/SGM identity four-level variable and each of the four dichotomized school environment factor variables described above. The two opposing codes for the factors were applied across the four levels, resulting in eight levels. For example, for bullying, students coded as non-REM/non-SGM for REM/SGM identity and not getting bullied for bullying became non-REM/non-SGM students who were not bullied (=0), students coded as REM/non-SGM for identity and not getting bullied for bullying became REM/non-SGM students who were not bullied (=1), students coded as non-REM/SGM for REM/SGM identity and not getting bullied for bullying became non-REM/SGM students who were not bullied (=2), and students coded as REM/SGM for REM/SGM identity and not getting bullied for bullying became REM/SGM students who were not bullied (=3). The same coding process was applied for students coded as getting bullied, resulting in non-REM/non-SGM students who were bullied (=4), REM/non-SGM students who were bullied (=5), non-REM/SGM students who were bullied (=6), and REM/SGM students who were bullied (=7). For all the interactions, the reference group was set to non-REM/non-SGM students without the negative school environmental factor (i.e., non-REM/non-SGM students who were not bullied). This reference group was selected based on the theory of intersectionality and the idea of intersecting forces of oppression (Crenshaw, 1989). Non-REM/non-SGM students without the negative school environmental factor are presumably facing the least minoritization compared to the other students who have at least one minoritized identity, so they effectively act as the

control group of no oppression in this analysis. Then, the same eight-level process was applied to the other school environment factors of discipline, support, and safety.

Statistical Analysis

Analyses were conducted in SAS OnDemand for Academics. This study first used descriptive statistics to determine the differences in demographic characteristics of the student population in ALCs (see Appendix, Table 1). Next, separate crude and multivariable adjusted logistic regression models were created to study associations between REM/SGM identity and each academic outcome (i.e., low attendance, low engagement, and low grades). In subsequent multivariable adjusted logistic regression models, associations were examined between REM/SGM identity and these outcomes and their interaction with school environment factors (i.e., bullying, discipline, support, and safety). The associations where interactions reached statistical significance at $p < 0.05$ were probed with multivariable adjusted logistic regression models that included a categorical interaction variable marking the intersection of REM/SGM identity and school environment factors. This statistical approach parsed this intersection to show how the odds of experiencing the academic outcomes might change depending on the students' identity and/or the school environment factors. All multivariable logistic regression models were conducted with the overall sample and stratified by assigned sex at birth. The models examining the overall samples were adjusted for assigned sex at birth, receiving free or reduced-price lunch, and age. Sex-stratified models were adjusted for receiving free or reduced-price lunch and age.

Results

Demographic Characteristics (see Appendix Table 2)

Age

On average, students reported an average of approximately 16.6 years.

Assigned Sex at Birth

On average, 53.4% of students in ALCs were assigned male sex, whereas 46.4% were assigned female sex. Non-REM, non-SGM students had the highest proportion of youth assigned male sex (67.8%), while non-REM, SGM students had the highest proportion of youth assigned female sex (68.2%).

Race and Ethnicity

Notably, students who identify with more than one race were disproportionately represented among REM, SGM youth (38.8%) compared to REM, non-SGM youth (29.2). Among both REM, non-SGM and REM, SGM youth, the next most prevalent race and ethnicity groups were Hispanic or Latino/a followed by Black, African, or African American.

Sexual Orientation

Among both non-REM, SGM and REM, SGM youth, bisexual was the most represented sexual orientation, making up 44.8% and 38.8% of the groups, respectively. Among both non-REM, SGM and REM, SGM youth, the next most prevalent sexual orientations were those who do not describe themselves in any of these ways followed by pansexual youth.

Gender Identity

In total, 3.9% of students in ALCs identified as transgender, genderqueer, or genderfluid. A higher proportion of non-REM, SGM youth identified as transgender, genderqueer, or genderfluid (22.2%) compared to REM, SGM youth (15.9%).

Receives Free or Reduced-Price Lunch

Receiving free or reduced-price lunch was stratified by racial and ethnic minoritized status with students in the REM, non-SGM (58.2%) and REM, SGM (55.5%) groups

disproportionately reported receiving free or reduced-price lunch versus non-REM, non-SGM (30.3) and non-REM, SGM (36.6%) students.

Logistic Regression Models: Academic Outcomes

Academic Outcomes for Overall Sample

Adjusted and unadjusted odds ratios are presented in Table 3 (see Appendix). For the sake of parsimony, only statistically significant adjusted associations will be presented in text.

Low Engagement. In adjusted model, there were no statistically significant associations among non-SGM, non-REM students and other REM and SGM groups.

Low Attendance. In the adjusted model, REM, non-SGM students (aOR = 1.56, 95% CI = 1.22-1.98) and REM, SGM students (aOR = 1.40, 95% CI = 1.04-1.88) had significantly higher odds of low attendance than non-REM, non-SGM students.

Low Grades. In the adjusted model, REM, non-SGM students (aOR = 1.34, 95% CI = 1.05-1.71) and REM, SGM students (aOR = 1.41, 95% CI = 1.05-1.91) had higher odds of low grades, compared to non-REM, non-SGM students.

Academic Outcomes Restricted to Students Assigned Male Sex

Adjusted and unadjusted odds ratios are presented in Table 4 (see Appendix). For the sake of parsimony, only statistically significant adjusted associations will be presented in text.

Low Engagement. The adjusted model revealed that REM, non-SGM students (aOR = 0.90, 95% CI = 0.84-0.96) had lower odds of low engagement than non-REM, non-SGM students. However, non-REM, SGM students had higher odds of low engagement (aOR = 1.31, 95% CI = 1.20-1.43) than non-REM, non-SGM students.

Low Attendance. In the adjusted model, REM, non-SGM students (aOR = 1.25, 95% CI = 1.16-1.34), non-REM, SGM students (aOR = 1.34, 95% CI = 1.21-1.48), and REM, SGM

students (aOR = 1.50, 95% CI = 1.33-1.69) had higher odds of low attendance, compared to their non-REM, non-SGM peers.

Low Grades. In the adjusted model, REM, non-SGM students (aOR = 1.34, 95% CI = 1.26-1.41), non-REM, SGM students (aOR = 1.43, 95% CI = 1.32-1.55), and REM, SGM students (aOR = 1.47, 95% CI = 1.33-1.63) had higher odds of low grades, compared to non-REM, non-SGM students.

Academic Outcomes Restricted to Students Assigned Female Sex

Adjusted and unadjusted odds ratios are presented in Table 5 (see Appendix). For the sake of parsimony, only statistically significant adjusted associations will be presented in text.

Low Engagement. In the adjusted model, REM, non-SGM students (aOR = 1.16, 95% CI = 1.05-1.28), non-REM, SGM students (aOR = 2.36, 95% CI = 2.16-2.58), and REM, SGM students (aOR = 2.33, 95% CI = 2.09-2.60) had higher odds of low engagement, compared to non-REM, non-SGM students.

Low Attendance. In the adjusted model, REM, non-SGM students (aOR = 1.33, 95% CI = 1.24-1.42), non-REM, SGM students (aOR = 1.26, 95% CI = 1.17-1.35), and REM, SGM students (aOR = 1.54, 95% CI = 1.40-1.68) had higher odds of low attendance, compared to non-REM, non-SGM students.

Low Grades. In the adjusted model, REM, non-SGM students (aOR = 1.70, 95% CI = 1.58-1.83), non-REM, SGM students (aOR = 2.20, 95% CI = 2.04-2.38), and REM, SGM students had higher odds of low grades (aOR = 2.70, 95% CI = 2.47-2.95), compared to their non-REM, non-SGM peers.

Logistic Regression Models with Interactions: Assessing the Moderating Role of School Environment Factors

Tables 6, 7, and 8 in the Appendix present proportions and multi-adjusted ORs with 95% CIs for models including a categorical interaction variable denoting the intersection of REM and SGM and status for the overall sample, the sample restricted to students assigned male sex at birth, and the sample restricted to students assigned female sex at birth.

Interactions for Overall Sample (refer to Appendix Table 6)

Among the overall sample, there was only a statistically significant interaction between REM and SGM identities and bullying with the outcome of low engagement, when adjusting for age, assigned sex at birth, and received free or reduced-price lunch ($p = 0.0063$).

Interactions Restricted to Students Assigned Male Sex (refer to Appendix Table 7)

After restricting to AMAB students, there were more statistically significant interactions between REM and SGM identities and various school environment factors. First, there was a statistically significant interaction between REM and SGM identities and bullying for the outcome of low grades ($p = 0.0487$). Second, there was a statistically significant interaction between REM and SGM identities and discipline for the outcome of low grades ($p = 0.0050$). Third, there were statistically significant interactions between REM and SGM identities and support for the outcomes of low engagement ($p = 0.0050$) and low grades ($p = 0.0038$) in the model for low teacher or adult at school support. Fourth, there were statistically significant interactions between REM and SGM identities and safety for the outcomes of low engagement ($p = 0.0035$), low attendance ($p = 0.0002$), and low grades ($p = 0.0052$).

Interactions Restricted to Students Assigned Female Sex (refer to Appendix Table 8)

There were also statistically significant results when restricting to AFAB students. First, there was a statistically significant interaction between REM and SGM identities and bullying for the outcome of low grades ($p < 0.0001$). Second, there were statistically significant interactions between REM and SGM identities and discipline for the outcome of low engagement ($p = 0.0030$) and low grades ($p < 0.0001$). Third, there were statistically significant interactions between REM and SGM identities and low teacher or adult at school support for the outcomes of low engagement ($p < 0.0001$), low attendance ($p = 0.0109$), and low grades ($p < 0.0001$). Fourth, there were statistically significant interactions between REM and SGM identities and low teacher or adult at school support for the outcomes of low engagement ($p = 0.0099$) and low grades ($p < 0.0001$).

Probing Statistically Significant Interaction Effects of Intersectional Identities and School Environment Factors

These results only include REM and SGM identity x school environment factor interaction terms reaching statistical significance at $p < 0.05$ among the overall sample and the sex-stratified samples, as described above.

Probed Interaction Effects for the Overall Sample

Adjusted and unadjusted odds ratios are presented in Table 9 (see Appendix). Only statistically significant adjusted associations will be presented in text.

Low Engagement x Bullying. The highest prevalence of low engagement was reported among non-REM, non-SGM students who were bullied (38.8%) compared to all other students. In the adjusted logistic regression model, when compared to the reference group of non-REM, non-SGM students who were not bullied, there was a significantly higher odds of low

engagement among non-REM, SGM students who were not bullied (aOR = 1.95, 95% CI = 1.23-2.85) non-REM, non-SGM students who were bullied (aOR = 1.92, 95% CI = 1.25-2.96), REM, non-SGM students who were bullied (aOR = 1.77, 95% CI = 1.15-2.74) , and REM, SGM students who were bullied (aOR = 1.67, 95% CI = 1.05-2.68).

Interaction Effects When Restricted to Students Assigned Male Sex

Adjusted and unadjusted odds ratios are presented in Table 10 (see Appendix). Only statistically significant adjusted associations will be presented in text.

Low Engagement x Support. Regardless of REM or SGM identity, students who reported low support had a substantially higher prevalence of low engagement than students who did receive support. The highest prevalence of low engagement was reported among non-REM, SGM students who did not receive support (48.3%). However, in the adjusted logistic regression model, only non-REM, non-SGM students who did not receive support had significantly increased odds of low engagement (aOR = 1.69, 95% CI = 1.03-2.78), compared to the non-REM, non-SGM students who received support.

Low Engagement x Safety. The highest prevalence of low engagement was reported among non-REM, SGM students who felt safe (45.3%) However, in the adjusted logistic regression model, there were no statistically significant differences in the odds of low engagement across all identities, regardless of whether they felt safe ($p > 0.05$ and 95% CI crossed null), compared to the non-REM, non-SGM students who felt safe.

Low Attendance x Bullying. The highest prevalence of low attendance was reported among REM, non-SGM students who were bullied are most likely to report low attendance (56.7%). In the adjusted logistic regression model, when compared to the reference group of non-REM, non-SGM students who were not bullied, there were significantly increased odds of

low attendance among REM, non-SGM students who were not bullied (aOR = 1.71, 95% CI = 1.22-2.39) and who were bullied (aOR = 2.03, 95% CI = 1.16-3.58).

Low Attendance x Safety. The highest prevalence of low attendance was reported among non-REM, SGM students who did not feel safe (53.9%). However, in the adjusted logistic regression model, only REM, non-SGM students had significantly increased odds of low attendance (aOR = 1.82, 95% CI = 1.32-2.52), compared to non-REM, non-SGM students who felt safe.

Low Grades x Bullying. The highest prevalence of low grades was reported among non-REM, SGM students who were bullied were most likely to report low grades (71.9%). In the adjusted logistic regression model, REM, non-SGM students who were not bullied (aOR = 1.46, 95% CI = 1.03-2.07) had significantly increased odds of low grades, compared to their non-REM, non-SGM peers who were not bullied.

Low Grades x Discipline. The highest prevalence of low grades was reported among REM, non-SGM students who received discipline (78.4%). In the adjusted logistic regression model, when compared to the reference group of non-REM, non-SGM students who did not receive discipline, non-REM, non-SGM students (aOR = 1.97, 95% CI = 1.11-3.51) and REM, non-SGM students (aOR = 2.74, 95% CI = 1.34-5.62) who received discipline reported significantly increased odds of low grades compared to non-REM, non-SGM students who did not receive discipline.

Low Grades x Support. Regardless of REM or SGM identity, students who did not receive support are substantially more likely to report low grades, compared to those who did receive support. The highest prevalence of low grades was reported among REM, non-SGM students (77.8%) and REM, SGM students (77.8%). In the adjusted logistic regression model,

REM, non-SGM students who did not receive support showed significantly increased odds of low grades (aOR = 3.38, 95% CI = 1.79-6.38), compared to the non-REM, non-SGM students who received support.

Low Grades x Safety. The highest prevalence of low grades was reported among REM, non-SGM students who did not feel safe (81.5%). In the adjusted logistic regression model, when compared to non-REM, non-SGM students who felt safe, REM, non-SGM students who did not feel safe showed significantly increased odds of low grades (aOR = 3.02, 95% CI = 1.10-8.26).

Interaction Effects When Restricted to Students Assigned Female Sex

Adjusted and unadjusted odds ratios are presented in Table 11 (see Appendix). Only statistically significant adjusted associations will be presented in text.

Low Engagement x Discipline. Students with either or both REM and SGM identities who received discipline are more likely to report low engagement than any of those who did not receive discipline or identified as non-REM, non-SGM. The highest prevalence of low engagement was reported among REM, non-SGM students who received discipline (48.0%). In the adjusted logistic regression model, when compared to the reference group of non-REM, non-SGM students who did not receive discipline, REM, non-SGM students (aOR = 3.50, 95% CI = 1.42-8.61), non-REM, SGM students (aOR = 3.12, 95% CI = 1.26-7.73), and REM, SGM students (aOR = 2.85, 95% CI = 1.14-7.20), all of whom received discipline, demonstrated significantly increased odds of low engagement.

Low Engagement x Support. Regardless of REM or SGM identity, students who did not receive support are more likely to report low engagement, compared to any of those who received support. The highest prevalence of low engagement was reported among REM, SGM

students who did not receive support (44.8%). Similarly, in the adjusted logistic regression model, when compared to the reference group of non-REM, non-SGM students who received support, non-REM, non-SGM students (aOR = 3.92, 95% CI = 1.75-8.77), REM, non-SGM students (aOR = 4.42, 95% CI = 2.08-9.41), non-REM, SGM students (aOR = 4.27, 95% CI = 2.06-8.85), and REM, SGM students (aOR = 4.86, 95% CI = 2.26-10.44), all of whom did not receive support, had significantly higher odds of low engagement.

Low Engagement x Safety. The highest prevalence of low engagement was reported among non-REM, non-SGM students who did not feel safe (53.9%). In the adjusted logistic regression model, when compared to the reference group of non-REM, non-SGM students who felt safe, non-REM, SGM students (aOR = 1.78, 95% CI = 1.04-3.07) and REM, SGM students (aOR = 1.96, 95% CI = 1.15-3.34) who felt safe reported higher odds of low engagement. Non-REM, non-SGM students (aOR = 7.22, 95% CI = 2.10-24.77), REM, non-SGM students (aOR = 4.68, 95% CI = 1.79-12.25), and non-REM, SGM students (aOR = 3.29, 95% CI = 1.37-7.88) who did not feel safe also reported higher odds of low engagement, compared to non-REM, non-SGM students who felt safe.

Low Attendance x Support. The highest prevalence of low attendance was reported among REM, SGM students who did not receive support are most likely to report low attendance (59.3%). In the adjusted logistic regression model, when compared to the reference group of non-REM, non-SGM students who received support, REM, non-SGM students (aOR = 1.90, 95% CI = 1.16-3.10) and REM, SGM students (aOR = 2.04, 95% CI = 1.24-3.38) who received support showed significantly higher odds of low attendance. non-REM, SGM students (aOR = 2.08, 95% CI = 1.13-3.85) and REM, SGM students (aOR = 2.47, 95% CI = 1.26-4.83) who did

not receive support also showed significantly higher odds of low attendance, compared to non-REM, non-SGM students who received support.

Low Grades x Bullying. The highest prevalence of low grades was reported among REM, SGM students who have been bullied (55.0%). However, in the adjusted logistic regression model, REM, SGM students who were not bullied (aOR = 1.87, 95% CI = 1.13-3.09) and who were bullied (aOR = 1.99, 95% CI = 1.11-3.55) demonstrated significantly higher odds of low grades, compared to the reference group of non-REM, non-SGM students who were not bullied.

Low Grades x Discipline. The highest prevalence of low grades was reported among REM, SGM students who received discipline (73.9%). In the adjusted logistic regression model, when compared to the reference group of non-REM, non-SGM students who did not receive discipline, REM, SGM students who did not receive discipline reported significantly higher odds of low grades (aOR = 1.71, 95% CI = 1.11-2.62). REM, non-SGM students (aOR = 3.23, 95% CI = 1.30-7.99), non-REM, SGM students (aOR = 3.03, 95% CI = 1.21-7.59), and REM, SGM students (aOR = 3.84, 95% CI = 1.42-10.35), all of whom received discipline, reported significantly higher odds of low grades, compared to non-REM, non-SGM students who did not receive discipline.

Low Grades x Support. The highest prevalence of low grades was reported among REM, non-SGM students who did not receive support (64.8%). In the adjusted logistic regression model, when compared to non-REM, non-SGM students who received support, REM, SGM students who received support reported significantly increased odds of low grades (aOR = 1.96, 95% CI = 1.19-3.24), REM, non-SGM students (aOR = 3.27, 95% CI = 1.68-6.35), non-REM, SGM students (aOR = 2.97, 95% CI = 1.59-5.54), and REM, SGM students (aOR = 2.73,

95% CI = 1.40-5.33), all of whom did not receive support, also reported significantly higher odds of low grades, compared to non-REM, non-SGM students who received support.

Low Grades x Safety. The highest prevalence of low grades was reported among REM, SGM students who did not feel safe (69.2%). In the adjusted logistic regression model, every group, regardless of REM or SGM identity, demonstrates significantly higher odds of low grades, compared to the reference group of non-REM, non-SGM students who felt safe. REM, non-SGM students (aOR = 1.83, 95% CI = 1.69-1.98), non-REM, SGM students (aOR = 2.14, 95% CI = 1.96-2.33), and REM, SGM students (aOR = 2.79, 95% CI = 2.52-3.09) reported significantly higher odds of low grades, compared to non-REM, non-SGM students who felt safe. Non-REM, non-SGM students (aOR = 2.61, 95% CI = 2.30-2.96), REM, non-SGM students (aOR = 2.82, 95% CI = 2.40-3.31), non-REM, SGM students (aOR = 4.48, 95% CI = 3.90-5.14), and REM, SGM students (aOR = 4.44, 95% CI = 3.73-5.30) reported significantly higher odds of low grades, compared to non-REM, non-SGM students who felt safe.

Discussion

Using data from the 2019 MSS, this study investigated the magnitude of disparities in self-reported academic outcomes and school environment factors between students with SGM and REM identities in the at-risk setting of ALCs. Overall, this study used an intersectional lens to examine how students with multiple minoritized identities might face unique difficulties in schools, even within an environment that is intended to improve their academic outcomes. Key findings suggest that regardless of SGM identity, students who are racial and ethnically minoritized are at risk of lower attendance and lower grades than their non-Hispanic, white peers. However, results from sex-stratified models demonstrate that disparities in attendance, engagement, and grades are magnified among youth assigned female sex holding multiple

minoritized identities. Notably, students assigned female sex who are REM, SGM have 130% higher odds of low engagement, 54% higher odds of low attendance, and 170% higher odds of low grades compared to girls who are non-REM, non-SGM. Further, we also interrogated the role of school environment factors in buffering or exacerbating associations, finding that students with at least one of the REM and SGM identities, especially those with both, often face increased disparities in various outcomes and in the interactions with school environment factors, compared to their non-REM, non-SGM peers. There were greater effects across the academic outcomes for students assigned female sex compared to the overall sample and students assigned male sex. Low grades were consistently significantly impacted by the four factors among both sex-stratified models. This result was additionally exacerbated for REM and/or SGM identity groups among youth assigned female sex.

Our finding that students assigned female sex holding multiple minoritized statuses of REM and SGM in ALCs have substantially poorer academic outcomes than their non-minoritized peers builds on previous research. For example, studies have found that REM and SGM students tend to report lower engagement (Konold et al., 2017; Seelman et al., 2012), lower attendance (Aragon et al., 2014; Seelman et al., 2012; Weathers et al., 2021), and lower grades (Aragon et al., 2014; Mickelson et al., 2013; Nitardy et al., 2015). Thus, this finding emulates what has been discussed by existing literature rooted in public schools about the academic disparities between REM and SGM students and their non-REM, non-SGM peers. Similarly, studies have found that female students typically report lower attendance compared to male students (Maynard et al., 2017). However, existing studies have found that female students actually tend to report higher engagement (Lietaert et al., 2015) and higher grades (O'Dea et al., 2018; Voyer & Voyer, 2014) compared to male students. The corroboration of this study's

findings on the outcome of low attendance but divergence from research on the outcomes of low engagement and low grades for female students suggests that there might be unique effects of the intersectional identities included in the statistical models and the ALC setting. For example, Dominant narratives of girls of color, for example that Black girls are disruptive and defiant in the classroom (Apugo et al., 2023), highlights disparities in school experiences for students with intersectional identities along these axes of gender and race. When they are in the ALC setting, these gendered and racialized behavioral lenses might continue to be perpetuated—or even be magnified—by faculty, staff, and the institution(s) themselves. With the additional axes of sexual orientation and (trans)gender identity, these lenses also lend themselves to uniquely extended and multi-faceted experiences of oppression from these various narratives that ultimately result in the disparities found in this analysis. As a result, these findings provide potential for future research on the understanding of students facing multiple axes of oppression in ALCs and their academic outcomes.

We found that the higher risk of poor academic outcomes was reported among REM, SGM students who experienced higher school bullying, higher school discipline, low teacher support, and low school safety, especially among students assigned female sex. This work is aligned with previous research showing REM and SGM students tend to report higher rates of getting bullied (Kosciw et al., 2013; Xu et al., 2020), receiving disciplinary action (Mittleman, 2018; Wegmann & Smith, 2019), not receiving support from adults at school (Bottiani et al., 2016; Konold et al., 2017), and feeling unsafe at school (Lacoe, 2015; Rose et al., 2018). In addition, existing research suggests that these school environment factors are more prevalent among female students. For example, female students are more likely to experience bullying than male students (Pontes et al., 2018). Welsh (2022) finds that when compared to male students,

female students are also more likely to experience disciplinary action (e.g., out-of-school suspension) for "subjective offenses," such as student incivility, breaking rules, and disorderly conduct. Further, female students, when compared to male students, have been found to report lower rates of feeling safe at school (Varjas et al., 2009). Notably, there are some mixed findings as to the reports of support from teachers or adults at school affecting female students compared to male students (Frymier & Houser, 2000; Lietaert et al., 2015). Thus, overall, these results help corroborate findings from previous research on this topic of unique and/or exacerbated experiences of school environment factors for students with multiple minoritized identities. Furthermore, similar to the case with academic outcomes, these findings might be related to the existing narratives and associated experiences of students with intersectional identities, which the existing literature emphasizes along the axes of gender and race and this paper extends to sexual orientation and (trans)gender identity and the unique educational environment of ALCs. Therefore, students with multiple minoritized identities ultimately face a combined effect of these various discriminatory narratives, resulting in the observed increased disparities, including the school environment factors.

Implications

These results have important implications for theory, research, and intervention. In relation to theory, there are several additions to the existing literature about the theory of intersectionality. Students with at least one, but especially both, of the REM and SGM identities, often facing increased disparities in various outcomes and in the interactions with school environment factors, compared to their non-REM, non-SGM peers, reveals that there are in fact disparities between minoritized students and non-REM, non-SGM students, even in ALCs. Further, this finding suggests evidence to support the theory that there are interlocking forces of

oppression that students with intersectional identities face, resulting in these unique disparities. Finally, across the analyses, there is also a trend of a greater number of significant differences in outcomes across the sex-stratified samples, rather than the overall sample. This finding suggests that there is a need to study the intersectional experiences of people with triple-minoritized identities, particularly youth and students, beyond the traditional analysis of intersectionality, which tends to focus on two axes of oppression.

From this study, there are new potential pathways for future research to better understand and assist students of marginalized, vulnerable populations. As previously mentioned, ALCs represent an understudied populations with most existing research on schools focusing on public schools. This is particularly true for studies examining REM and SGM students, especially for the latter, as no studies have been conducted in ALCs related to SGM students. Considering how the foundational finding of this study is that REM and SGM students are overrepresented in ALCs, there is a clear indication that ALCs must be a greater studied educational environment within research. This is especially true since ALCs are currently the solution for students, who often identify as REM and/or SGM according to existing research (i.e., Dunning-Lozano, 2014; Himmelstein & Brückner, 2011; Verdugo & Glenn, 2006), but they are evidently missing the mark on improving academic outcomes for all students.

Due to this gap in solutions for students in ALCs, especially those with intersectional identities, there are key implications for interventions, as it demonstrates the necessity of ALCs in assisting the well-being and academic attainment of REM and SGM students. This is the first study to assess disparities in academic outcomes for SGM students and those with intersectional identities based on REM and SGM identity, and the additional stratification based on assigned sex at birth, in ALCs. It is critical that interventions are developed to prevent these minoritized

students from being diverted to ALCs that are suggested to be associated with significantly worse academic outcomes and increased likelihoods of negative school environment factors. The findings suggest that there are some unique effects for students with at least one REM or SGM identity, particularly when the samples are sex stratified. It is important for interventions to actively target these vulnerable, marginalized, and often hard-to-reach student populations. Within ALCs, interventions could look like establishing stronger support systems at every level of the school structure; such systems have been recommended (Vacha & McLaughlin, 1992) or found (Swanson & Gettinger, 2016) to be helpful in previous studies. One example is a social-belonging intervention developed by Walton and Cohen (2011), where the authors experimented with using positive messages to help improve outcomes for Black students. Students were provided with an encouraging narrative that framed social adversity as a shared and common experience (Walton & Cohen, 2011). Such messaging could be implemented in the school environment through class lessons or hallway posters to reduce academic disparities in the ALC environment. Gender Sexuality Alliances (GSAs) are another important site of intervention, which studies have found to reduce the negative impacts of school environment factors and improve academic outcomes for both SGM and non-SGM students (e.g., Feldman et al., 2022; Ioverno & Russell, 2021; Poteat et al., 2020; Poteat et al., 2024). However, to our knowledge, the prevalence of GSAs within ALCs is unknown, an important opportunity for future research and intervention. Taking into consideration these existing studies among REM- or SGM-specific samples, more interventions must be developed to target students with intersectional identities along different axes (e.g., race and ethnicity, assigned sex at birth, gender identity, and sexual orientation), particularly in the unique and lesser-known ALC environment. Even further, ALCs themselves can be used as a focal point of intervention, considering their important position

working parallel to and along the school-to-prison pipeline. These findings indicate persistent disparities for students with intersectional identities in ALCs, who already face increased risk of interactions with the juvenile carceral systems. Thus, it is evident that there must be an intervention to prevent students from being pushed into ALCs as a result of extraneous disciplinary consequences but also to intercept their path to incarceration and legal punishments.

Limitations

There are a few notable limitations of this study. First, although the MSS is statewide, population-based survey, the analyses were somewhat limited in the sample sizes, particularly for students who did experience the negative school environment factors (i.e., bullied, received discipline, did not receive support, did not feel safe). Second, the original survey was restricted to one Midwestern state, meaning that the results might not be entirely generalizable at a greater scale. Third, the analysis did not assess other potential influences on academic outcomes (e.g., drug or alcohol use). Studies have found that substance use occurs at increased rates among SGM (Felner et al., 2020; Marshal et al., 2008; Mereish, 2019) and REM (Cheadle & Whitbeck, 2011; Swendsen et al., 2012; Watt, 2008) young people, and even youth who identify as both SGM and REM (Eisenberg et al., 2022), compared to their non-SGM and non-REM peers. Fourth, the analysis did not parse differences in results among different sexual orientations or gender identities. SGM and REM youth are not monoliths (Mayo, 2007; Schreuder, 2021), so there might be additional differential effects to be observed within groups. Finally, the data is from a cross-sectional survey, so there is need for future longitudinal data to assess causality.

Conclusion

The findings from this analysis suggest significant disparities in academic outcomes within ALCs for students with at least one and especially both REM and/or SGM identities,

particularly among sex-stratified samples, compared to their non-REM, non-SGM peers. They also suggest significant effects in the interactions between these intersectional identities and school environment factors for students with at least one and especially both REM and/or SGM identities, again particularly among sex-stratified samples, compared to their non-REM, non-SGM peers with ALCs. There are important implications for theory, research, and intervention, as ALCs are an understudied educational environment, where students with intersectional (particularly along axes of REM and SGM status) identities are often diverted after becoming considered at-risk in traditional public schools. Future studies should continue studying students attending ALCs and students with intersectional (especially multiple minoritized) identities as high priority populations for interventions targeting academic outcomes.

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Appendix

Table 1

Demographic Characteristics Across Public Schools and Alternative Learning Centers

	Non-LGBTQ youth in public schools (N=60291)	LGBTQ youth in public schools (N=15297)	Non-LGBTQ youth in ALCs (N=1431)	LGBTQ youth in ALCs (N=708)
Characteristic	n (%)	n (%)	n (%)	n (%)
Age, M [SD]	15.5 [1.1]	15.4 [1.1]	16.7 [1.3]	16.6 [1.3]
Sex assigned at birth				
Male	31680 (52.6)	5407 (35.4)	916 (64.0)	226 (31.9)
Female	28564 (47.4)	9842 (64.3)	515 (36.0)	477 (67.4)
No answer	47 (0.1)	48 (0.3)	0 (0.0)	5 (0.7)
Race/Ethnicity				
American Indian or Alaska Native	586 (1.0)	275 (1.8)	61 (4.2)	35 (4.9)
Asian or Asian American	3643 (6.0)	1128 (7.3)	47 (3.3)	42 (5.9)
Black, African or African American	4290 (7.1)	1141 (7.4)	162 (11.3)	62 (8.7)
Hispanic or Latino/a	3339 (5.5)	1114 (7.2)	213 (14.8)	76 (10.7)
Native Hawaiian or Pacific Islander	95 (0.2)	40 (0.3)	7 (0.5)	1 (0.1)
Non-Hispanic White	43685 (72.2)	9970 (64.7)	739 (51.4)	355 (50.0)
More than one race	4653 (7.7)	1629 (10.6)	202 (14.0)	137 (19.3)
No answer	240 (0.4)	119 (0.8)	8 (0.6)	2 (0.0)
Sexual orientation				
Heterosexual	60291 (100.0)	338 (2.2)	1431 (100.0)	22 (3.1)
Bisexual	0 (0.0)	4339 (28.4)	0 (0.0)	296 (41.8)

Gay or lesbian	0 (0.0)	1210 (7.9)	0 (0.0)	51 (7.2)
Pansexual	0 (0.0)	1306 (8.5)	0 (0.0)	101 (14.3)
Queer	0 (0.0)	336 (2.2)	0 (0.0)	9 (1.3)
Questioning/not sure	0 (0.0)	1579 (10.3)	0 (0.0)	32 (4.5)
I don't describe myself in any of these ways	0 (0.0)	6189 (40.5)	0 (0.0)	197 (27.8)
Gender identity				
Yes (identifies as transgender/ genderqueer/genderfluid)	0 (0.0)	1101 (7.2)	0 (0.0)	83 (11.7)
I am not sure about my gender identity	0 (0.0)	1113 (7.3)	0 (0.0)	52 (7.3)
No	60291 (100.0)	13083 (85.5)	1431 (100.0)	573 (80.9)
Transgender/genderqueer/ genderfluid gender identity				
Male, trans male, trans man, or trans masculine	0 (0.0)	417 (38.2)	0 (0.0)	34 (41.0)
Female, trans female, trans woman, or trans feminine	0 (0.0)	127 (11.6)	0 (0.0)	11 (13.3)
Non-binary, genderqueer, or genderfluid	0 (0.0)	459 (42.0)	0 (0.0)	35 (42.2)
I prefer to describe my gender as something else	0 (0.0)	89 (8.2)	0 (0.0)	3 (3.6)
Receives free or reduced-price lunch				
Yes	12788 (21.2)	4453 (29.1)	627 (43.8)	326 (46.1)
No	41770 (69.3)	8700 (56.9)	411 (28.7)	200 (28.3)
Not sure	4984 (8.3)	1663 (10.9)	157 (11.0)	73 (10.3)
No answer	749 (1.2)	481 (3.1)	236 (16.5)	109 (15.4)
How often do you care about doing well in schools?				

All of the time	27907 (46.3)	5973 (39.1)	369 (25.8)	170 (24.0)
Most of the time	24160 (40.1)	6380 (41.7)	630 (44.0)	311 (43.9)
Some of the time	6933 (11.5)	2448 (16.0)	369 (25.8)	201 (28.4)
None of the time	687 (1.1)	306 (2.0)	45 (3.1)	23 (3.3)
No answer	604 (1.0)	190 (1.2)	18 (1.3)	3 (0.4)
During the last 30 days, how many times did you miss a full day of schools?				
None	28209 (46.8)	6305 (41.2)	237 (16.5)	104 (14.7)
Once or twice	22147 (36.7)	5572 (36.4)	406 (28.2)	202 (28.5)
3 to 5 times	6749 (11.2)	1998 (13.1)	341 (23.7)	170 (23.9)
6 to 9 times	1584 (2.6)	566 (3.7)	121 (8.4)	71 (10.0)
10 or more times	704 (1.2)	315 (2.1)	92 (6.4)	56 (7.9)
No answer	898 (1.5)	541 (3.5)	242 (16.8)	107 (15.1)
How would you describe your grades this school year?				
Mostly A's	28337 (47.0)	5699 (37.3)	221 (15.4)	112 (15.8)
Mostly B's	19804 (32.9)	5328 (34.8)	392 (27.4)	219 (30.9)
Mostly C's	8577 (14.2)	2763 (18.1)	395 (27.6)	166 (23.5)
Mostly D's	2189 (3.6)	809 (5.3)	164 (11.5)	70 (9.9)
Mostly F's	719 (1.2)	349 (2.3)	83 (5.8)	44 (6.2)
Mostly Incompletes	393 (0.7)	199 (1.3)	76 (5.3)	41 (5.8)
None of these letter grades	109 (0.2)	92 (0.6)	90 (6.3)	54 (7.6)
No answer	163 (0.3)	58 (0.4)	10 (0.7)	2 (0.3)

Table 2

Demographic Characteristics Across REM and SGM Identity Combination Groups

	Overall (N=2139)	Non-REM, non-SGM youth (N=739)	REM, non-SGM youth (N=692)	Non-REM, SGM youth (N=355)	REM, SGM youth (N=353)
Characteristic	n (%)	n (%)	n (%)	n (%)	n (%)
Age, M [SD]	16.7 [1.3]	16.7 [1.2]	16.7 [1.3]	16.7 [1.2]	16.6 [1.4]
Sex assigned at birth					
Male	1142 (53.4)	501 (67.8)	415 (60.0)	110 (31.0)	116 (32.9)
Female	992 (46.4)	238 (32.2)	277 (40.0)	242 (68.2)	235 (66.6)
No answer	5 (0.2)	0 (0.0)	0 (0.0)	3 (0.9)	2 (0.6)
Race/Ethnicity					
American Indian or Alaska Native	96 (4.5)	0 (0.0)	61 (8.8)	0 (0.0)	35 (9.9)
Asian or Asian American	89 (4.2)	0 (0.0)	47 (6.8)	0 (0.0)	42 (11.9)
Black, African or African American	224 (10.5)	0 (0.0)	162 (23.4)	0 (0.0)	62 (17.6)
Hispanic or Latino/a	289 (13.5)	0 (0.0)	213 (30.8)	0 (0.0)	76 (21.5)
Native Hawaiian or Pacific Islander	8 (0.4)	0 (0.0)	7 (1.0)	0 (0.0)	1 (0.3)
Non-Hispanic White	1091 (51.2)	739 (100.0)	0 (0.0)	355 (100.0)	0 (0.0)
More than one race	339 (15.9)	0 (0.0)	202 (29.2)	0 (0.0)	137 (38.8)
Sexual orientation					
Heterosexual	1453 (67.9)	739 (100.0)	692 (100.0)	9 (2.5)	13 (3.7)
Bisexual	296 (13.8)	0 (0.0)	0 (0.0)	159 (44.8)	137 (38.8)
Gay or lesbian	51 (2.4)	0 (0.0)	0 (0.0)	24 (1.1)	27 (7.7)
Pansexual	32 (1.5)	0 (0.0)	0 (0.0)	54 (15.2)	47 (13.3)
Queer	101 (4.7)	0 (0.0)	0 (0.0)	7 (2.0)	2 (0.6)

Questioning/not sure	9 (0.4)	0 (0.0)	0 (0.0)	18 (5.1)	14 (4.0)
I don't describe myself in any of these ways	197 (9.2)	0 (0.0)	0 (0.0)	84 (23.7)	113 (32.0)
Gender identity					
Yes (identifies as transgender/ genderqueer/genderfluid)	83 (3.9)	0 (0.0)	0 (0.0)	50 (14.1)	33 (9.4)
I am not sure about my gender identity	52 (2.4)	0 (0.0)	0 (0.0)	29 (8.2)	23 (6.5)
No	2004 (93.7)	739 (100.0)	692 (100.0)	276 (77.8)	297 (84.1)
Transgender/genderqueer/ genderfluid gender identity					
Male, trans male, trans man, or trans masculine	34 (1.6)	0 (0.0)	0 (0.0)	21 (5.9)	13 (3.7)
Female, trans female, trans woman, or trans feminine	11 (0.5)	0 (0.0)	0 (0.0)	6 (1.7)	5 (1.4)
Non-binary, genderqueer, or genderfluid	35 (1.6)	0 (0.0)	0 (0.0)	23 (6.5)	12 (3.4)
I prefer to describe my gender as something else	3 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)	3 (0.9)
No answer	2056 (96.1)	739 (100.0)	692 (100.0)	305 (85.9)	320 (90.7)
Receives free or reduced-price lunch					
Yes	953 (44.6)	224 (30.3)	403 (58.2)	130 (36.6)	196 (55.5)
No	611 (28.6)	287 (38.8)	124 (17.9)	136 (38.3)	64 (18.1)
Not sure	230 (10.8)	81 (11.0)	76 (11.0)	23 (6.5)	50 (14.2)
No answer	345 (16.1)	147 (19.9)	89 (12.9)	66 (18.6)	43 (12.2)

Table 3

Logistic Regression of Academic Outcomes Across REM and SGM Identities for Overall Sample

	Non-REM, non-SGM youth (N=739)	REM, non-SGM youth (N=692)	Non-REM, SGM youth (N=355)	REM, SGM youth (N=353)
Outcomes	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]
Low engagement				
Unadjusted	*Ref.*	0.85 [0.67-1.06]	1.09 [0.83-1.43]	0.99 [0.75-1.31]
Adjusted	*Ref.*	0.99 [0.76-1.29]	1.38 [1.00-1.91]	1.24 [0.90-1.71]
Low attendance				
Unadjusted	*Ref.*	1.70 [1.35-2.14]***	1.40 [1.06-1.86]*	1.58 [1.20-2.08]**
Adjusted	*Ref.*	1.56 [1.22-1.98]***	1.29 [0.96-1.74]	1.40 [1.04-1.88]*
Low grades				
Unadjusted	*Ref.*	1.28 [1.04-1.58]*	0.90 [0.70-1.17]	1.04 [0.80-1.34]
Adjusted	*Ref.*	1.34 [1.05-1.71]*	1.14 [0.84-1.53]	1.41 [1.05-1.91]*

OR = Odds Ratio
CI = Confidence Interval
Ref. = Reference
Adjusted models control for age, assigned sex at birth, and receiving free/reduced-price lunch.
* = $p<0.05$; ** = $p<0.01$; *** = $p<0.001$

Table 4

Logistic Regression of Academic Outcomes Across REM and SGM Identities for AMAB Students

	Non-REM, non-SGM youth (N=739)	REM, non-SGM youth (N=692)	Non-REM, SGM youth (N=355)	REM, SGM youth (N=353)
Outcomes	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]
Low engagement				
Unadjusted	*Ref.*	1.08 [1.02-1.15]*	1.35 [1.24-1.47]***	1.37 [1.22-1.53]***
Adjusted	*Ref.*	0.90 [0.84-0.96]**	1.31 [1.20-1.43]***	1.12 [0.99-1.25]
Low attendance				
Unadjusted	*Ref.*	1.50 [1.41-1.60]***	1.37 [1.25-1.51]***	1.86 [1.66-2.08]***
Adjusted	*Ref.*	1.25 [1.16-1.34]***	1.34 [1.21-1.48]***	1.50 [1.33-1.69]***
Low grades				
Unadjusted	*Ref.*	1.87 [1.77-1.97]***	1.50 [1.39-1.62]***	2.19 [1.99-2.40]***
Adjusted	*Ref.*	1.34 [1.26-1.41]***	1.43 [1.32-1.55]***	1.47 [1.33-1.63]***

OR = Odds Ratio
CI = Confidence Interval
Ref. = Reference
Adjusted models control for age, assigned sex at birth, and receiving free/reduced-price lunch.
* = $p<0.05$; ** = $p<0.01$; *** = $p<0.001$

Table 5

Logistic Regression of Academic Outcomes Across REM and SGM Identities for AFAB Students

	Non-REM, non-SGM youth (N=739)	REM, non-SGM youth (N=692)	Non-REM, SGM youth (N=355)	REM, SGM youth (N=353)
Outcomes	OR [95% CI]	OR [95% CI]	OR [95% CI]	OR [95% CI]
Low engagement				
Unadjusted	*Ref.*	1.44 [1.32-1.58]***	2.53 [2.32-2.75]***	3.05 [2.76-3.37]***
Adjusted	*Ref.*	1.16 [1.05-1.28]**	2.36 [2.16-2.58]***	2.33 [2.09-2.60]***
Low attendance				
Unadjusted	*Ref.*	1.67 [1.57-1.78]***	1.34 [1.25-1.44]***	1.98 [1.82-2.16]***
Adjusted	*Ref.*	1.33 [1.24-1.42]***	1.26 [1.17-1.35]***	1.54 [1.40-1.68]***
Low grades				
Unadjusted	*Ref.*	2.52 [2.35-2.70]***	2.46 [2.29-2.65]***	4.07 [3.75-4.42]***
Adjusted	*Ref.*	1.70 [1.58-1.83]***	2.20 [2.04-2.38]***	2.70 [2.47-2.95]***

OR = Odds Ratio
CI = Confidence Interval
Ref. = Reference
Adjusted models control for age, assigned sex at birth, and receiving free/reduced-price lunch.
* = $p<0.05$; ** = $p<0.01$; *** = $p<0.001$

Table 6

Logistic Regression of School Environment Factors and Interactions Between Academic Outcomes and REM/SGM Identity Combination Groups for Overall Sample

	Low engagement			Low attendance			Low grades		
	aOR	95% CI	p-Value	aOR	95% CI	p-Value	aOR	95% CI	p-Value
Bullying	Model 1a			Model 1b			Model 1c		
REM, non-SGM Identity [versus non-REM, non-SGM]	1.00	0.73; 1.36	.9908	1.63***	1.24; 2.14	.0004	1.45**	1.10; 1.91	.0093
Non-REM, SGM Identity [versus non-REM, non-SGM]	1.95***	1.33; 2.85	.0006	1.27	0.89; 1.82	.1833	1.17	0.82; 1.67	.3949
REM, SGM Identity [versus non-REM, non-SGM]	1.33	0.89; 1.98	.1618	1.39	0.98; 1.98	.0690	1.45*	1.01; 2.07	.0444
Reported harassment or bullying by students for gender, gender expression, sexual orientation, and/or race/ethnicity/ national origin [versus no harassment or bullying by	1.92**	1.25; 2.96	.0029	0.78	0.51; 1.21	.2717	1.41	0.93; 2.15	.1085

students for those things]									
Interaction of SGM and REM identities and bullying	*p*-Value = .0056			*p*-Value = .7355			*p*-Value = .8259		
Discipline	Model 2a			Model 2b			Model 2c		
REM, non-SGM Identity [versus non-REM, non-SGM]	0.88	0.66; 1.19	.4130	1.48**	1.15; 1.92	.0027	1.35*	1.04; 1.75	.0243
Non-REM, SGM Identity [versus non-REM, non-SGM]	1.32	0.93; 1.88	.1174	1.28	0.93; 1.76	.1241	1.11	0.81; 1.53	.5101
REM, SGM Identity [versus non-REM, non-SGM]	1.21	0.85; 1.72	.2859	1.31	0.96; 1.79	.0926	1.46*	1.06; 2.00	.0201
Received disciplinary action of getting sent outside once or more in last 30 days [versus none]	1.84*	1.14; 2.97	.0128	1.19	0.75; 1.91	.4601	1.85*	1.12; 3.07	.0165
Interaction of SGM and REM identities and discipline	*p*-Value = .3414			*p*-Value = .4814			*p*-Value = .9444		
Support	Model 3a			Model 3b			Model 3c		
REM, non-SGM Identity [versus non-REM, non-SGM]	0.88	0.62; 1.24	.4628	1.93***	1.43; 2.60	<.0001	1.27	0.94; 1.71	.1191

Non-REM, SGM Identity [versus non-REM, non-SGM]	1.46	0.97; 2.20	.0721	1.35	0.94; 1.95	.1031	0.98	0.68; 1.42	.9313
REM, SGM Identity [versus non-REM, non-SGM]	1.02	0.66; 1.57	.9293	1.45	1.01; 2.08	.0461	1.51*	1.05; 2.18	.0278
Low teacher/adult support [versus received support]	2.12***	1.40; 3.23	.0004	1.57*	1.05; 2.34	.0269	1.45	0.97; 2.18	.0721
Interaction of SGM and REM identities and low teacher/ adult support	*p*-Value = .6891			*p*-Value = .2927			*p*-Value = .1709		
Safety	Model 4a			Model 4b			Model 4c		
REM, non-SGM Identity [versus non-REM, non-SGM]	0.96	0.73; 1.28	.8014	1.71***	1.33; 2.21	<.0001	1.34*	1.03; 1.73	.0273
Non-REM, SGM Identity [versus non-REM, non-SGM]	1.43*	1.01; 2.02	.0455	1.33	0.97; 1.83	.0798	1.07	0.78; 1.47	.6864
REM, SGM Identity [versus non-REM, non-SGM]	1.37	0.97; 1.94	.0734	1.49*	1.09; 2.05	.0127	1.42*	1.03; 1.95	.0322
Feeling unsafe at school [versus feeling safe at school]	1.67	0.98; 2.84	.0577	1.60	0.95; 2.68	.0753	1.45	0.85; 2.48	.1780

Interaction of SGM and REM identities and feeling unsafe at school	*p*-Value = .0873	*p*-Value = .2613	*p*-Value = .6421

aOR = Adjusted Odds Ratio
CI = Confidence Interval
Adjusted models control for age, assigned sex at birth, and receiving free/reduced-price lunch.
* = p<0.05; **= p<0.01; ***= p<0.001

Table 7

Logistic Regression of School Environment Factors and Interactions Between Academic Outcomes and REM/SGM Identity Combination Groups for AMAB Students

	Low engagement			Low attendance			Low grades		
	aOR	95% CI	p-Value	aOR	95% CI	p-Value	aOR	95% CI	p-Value
Bullying	Model 1a			Model 1b			Model 1c		
REM, non-SGM Identity [versus non-REM, non-SGM]	0.91*	0.83; 0.98	.0165	1.33***	1.22; 1.44	<.0001	1.40***	1.30; 1.49	<.0001
Non-REM, SGM Identity [versus non-REM, non-SGM]	1.19**	1.07; 1.33	.0017	1.19**	1.05; 1.35	.0052	1.33***	1.21; 1.47	<.0001
REM, SGM Identity [versus non-REM, non-SGM]	1.03	0.89; 1.20	.6809	1.39***	1.19; 1.62	<.0001	1.48***	1.31; 1.69	<.0001
Reported harassment or bullying by students for gender, gender expression, sexual orientation, and/or race/ethnicity/ national origin [versus no harassment or bullying by	1.47***	1.35; 1.60	<.0001	1.33***	1.21; 1.47	<.0001	1.36***	1.25; 1.47	<.0001

students for those things]									
Interaction of SGM and REM identities and bullying	*p*-Value = .0905			*p*-Value = .0001			*p*-Value = <.0001		
Discipline	Model 2a			Model 2b			Model 2c		
REM, non-SGM Identity [versus non-REM, non-SGM]	0.89**	0.82; 0.96	.0016	1.23***	1.14; 1.33	<.0001	1.33***	1.25; 1.42	<.0001
Non-REM, SGM Identity [versus non-REM, non-SGM]	1.29***	1.17; 1.42	<.0001	1.25***	1.13; 1.40	<.0001	1.42***	1.31; 1.55	<.0001
REM, SGM Identity [versus non-REM, non-SGM]	1.09	0.95; 1.24	.2107	1.40***	1.22; 1.60	<.0001	1.52***	1.36; 1.69	<.0001
Received disciplinary action of getting sent outside once or more in last 30 days [versus none]	3.24***	2.90; 3.61	<.0001	2.23***	1.97; 2.52	<.0001	3.64***	3.27; 4.04	<.0001
Interaction of SGM and REM identities and discipline	*p*-Value = .7140			*p*-Value = .3262			*p*-Value = .0050		
Support	Model 3a			Model 3b			Model 3c		
REM, non-SGM Identity [versus non-REM, non-SGM]	0.97	0.88; 1.06	.4446	1.25***	1.14; 1.37	<.0001	1.38***	1.29; 1.49	<.0001

Non-REM, SGM Identity [versus non-REM, non-SGM]	1.23***	1.10; 1.39	.0006	1.21**	1.06; 1.37	.0034	1.40***	1.26; 1.55	<.0001
REM, SGM Identity [versus non-REM, non-SGM]	1.10	0.93; 1.29	.2582	1.36***	1.16; 1.59	.0001	1.49***	1.31; 1.69	<.0001
Low teacher/adult support [versus received support]	3.13***	2.90; 3.38	<.0001	1.48***	1.35; 1.63	<.0001	2.367***	2.2-; 2.55	<.0001
Interaction of SGM and REM identities and low teacher/ adult support	*p*-Value = .0050			*p*-Value = .5333			*p*-Value = .0038		
Safety	Model 4a			Model 4b			Model 4c		
REM, non-SGM Identity [versus non-REM, non-SGM]	0.91*	0.85; 0.98	.0115	1.29***	1.20; 1.40	<.0001	1.34***	1.26; 1.43	<.0001
Non-REM, SGM Identity [versus non-REM, non-SGM]	1.22***	1.10; 1.34	<.0001	1.26***	1.13; 1.40	<.0001	1.35***	1.23; 1.47	<.0001
REM, SGM Identity [versus non-REM, non-SGM]	1.12	0.98; 1.27	.0894	1.53***	1.34; 1.74	<.0001	1.52***	1.36; 1.69	<.0001
Feeling unsafe at school [versus feeling safe at school]	2.61***	2.34; 2.91	<.0001	1.82***	1.60; 2.07	<.0001	2.05***	1.84; 2.29	<.0001

Interaction of SGM and REM identities and feeling unsafe at school	*p*-Value = .0035	*p*-Value = .0002	*p*-Value = .0052

aOR = Adjusted Odds Ratio
CI = Confidence Interval
Adjusted models control for age and receiving free/reduced-price lunch.
* = p<0.05; **= p<0.01; ***= p<0.001

Table 8

Logistic Regression of School Environment Factors and Interactions Between Academic Outcomes and REM/SGM Identity Combination Groups for AFAB Students

	Low engagement			Low attendance			Low grades		
	aOR	95% CI	p-Value	aOR	95% CI	p-Value	aOR	95% CI	p-Value
Bullying	Model 1a			Model 1b			Model 1c		
REM, non-SGM Identity [versus non-REM, non-SGM]	1.18**	1.04; 1.33	.0090	1.33***	1.23; 1.45	<.0001	1.87***	1.71; 2.05	<.0001
Non-REM, SGM Identity [versus non-REM, non-SGM]	2.18***	1.94; 2.45	<.0001	1.19***	1.08; 1.31	.0004	1.98***	1.79; 2.19	<.0001
REM, SGM Identity [versus non-REM, non-SGM]	2.27***	1.97; 2.63	<.0001	1.46***	1.30; 1.64	<.0001	2.19***	2.42; 3.06	.0001
Reported harassment or bullying by students for gender, gender expression, sexual orientation, and/or race/ethnicity/ national origin [versus no harassment or bullying by	1.80***	1.60; 2.03	<.0001	1.37***	1.25; 1.50	<.0001	1.93***	1.74; 2.13	<.0001

students for those things]									
Interaction of SGM and REM identities and bullying	*p*-Value = .1269			*p*-Value = .5455			*p*-Value = <.0001		
Discipline	Model 2a			Model 2b			Model 2c		
REM, non-SGM Identity [versus non-REM, non-SGM]	1.18***	1.06; 1.31	.0018	1.31***	1.22; 1.41	<.0001	1.74***	1.61; 1.88	<.0001
Non-REM, SGM Identity [versus non-REM, non-SGM]	2.37***	2.16; 2.60	<.0001	1.24***	1.15; 1.34	<.0001	2.22 ***	2.05; 2.41	<.0001
REM, SGM Identity [versus non-REM, non-SGM]	2.26***	2.01; 2.54	<.0001	1.47***	1.34; 1.62	<.0001	2.67***	2.43; 2.94	<.0001
Received disciplinary action of getting sent outside once or more in last 30 days [versus none]	6.35***	5.15; 7.83	<.0001	3.04***	2.49; 3.71	<.0001	6.91***	5.67; 8.41	<.0001
Interaction of SGM and REM identities and discipline	*p*-Value = .0030			*p*-Value = .8046			*p*-Value = <.0001		
Support	Model 3a			Model 3b			Model 3c		
REM, non-SGM Identity [versus non-REM, non-SGM]	1.20*	1.04; 1.38	.0125	1.31***	1.20; 1.43	<.0001	1.83***	1.66; 2.02	<.0001

Non-REM, SGM Identity [versus non-REM, non-SGM]	2.48***	2.18; 2.82	<.0001	1.25***	1.14; 1.37	<.0001	2.13***	1.92; 2.37	<.0001
REM, SGM Identity [versus non-REM, non-SGM]	2.36***	2.01; 2.78	<.0001	1.59***	1.41; 1.79	<.0001	2.88***	2.55; 3.26	<.0001
Low teacher/adult support [versus received support]	4.41***	3.94; 4.95	<.0001	1.76***	1.61; 1.93	<.0001	2.81***	2.54; 3.10	<.0001
Interaction of SGM and REM identities and low teacher/ adult support	p-Value = <.0001			p-Value = .0109			p-Value = <.0001		
Safety	Model 4a			Model 4b			Model 4c		
REM, non-SGM Identity [versus non-REM, non-SGM]	1.22***	1.10; 1.36	.0003	1.35***	1.25; 1.45	<.0001	1.83***	1.69; 1.98	<.0001
Non-REM, SGM Identity [versus non-REM, non-SGM]	2.25***	2.03; 2.49	<.0001	1.25***	1.15; 1.35	<.0001	2.14***	1.96; 2.33	<.0001
REM, SGM Identity [versus non-REM, non-SGM]	2.30***	2.03; 2.61	<.0001	1.48***	1.34; 1.64	<.0001	2.79***	2.52; 3.09	<.0001
Feeling unsafe at school [versus feeling safe at school]	3.18***	2.77; 3.65	<.0001	1.78***	1.58; 2.00	<.0001	2.61***	2.30; 2.96	<.0001

Interaction of SGM and REM identities and feeling unsafe at school	*p*-Value = .0099	*p*-Value = .0896	*p*-Value = <.0001

aOR = Adjusted Odds Ratio
CI = Confidence Interval
Adjusted models control for age and receiving free/reduced-price lunch.
* = p<0.05; **= p<0.01; ***= p<0.001

Table 9

Probing Effects of School Environment Factors on Significant Interactions Between Academic Outcomes and REM/SGM Identity Combination Groups for Overall Sample

	N with negative academic outcome	Proportion with negative academic outcome	aOR [95% CI]
Low engagement			
Not bullied			
Non-REM, non-SGM	165	28.8	*Ref.*
REM, non-SGM	133	25.4	1.00 [0.73-1.36]
Non-REM, SGM	78	34.8	1.95 [1.33-2.85]***
REM, SGM	65	29.3	1.33 [0.89-1.98]
Bullied			
Non-REM, non-SGM	57	38.8	1.92 [1.25-2.96]**
REM, non-SGM	49	33.8	1.77 [1.15-2.74]**
Non-REM, SGM	38	29.5	1.16 [0.69-1.95]
REM, SGM	41	32.8	1.67 [1.05-2.68]*

aOR = Adjusted Odds Ratio
CI = Confidence Interval
Ref. = Reference
Adjusted models control for age and receiving free/reduced-price lunch.
* = $p<0.05$; ** = $p<0.01$; *** = $p<0.001$

Table 10

Probing Effects of School Environment Factors on Significant Interactions Between Academic Outcomes and REM/SGM Identity Combination Groups for AMAB Students

	N with negative academic outcome	Proportion with negative academic outcome	aOR [95% CI]
Low engagement			
Received support			
Non-REM, non-SGM	103	30.9	*Ref.*
REM, non-SGM	62	25.2	0.84 [0.55-1.27]
Non-REM, SGM	30	41.1	1.70 [0.96-3.02]
REM, SGM	16	23.5	0.71 [0.36-1.38]
Did not receive support			
Non-REM, non-SGM	52	45.2	1.69 [1.03-2.78]*
REM, non-SGM	46	46.5	1.74 [1.03-2.92]
Non-REM, SGM	14	48.3	2.33 [0.90-6.08]
REM, SGM	13	48.2	1.98 [0.81-4.86]
Felt safe			
Non-REM, non-SGM	116	33.5	*Ref.*
REM, non-SGM	96	30.2	0.88 [0.62-1.23]
Non-REM, SGM	34	45.3	1.59 [0.96-2.65]
REM, SGM	29	34.5	1.14 [0.68-1.91]
Did not feel safe			
Non-REM, non-SGM	21	38.2	1.19 [0.65-2.15]
REM, non-SGM	12	42.9	1.46 [0.66-3.25]
Non-REM, SGM	4	30.8	0.81 [0.24-2.71]
REM, SGM	4	26.7	0.70 [0.21-2.28]
Low attendance			
Not bullied			
Non-REM, non-SGM	126	38.8	*Ref.*

REM, non-SGM	149	53.0	1.71 [1.22-2.39]**
Non-REM, SGM	27	42.9	1.19 [0.69-2.05]
REM, SGM	27	40.3	1.03 [0.59-1.79]
Bullied			
Non-REM, non-SGM	28	37.8	0.95 [0.56-1.60]
REM, non-SGM	34	56.7	2.03 [1.16-3.58]*
Non-REM, SGM	10	41.7	1.14 [0.49-2.66]
REM, SGM	9	30.0	0.64 [0.28-1.46]
Felt safe			
Non-REM, non-SGM	129	37.4	*Ref.*
REM, non-SGM	168	53.0	1.82 [1.32-2.52]***
Non-REM, SGM	30	40.0	1.13 [0.67-1.88]
REM, SGM	33	39.8	1.07 [0.65-1.77]
Did not feel safe			
Non-REM, non-SGM	27	49.1	1.66 [0.94-2.95]
REM, non-SGM	13	48.2	1.49 [0.67-3.31]
Non-REM, SGM	7	53.9	1.99 [0.65-6.08]
REM, SGM	3	20.0	0.39 [0.11-1.43]
Low grades			
Not bullied			
Non-REM, non-SGM	230	57.9	*Ref.*
REM, non-SGM	217	66.6	1.46 [1.03-2.07]*
Non-REM, SGM	47	61.0	1.13 [0.64-1.97]
REM, SGM	44	57.1	0.98 [0.57-1.71]
Bullied			
Non-REM, non-SGM	65	69.9	1.61 [0.93-2.78]
REM, non-SGM	45	65.2	1.44 [0.80-2.61]
Non-REM, SGM	23	71.9	1.94 [0.75-5.05]
REM, SGM	22	66.7	1.55 [0.70-3.46]
Did not receive discipline			
Non-REM, non-SGM	194	58.1	*Ref.*
REM, non-SGM	196	65.3	1.36 [0.97-1.90]

Non-REM, SGM	51	64.6	1.27 [0.76-2.12]
REM, SGM	52	60.5	1.14 [0.69-1.89]
Received discipline			
Non-REM, non-SGM	52	73.2	1.97 [1.11-3.51]*
REM, non-SGM	40	78.4	2.74 [1.34-5.62]**
Non-REM, SGM	7	77.8	2.57 [0.52-12.62]
REM, SGM	9	69.2	1.68 [0.50-5.59]
Received support			
Non-REM, non-SGM	188	56.5	*Ref.*
REM, non-SGM	154	62.9	1.24 [0.84-1.82]
Non-REM, SGM	46	63.0	1.30 [0.73-2.31]
REM, SGM	36	53.7	0.90 [0.50-1.61]
Did not receive support			
Non-REM, non-SGM	76	66.7	1.35 [0.81-2.23]
REM, non-SGM	77	77.8	3.38 [1.79-6.38]***
Non-REM, SGM	21	72.4	2.04 [0.70-5.90]
REM, SGM	21	77.8	2.77 [0.97-7.87]
Felt safe			
Non-REM, non-SGM	206	59.7	*Ref.*
REM, non-SGM	209	65.9	1.30 [0.93-1.81]
Non-REM, SGM	48	64.0	1.16 [0.69-1.95]
REM, SGM	50	60.2	1.05 [0.63-1.74]
Did not feel safe			
Non-REM, non-SGM	37	67.3	1.39 [0.75-2.55]
REM, non-SGM	22	81.5	3.02 [1.10-8.26]*
Non-REM, SGM	10	76.9	2.23 [0.60-8.30]
REM, SGM	9	60.0	1.05 [0.36-3.07]

aOR = Adjusted Odds Ratio
CI = Confidence Interval
Ref. = Reference
Adjusted models control for age and receiving free/reduced-price lunch.
* = $p<0.05$; ** = $p<0.01$; *** = $p<0.001$

Table 11

Probing Effects of School Environment Factors on Significant Interactions Between Academic Outcomes and REM/SGM Identity Combination Groups for AFAB Students

	N with negative academic outcome	Proportion with negative academic outcome	aOR [95% CI]
Low engagement			
Did not receive discipline			
Non-REM, non-SGM	32	18.9	*Ref.*
REM, non-SGM	42	19.4	1.02 [0.61-1.72]
Non-REM, SGM	43	24.6	1.42 [0.84-2.39]
REM, SGM	47	25.3	1.43 [0.85-2.40]
Received discipline			
Non-REM, non-SGM	2	15.4	0.78 [0.16-3.75]
REM, non-SGM	12	48.0	3.50 [1.42-8.61]**
Non-REM, SGM	11	45.8	3.12 [1.26-7.73]*
REM, SGM	10	43.5	2.85 [1.14-7.20]*
Received support			
Non-REM, non-SGM	20	12.7	*Ref.*
REM, non-SGM	25	14.4	1.15 [0.58-2.30]
Non-REM, SGM	35	22.9	1.80 [0.90-3.59]
REM, SGM	37	23.4	1.68 [0.86-3.30]
Did not receive support			
Non-REM, non-SGM	27	40.9	3.92 [1.75-8.77]***
REM, non-SGM	25	35.2	4.42 [2.08-9.41]***
Non-REM, SGM	30	38.0	4.27 [2.06-8.85]***
REM, SGM	26	44.8	4.86 [2.26-10.44]***
Felt safe			
Non-REM, non-SGM	27	16.1	*Ref.*
REM, non-SGM	46	20.7	1.33 [0.78-2.27]

Non-REM, SGM	43	25.2	1.78 [1.04-3.07]*
REM, SGM	50	27.9	1.96 [1.15-3.34]*
Did not feel safe			
Non-REM, non-SGM	7	53.9	7.22 [2.10-24.77]**
REM, non-SGM	10	47.6	4.68 [1.79-12.25]**
Non-REM, SGM	11	39.3	3.29 [1.37-7.88]**
REM, SGM	6	23.1	1.40 [0.51-3.85]
Low attendance			
Received support			
Non-REM, non-SGM	48	38.1	*Ref.*
REM, non-SGM	89	56.3	1.90 [1.16-3.10]*
Non-REM, SGM	60	48.4	1.53 [0.92-2.55]
REM, SGM	81	57.9	2.04 [1.24-3.38]**
Did not receive support			
Non-REM, non-SGM	21	45.7	1.47 [0.73-2.94]
REM, non-SGM	30	53.6	1.77 [0.92-3.38]
Non-REM, SGM	38	57.6	2.08 [1.13-3.85]*
REM, SGM	32	59.3	2.47 [1.26-4.83]**
Low grades			
Not bullied			
Non-REM, non-SGM	70	40.2	*Ref.*
REM, non-SGM	95	49.0	1.51 [0.94-2.42]
Non-REM, SGM	65	44.5	1.29 [0.78-2.15]
REM, SGM	72	50.4	1.87 [1.13-3.09]*
Bullied			
Non-REM, non-SGM	22	40.7	1.20 [0.59-2.41]
REM, non-SGM	41	54.0	1.72 [0.94-3.15]
Non-REM, SGM	44	46.3	1.39 [0.78-2.47]
REM, SGM	50	55.0	1.99 [1.11-3.55]*
Did not receive discipline			
Non-REM, non-SGM	66	39.5	*Ref.*
REM, non-SGM	104	48.6	1.41 [0.93-2.14]

Non-REM, SGM	74	42.1	1.14 [0.74-1.77]
REM, SGM	99	53.2	1.71 [1.11-2.62]*
Received discipline			
Non-REM, non-SGM	6	46.2	1.43 [0.46-4.47]
REM, non-SGM	18	69.2	3.23 [1.30-7.99]*
Non-REM, SGM	16	66.7	3.03 [1.21-7.59]*
REM, SGM	17	73.9	3.84 [1.42-10.35]**
Received support			
Non-REM, non-SGM	56	35.9	*Ref.*
REM, non-SGM	75	43.4	1.37 [0.83-2.24]
Non-REM, SGM	52	34.0	0.93 [0.55-1.58]
REM, SGM	77	48.7	1.96 [1.19-3.24]**
Did not receive support			
Non-REM, non-SGM	32	48.5	1.62 [0.81-3.23]
REM, non-SGM	46	64.8	3.27 [1.68-6.35]***
Non-REM, SGM	50	63.3	2.97 [1.59-5.54]***
REM, SGM	34	58.6	2.73 [1.40-5.33]**
Felt safe			
Non-REM, non-SGM	64	38.3	*Ref.*
REM, non-SGM	108	49.1	1.83 [1.69-1.98]***
Non-REM, SGM	71	41.5	2.14 [1.96-2.33]***
REM, SGM	96	53.6	2.79 [2.52-3.09]***
Did not feel safe			
Non-REM, non-SGM	6	50.0	2.61 [2.30-2.96]***
REM, non-SGM	14	66.7	2.82 [2.40-3.31]***
Non-REM, SGM	18	64.3	4.48 [3.90-5.14]***
REM, SGM	18	69.2	4.44 [3.73-5.30]***

aOR = Adjusted Odds Ratio
CI = Confidence Interval
Ref. = Reference
Adjusted models control for age and receiving free/reduced-price lunch.
* = $p<0.05$; **= $p<0.01$; ***= $p<0.001$