Erased from the Permanent Record: Data Collection Practices and Non-Binary Student Experiences in School

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Abstract: State education data systems often undercount non-binary students, constraining schools' ability to support them. This study examines the scope and implications of non-binary erasure in school data collection. Drawing on survey responses from nearly 13,000 students across seven Massachusetts districts, we find that current practices substantially undercount non-binary students, who also report less positive experiences of school culture, including student–teacher relationships, belonging, and emotional safety. Although inclusive data could guide efforts to create more supportive environments, districts face growing political resistance from parent organizations aligned with the White Christian Nationalist movement. These groups frame inclusivity as a threat to parental rights. We argue that state-level policies mandating inclusive gender data practices are needed to affirm the presence of non-binary students, protect districts from politicized backlash, and enable leaders to prioritize equity in school improvement.

Eliminados del expediente permanente: Prácticas de recopilación de datos y experiencias de estudiantes no binarios en la escuela
Resumen: Los sistemas de datos educativos estatales a menudo subestiman la cantidad de estudiantes no binarios, lo que limita la capacidad de las escuelas para brindarles el apoyo necesario. Este estudio examina el alcance y las implicaciones de la invisibilización de las personas no binarias en la recopilación de datos escolares. Basándonos en las respuestas de una encuesta realizada a casi 13.000 estudiantes de siete distritos de Massachusetts, encontramos que las prácticas actuales subestiman considerablemente la cantidad de estudiantes no binarios, quienes también reportan experiencias menos positivas en cuanto a la cultura escolar, incluyendo las relaciones entre estudiantes y docentes, el sentido de pertenencia y la seguridad emocional. Si bien los datos inclusivos podrían guiar los esfuerzos para crear entornos más favorables, los distritos se enfrentan a una creciente resistencia política por parte de organizaciones de padres alineadas con el movimiento nacionalista cristiano blanco. Estos grupos presentan la inclusión como una amenaza a los derechos parentales. Sostenemos que se necesitan políticas a nivel estatal que exijan prácticas de recopilación de datos de género inclusivas para reconocer la existencia de estudiantes no binarios, proteger a los distritos de las reacciones políticas adversas y permitir que los líderes prioricen la equidad en la mejora escolar.
Palabras-clave: no binario; clima escolar; recopilación de datos; *queercrit*; derechos parentales

Removido do registro permanente: Práticas de coleta de dados e experiências de estudantes não binários na escola
Resumo: Os sistemas de dados da educação estatal subestimam frequentemente o número de alunos não binários, limitando a capacidade das escolas para os apoiar. Este estudo examina o alcance e as implicações da invisibilização dos alunos não binários na recolha de dados escolares. Com base nas respostas de inquéritos de quase 13.000 alunos em sete distritos de Massachusetts, verificámos que as práticas atuais subestimam significativamente o número de alunos não binários, que também relatam experiências menos positivas em relação à cultura escolar, incluindo as relações com os professores, o sentimento de pertença e a segurança emocional. Embora os dados inclusivos pudessem orientar os esforços para criar ambientes mais acolhedores, os distritos enfrentam uma crescente resistência política por parte das organizações de pais alinhadas com o movimento nacionalista cristão branco. Estes grupos enquadram a inclusão como uma ameaça aos direitos parentais. Argumentamos que são necessárias políticas a nível estadual que exijam práticas inclusivas de recolha de dados de género para afirmar a presença de alunos não binários, proteger os distritos de reações políticas adversas e permitir que os líderes priorizem a equidade na melhoria das escolas.
Palavras-chave: não binário; clima escolar; recolha de dados; *queercrit*; direitos parentais

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Although 5% of young people in the United States identify as non-binary (Pew Research Center, 2022), state education datasets often report significantly lower numbers. In Massachusetts—a historically progressive state—only 0.2% of students are identified as non-binary in Department of Education data (DESE, 2024). These figures typically rely on gender markers selected by parents

during initial school enrollment in kindergarten, often years before students begin exploring their gender identities. Without alternative data sources, it is difficult to assess the extent to which state systems undercount non-binary students. Yet, inclusive and accurate data is essential for school improvement and advocacy. When students are invisible in data, they are often invisible in decision-making.

Efforts to include non-binary students in school data are further complicated by an increasingly hostile policy environment. At the federal level, executive orders from the Trump administration target schools that affirm non-binary identities. Locally, White Christian Nationalist groups are mobilizing against inclusive policies, pressuring school boards, and launching costly legal challenges (Rogers et al., 2024). At the time of this writing, 1,000 anti-trans bills have been introduced in 2025 (Trans Legislation Tracker, 2025). These tactics not only undermine inclusive data practices but they contribute to school environments that are unsafe and unwelcoming to non-binary students (ACLU, 2024; The Trevor Project, 2023).

The stakes are high. More than half of non-binary youth have considered suicide in the past year, and nearly one in five have attempted it (The Trevor Project, 2023). In contrast, research shows that affirming school environments improve student well-being (Kelley et al., 2022). Creating such environments begins with making students visible (Ullman, 2022). This project responds to that challenge. We examine the shortcomings of current state-level data systems and propose a model for inclusive and affirming data practices. In a data-driven policy environment, inclusion in data is a necessary first step toward equity in education. When non-binary students are visible in educational data systems, school administrators have the nuanced data they need to both protect students from the harms noted above and, importantly, to understand the unique strengths that non-binary students contribute to their school communities.

Through this study, we aim to gain a deeper understanding of the extent of non-binary erasure and provide insight into what can be learned about non-binary student experiences when they are more accurately represented in our educational data systems. We draw on survey data from approximately 13,000 students in Massachusetts to understand the extent of non-binary erasure in the official state data system. We also examine how non-binary students' experiences compare to those of their cisgender classmates on a range of school culture measures. Two research questions guide this project:

1. How do self-reported gender identity demographics compare to gender identity demographics in the state data set?
2. How do non-binary students' experiences in school compare to the experiences of male and female students?

Conceptual Framework: QueerCrit in a Time of Erasure

In response to Keenan's (2022) call for research that illuminates the experiences of non-binary students, this paper follows Strunk (2024) in applying QuantCrit towards the study of policies that affect the LGBTQ+ community. While the foundational QuantCrit literature illuminates the erasure of race in quantitative measurement, the companion QueerCrit emphasizes the erasure of gender identity. Both perspectives are intersectional. Along these lines, we adopt the following tenets of QueerCrit theory:

Numbers are not neutral.
Categories are not natural (e.g., male/female binary).
Quantitative data can promote marginalized voices.
Quantitative data can be a starting point for social justice.

Specifically, we engage the complexity of gender by calling attention to three interconnected forms of erasure: political, institutional, and relational (Bauer et al., 2009; McQuillan et al., 2024; Woolley, 2019). Throughout our analysis, we apply a QueerCrit lens when looking at each form of erasure.

Political erasure occurs when laws and policies convey state-sanctioned erasure of students in the K-12 education system (McQuillan et al., 2024). Massachusetts, the focal state for our research, offers a complex image of political erasure for non-binary students. At the time of this writing, there are six proposed bills labeled as anti-trans by the Trans Legislation Tracker (2025) that affect healthcare, sports, and public education. For example, MA H551 would prohibit instruction on gender identity for students in Grades K-3. In addition, a series of bills in the Massachusetts House of Representatives would allow schools to boycott athletic competitions that include trans students. There is also legislation that protects non-binary students. In August 2025, Governor Maura Healy signed an update to the state's 2022 "shield" law, which protects physicians and parents who seek controversial forms of healthcare. In particular, the new law prevents courts from pursuing cases of neglect or maltreatment against parents who seek affirming care for transgender children. Of course, the political erasure of non-binary students has taken on a pace that is difficult to track accurately. Much of this is driven by the perhaps unprecedented influence of White Christian Nationalism on American K-12 education policy.

White Christian Nationalism is a political movement that believes, "public institutions and policies should reflect and assert Christianity" (Burke et al., 2023, p. 288). This belief rests on the false premise that the United States was founded as a Christian nation (Gorski & Perry, 2022). White Christian Nationalists connect this fallacy to political action that seeks to protect and assert their power by promoting an authoritarian, patriarchal caste system (Gorski & Perry, 2022; Miller, 2022; Whitehead & Perry, 2020). Despite the usage of Christian iconography, including traditions, symbols, and values, White Christian Nationalism is not actually a religious movement, but a political one.

Our study illustrates how political erasure can proliferate in a so-called "blue" state that does not align itself with the more overt and antagonistic forms of political erasure promoted by the second Trump administration. Instead, in our study context, political erasure is most evident in the official state datasets that are blind not only to the experiences of non-binary students but, even more fundamentally, to their existence at all in K-12 public education. In this form of erasure, the QueerCrit lens helps us to see what is obscured in traditional quantitative measurement. Official state datasets, for example, may appear to be objective; however, as illustrated throughout our discussion, these numbers are often filtered through a complex interaction of parental knowledge, belief, and acceptance of their child(ren)'s evolving gender identity. As a result, the number produced from this process—the simple count of male, female, and non-binary students—cannot be viewed as neutral or free from bias. White Christian Nationalist ideologies—in particular, the belief that there are only two genders—are sustained not only through explicitly political discourse but also through institutional practices that naturalize binary conceptions of sex and gender. In schools, these commitments can become embedded in routine data practices, such as the design of climate surveys, which have important implications for the visibility and well-being of non-binary students, as discussed further in the conclusion.

Institutional erasure describes procedures and practices that prevent the inclusion of trans and non-binary students in the educational system (Bauer et al., 2009). While political erasure is evident in the official laws and policies of federal and state governments, institutional erasure is present in less formal policies and practices within institutions that serve non-binary students, such as their local school or a community-based organization. Again, White Christian Nationalism is a driving force behind institutional erasure. Most notably, so-called "parents' rights" advocates seek to

increase their own power over all children, while decreasing collective public control (Foran, 2022). In recent years, for example, groups aligned with White Christian Nationalism have worked aggressively to limit student access to books featuring LGBTQ+ characters and storylines.

Again, despite its reputation as a progressive state, Massachusetts is not immune to the institutional erasure of non-binary students. White Christian Nationalist groups, including the Massachusetts Family Institute and Parents Defending Education, have active chapters throughout the state (Hogan, 2024). These groups invite members to target districts with policies protecting non-binary students (Massachusetts Family Institute, 2021; Parents Defending Education, 2023). Indeed, Massachusetts had the 4th highest number of book ban attempts in 2022, according to the American Library Association. More recently, Massachusetts districts have seen a rise in parent activism associated with the White Christian Nationalist agenda, for example, a recently filed federal investigation into a student survey on high-risk behaviors that has caught parental ire in a suburban district (U.S. DOE, 2025)

Political erasure is, of course, connected to institutional erasure. For example, if a school leader trusts the official state dataset, they might believe that there are only a few non-binary students at their school, thus limiting their motivation to build forms of institutional inclusion for non-binary students. Our study aligns with QuantCrit scholars who charge that "misrepresentations of quantitative data are at the heart of an institutional process" that erases marginalized identities (Crawford, 2019, p. 423). Along these lines, we pay attention to the way that non-binary students experience institutional erasure in schools that participated in the surveys analyzed below.

Specifically, we examine student responses to survey measures of institutional erasure, such as whether students perceive that their identities are reflected in the school curriculum and whether students find personal value in academic learning. Consistent with the QueerCrit principles outlined above, we believe that measurement attuned to gender identity can begin to outline the extent of non-binary erasure and offer initial guidance on building more inclusive institutional environments.

Lastly, relational erasure is the formalized invisibility of non-binary students and our insensitivity towards non-binary students in interpersonal interactions (McQuillan et al., 2024). In the school setting, relational erasure can include overtly refusing to acknowledge a person's identity through misgendering, dead-naming, or dismissing an individual's identity on the grounds that they are "confused" or "going through a phase." It can also include less overt forms of erasure, such as exclusionary language, as seen in phrases like "Good morning, boys and girls." The cumulative stress of relational erasure negatively impacts the social and emotional well-being of non-binary students who experience confusion, self-doubt, rumination, and internalize shame as a result of being continuously invalidated (Johnson et al., 2019). As a result, non-binary students experience more negative schooling outcomes, including higher rates of absenteeism, higher rates of truancy, higher rates of missing school to use alcohol and drugs, and lower grades (Day et al., 2018).

As mentioned above, relational erasure is closely tied to political and institutional erasure. As Green (1983) articulates, equity is "statistically describable and can become a source of human motivation only at a fairly high level of social aggregation—say, at the state or federal levels of policy" (p. 32). Fostering supportive school environments for non-binary youth begins with validating their existence and recognizing their inequitable schooling experiences in the data. Instead, in contemporary American K-12 education, state and federal policy allow the omission of non-binary students in official data systems. At the institutional or school level, with inaccurate data, school leaders cannot adequately foster learning and teaching environments that appropriately support non-binary students. Non-binary students are then improperly recognized by educators and classmates in their school relationships, including classroom interactions and during extracurricular activities like sports.

Our dataset allows unique insight into relational forms of erasure experienced by non-binary students at our partner schools. As detailed below, we utilize survey results to examine relational forms of harm or neglect in student-teacher relationships, emotional safety, and sense of belonging. Consistent with QueerCrit, then, our study experiments with using quantitative data to promote marginalized voices and work towards social justice.

Methods

Survey Instrument and Data Collection

This study relies on surveys and data that are part of a larger collaborative project to more holistically measure school quality involving each district and a research center at a large public research university in New England. The survey framework, created through a democratic process involving school and district leadership, teachers' union members, and community members, includes multiple measures—academic, social-emotional, and school culture indicators—to piece together a fairer and more comprehensive picture of school performance. Complete survey scales are available in Appendix A. Each survey item uses a 5-point Likert scale.

Psychometric analyses indicated strong internal reliability, with factor analyses supporting the scale structure, and most Cronbach's alpha coefficients exceeding 0.70. Scales falling below this threshold were revised, repiloted, and reanalyzed. School-level variation in average scores ranged from 0.09 to 0.46 on a five-point scale, reflecting expected differences across schools. The survey was also evaluated for measurement validity (the accuracy of construct measurement) and functional validity (its usefulness for practice) through stakeholder reviews and collaboration with school leaders.

As guided by the QueerCrit framework, our analysis "engage[s] with the full complexity of gender" rather than "'collapsing the data' to remove trans and intersex individuals due to our small numbers within the general population" (Keenan, 2022, p. 302). We draw on survey data from 12,717 students enrolled in Grades 5-12 in 38 Massachusetts schools across seven districts. For comparison, there are around 300 public school districts in the state.

Only consortium districts that offered students the opportunity to self-identify as non-binary on the gender question were included. The included districts are diverse in terms of student racial demographics, poverty level, and urbanicity. The percentage of White students ranges from 20% to 82%, while the percentage of low-income students ranges from a low of 7% to a high of 87%. Two of the included districts are urban, three are suburban, one is rural, and one is a regional district that serves both rural and suburban areas. While districts are demographically diverse, participation in the consortium from which data were drawn was voluntary in nature. It is possible that districts that opted in to this consortium may differ in important ways from those that did not. Moreover, the districts included in the study allow students to self-identify as non-binary, suggesting that these communities may be more supportive of non-binary students. Students in the sample had at least three choices for the gender survey item: (1) Male, (2) Female, (3) Non-Binary. A small subset of districts also offered students a fourth open-response option: Some other gender, which we did not analyze in this project. Table 1 for comprehensive demographic information.

Surveys were administered during the 2023-2024 school year, with a response rate of 62.1%. We calculated the response rate by dividing the number of students who completed the survey by the total number of students enrolled in the surveyed schools. While all students, Grades 5-12, in participating districts were offered the survey, there are several reasons why not all students completed the survey. Some students were absent during implementation, some parents opted their students out of the survey, some students chose not to participate, and some survey responses were

removed during cleaning due to incompleteness or questionable response patterns, such as answering all items the same.

Table 1

District Demographics

District	Black	Asian	Hispanic	White	Multiracial/Other	Low-Income Students	Urbanicity
District 1	3%	3%	11%	78%	5%	24%	Suburban/Rural*
District 2	1%	3%	12%	82%	2%	87%	Rural
District 3	8%	28%	40%	20%	4%	70%	Urban
District 4	4%	1%	36%	54%	5%	60%	Suburban
District 5	3%	4%	65%	25%	3%	65%	Urban
District 6	2%	20%	4%	67%	7%	7%	Suburban
District 7	10%	1%	10%	62%	17%	60%	Suburban

Note. Demographics have been rounded to maintain district anonymity.
*This is a regional district that serves students from suburban and rural areas.

Two consent mechanisms were involved in this project, the first of which we were involved in as researchers. In line with our IRB application, students were explicitly informed that the survey is optional and that they can stop at any time. This is communicated to students through a written preamble to the survey and also verbally by their teachers, who use a script to administer the survey. The second consent process operates under the Protection of Pupil Rights Amendment. Districts create policies that provide notice and a pathway for parents (or students who are 18 years old or older) to opt out of educational surveys or activities. These policies vary by district and are the responsibility of the district. Typically, teachers are given a list of students whose parents have opted them out, so they do not administer the survey to those students. As researchers, we were not involved in the districts' opt-out processes. Our final sample consisted of students who self-identified as follows: 47.8% Male, 48.7% Female, and 3.5% non-binary. The percentage of students who self-identified as non-binary varied across the included districts from 2.6% to 11.9%. The number of non-binary students in each school in our sample ranged from 1 to 33, with an average of 13.7.

Table 2

Cross Table Comparing Race and Gender of the Sample

Gender	White	Non-White	Prefer Not to Say
Cisgender	3,721(29.3%)	7,782(61.2%)	762(6.0%)
Non-Binary	127(1.0%)	252(2.0%)	73(0.6%)

Note. Percentages may not add up to 100% due to rounding.

This project also draws on statewide enrollment data for the included districts. We retrieved this data from the Massachusetts Department of Elementary and Secondary Education website. Massachusetts utilizes a Student Information Management System (SIMS) that collects student-level data for all students enrolled in the state's public schools. Districts transmit this data to the state for all students using a secure portal (DESE, 2025).

Variables

Our model estimated the outcomes of 12 variables related to school climate: (1) physical safety (2) emotional safety, (3) sense of belonging, (4) value of learning, (5) academic challenge, (6) cultural representation, (7) engagement in school, (8) student-teacher relationships, (9) appreciation for diversity, (10) civic participation, (11) perseverance & determination, and (12) growth mindset. These climate measures were selected because positive school climates are associated with a reduction in harm for non-binary students (Trevor Project, 2023).

The **physical safety** variable measures the extent to which students feel safe and free from bodily harm at school. **Emotional safety** is based on students' reports about the nature of their relationships with one another. **Sense of belonging** measures the degree to which students feel understood, supported, and accepted by both their peers and school staff. **Cultural representation** measures the degree to which students see people from different backgrounds represented in the curriculum and their classrooms. This measure takes a definition of culture that encompasses identity broadly by asking questions like, "In your classes, how often do you see people like you represented in what you study?" It also asks about more traditional understandings of culture through questions like, "How valued do you think all students' home cultures and languages are in the school curriculum?" **Engagement in school** measures students' level of focus, participation, and interest in class.

Valuing of learning measures how important school is to students and how much they view themselves as learners. **Academic challenge** measures the degree to which teachers encourage students to strive for their best, work diligently, and grasp new concepts. The **Student-teacher relationships** variable measures the degree to which students feel respected and cared for by their teachers. **Appreciation for diversity** measures how much students consider diverse perspectives by exercising social perspective-taking. **Civic participation** measures how motivated students feel to get involved in their schools and beyond, including addressing challenging inequities. The **perseverance and determination** variable measures how persistent students are in achieving goals even amid setbacks. Finally, **growth mindset** measures the extent to which students see intelligence and ability as things that can be developed through effort, learning, and practice.

Analysis

To answer our first research question about the extent to which state data systems undercount non-binary students, we relied on descriptive statistics to compare the percentages of students who identified as non-binary in the survey to the percentages of non-binary students reported in state data systems for each district in the sample. To answer our second research question, we conducted a series of Welch's *t*-tests to better understand how non-binary students experience school compared to their cisgender peers. Welch's *t*-test is appropriate for situations where the sample sizes of comparison groups differ significantly, as is the case in the present study. Statistical analyses were performed using R version 4.0.3.

Findings

Non-Binary Erasure in State Datasets

Research question one asked how self-reported gender identity demographics compare to those collected by the state. According to state data for the 2023-2024 school year, 0.09% of students in Grades 5-12 at the included schools identified as non-binary. Student perception survey data, which allows students to self-identify gender each year, shows a higher rate of students self-identifying as non-binary during the same year, around 3.5%. This statistic is closer to national survey data findings that 3% of adults aged 18-29 identify as non-binary and 2% identify as transgender (Pew Research Center, 2022). The rate of students who identify as non-binary ranged widely across the included districts, from 2.4% in a wealthy Boston suburb to 11.9% in a rural town in the western part of the state. See Table 3 for data by district.

Table 3

Percentage of Non-Binary Students Self-Report vs. State Report Grades 5-12

District	Self-Report Non-Binary Students	% State Reported Non-Binary Students
District 1	38 (3.2%)	1 (0.04%)
District 2	32 (11.9%)	1 (0.24%)
District 3	153 (3.9 %)	6 (0.07%)
District 4	38 (2.6%)	1 (0.06%)
District 5	95 (3.1%)	4 (0.09%)
District 6	54 (2.4%)	3 (0.11%)
District 7	41 (7.6%)	3 (0.30%)
Total	451 (3.5%)	19 (0.09%)

Note: Percentages of state-reported non-binary students are from the Department of Elementary and Secondary Education.

Non-Binary Students Have Less Positive Schooling Experiences

To answer our second research question, comparing the experiences of non-binary students in the school with those of cisgender students, we conducted a series of *t*-tests. Results of *t*-tests suggested notable differences between non-binary students and their peers. On average, non-binary students tended to report less positive schooling experiences compared to students who identified as cisgender. In 10 of the 12 measures we examined, differences were statistically significant. Results for all measures are presented in Table 4.

Table 4

Results of T-Tests Comparing Cisgender & Non-Binary Student Experiences

Measure	Cisgender		Non-Binary		t(df)	p
	M	*SD*	*M*	*SD*		
Social-Emotional						
Physical safety	3.87	.77	3.64	.78	5.39(351)	1.327e-07***
Emotional safety	3.20	1.01	2.75	1.14	7.13(353)	5.727e-12***
Sense of belonging	3.27	.84	2.90	.94	7.20(350)	3.682e-12***
Academic						
Valuing of learning	3.35	.90	3.02	1.03	5.74(346)	2.023e-08***
Academic challenge	3.73	.87	3.37	1.07	6.14(353)	2.254e-09***
Cultural representation	3.28	.85	2.98	.98	5.62(352)	3.907e-08***
Engagement in school	2.88	.92	2.61	1.03	4.78(351)	2.566e-06***
Community						
Student-teacher relationships	3.28	.94	2.94	1.1	5.64(351)	3.503e-08***
Appreciation for diversity	3.40	.92	3.18	.99	3.92(361)	0.0001***
Civic participation	3.24	.88	3.11	1.03	2.39(349)	0.017*
Mindset						
Perseverance & determination	2.61	1.23	2.70	1.38	-1.26(343)	0.208
Growth mindset	2.96	1.04	3.60	1.19	-1.52(358)	0.129

*p < .05 **p < .01 ***p < .001*

Social Emotional Measures

Looking at social-emotional measures, non-binary students tended to rate their experiences across three domains lower than cisgender students. Non-binary students reported statistically significant lower levels of physical safety (M = 3.64, SD = .78) than their peers (M = 3.87, SD = .77), t(351) = 5.39, p = 1.327e-07. They also reported statistically significant lower levels of emotional safety (M = 2.75, SD = 1.14) compared to their peers (M = 3.20, SD = 1.01), t(353) = 7.13, p = 5.727e-12. Non-binary students reported statistically significant lower sense of belonging, on average, (M = 2.90, SD = .94) than male and female students (M = 3.27, SD = .84), t(350) = 7.20, p = 3.682e-12.

Academic Experiences

This trend extended to the academic domain. Non-binary students reported statistically significant lower levels of valuing of learning (M = 3.02, SD = 1.03) than their peers (M = 3.35, SD = .90), t(346) = 5.74, p = 2.023e-08. They also reported statistically significant lower levels of academic challenge (M = 3.37, SD = 1.07) than students who identify as cisgender (M = 3.73, SD = .87), t(353) = 6.14, p = 2.254e-09. Non-binary students reported feeling less engaged in school (M =

2.61, SD = 1.03) than their peers (M = 2.88, SD = .92), $t(351) = 4.78$, $p = 2.566e\text{-}06$—a finding was statistically significant. They reported statistically significant lower levels of seeing their culture represented in curriculum and learning materials (M = 2.98, SD = .98) than students who identify as cisgender (M = 3.28, SD = .85), $t(352) = 2.39$, $p = 3.907e\text{-}08$.

Sense of Community

On average, non-binary students reported statistically significant weaker relationships with their teachers (M = 2.94, SD = 1.1) compared to their peers (M = 3.28, SD = .94), $t(351) = 5.64$, $p = 3.503e\text{-}08$. They also reported less appreciation for diversity (M = 3.18, SD = 0.99) compared to students who identify as male or female (M = 3.40, SD = 0.92), $t(361) = 3.92$, $p = .0001$—a statistically significant finding. Non-binary students reported statistically significant lower levels of civic participation (M = 3.11, SD = 1.03) than their peers (M = 3.24, SD = .88), $t(349) = 2.39$, $p = .017$.

Mindset

We also examined two mindset measures; however, there was no significant effect for gender. Non-binary students reported slightly higher, but not statistically significant, perseverance and determination (M = 2.70, SD = 1.38) than students who identified as male and female (M = 2.61, SD = 1.23), $t(343) = -1.26$, $p = .208$. Non-binary students also rated their growth mindset higher (M = 3.60, SD = 1.19) than their peers (M = 2.96, SD = 1.04), $t(358) = -1.52$, $p = .129$; however, this was also not statistically significant.

Of course, these dispositions are important for all students, and it is particularly striking that non-binary students stand out on these measures in spite of the overwhelmingly negative trends in their social experiences of school. Due, in part, to the small sample size that is endemic to this population of students, our results on the mindset measures were not statistically significant. As a result, we cannot make larger statements about whether this trend holds up across the larger K-12 student population. Instead, we offer this finding as an example of how nuanced data collection can highlight both the harms experienced by non-binary students and the strengths of students who face these harms.

Discussion

Current Practices Erase Students

Under the current system, the gender selection parents make for their children upon initial school enrollment follows students through their K-12 school careers. However, in most locations, these selections severely underreport non-binary students in the data, which limits the usability of the data to understand non-binary student experiences. Given that self-reported gender data tends to more accurately align with the estimates of non-binary people in the general population, this study has implications for the way states collect and report data on gender. Allowing students to anonymously or confidentially self-report gender on student experience surveys, for example, can mitigate the erasure of non-binary students in datasets. Moreover, allowing students to self-identify annually would allow for gender identity fluidity. Recent scholarship finds that trans and non-binary youth experience fluidity in both gender identity and sexual orientation identity (Katz-Wise et al., 2024). Allowing students to self-identify on an annual basis would enable more accurate data collection.

Current Practices Limit School Improvement Practices

Our findings—that non-binary students' schooling experiences are more negative than those of their peers—illustrate how more accurate data could be used as a starting point for understanding more nuanced gender differences across student populations, and for tracking efforts to create more gender-inclusive environments. For example, with accurate data, a concerned school leader might implement practices, such as including non-binary students in the school curriculum, and then measure the change over time in non-binary students' ratings of curriculum diversity.

Despite the value of more inclusive data practices, political hurdles abound. While some districts do use inclusive data collection practices like those we recommend here, district leadership in these locales are vulnerable to backlash from so-called parents' rights advocates, aligned with White Christian Nationalism, who cite "harmful" practices, which they claim "indoctrinate" students and undermine "Judeo-Christian values" (e.g., Massachusetts Family Institute, 2021, n.p.; Parents Defending Education, 2023, n.p.). The Massachusetts Family Institute (MFI), for example, has targeted Massachusetts school districts for utilizing surveys that ask about gender identity. MFI followers have attended school committee meetings and demanded the resignation of district leaders. Nationwide, this type of disruptive behavior raises safety concerns and incurs taxpayer dollars. This makes implementing gender-inclusive policies at the local level costly and, in some cases, unsafe. Districts—even those in "blue" states—may bow to special interest groups when put into this position. In fact, one Massachusetts district recently targeted by a parental rights organization now considers opt-in policies on a survey-by-survey basis (Burlington Public Schools, 2025). This shift limits school improvement by dismantling the data systems that school leaders rely on. We view this effort as part of a larger political ideology. White Christian Nationalists espouse that only two genders exist. By crippling data systems that provide evidence of a third gender category or that gender exists on a spectrum, their narrative is easier to tell.

A Call for Stronger State Stances

Stronger state stances on data collection practices can shield districts from political actors while allowing schools and districts to collect essential feedback to improve the experiences of non-binary students. If a state like Massachusetts, which has historically demonstrated strong support for LGBTQ+ causes, were to mandate inclusive data collection, White Christian Nationalist organizations would not be incentivized to target local districts. This would relocate policy contestation to the state level, effectively shielding schools and districts. Even if only a small number of states began systematically collecting data using inclusive practices, this would also create larger datasets that could be used for non-binary advocacy beyond those states.

Given the pervasive sense of fear and caution in the current political environment, there are understandable questions. For example, is increased state-level action even possible under a retributive and increasingly authoritarian federal government? While the inclination to coalesce with federal "mandates" is strong, it is essential to note that half of the states are not adhering to the education guidance issued by the Trump administration. At the time of this writing, nearly eight months have passed since the Trump administration issued its "Dear Colleague" letter, threatening to eliminate funding for public schools that use DEI. Still, 25 states have refused to certify the letter (Lustick, 2025). Legal experts have noted that the Trump administration is largely relying on self-censorship and anticipatory adherence to directives that are not based in the law—a common tactic in authoritarian regimes (Yuen & Lee, 2025). Despite the risks, a sizable number of states continue to take positions aligned with educational equity, suggesting that resistance remains both possible and necessary. Even with the shortcomings noted in our research, Massachusetts and other states already collect data on non-binary students. Improving and protecting these practices would not

require major policy changes. Moreover, in Massachusetts, protective measures for trans people have already been passed. Taking advantage of these political conditions would further protect data systems and local districts.

Much has been written about how authoritarian regimes employ large-scale data systems to reinforce and extend their power (e.g., Carlitz & McLellan, 2021; Kabanov & Karyagin, 2018; Zeng, 2016). We believe that there is also a grave threat to data systems at the individual school and district levels. These data systems comprise a robust network of smaller-scale data that is less susceptible to the threat of federal governance whims. These smaller state and district systems are incredibly important. Unfortunately, the current network of parental rights/White Christian Nationalist organizations is adept at causing conflict and disruption at the local level (Rogers et al., 2024). Disassembling these data practices at the local level further serves the ideology of White Christian Nationalists, who maintain that biological gender has two discrete sexes: man and woman. Data on non-binary students validates the existence of non-binary people. Destroying data systems in a world governed by big data supports their ideological mission of erasing non-binary people.

Study Limitations and Considerations for Research

The primary limitation of this study is that our analysis considers gender identity narrowly (non-binary vs. cisgender) and without regard to other characteristics, like race and poverty, that are connected to students' schooling experiences. Furthermore, our analysis does not account for the role that schools or districts play in shaping schools as inclusive spaces that welcome diverse students. Our choice to use *t*-tests is a result of the population size of non-binary students in our dataset. While our sample includes nearly 400 non-binary students, the statistical power of the population diminishes when disaggregated to consider factors like race or school and district clustering, thereby limiting the statistical power and scope of possible analyses. While more advanced statistical analyses, such as multivariate multiple regression or multilevel modeling, would be preferred, the present dataset does not permit them.

This challenge is not unique to this study but reflects a broader issue in educational research: non-binary students constitute a small proportion of the population and are frequently rendered invisible by inadequate or binary-only data collection practices in schools and districts. As a result, researchers working to document their experiences often face constraints in terms of sample size and analytical options. These constraints highlight the need for increased efforts to accurately represent non-binary students in datasets. In the meantime, these structural limitations demand a rethinking of methodological expectations. In contexts where large samples and complex modeling are not feasible, simpler statistical approaches—such as descriptive statistics and independent-sample *t*-tests—can offer valuable insights. We encourage journal editors and reviewers to recognize the importance of inclusive research and to support studies that use accessible, transparent methods to shed light on marginalized populations. Continuing to hold studies of non-binary students to the same sample-size-driven standards as those of larger populations risks perpetuating their erasure from education research. In addition, the need for an increased sample size may lead to research that considers non-binary as a monolithic category. Research, however, notes the importance of "unpacking the T" in LGBTQ to explore the variety and fluidity of gender identity that exists underneath the non-binary label (Leonardi et al., 2021). This tension is one that scholars are currently grappling with (Albaugh et al., 2025). While this approach is indeed necessary to achieve the level of nuance that non-binary students deserve, it also risks further extending the sample size challenges described in our study.

As researchers, we are currently collaborating with educational leaders to obtain access to historical data, which would enable us to pool multiple years of data to increase statistical power and

facilitate more advanced statistical analyses. Such analyses would enable us to examine how other identities, such as race and poverty, intersect with gender identity to shape students' experiences at school. Pooling multiple years of data would also allow us to investigate how school and district contexts shape the social-emotional experiences of non-binary youth. In the present study, we found that students self-identified as non-binary at the highest rate in a rural school district in the Western part of the state and at the lowest rate in a posh Boston suburb, raising questions about how school and district cultures might shape students' comfort in self-identifying as non-binary. In future research, we could ask, for example, whether certain cultural variables are more malleable to school-level influence. Answering such a question could provide actionable insights for school leaders who want to better support our most vulnerable students.

Lastly, as noted above, the non-binary students in our sample demonstrated higher levels of perseverance and determination than their peers who identify within the gender binary. Although these results did not show a statistically significant difference, the finding is worth noting, given the overwhelming lack of evidence about the schooling experiences of non-binary students. Specifically, we believe that the results from our pilot study warrant further research to evaluate these trends with a sample size that is more conducive to statistical significance. With more accurate data and more possibilities for large-scale research, we might see non-binary students through the lens of their challenges as well as their remarkable resilience. Indeed, non-binary students might have something to teach us all about perseverance and determination; yet, those messages are often lost when students' data are suppressed during analysis.

Conclusion

This study reveals how dominant data collection practices in U.S. K–12 education systematically undercount and erase non-binary students, thereby reinforcing a gender binary that fails to reflect the full diversity of student identities. When non-binary students are not allowed to self-identify, they are rendered invisible in aggregate data, limiting schools' ability to understand and respond to their experiences. By analyzing a dataset that includes an explicit non-binary category, this research provides a more comprehensive and nuanced understanding of students' experiences with school culture. The data show that non-binary students often experience less belonging, lower levels of academic engagement, and greater feelings of isolation compared to their peers—insights that would remain obscured under binary-only reporting systems.

These findings carry urgent implications for policy and practice. White Christian Nationalists frequently target school districts that use inclusive data practices on student surveys. States with the political will to do so should enact policies to mandate inclusive data practices, such as allowing students to self-identify their gender annually on student perception surveys. Such efforts would relocate policy contestation to the state level, thereby removing costly and consequential disputes between special interest actors and school and district leadership.

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Appendix A

Survey Scales

Physical Safety

- How often do you worry about violence at your school?
    - Almost never
    - Rarely
    - Occasionally
    - Regularly
    - Very frequently
- How often do students get into physical fights at your school?
    - Almost never
    - Rarely
    - Occasionally
    - Regularly
    - Very frequently
- Overall, how physically safe do you feel at school?
    - Extremely unsafe
    - Quite unsafe
    - Somewhat safe
    - Quite safe
    - Extremely safe
- How often do you feel like you might be harmed by someone at school?
    - Almost never
    - Rarely
    - Occasionally
    - Regularly
    - Very frequently

Emotional Safety

- How often are students unkind to each other at this school?
    - Almost never
    - Rarely
    - Occasionally
    - Regularly
    - Very frequently
- How often are students at this school unkind to each other online?
    - Almost never
    - Rarely
    - Occasionally
    - Regularly
    - Very frequently
- How much bullying occurs at this school?
    - Almost none
    - A little bit
    - Some
    - Quite a bit
    - A tremendous amount

Sense of Belonging

- At your school, how accepted do you feel by the other students?
    - Not at all accepted
    - A little accepted
    - Somewhat accepted
    - Quite accepted
    - Extremely accepted
- Overall, how much do you feel like you belong at your school?
    - Do not belong
    - Belong a little bit
    - Belong somewhat
    - Belong quite a bit
    - Almost totally belong
- How well do people at your school understand you?
    - Don't understand me
    - Understand me a little
    - Understand me somewhat
    - Understand me quite a bit
    - Understand me extremely well
- How much respect do students in your school show you?
    - No respect at all
    - A little bit of respect
    - Some respect
    - Quite a bit of respect
    - A great deal of respect
- How connected do you feel to the adults at your school?
    - Not at all connected
    - Slightly connected
    - Somewhat connected
    - Quite connected
    - Extremely well connected

Valuing of Learning

- Overall, how important is school to you?
    - Not at all important
    - Slightly important
    - Somewhat important
    - Quite important
    - Extremely important
- How curious are you to learn more about things you talked about in school?
    - Not at all curious
    - Slightly curious
    - Somewhat curious
    - Quite curious
    - Extremely curious
- How much do you enjoy learning in school?
    - Do not enjoy at all
    - Enjoy a little bit
    - Enjoy somewhat

- o Enjoy quite a bit
- o Enjoy a tremendous amount
- How much do you see yourself as a learner?
  - o Don't see myself as a learner at all
  - o See myself as a learner a little bit
  - o See myself somewhat as a learner
  - o See myself as a learner to some extent
  - o See myself completely as a learner

Academic Challenge

- How much does your teacher encourage you to do your best?
  - o Does not encourage me at all
  - o Encourages me a little bit
  - o Encourages me some
  - o Encourages me quite a bit
  - o Encourages me a tremendous amount
- When you feel like giving up on a difficult task, how likely is it that your teacher will help you keep trying?
  - o Does not help me at all
  - o Helps me a little bit
  - o Helps me some
  - o Helps me quite a bit
  - o Helps me a tremendous amount
- How often does your teacher ask you to explain your answers?
  - o Almost never
  - o Rarely
  - o Occasionally
  - o Regularly
  - o Very frequently
- How often does your teacher take time to make sure you understand the material?
  - o Almost never
  - o Rarely
  - o Occasionally
  - o Regularly
  - o Very frequently

Cultural Representation

- In your classes, how often do you see people like you represented in what you study?
  - o Almost never
  - o Rarely
  - o Occasionally
  - o Regularly
  - o Very frequently
- How valued do you think all students' home cultures and languages are in the school curriculum?
  - o Not at all valued
  - o Slightly valued
  - o Somewhat valued
  - o Quite valued
  - o Extremely valued

- In your classes, how often do you see many different kinds of people represented in what you study?
    - Almost never
    - Rarely
    - Occasionally
    - Regularly
    - Very frequently
- How valued do you think your home culture and language are in the school curriculum?
    - Not at all valued
    - Slightly valued
    - Somewhat valued
    - Quite valued
    - Extremely valued

Engagement in School

- Overall, how interested are you in your classes?
    - Not at all interested
    - Slightly interested
    - Somewhat interested
    - Quite interested
    - Extremely interested
- How excited are you about going to your classes?
    - Not at all excited
    - Slightly excited
    - Somewhat excited
    - Quite excited
    - Extremely excited
- How often do you get so focused on class activities that you lose track of time?
    - Almost never
    - Rarely
    - Occasionally
    - Regularly
    - Very frequently

Student-Teacher Relationships

- When your teacher asks how you are doing, how often do you feel that he/she is really interested in your answer?
    - Almost never
    - Rarely
    - Occasionally
    - Regularly
    - Very frequently
- How interested is your teacher in what you do outside of class?
    - Not at all interested
    - Slightly interested
    - Somewhat interested
    - Quite interested
    - Extremely interested
- If you walked into class upset, how concerned would your teacher be?
    - Not at all concerned

- o Slightly concerned
- o Somewhat concerned
- o Quite concerned
- o Extremely concerned
- If you came back to visit class three years from now, how excited would your teacher be to see you?
  - o Not at all excited
  - o Slightly excited
  - o Somewhat excited
  - o Quite excited
  - o Extremely excited
- If you had something on your mind, how carefully would your teacher listen to you?
  - o Not at all carefully
  - o Slightly carefully
  - o Somewhat carefully
  - o Quite carefully
  - o Extremely carefully

Appreciation for Diversity

- In general, how often do you try to understand how other people see things?
  - o Almost never
  - o Rarely
  - o Occasionally
  - o Regularly
  - o Very frequently
- How often do you try to think of more than one explanation for why someone else acted as they did?
  - o Almost never
  - o Rarely
  - o Occasionally
  - o Regularly
  - o Very frequently
- Overall, how often do you try to understand the point of view of other people?
  - o Almost never
  - o Rarely
  - o Occasionally
  - o Regularly
  - o Very frequently

Civic Participation

- How important is it to you to take action when something in society needs changing?
  - o Not at all important
  - o Slightly important
  - o Somewhat important
  - o Quite important
  - o Extremely important
- How much do you believe that being concerned with national, state, and local issues is everyone's responsibility?
  - o Not at all
  - o A little bit

- o Somewhat
- o Quite a bit
- o A great deal
- How important is it to you to get involved in improving your community?
  - o Not at all important
  - o Slightly important
  - o Somewhat important
  - o Quite important
  - o Extremely important
- How important is it to you to actively challenge inequalities in society?
  - o Not at all important
  - o Slightly important
  - o Somewhat important
  - o Quite important
  - o Extremely important

Perseverance & Determination

- If you face a problem while working towards an important goal, how well can you keep working?
  - o Not well at all
  - o Slightly well
  - o Somewhat well
  - o Quite well
  - o Extremely well
- How important is it to you to finish things you start?
  - o Not at all important
  - o Slightly important
  - o Somewhat important
  - o Quite important
  - o Extremely important
- How confident are you that you can remain focused on what you are doing, even when there are distractions?
  - o Not at all confident
  - o Slightly confident
  - o Somewhat confident
  - o Quite confident
  - o Extremely confident
- If you fail to reach an important goal, how likely are you to try again?
  - o Not at all likely
  - o Slightly likely
  - o Somewhat likely
  - o Quite likely
  - o Extremely likely

Growth Mindset

- How much do you think that being bad at math is something someone can change?
  - o Can't change it at all
  - o Can change it a bit
  - o Can change it somewhat
  - o Can change it significantly

- o   Can change it tremendously
- How much do you think you can change your own intelligence?
  - o   Can't change it at all
  - o   Can change it a bit
  - o   Can change it somewhat
  - o   Can change it significantly
  - o   Can change it tremendously
- How much do you think that struggling as a writer is something someone can change?
  - o   Can't change it at all
  - o   Can change it a bit
  - o   Can change it somewhat
  - o   Can change it significantly
  - o   Can change it tremendously
- How much do you think that intelligence is something that can be changed?
  - o   Can't change it at all
  - o   Can change it a bit
  - o   Can change it somewhat
  - o   Can change it significantly
  - o   Can change it tremendously