



Unveiling Racism: A Systematic Review of Survey Measures of Racism in Education

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Education policy research aimed at eliminating racism necessitates methodological innovation that fosters both equity-centered approaches and robust empirical analysis of the systemic nature of racism. Most quantitative research in educational psychology omits the racist environment that students in K-12 education exist in (DeCuir-Gunby & Schutz, 2014; Strunk & Andrzejewski, 2023). Drawing from Bronfenbrenner's ecological systems theory and the ethos of QuantCrit, this study evaluates various scales to highlight gaps and challenges in measuring racism within school settings using survey scales. This review aims to uplift survey measures for researchers to use in their work and advocate for more targeted resources and reparations. Reviewing 66 studies and 50 unique survey scales, key findings include the overreliance on scales designed to measure racial discrimination at the intrapersonal level, while systemic factors are often overlooked. Most measures were self-report surveys for older students developed more than 15 years ago. The results demonstrate the need to move beyond measures of intrapersonal racism to more up-to-date, multi-dimensional tools. The study's findings also underscore the necessity of constant reevaluation of the tools used to match the shifting cultural realities of how racism operates, and the specific ways it impacts marginalized communities. As racism continues to evolve, so too must the methods by which it is measured.

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Unveiling Racism: A Systematic Review of Quantitative Measures of Racism in Education

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Abstract:

Education policy research aimed at eliminating racism necessitates methodological innovation that fosters both equity-centered approaches and robust empirical analysis of the systemic nature of racism. Most quantitative research in educational psychology omits the racist environment that students in K-12 education exist in (DeCuir-Gunby & Schutz, 2014; Strunk & Andrzejewski, 2023). Drawing from Bronfenbrenner’s ecological systems theory and the ethos of QuantCrit, this study evaluates various survey scales to highlight gaps and challenges in measuring racism within school settings. This review aims to uplift survey measures for researchers to use in their work and advocate for more targeted resources and reparations. Reviewing 66 studies and 50 unique scales, key findings include the overreliance on scales designed to measure racial discrimination at the intrapersonal level, while systemic factors are often overlooked. Most measures were self-report surveys for older students developed more than 15 years ago. The results demonstrate the need to move beyond measures of intrapersonal racism to more up-to-date, multi-dimensional tools. The study’s findings also underscore the necessity of constant reevaluation of the tools used in order to match the shifting cultural realities of how racism operates, and the specific ways it impacts marginalized communities. As racism continues to evolve, so too must the methods by which it is measured.

Key words: Racism, Race, Ethnicity, Discrimination, systemic, institutional, interpersonal,
intrapersonal

Racism, not race, is a root cause of inequities in educational and life outcomes. These inequities stem from an egregious history of colonization, disenfranchisement, dehumanization, forced removal, genocide, and enslavement (Bailey et al., 2015) and have been well documented (c.f. Harber et al., 2012; Kozol, 2012; Nicholson-Crotty et al., 2016; Okonofua & Eberhart, 2015; U.S. Department of the Treasury, 2023). Nonetheless, the majority of quantitative research in educational psychology fails to consider the pervasive racism students in K-12 education experience (DeCuir-Gunby & Schutz, 2014; Strunk & Andrzejewski, 2023). This omission ultimately results in flawed methodology and potentially causes more harm by reinforcing systemic inequities.

Education policy research aimed at eliminating racism in the educational environment necessitates methodological innovation that fosters both equity-centered approaches and robust empirical analysis of the systemic nature of racism. Mitigating and eliminating racism will be a multifaceted effort. One approach is to move away from the status quo of using racial and ethnic identity as a control for racism and instead directly attempt to estimate the impact of racism (Castillo & Strunk, 2024). Reviews of quantitative measures of racism exist in other sectors, such as health (Atkins, 2014; Furtado et al., 2023; Groos et al., 2018) and psychology (Schooley et al., 2019), but none to date completed in education. This gap leaves the field lacking comprehensive measures to accurately assess the racism students encounter in educational environments. This review directly addresses this void in the literature with the goal of identifying and advancing tools for researchers to use in their work, and advocating for more targeted resources and reparations. Specifically, research questions include: 1) What are the features of the quantitative measures and tools used to measure racism in education? 2) For what

reasons were the measures used? 3) How do these measures operationalize racism and take into account (or not) the multiple contexts of education?

Significance

The murders of George Floyd, Breonna Taylor, and Ahmaud Arbery sparked a resurgence of the Black Lives Matter (BLM) movement during the global pandemic (Kolluri et al., 2023). Their unjust deaths brought race and racism to the forefront of American consciousness, along with increased acknowledgment that racism and white¹ supremacy were still alive and well. In the summer of 2020, polling found that 76% of Americans stated racism was a problem compared to 53% in 2015 (Monmouth University, 2020). Yet, America's pandemic-era racial reckoning was short-lived. A year later, 90% of the \$50 billion pledged from corporations to racial equity organizations and causes had yet to actually materialize (Jung, 2021), and support for the BLM movement dropped 20 percentage points, returning to pre-pandemic levels (Chudy & Jefferson, 2021). This rapid shift underscores the urgency of developing better tools to measure racism: failure to do so enables denial of the existence of racism and hinders advocacy for resources aimed at eliminating racism. Furthermore, if quantitative researchers are not encouraged to measure racism, the field risks maintaining the status quo by studying 'race' without ever examining the impact of racism on racial disparities in education (Harper, 2012).

The common adages say, “what gets measured, gets managed” and “what gets measured, gets done.” If we measure racism, we can: 1) manage and address it effectively with data-driven interventions and policies; 2) track our progress as a society in combating it; and 3) raise awareness in those who may not believe they are directly affected (positively or negatively) by it.

¹ We intentionally use a lowercase white to distance ourselves from white supremacists who capitalize the term (Daniszewski, 2020).

An example of the impact of measurement can be seen when, in the last decade, researchers, practitioners, and communities have also pushed to use and measure social-emotional learning (SEL), including self-efficacy and student belonging (CASEL, n.d.). And now, at least 19 large districts are measuring SEL-related indicators, including Austin, Atlanta, Boston, Baltimore, Chicago, Cleveland, Denver, Minneapolis, Nashville, Oakland, Sacramento, and Tulsa (Committee for Children, 2019). The American Teacher and School Leader Panel Survey found that in the 2023-24 school year, 83% of districts used a SEL program or curriculum, up from 66% two years prior (Skoog-Hoffman et al., 2024). And in 2019, Congress passed a bill allocating 123 million in federal funding for SEL (Stringer, 2019). Because of these new approaches to using data, communities now understand the problem and are better equipped to improve SEL in schools.

In advocating for the *quantitative* measurement of racism, it is important to first acknowledge and reckon with the eugenic roots of statistics and psychometrics methods. Frequently used statistical concepts, such as the F-test, regression, and correlation, were developed by known eugenicists Ronald Fisher, Francis Galton, and Karl Pearson, respectively, to give scientific backing to racist concepts of the genetic superiority of white people and the intellectual inferiority of Black people (Evans, 2020; Weiss, 2010; Zuberi, 2001). Pioneers in the field of psychometrics were also known eugenicists. Edward Thorndike and Robert Yerkes, pioneers of early intelligence and mass testing, asserted that innate differences in intelligence are directly related to racial hierarchy. Yerkes developed the Army Alpha aptitude test that was used specifically to exclude Black men from officer rankings in the military (Castillo & Strunk, 2024). That same framework was used to design the SAT (formerly known as the Scholastic Aptitude Test), which is still used today as a college entrance exam (Lemann, 1999). “Racism is, so to

“speak, baked into the bread” (Castillo & Strunk, 2024) because performing well on many aptitude tests (including the SAT) and other standardized assessments relies on understanding vocabulary and culturally specific associations that reflect predominantly white, middle-class norms (Au, 2020; Gillborn, 2016; Modaffari & Jimenez, 2021). It logically follows that students of Color score poorly on assessments that do not reflect their background and culture, reinforcing a deficit narrative about their abilities that detracts from stakeholders from addressing the cumulative impacts of systemic racism (Harper & Davis, 2012; Howard, 2013; Noguera, 2003; Randall, 2021). These tests’ racist legacies continue to permeate modern educational practices and assessments, to the detriment of progress and sustain the status quo (white supremacy).

The roots of quantitative methods are not just historical. Although eugenics fell out of favor post World War II, eugenicist statisticians continued publishing racist ideas in scholarly research throughout the 60s and 70s (c.f. Cattell, 1965; Jencks, 1972; Terman, 1961). As recently as the ‘90s, Charles Murray and Herrnstein published *The Bell Curve* (1994), attributing racial and gender differences to genetics, not systemic discrimination. These methods are still deployed today to justify and explain societal stratification, rationalize under-funding of schools for students of Color, and place the blame on communities of Color for educational and other life outcome disparities (Allen et al., 2008; Carter, 2005; Strunk, 2022). For instance, the frequently repeated (but false) claim that students of Color are less motivated or lack work ethic compared to white students is a socially created rather than a biological explanation for educational disparities. This argument persists in some educational research, despite that it has been thoroughly debunked by rigorous, racially-conscious scholars (e.g., Castillo, 2020; Harper & Davis, 2012), further emphasizing the need for changes in quantitative methods.

Many frameworks have attempted to “flip the script” and use data for justice, including data feminism (D’Ignazio & Klein, 2020), QuantCrit (Gillborn et al., 2018), and critical quantitative inquiry (Stage, 2007). Although ours is *not* a QuantCrit study because we primarily followed traditional systematic review methods to guide the work, this study is grounded in tenets of QuantCrit as it first and foremost centers on the realities of racism and advocates for measuring it (Gillborn et al., 2018). Aligned with another tenet of QuantCrit, “Data is not neutral,” we acknowledge that data and assessments created by mostly white researchers have been used to legitimize racial inequities (National Center for Education Statistics, n.d.). The last tenet of QuantCrit, “a social justice and equity orientation,” is also applied as this study’s purpose is to both uplift tools and call for the creation of new tools to more accurately measure racism with the intention of using data to advocate for resources and reparations for oppressed communities.

A promising practice of QuantCrit is to provide a positionality statement wherein all authors explore their positions in society and potential biases (Boveda et al., 2023; Randall, 2021). For brevity, and given space constraints, we have provided a team positionality statement:

We are a racially diverse team composed of three Latinas, two Black women, 1 Latino, and 1 white woman. We hold many intersectional identities including but not limited to being a member of the LGBTQ community, 1st or 2nd generation immigrants in this country, parents, members of the working/lower class, English Learners, disabled, and first-generation college students. Everyone on the team acknowledges that they have been positively (white author) and negatively (authors of Color) impacted by racism in their schooling. Specifically, team members can recall teachers holding lower expectations for students of Color,

tracking, and/or attending segregated, dilapidated public schools. All of us have been trained in traditional statistics and/or psychometric methods, and most at elite universities. Everyday we work to unlearn these approaches and relearn statistics with an eye for racial equity. Many, but not all of us, continue to be affiliated with prestigious universities. We recognize the privileges and credibility that are automatically assumed because of where we trained and who we trained with. We pledge to use this amplified credibility for justice for Black and Brown communities. We also are upfront and transparent about using our *cultural intuition* (Perez et al., 2018) that stems from our backgrounds and experiences as a source of knowledge to contribute to this study.

Theoretical Framework

According to Bronfenbrenner's (1977) ecology of human development, humans interact with experiences within their environments to grow and progress. Said differently, individuals exist within systems with which they interact. These systems are in turn nested within each other. Bronfenbrenner proposes four levels, moving outward: microsystems, mesosystems (spans between microsystems), exosystems, and macrosystems. In later conceptions of the model, Bronfenbrenner stressed that these systems change throughout the lifespan and depend on a person's personal characteristics, such as race and gender (Bronfenbrenner, 1988; Rosa et al., 2013), yet still did not consider racism explicitly.

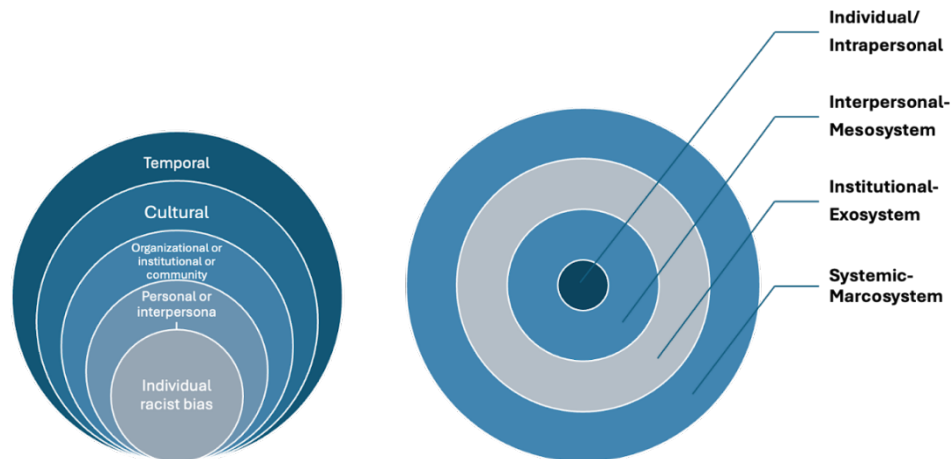
Bronfenbrenner's (1977) ecological systems theory has been criticized by racial equity scholars for its neutral stance on race and failing to take into account the interlocking systems of racism that individuals experience (Crawford et al., 2020; Pat, 2013; Skinner-Dorkenroo et al.,

2023; Stern et al., 2022); particularly in the ways Black and Brown individuals experience overlapping systems of overt and covert layers of oppression in both racial, gender, and other types of discrimination. Recently, racial equity scholars have *reclaimed* the theory by explicitly reconceptualizing Bronfenbrenner’s model to study race and racism; the model provides an apt framework for understanding racism as it occurs at each of these levels and is perceived by an individual differently throughout their lifetime. For example, Stern and colleagues applied it (2022) to study Black youth, Crawford et al. (2020) for studying underrepresented populations in gifted education, and Paat (2013) for immigrant families. Each example provided the team with historical context for marginalized populations, added examples of racism in each level of the Bronfenbrenner model, and thus supported the definitions used for coding (see coding section).

We follow previous scholarship and also adapt Bronfenbrenner’s model for the purposes of understanding the measurement of racism (Crawford et al., 2020; Paat, 2013; Peterson, 2014; Skinner-Dorkenroo et al., 2023; Stern et al., 2022). We closely follow Skinner-Dorkenroo and colleagues’ (2023) contemporary and relevant approach to using models of nested influence to understand race relations (Bronfenbrenner, 1979; Peterson, 2014). We have adapted Skinner-Dorkenroo’s and colleagues’ model of Bronfenbrenner’s (1979) theory as visualized below in Figure 1, with Skinner-Dorkenroo’s on the left and this study’s adaption on the right.

Figure 1

Adaptation of Skinner-Dorkenroo and Bronfenbrenner Model



Skinner-Dorkenroo's et al.'s (2023) individual racist bias level maps to Bronfenbrenner's individual level, which involves an individual's immediate surroundings, such as the home, work, or educational setting. Skinner-Dorkenroo and colleagues (2023) personal or interpersonal is equivalent to Bronfenbrenner's microsystems. In this study, we define the individual level as intrapersonal racism, which is a person's internal perceptions of self and/or groups based on race or ethnicity. Beyond a single person, Bronfenbrenner (1977) called the mesosystem "a system of microsystems" (p. 515), sets of interactions that occur between people and the immediate settings at a particular age. For example, students interact with their families or guardians, while said families or guardians also have relationships with school staff. In this study, like Skinner-Dorkenroo et al.'s (2023), we also call it interpersonal racism and define it as racism that is relational or enacted between individuals. Skinner-Dorkenroo and colleagues' (2023) organizational/institutional/community level is similar to Bronfenbrenner's exosystem, which involves larger structures that directly impact students. Such larger structures may include government agencies, the media, social services, and extended social networks. The internet services or transportation capabilities of the student's environment would impact the student's ability to interact with the smaller systems of school or work. They can, therefore, directly

impact the student daily. Like Skinner-Dorkenroo et al. (2023), we call it institutional racism to describe it as racism that occurs at the community level and that varies for sub-groups in society. Finally, Bronfenbrenner's macrosystem is the largest system. It does not relate to the specific environments of the person, and rather, it revolves around the cultural norms and guidelines that create the smaller settings. These guidelines may be formal, such as the rules that dictate the number of students and resources available in public school classrooms. These guidelines may also be informal or unwritten, such as society's expectations regarding discipline or performance. These adaptations provided examples and guidance in various aspects of educational contexts for the coding aspect of the project (see Method).

Literature on Prior Measurement of Racism

The direct measurement of racism is critical to understanding its far-reaching impacts on individuals and society. Historically, researchers have often relied on proxy variables, such as race, to infer the presence of racism, interpreting differences in outcomes between racial groups as potentially driven by individual, structural, or systemic racism (Author, 2022). However, this approach has limitations. Relying solely on race to stand in for racism oversimplifies the nuanced and dynamic ways racism operates. Racism is not experienced uniformly by all members of a racial group; rather, it is a fluid and complex system that manifests differently depending on the context, moment, and individual (Bonilla-Silva, 2021). This complexity highlights the necessity for researchers to move toward more direct measures of racism that can capture its variability and provide a clearer understanding of how it shapes life chances and outcomes.

Survey-based measures remain one of the most prevalent methods for directly assessing individual experiences of racism, particularly among people of Color. These measures aim to

capture both overt and subtle forms of discrimination and therefore are the focus of our review. For instance, the Adolescent Discrimination Distress Scale includes items such as "You were discouraged from joining an advanced level class" focusing on more explicit forms of racial discrimination (Fisher et al., 2000). Similarly, the Perceived Racism Scale includes questions about experiences like exclusion from study groups or discomfort in the classroom based on race (Dominguez McNeilly et al., 1996). These instruments have been foundational in capturing the everyday realities of racial discrimination, though they are not without limitations. The challenge lies in the fact that racism is constantly evolving, and these measures must be regularly reassessed to ensure they remain relevant and accurate in capturing contemporary forms of racism (Domínguez & Embrick, 2020).

The measurement of microaggressions, a more subtle form of individual-level racism, has also gained traction in recent years. Microaggressions refer to slight, often unconscious comments or behaviors that convey negative racial attitudes (Sue et al., 2007). Instruments like the Racial and Ethnic Microaggressions Scale aim to capture these daily slights, with items such as "Someone assumed that I would have a lower education because of my race" and "Someone avoided eye contact with me because of my race" (Nadal, 2011). However, measuring microaggressions presents distinct challenges. Microaggressions are often subtle and ambiguous, making it difficult for individuals to definitively label their experiences as racially motivated, a phenomenon referred to as racial gaslighting (Sue et al., 2007). This ambiguity can result in underreporting or misinterpretation of experiences, complicating the survey process. Thus, while scales measuring microaggressions provide valuable insights into everyday racism, they also require careful consideration of the subtlety of these interactions (Domínguez & Embrick, 2020).

We therefore include measures that look beyond individuals and extend to institutions and structures, to understand the strengths and limitations of measurement of racism at all levels.

We acknowledge the limitations associated with surveys based on self-reports, particularly to measure racist beliefs and attitudes (West et al., 2016). White respondents often deny harboring racist beliefs and/or due to social desirability bias survey takers (students, teachers, parents) may respond to an item in a manner that s/he believes will please or avoid hurting others, making self-report measures unreliable (Bonilla-Silva, 2021; Paulhus, 2002). Self-report scales are also vulnerable to reference bias, which is the idea that students respond in reference to their classmates, school, peer group, family, and/or community (West et al., 2016). For example, one among many potential sources of reference bias is differences in the characteristics of the schools that have high concentrations of students of Color compared to those who have low concentrations (Reardon et al., 2013; West et al., 2016). Majority white schools are more likely to attend high-resourced schools (Reardon et al., 2013) and, as a result, students from varying racial groups will experience different points of reference for gauging what it means to “have teachers who look like you” or “feel like you belong.”

Overall, while survey-based measures are not without challenges, they also provide an essential framework for directly measuring racism and have advantages over other types of quantitative measurement. For large scale data collection, researchers and practitioners can quickly, easily, and cheaply administer self-report scales to thousands of students (West et al., 2016). Additionally, self-report scales can be tailored to ask questions about specific experiences, while an observation tool can capture only what the researcher observed at one point in time (West et al., 2016). The complexity of racism, especially as it morphs over time and operates differently at individual, interpersonal, institutional, and systemic levels, necessitates

ongoing evaluation of existing tools and the development of new, more nuanced measures. Researchers must carefully and continually refine their instruments to ensure they align with contemporary understandings of racism, recognizing that the ways racism is experienced and expressed are subject to ongoing change (Williams et al., 1997; Sue et al., 2007).

Methods

Systematic reviews can place a concept like the measurement of racism in education “into the broader framework of research areas in a scholarly discipline, [build] upon the body of knowledge in that area and [identify] gaps in the literature” (Zawacki-Richter, 2020, p. v). To answer our research questions, we followed systematic review protocols and practices within educational research (e.g., Polanin et al., 2019). We also incorporated emerging systematic review guidelines on centering diversity, equity, and inclusion in synthesis work, such as creating research questions that challenge the status quo and center specific groups, forming a team that reflects the populations of focus in the studies, encouraging full participation of team members in refining the training to reduce power dynamics and create clarity, and extracting data regarding specific subgroups in the studies (i.e., racial and ethnic proportions) (Polanin et al., 2024).

Search

We searched for peer-reviewed articles published since 2003 within the academic databases of ERIC, Education Research Complete, PsycInfo, and PsycArticles. We searched article abstracts for key terms of quantitative measures (e.g., “survey”) on race and racism (e.g., “prejudice”) within systems and structures (e.g., “institutional”) specifically in K-12 educational settings (e.g., “middle school”). See Table 1 for initial search terms. To reduce the number of

irrelevant articles, we also used NOT to include settings outside of the United States (e.g., “Canada”) and in irrelevant contexts (e.g., “dental”) that appeared in initial searches.

Table 1

List of Search Terms

race OR racial OR racism OR discriminat* OR prejudic*
interpersonal OR intrapersonal OR systemic OR Institutional OR Internalized OR structural OR belief*
educat* OR K-12 OR higher education OR college OR postsecondary OR student* OR teacher* OR instruct* OR professor* OR educator* OR primary OR elementary OR secondary OR “middle school” OR youth OR young OR child*
survey* OR outcome* OR instrument* OR scale* OR tool* OR validation OR reliability OR measur* OR questionnaire OR assess*

Inclusion Criteria and Screening

To be included in the review, the study had to include a quantitative measure whether it was a from quantitative or mixed methods study. Measures for the purposes of this study included questionnaires, surveys, subscales, or individual closed-ended items that were completed by students, parents, teachers, or other school staff. We excluded experimental tools (e.g., picture judgments), proxy variables created to measure racism in other ways (e.g., housing discrimination), and open-ended survey items because these comparisons would require different methods and would not be equivalent. Pre-K and early childhood articles and articles that did not include data collection in the United States were excluded. Higher education articles were only

included if the focus was on pre-service or in-service educators or educational staff (e.g., school counselors).

Articles were excluded if they measured racism generally (including discrimination based on race/ethnicity) *and* did not explicitly connect racism to K-12 educational settings in the United States (e.g., diversity not explicitly about race, discrimination occurring in non-school settings, culturally responsive pedagogy scales that do not mention race). Said differently, studies needed to include at least one item on the presence of institutional or structural racism, schooling experiences of racism, perceptions of racism in school, or racist attitudes/beliefs about schooling. Items that included content around racism but did not specify *educational* racism were excluded. Prominent examples excluded in this realm included questions to parents about their beliefs on racism in society, student/parent encounters with trauma related to their personal upbringing unrelated to educational experiences, and health-based studies that included measures of racism for school-age children but only asked questions about discrimination broadly. We note that two commonly used measures were excluded Multigroup Ethnic Identity Measure-Revised (Phinney & Ong, 2007) and the Multidimensional Inventory of Black Identity (Sellers et al., 2006) because their items were not directly asking about racism schooling experiences, but rather were asking about racist experiences generally.

We included other forms of educational discrimination—namely characteristics that racialized ethnic individuals, such as discrimination based on language, immigration status, and religion. While not all races and ethnicities experience racism due to their language, religion, and/or immigration status, many researchers have noted high rates of discrimination based on these characteristics. thus we sought to be as inclusive as possible in understanding how racism

might be measured (Cano et al., 2021; Cobb et al., 2018; Gong et al., 2016; Sugarman et al., 2018).

We exported the initial search to Rayyan, an online collaborative systemic review site, for removing duplicates and screening. Rayyan has been increasingly popular in systematic reviews because of the search innovation features that allow screeners to “triage” articles more quickly such as search bars and highlights of key inclusion/exclusion criteria (Harrison et al., 2020; Oloffson et al., 2017). During both title/abstract and full-text screening, to improve screening reliability, team members screened 10 random articles at a time and conferred on the inclusion/exclusion of articles following each batch until agreement reached 90%. After reaching 90%, the screeners independently screened and marked “maybe” or “unsure” articles for discussion in screening meetings. All “unsure” articles were discussed by the screening team until full consensus was achieved.

Data Extraction

With the final set of articles, we extracted bibliographic information, sample information (e.g., respondent type [student, parent, teacher, other school staff, other], racial groups), and measure information (e.g., name, year created, number of items, number of scales). If authors did not provide a year the scale, subscale, or item was created, we inferred it was the year the data was collected; if no information about the year the data was collected, we used the year of publication as an approximation. We noted the extent to which authors of the articles included the items (none, some, all). If some or none of the items were available in the article and if the authors cited another article for the scale they used, we located the original article and searched for the items. Also, if authors cited other scales that fit our criteria and were not already in our review, we located those articles to screen the full text and determine inclusion. Articles used for

extracting item details but not included as part of the full analysis included Augoustinos and Rosewarne (2001), Bogardus (1933), Brigham (1993), Devine (1989), Eccles (1997), Fisher et al (2000), Kulis et al (2009), Landrine and Klonoff (1996), Neville et al (2000), Nadal (2011), Vinokurov et al (2002), Pohan and Aguilar (1994, 2001), Phinney et al (1998), Seaton et al (2008), Utsey et al. (2013) and Torres et al (2010). Lastly, we selected a random 10% of the articles to check references and add additional articles that met our inclusion criteria. See Figure 1 for the full inclusion process.

Analysis

Features and Descriptives of Measures

Using extracted data, the team used quantitative and qualitative analytical methods to answer the research questions. We calculated descriptive statistics to understand the most frequent measures and their features, such as who completed the measure (parent, teacher, student or other school staff), demographics of students, setting, and year it was developed versus year it was used. We also calculated descriptive statistics to understand the proportion of scales that aligned within each area of the bioecological systems theory to understand where focus was concentrated in the field. Many scales were used multiple times which complicates the descriptive statistics regarding the scale characteristics. To focus on the *scale* characteristics rather than individual *study* characteristics, we calculated the characteristics below based on scales. For example, when three studies used the same scale, we counted the unique characteristics of participant, age, etc. only once. Additionally, coding allowed “select all” for scale characteristics.

In the first coding cycle, we qualitatively coded each of the measures using attribute coding (Saldaña, 2023). Attribute codes included why authors used the scale and the types of

racism present in each of the scales and whether they are part of individual beliefs and perceptions (intrapersonal), microsystem (interpersonal), exosystem including course curricula (institutional), or macrosystem such as larger cultural stereotypes (systemic) levels of racism in alignment with bioecological theory adapted for discussions of racism (e.g., Peterson, 2015; Race Forward, 2023; Stern et al., 2021). We did not include anti-racism as it reflects another construct, a proactive charge to undo educational racism at any of the levels (e.g., Alvarez, 2024; Smithsonian, n.d.). This was beyond the scope of this project, but should be reviewed in future research and will be a follow-up study of this current project. Because some forms of racism could potentially apply to multiple levels of the theoretical model (because the nature of racism means that many systems overlap), we coded the *general* or more common practice of racism across the country. For example, school segregation happens because of redlining policies, which are national, systemic issues. Yet, on a macro level, districts can address racism by creating new funding and enrollment policies that place students in schools that are equally funded and have representation of races and ethnicities that reflect the entire city. This is true of discipline as well. Some teachers, particularly in smaller schools, have more autonomy to dictate the disciplinary actions of students, which would take place in the microsystem. Still, most disciplinary actions happen at the school or district leadership level, which would place them in the exosystem. While these examples can highlight opportunities for change in America, they do not reflect the majority of educational experiences in the country. Thus we coded for general occurrences rather than outliers. See Table 2 below for example codes across each level. To ensure adequate reliability between coders, the coding team collectively reviewed the extraction form and coded five articles together for practice before refining the extraction form. The coding team then independently coded five articles at a time, engaged in coding discussions, and came

to an agreement on extraction and codes. Coding meetings occurred as needed to discuss coding issues, and all disagreements were resolved via consensus.

Table 2

Example Racism Codes in Each Level of Bioecological Systems Theory

Ecological Level	Racism Code	Team Definition	Examples
Macro system	Systemic /structural	Societal-level; broad, cultural structures that shape racial and ethnic communities	<ul style="list-style-type: none"> • Housing discrimination via redlining leading to segregated neighborhoods and unequal school funding • Environmental racism through lack of access to clean water at schools or heat island impacts • Racial achievement/opportunity gaps • Racially segregated schools
Exo system	Institutional	Community-level; racism that occurs within sub-groups in societies	<ul style="list-style-type: none"> • District-level policies on hair and clothing that disproportionately affect students of color • Tracking by schools/districts (e.g. discriminatory access/placement to advanced coursework) • Within-school segregation • Approved school or district curricula that avoids teaching diverse histories and cultures • Disproportionate referrals to special education or gifted and talented programming • Underrepresentation of Black and Brown teachers and school administration • Unfair disciplinary actions/policies
Micro system	Interpersonal	Relational; racism enacted between individuals	<ul style="list-style-type: none"> • Discrimination by peers or school staff • Low expectations for students of color • Discipline referral bias and in-class individual discipline bias

Individual	Intrapersonal	Individual; internal perceptions of self and groups based on race or ethnicity	<ul style="list-style-type: none"> Racial/ethnic bias attitudes and stereotypes of students of color
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Psychometric Examination of Reliability and Validity

To assess psychometric properties we focused on measures of reliability and validity, the cornerstones of any psychometric evaluation. Reliability refers to the consistency of a measure, its stability, and its repeatability over different contexts (Cronbach, 1951). Validity, on the other hand, ensures that measures meaningfully and applicably measure the concept that is intended to be measured (Messick, 1995). By examining reliability and validity, we can determine the overall effectiveness of a psychometric tool (DeVellis, 2017). When examining reliability, we expected to see at least two estimates and not complete reliance on one Cronbach’s alpha, which has been documented as problematic (Cortina, 1993; Yang & Green, 2011). These estimates could be item-total correlations, Omega, Kuder-Richardson Formula 20 (KR-20), test-retest correlations, intraclass correlations, etc. When evaluating the estimates, we followed the standard approach of categorizing values greater than 0.70 as acceptable (Dunn et al., 2014; Nunally, 1978).

For confirmatory factor analytic (CFA) approaches, the fit was assessed through the root mean square error of approximation (RMSEA), the standardized root means square residual (SRMR), the comparative fit index (CFI), and the Tucker-Lewis index (TLI). An RMSEA < 0.06 indicates an excellent fit, and an SRMR < 0.08 indicates a good fit to the data (Hu & Bentler, 1999). However, an RMSEA < 0.08 will be considered an adequate fit to the data (Browne & Cudeck, 1993). The CFI and the TLI should be over 0.90 for an adequate fit and over 0.95 for an excellent fit (Bentler & Bonnet, 1980; Schumacker & Lomax, 2010). An acceptable fitting model

is defined when three of these four statistics are at least adequate (Hu & Bentler, 1999). An Exploratory Factor Analysis (EFA) should consider the items' nature. That is, polytomous items should employ smooth tetrachoric/polychoric correlations. This is because, unlike continuous items, traditional product-moment correlations tend to penalize polytomous items by a fifth on average (Lord & Novick, 1968). If authors opted to provide validity estimates for their instrument through a full-information Item-Response Theory factor analytical approach, proper explication of the parameters should be addressed. Authors needed to explain the usage of a one vs a two-parameter logistic model for dichotomous items (Baker & Kim, 2004). For polytomous items, we looked for the employment of the Generalized Partial Credit Model, the Testlet Model, or the Graded Response Model, depending on the number of categories for each item and the aims described by the authors (Baker & Kim, 2004). Lastly, we examined if authors provided criterion-related validity (convergent and discriminant validity) for incremental validity (Smith et al., 2003).

To evaluate the appropriateness of scales, we have designed and coded four categories incorporating the above mentioned information. These categories are “S” = Satisfactory, “P” = Partially appropriate, “A” = Absent, and “U” = Unsatisfactory. For a detailed description of these categories, see Table 3 below:

Table 3

Rubric for Assessing Measures

	Satisfactory	Partially	Absent	Unsatisfactory
Reliability	Authors provide at least two estimates of reliability and are acceptably strong (Ex: Cronbach’s alpha > 0.70 per subscale).	Authors provide at least one estimate to reliability, with this measure acceptably robust (Ex:	Reliability estimates are absent.	Reliability estimates are unacceptable (Ex: Cronbach’s alpha < 0.70 per subscale)

		Cronbach's alpha > 0.70 per subscale).		
Criterion-Related Validity	Authors provide estimates for both, convergent and discriminant validity, with significant correlations ($p < 0.05$).	Authors provide estimates for either convergent or discriminant validity, with significant correlations ($p < 0.05$).	Criterion-Related Validity estimates are absent.	Authors provide estimates for either convergent or discriminant validity, with insignificant correlations ($p > 0.05$)
Construct Validity	<p>Authors perform both, an EFA and CFA.</p> <p>The EFA is appropriate (uses smoothed tetrachoric correlations for polytomous items or uses an appropriate IRT model based on the number of parameters being estimated).</p> <p>The CFA fit statistics are appropriate: at least three out of the RMSEA, SRMR, CFI, TLI are adequate (Hu & Bentler, 1999).</p>	<p>Authors perform either an EFA or CFA.</p> <p>The EFA is appropriate (uses smoothed tetrachoric correlations for polytomous items or uses an appropriate IRT model based on the number of parameters being estimated).</p> <p>The CFA fit statistics are appropriate: at least three out of the RMSEA, SRMR, CFI, TLI are adequate (Hu & Bentler, 1999).</p>	Construct Validity estimates are absent.	<p>Authors perform either an EFA or CFA, with unacceptable results.</p> <p>The EFA is not appropriately employed (uses heuristic correlations for polytomous items or uses an inappropriate IRT model based on the number of parameters being estimated).</p> <p>The CFA fit statistics are unacceptable: less than three out of the RMSEA, SRMR, CFI, TLI are adequate (Hu & Bentler, 1999).</p>

Results

Of the 3,813 imported references, 1,501 were duplicates, and 66 articles aligned with the inclusion criteria. Authors of these articles mostly used different scales; a total of 50 scales, subscales, or items were extracted from the articles, and five of the 66 articles used more than one measure. The following scales were the most commonly used (each by at least three articles)

listed from highest to lowest frequency: Critical Consciousness Scale (CCS) (Diemer et al., 2017), Index of Race-Related Stress (Seaton, 2003), Everyday Discrimination Scale (Seaton et al., 2008), Schedule of Racist Events (Landrine & Klonoff, 1996), School Climate for Diversity Scale—Secondary (Byrd, 2017), and Color-Blind Racial Attitudes Scale (CoBRAS) (Neville et al., 2000). Appendix Table A.1 lists all the scales/subscales, the type of coded racism (e.g., intrapersonal, interpersonal, institutional, or systemic), who developed it, who used it, and lists relevant education-related items.

Features of Measures on Racism

Of the 50 measures/scales/subscales/items that explicitly asked questions about racism in schools, only 11 explicitly operationalized racism and even fewer (n=2) had both satisfactory reliability and validity estimates. The scales used in this study were developed, on average, in 2008. However, year of scale development ranges from 1972 to 2023. The mean year of scale usage is 2015, while usage ranges from 2001 to 2023. Most of the scales were used in student settings, with 60% of respondents being students. Teachers were the second largest group to be surveyed at 34%. Both parents and other school staff were surveyed at a smaller rate. Additionally, 62% of the scales assessed racism at the individual or intrapersonal level. Both interpersonal and institutional racism were measured at comparable rates, 38% and 38 % respectively. Finally, systemic racism was the least captured, at just 8%. See Table 4 and Table 5 below for more descriptive details.

Table 4

Descriptive Statistics for Scale Characteristics

Average Year Developed	2008
Average Year Used	2015

% Answered by Students	60%
% Answered by Parents	16%
% Answered by Teacher	34%
% Answered by other School Staff	2%
% Measured Systemic Racism	8%
% Measured Institutional Racism	38%
% Measured Interpersonal Racism	38%
% Measured Individual/Intrapersonal Racism	62%
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	n=50
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Table 5

Descriptive Statistics for Scale Characteristics of Student Scales

% Demographic Measured was Mostly Asian	3.3%
% Demographic Measured was Mostly Black	53.3%
% Demographic Measured was Mostly Indigenous	0%
% Demographic Measured was Mostly Latine	33.3%
% Demographic Measured was a Mix	33.3%
% Demographic Measured was Mostly People of Color	10%
% Demographic Measured was Mostly White	33.3%
% Measured in Urban Areas	72.7%
% Measured in Suburban Areas	50%
% Measured in Rural Areas	20%
% Area Not Stated	23.3%
% Elementary Age	20%
% Middle School Age	56.7%
% High School Age	66.7%
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Of the 50 scales, 30 were used in student settings. Just over half of the student sample consists primarily of Black students, while white, Latine, and mixed settings – with no single group forming a majority – are represented at similar rates. Indigenous, Asian, and People of Color were surveyed the least frequently, if at all. In addition, most of the sample consisted of students from urban areas, while students from rural areas were least represented. Likewise, middle school aged and high school aged students are surveyed more frequently and at similar rates compared to elementary school students. While teacher demographics are not specified in Table 5, most teachers that were surveyed identified as white. This pattern is not observed among parents, as their sample is more diverse.

How Authors Operationalize Racism

We also found that the majority of tools focused on one type of discrimination, racial/ethnic, rather than examining discrimination through an intersectional lens that included other forms of oppression (intersectionality of sexism, homophobia, etc.). Eleven discussions using these scales provided more concrete operationalizations of racism specifically. For the Index of Race-Related Stress (Seaton, 2003), Awareness of Structural Racism (Seider et al., 2018), and Critical Reflection Achievement Gap Attributions (Banales et al., 2019) scales, authors using these scales discussed multiple levels of racism, including individual, interpersonal, institutional, and structural racism. Other scales were used through more systemic or institutional systems, using the foundations of Critical Race Theory (CRT) to explore discussions around school-based racial inequities when using the Racism and Inequity Beliefs Questionnaire (Legette et al., 2023), and teachings of history and white supremacy when using

the Teaching About Race/Racism scale (Brooks & Martin, 2023). Relevant discussions about race-conscious policies and color-blind racism for the Policy Endorsements: School Desegregation and Affirmative Action (Hughes & Bigler, 2011), Teachers Race Talk Survey (Alvarez & Milner IV, 2018), and COBRAS (Wang et al., 2023) scales, racial segregation for the Race, Racial Attitudes and School Segregation Survey (Billingham and Hunt, 2016), and structural dominance with the Teacher Candidates' Perceptions About Adolescents Based on the Adolescents' Physical Characteristics scale (DeCastro-Ambrosetti and Cho, 2011). Authors discussed historical representations of racism and race-related concepts for the Cognitive and Reflective Responses to Lessons scale (Hughes & Bigler, 2007), but did not state or explicitly define racism..

Seventeen scales either focused on concepts of discrimination (e.g. racial/ethnic, gender, and/or religion) or contextualized race through discriminatory practices and experiences, which tended to be more focused on the institutional, interpersonal, and intrapersonal. Authors using the Everyday Discrimination Scale (Saleem et al., 2022), Perceived Discrimination based on ethnic group membership (Faircloth & Hamm, 2005), School-Based Racial Discrimination (Eccles et al., 2006), Perceived Institutional Discrimination (Hope & Jagers, 2014), Perceived Discrimination Scale (Karcher et al., 2022), and the Perceived Ethnic Discrimination (Nieri et al., 2022) scales focused discussions on how race-based discrimination is related to negative experiences. Other scales, such as the Students' Awareness and Endorsement of Cultural Stereotypes About Race and Math (Cvencek et al., 2015), Experiences of Discrimination Based on Gender or Race (Copur-Gencturk et al., 2023), and Bias-based Bullying (Vigna et al., 2018), had discussions around biases and stereotypes to frame the development and use of scale. Lastly, some researchers using the School Discrimination (Bennett et al., 2020), Teacher Discrimination

Scale (Kyere et al., 2023), and Acculturative Hassles adapted (Oberoi et al., 2018) focused more on structural, school-based discrimination to discuss scales. The other fifteen scales either explained their scale through anti-racism efforts, critical reflection practices, general belief systems and ideologies, importance of diversity and multiculturalism, or did not have context provided for the exploration of race and racism.

Why Authors Measured Racism

Four primary reasons were noted in the reviewed articles on why scales were used: socio-emotional and psychosocial processes, ideologies and beliefs, environmental examinations, and measurement development. Researcher's purpose in using scales, such as the Race, Racial Attitudes, and School Segregation Survey (Billingham & Hunt, 2016) and Perceived Discrimination based on ethnic group membership scales (Faircloth & Hamm, 2005), was often to connect systemic or institutional inequities to interpersonal and intrapersonal factors. Some researchers studied wellbeing, stress, self-compassion, psychological adjustment, and empathy to specifically understand how those emotional and psychosocial experiences were related to or caused by racism, discrimination, and segregation. Other researchers focused more on using these scales to better understand different groups' ideologies and beliefs on topics about racism. Researchers noted language use, beliefs on diversity, awareness, racial stereotypes on both ability and physical characteristics, and social distancing as reasons for why these scales were used. A couple of researchers explored how scales, such as Teaching About Race/Racism (Brooks & Martin, 2023) and Middle School Social Distance Scale (Brandwein & Donoghue, 2011), helped examine race and racism through programmatic and workshop efforts and how teacher ideologies may influence students' learning on these issues. A majority of purpose in scale use was tied to interpersonal, intrapersonal, or individual levels of racism and

discrimination with some connections to how systemic and institutional levels of racism impact these personal experiences and beliefs.

A smaller subset of the scales were used to measure environmental factors that relate to racism and discrimination. Most of these scales, such as the School Discrimination (Bennett et al., 2020) and the Teacher Discrimination Scale (Kyere et al., 2023), focused on school climate around race and diversity, school-based discrimination, and exclusionary practices within school settings. One scale, Policy Endorsements: School Desegregation and Affirmative Action (Hughes & Bigler, 2011), was more intentional in measuring how systemic-level policies like affirmative action relate to interpersonal and institutional beliefs about policy impact. Lastly, researchers' intentional use of four scales was to either develop more accurate assessments of race and racism concepts or to validate the scale. Although specific intentions for scale use varied, researchers explored all levels of racism through their scholarship using selected scales.

Psychometric Evaluation

Generally, reliability estimates were either missing or entirely reliant on Cronbach's alpha, a statistic criticized for its misuse and misunderstanding (Cortina, 1993). While this is a problem, more concerning is that a fifth of all assessments did not report a single reliability estimate. Noticeably, between reliability, criterion-related validity, and construct validity, estimates of reliability were most often unsatisfactory (14%, 2%, and 6%, respectively). While estimates of criterion-related validity are most infrequently classified as unsatisfactory, 72% of the assessments under consideration did not provide a single estimate of criterion-related validity. Similarly, we find that 72% of scales failed to provide any estimates for construct validity. More so, the 18% of authors providing estimates for construct validity relied on either an Exploratory Factor Analysis (EFA) or a Confirmatory Factor Analysis (CFA), but not both. Furthermore, only 4% of assessments provided satisfactory reliability and construct validity

estimates. The aforementioned descriptive results are in Table 6, for a detailed coding of each measure see Table A.2 in the Appendix.

Table 6

Overview of Psychometric Evaluation of Measures

Quality Coded Classification	Internal Reliability	Criterion-related Validity	Construct Validity
	Percent		
Satisfactory	4%	22%	4%
Partially	62%	4%	18%
Absent	20%	72%	72%
Unsatisfactory	14%	2%	6%

N=50

Promising Examples

Based on our review we wanted to highlight promising examples for the field. We chose measures based on the following criteria: created within the last 10 years (to account for the ever-evolving nature of racism research), tried to measure some type of racism in schools (the purpose of the review), and have at least one reliability AND validity estimate. The teacher scales that met that criteria were: Attributions of Mathematical Excellence Construct (Jacobson et al., 2022), Racism and Inequity Beliefs (RIB) Questionnaire (Legette et al., 2023), and School/Teacher Racial Encounter Stress Scale (STRESS) (Bentley-Edwards et al., 2020). The student scales that met that criteria were: Critical Consciousness Scale (CCS) (Diemer et al., 2017), Critical Reflection Achievement Gap Attributions (Banales et al., 2019), School Climate for

Diversity Scale—Secondary (Byrd, 2017), School Racial Vigilance Scale and School Racial Threat Scale (Stevenson et al., 2024).

Of the teacher scales, RIB (Leggette et al., 2023) was the only scale to explicitly define racism and also measures systemic factors. RIB drew on Critical Race Theory (CRT) to incorporate definitions of racism (cultural, systemic, individual), cultural deficit, and color-evasiveness. We attributed the type of racism the scale attempted to measure as systemic and intrapersonal/individual racism. Omega was used as a reliability measure (.7 and above for all subscales) and CFA was conducted for validation. The scale sampled a predominantly white teacher population with both rural and urban representation in a Southeastern state. The scale consists of items designed to capture causes of racial inequity that aligned with individualistic, post-racial, deficit, and systemic beliefs including “In general, racial/ethnic minorities do not work as hard in school as white children,” “In general, teachers treat students differently based on race,” and “In general, racial/ethnic discrimination is a factor in Black kids' suspensions.” For a larger list of the items see Appendix Table A.1.

Among the student scales, Critical Reflection Achievement Gap Attributions (Banales et al., 2019), which was also administered to parents, and school staff, was the only scale that explicitly defined racism as structural versus individual: “Structural attributions point to institutional racism, discrimination, and other systemic impediments to success as causes of social inequities... In contrast, individual attributions are causal explanations that credit people’s work ethic, attitudes, and merit as the causes of achievement gaps.” We coded the type of racism they attempted to measure as intrapersonal/individual and systemic. Authors included Cronbach Alpha estimates (.8 and above for all subscales) for reliability and CFA was conducted for validation. The scale was used in a study for urban, mostly Black high school students in a Southeastern region of the US. To measure structural attributions, the scales asked “White

students usually go to schools with more resources than Black students,” and to measure individual attributions the scales asked “Black students don't work as hard as white students regarding the Black/white academic achievement gap.” Additionally, these items were asked with the following instructions: “There are many theories about why Black students do less well than whites in school. Indicate how much you think these differences are caused by each of the following: individual attributions, structural attributions.” These promising examples can provide a foundation for measuring various facets of racism in educational settings because their items offer specific ways to ask about different aspects of systemic and individual racism and how they manifest within school environments.

Discussion

Although we know the way individuals experience racism changes as our society changes over time, the field of measurement has not kept up, as the average year of development for these measures was 16 years ago (2008). This constant evolution underscores the need for researchers to remain vigilant in ensuring that their instruments accurately reflect current racial dynamics. A majority of the scales centered on personal and individual based racial discriminatory practices and experiences, but a much smaller subset focused on how those connect to systemic and institutional inequities or were able to tie their scale use to definitive operationalizations of racism. This is more evident, as the reasons why researchers used these scales were focused on interpersonal and intrapersonal emotions and feelings and less on environmental factors that uphold racist practices and policies. While beliefs are just one part of structural change, they are essential in shifting attitudes, even though this alone does not equate to systemic change. Our review found a focus on student to student interaction rather than calling out other systems. If we

want to change systems, we need to measure more than student peer interactions and highlight systemic issues and track progress over time.

While we support the use of high-quality psychometric tools to ensure they are applied appropriately within communities, we also recognize that excessively high standards can reinforce systemic inequities, presenting a complex balance between rigor and equity. For example, we would not want a racism measure validated in a Latino population in Chicago used to measure racism for Black students in the South. At the same time, we acknowledge that access to the knowledge, skills, funding, and large sample sizes needed to validate scales is often limited to prestigious institutions, whose scholars are predominantly white individuals. Although our review carefully analyzed reliability and validity measures, we intentionally held modest standards to avoid reinforcing the “status quo” (white norms) in our review. Thus, other important psychometrics robustness checks were not used to evaluate the scales in our review, such as scree plots, parallel analysis, and Velicer's Minimum Average Partial (MAP) test (Hayton et al., 2004).

Implications

We see this review as a start to raising awareness and increasing research around the extent and forms of racism within education. We call for researchers to discontinue the practice of using race/ethnicity as a default control for racism, and instead operationalize and define race and racism. Secondly, systematic research should consider adopting QuantCrit as a guiding framework. Using the ethos of QuantCrit in this review allowed us to center racism, challenge traditional psychometric properties, and acknowledge the systemic and complicated nature of racism. Infusing QuantCrit may involve incorporating its tenets throughout the review process (as done in this study), developing new methods for conducting systematic reviews, including a

community-based participatory approach, and applying QuantCrit principles as criteria for study inclusion—the latter three of which were not applied in this review.

Thirdly, we seek to advance the more robust and rigorous measures of systemic racism in education. This review shows the need to create more measures for rural, Asian and Indigenous students, since only six scales surveyed a rural student population, only one used a majority Asian student sample, and no measure was found that used a majority Indigenous sample. We also acknowledge that survey instruments measuring racist attitudes must adapt continuously to reflect evolving forms of racial bias and exclusion. However, future measurement of racism should make sure to include historical, geographical, political, and theoretical aspects to capture the multi-faceted and systemic properties of racism. Additionally, it is crucial to create multidimensional measures that go beyond individual scales and self-report surveys, and rather use innovative quantitative and qualitative components to capture a broader spectrum of experiences.

To address the drawback of survey measures, researchers have developed promising examples such as the Implicit Association Test (IAT) attempting to assess unconscious biases by measuring reaction times when participants are asked to associate positive or negative attributes with racial groups (Greenwald et al., 1998). Another innovative approach to measure school segregation, an example of institutional and systemic racism, is Fiel's (2013) study. Fiel (2013) used a decomposition approach to assess the relative contributions of distributive processes and compositional changes to the observed resegregation of schools between 1993 and 2010. Other approaches to measuring school segregation include using Index of Dissimilarity (D), which is frequently used for measuring residential segregation (Frankenberg, 2013, Frankel & Volij, 2011). D is a two-group measure that assesses the degree to which groups are evenly distributed

across geographical areas, and education scholars have used D to measure within-district segregation in racially isolated districts (Frankenberg, 2013). Polos and colleagues (2022) measured school-level structural racism by analyzing a combination of student demographics, sense of connectedness, perceived life opportunities, school discipline records, and attendance data. Despite these innovative approaches, these tools remain controversial, with some scholars questioning their reliability and validity (Schimmack, 2019). While not the primary focus of this paper, we note the presence of anti-racist measures and tools that hold potential for advancing this work further.

Although we can attempt to quantitatively measure racism, this is not the same as actively working towards reducing and eliminating the interconnected systems that perpetuate racism and other forms of oppression. This work will not be done overnight and requires deconstructing and rebuilding across all sectors, including public and private educational institutions. The process of quantifying racism in education will be iterative and aspirational in nature. Quantitative methods will eventually reach their limits, and we may never be able to unpack the complexity and layers of systemic racism. However, we remain committed to try and measure it as best we can, with the understanding that better data can lead to more resources for students of color and the development of anti-racist programs and policies. We aim to inspire ongoing research and action toward racial justice, understanding that this work requires the constant reevaluation of our measures and methods to match the shifting cultural realities of how racism operates, and the specific ways it impacts marginalized communities. As racism continues to evolve, so too must the methods by which it is measured.

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Appendix

Table A.1. Each measure used in the study, developer, study that used it, respondent and list of relevant items

Name of the scale/subscale (developed by whom)	Used by	Type of racism	Respondent	List of relevant education-related items
Acculturative Hassles adapted (Vinokurov, Trickett, and Birman, 2002)	(Oberoi & Trickett, 2018)	Interpersonal; Institutional	Student	<p>Muslim School Discrimination</p> <ul style="list-style-type: none"> - A teacher told you that you shouldn't speak Arabic in class or in the school. - You saw another Muslim student treated badly or discriminated against. - A teacher treated you unfairly because you are Muslim. - An American student treated you in some way because you are Muslim. - Someone made fun of you because you did not speak English correctly, for example, your accent. - Someone made fun of you because you did not look “American” (clothing, hairstyle, and so on). - A school administrator treated you unfairly because you are Muslim. - You got in trouble in school because you did not understand how the school rules work.

				<p>Peer Interaction</p> <ul style="list-style-type: none">- You tried to make friends with an American student.- You tried to make friends with a Muslim student.- You had an argument or fight with a Muslim friend.- You had an argument or fight with an American friend. <p>English</p> <ul style="list-style-type: none">- You could not understand something that a teacher said in class because of English
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<p>Attributions of Mathematical Excellence Construct: AME-G subscale (Jacobson et al., 2022)</p>	<p>(Jacobson et al., 2022)</p>	<p>Individual/Intrapersonal</p>	<p>Teacher</p>	<p>-Inherent biological factors explain why Black children are less likely than White children to demonstrate high mathematical achievement.</p> <p>-I believe that genetic differences by race explain the large number of White children who are identified as mathematically gifted.</p> <p>-Fundamental biological differences explain why Asian students have higher mathematical achievement than White students.</p> <p>-In my view, genetic factors explain why Hispanic and Latino students struggle to learn mathematics.</p> <p>-I think that differences in upbringing explain why Asian children are more likely than White children to have an interest in mathematics.</p> <p>-In my opinion, Black students are not interested in mathematics because of their cultural heritage.</p> <p>-Fundamental biological differences explain why Asian students have higher mathematical achievement than White students.</p> <p>-Hispanic or Latino children are less likely to pursue mathematics-related careers than White children because of how they are raised.</p> <p>-Hispanic or Latino students are less likely than White students to succeed in mathematical professions because of their upbringing.</p>
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				<p>-Asian students will excel in mathematics whether or not they try very hard.</p> <p>-Students often decide to pursue mathematics-related careers because of how they are raised.</p> <p>-White students have higher mathematical achievement than Black students because they go to better schools.</p> <p>-In my opinion, when Hispanic or Latino students struggle in mathematics, it is because they have insufficient instructional support.</p> <p>-I believe that Asian students who excel in mathematics have more educational opportunities than students from other groups who do not excel in mathematics.</p> <p>-I think that inadequate instruction is the main reason that Black students do poorly in a mathematics class.</p> <p>-Black students struggle to learn mathematics because they do not put in the required time and hard work.</p> <p>-White students are more likely than Black students to pursue a career that requires mathematics because they put in more effort learning mathematics in school.</p> <p>-White students score higher on standardized mathematics tests than Hispanic or Latino students because White students spend more time studying.</p>
Awareness of structural racism	(Seider et al. 2018)	Individual/Intrapersonal	Student	-Racism in the educational system limits the success of Blacks, Latinos, and other racial minorities

(Seider et al., 2018)				
Bias-based bullying (BB) (Vigna, Poehlmann-Tynan, and Koenig, 2018)	(Vigna et al., 2018)	Interpersonal	Student	<p>Bullying Experienced by Students</p> <ul style="list-style-type: none"> - Being bullied, threatened, or harassed because others think you're gay, lesbian, bisexual, or transgender. - Being bullied, threatened, or harassed because of your race or ethnic background. - Being bullied, threatened, or harassed because of your appearance.
Cognitive and Reflective Responses to Lessons (Hughes and Bigler, 2007)	(Hughes et al. 2007)	Individual/Intrapersonal	Student	<p>The cognitive items concerned:</p> <ul style="list-style-type: none"> -endorsement of counter stereotypic beliefs: “Did today’s lesson make you think that African American [Black] people are really smart and hardworking?” -perception of within-group variability: “Did today’s lesson make you think that African American people are unique, special, and different from each other?” -perception of between-group variability: “Did today’s lesson make you think that African American people and White people have a lot in common and aren’t very different?” <p>The affective responses included:</p>

				-valuing of racial fairness: ‘Did today’s lesson make you wish African American people were treated more fairly and given what they deserved?’
Color-Blind Racial Attitudes Scale (COBRAS) (Neville et al., 2000)	(Lee et al., 2006; Pieterse et al., 2016; Wang et al., 2023)	Individual/ Intrapersonal	Parent	Asked children about their feelings towards having a Latino, Black, or White individual as a... Teacher, Friend, Neighbor, Doctor, Babysitter.
Comfort Level with Individuals from Different Backgrounds: Racial/Ethnic Comfort Subscale (Riskowski, 2010)	(Riskowski 2010)	Individual/Intrapersonal	Student	<p>Racial/ethnic comfort level</p> <ul style="list-style-type: none"> - I am comfortable being in the same school with someone from a different race/ethnicity. - I am comfortable playing with someone from a different race/ethnicity. - I am comfortable being in the same class with someone from a different race/ethnicity. - I am comfortable sitting next to someone from a different race/ethnicity at school. - I am comfortable doing homework with someone from a different race/ethnicity.

				- I think someone from a different race/ethnicity.
Comprehensive Race Socialization Inventory (Lesane-Brown et al., 2005)	(Lesane-Brown et al., 2005)	Individual/Intrapersonal	Student	-How often did other adults such as members of your place of worship, your teachers, or neighbors talk with you about what it means to be Black and how to deal with people outside your race?
Critical Consciousness Scale (CCS) (Diemer et al., 2017)	(Anyiwo et al., 2023; Anyiwo et al., 2022; Aldana et al., 2019; Diemer & Rapa, 2016, Diemer et al., 2017; Golden, & Byrd, 2022; Heberle et al., 2023)	Institutional; Systematic; Individual/Intrapersonal	Student, Parent	Critical Consciousness Scale: Perceived Inequality Subscale -Certain racial or ethnic groups have fewer chances to get a good education. -All ethnic and racial groups should have equal chances at education. -Schools should teach students to respect members of all ethnic and racial groups.

Critical Reflection Achievement Gap Attributions (Bañales et al., 2019)	(Bañales et al., 2019)	Individual/Intrapersonal; Systemic; Institutional	Student, Parent, Other school staff	<p>-Measured structural attributions: White students usually go to schools with more resources than Black students.</p> <p>-Measured individual attributions: Black students don't work as hard as White students regarding the Black/White academic achievement gap.</p> <p>The items were preceded by these instructions: “There are many theories about why Black students do less well than Whites in school. Indicate how much you think these differences are caused by each of the following: Individual attributions, structural attributions.</p>
Cultural Socialization Measure (Lee et al., 2006)	(Lee et al., 2006)	Individual/Intrapersonal	Parent	-It is important for public schools to teach about the history and contributions of racial and ethnic minorities
Difficulty with Racial Dialogue Scale (Bentley-Edwards et al., 2020)	(Bentley-Edwards et al., 2020)	Individual/Intrapersonal; Institutional	Teacher	Asks teachers how easy or hard it is to talk about racial conflicts with friends, White colleagues, colleagues of color, and principal at school
Everyday Discrimination Scale (Seaton et al., 2008)	(Butler, 2022; Fine et al., 2018; Saleem et al., 2022; Vargas et al., 2021)	Interpersonal; Systematic	Student	<ul style="list-style-type: none"> - Your teachers treat you with less respect than other students. - Your teachers act as if they think you are not smart. - Your teachers act as if they are afraid of you.

<p>Experiences of Discrimination Based on Gender or Race adapted by (Coppur-Gencturk, Thacker, and Cimpian, 2023)</p>	<p>(Coppur-Gencturk et al., 2023)</p>	<p>Interpersonal</p>	<p>Teacher</p>	<p>Please think about your experience as a student.</p> <ul style="list-style-type: none"> -How frequently have you experienced the following unequal treatment or were held to different expectations because of your race? -Grades K-12 Others expecting your math ability to be inferior because of your race -Not being taken seriously in math classes because of your race -Your math ideas or opinions being minimized, ignored, or devalued because of your race -Being treated as if you were not mathematically capable because of your race
<p>Index of Race-Related Stress (Seaton, 2003)</p>	<p>(Hope et al., 2021; Seaton, 2003; Seaton, 2006; Seaton, 2010; Seaton & Yip, 2009)</p>	<p>Institutional; Individual/Intrapersonal</p>	<p>Student</p>	<p>Items from collective/institutional subscale</p> <ul style="list-style-type: none"> -You were passed over for an important school project, although you were better at the task than the White/non-Black person given the -task. -You have been given more schoolwork or the school projects you don't want, while the White/non-Black students are given less work and the tasks you want. -You think you did not receive a school award you deserved because you are Black.

<p>Language Attitude Teachers Survey-Revised (LATS-R) adapted by B. B. Flores and Smith (2008)</p>	<p>(Cho et al., 2023)</p>	<p>Individual/Intrapersonal</p>	<p>Teacher</p>	<p>Factor 1</p> <ul style="list-style-type: none"> -Too much time and energy is now being placed on multiculturalism in schools and society. -Having a non- or limited-English-proficient student in the classroom is detrimental to the learning of other students. -The government should spend additional money to provide better programs for linguistic-minority students in public schools. <p>Factor 2</p> <ul style="list-style-type: none"> -Teachers should modify their instruction for their students' cultural and linguistic needs.* -Regular classroom teachers should be required to receive preservice or in-service training to be prepared to meet the needs of linguistic minorities.* -It is unreasonable to expect a regular classroom teacher to teach a child who does not speak English. <p>Factor 3</p> <ul style="list-style-type: none"> -Non- and limited-English proficient students often use unjustified claims of discrimination as an excuse for not doing well in school. -Most non- and limited-English proficient children are not motivated to learn English. -Even when they do speak English, minority parents don't participate in school related activities as other parents do.
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			<p>Rights and Privileges</p> <ul style="list-style-type: none"> -Parents of ELLs should be counseled to speak English With their kids whenever possible. -Having a non-English-proficient student in the classroom is detrimental to the learning of other students. -Non- and limited-proficient-English students often use unjustified claims of discrimination. <p>The rapid learning of English should be a priority of non-English-proficient or limited-English-proficient students even if it means they lose their ability to speak their native language.</p> <ul style="list-style-type: none"> -Much time and energy is now being placed on multiculturalism in schools and society. -It is unreasonable to expect a regular classroom teacher to teach a child who does not speak English. <p>Aesthetic Caring</p> <ul style="list-style-type: none"> -Teachers should modify their instruction for their students' cultural and linguistic needs. -I would support the government spending additional money to provide better programs for linguistic-minority students in public schools -Regular classroom teachers should be required to receive preservice or in-service training to be prepared to meet the needs of linguistic minorities
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				<p>Exclusion/Assimilationist</p> <p>-At school, the learning of the English language by non- or limited-English-proficient takes precedence.</p> <p>Responsibility/Culpability</p> <p>-It is important for teachers to reach out to involve the parents of all their students.</p> <p>-Most non- and limited-English-proficient children are not motivated to learn English.</p> <p>-Even when they do speak English, minority parents don't participate in school-related activities as other parents do.</p>
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Middle School Social Distance Scale based on the Bogardus Social Distance Scale (Bogardus, 1933)	(Brandwein & Donoghue, 2011)	Interpersonal	Student	<p>The willingness of middle school-aged children to accept members of various ethnic groups into their personal relationships.</p> <p>Participants indicate the closest level of relationship they would be willing to have with each target group by selecting a number from 1 to 7:</p> <p>1 = best friends 2 = eat lunch with 3 = sit beside in class 4 = say hi only 5 = member of homeroom only 6 = member of school only 7 = exclude them</p>
Perceived Discrimination based on ethnic group membership (Faircloth and Hamm, 2005)	(Faircloth & Hamm, 2005)	Interpersonal	Student	<p>3-item measure of the students' perceptions of how frequently teachers, other adults at school, or other students, respectively, were unfair or negative toward the respondent based on his or her ethnic background.</p>
Perceived Discrimination Scale (PDS). (Phinney, 1998)	(Karcher et al., 2022)	Interpersonal	Student	<p>How often they experienced discrimination over the past 12 months:</p> <ul style="list-style-type: none"> -From teachers -From other students based on their ethnicity,
Perceived Discrimination Scale (Romero & Roberts, 2003)	(Romero & Roberts, 2003)	Individual/Intrapersonal; Institutional	Student	<p>I have had problems at school because of my poor English.</p>

<p>Perceived Ethnic Discrimination (Kulis, Marsiglia, and Nieri, 2009)</p>	<p>(Nieri et al., 2022)</p>	<p>Individual/Intrapersonal Interpersonal</p>	<p>Student</p>	<ul style="list-style-type: none"> -People don't like me because of my ethnic group -Kids at school say bad things or make jokes about me because of my ethnic group -Kids my age exclude me from their activities or games because my ethnic group is different -People think my English is bad -Kids like me, who are from my ethnic group, can't get good grades at school
<p>Perceived Institutional Discrimination Subscale (Hope and Jagers, 2014)</p>	<p>(Hope & Jagers, 2014)</p>	<p>Individual/Intrapersonal Interpersonal</p>	<p>Student</p>	<ul style="list-style-type: none"> -It is hard for young Black people to get ahead because they face so much discrimination -Generally, I feel like a full and equal citizen in this country with all the rights and protections that other people have -On average, Black youth receive a poorer education than white youth

<p>Personal and Professional Beliefs About Diversity Scale (Pohan and Aguilar, 1994)</p>	<p>(Dedeoglu & Lamme, 2011)</p>	<p>Individual/Intrapersonal</p>	<p>Teacher</p>	<p>Professional Beliefs About Diversity Scale</p> <ul style="list-style-type: none"> -Students and teachers would benefit from having a basic understanding of different (diverse) religions -All students should be encouraged to become fluent in a second language. -Only schools serving students of color need a racially, ethnically, and culturally diverse staff and faculty. -People of color are adequately represented in most textbooks today. <p>Students living in racially isolated neighborhoods can benefit socially from participating in racially integrated classrooms.</p> <ul style="list-style-type: none"> -Historically, education has been monocultural, reflecting only one reality and has been biased toward the dominant (European) group. -Whenever possible, second language learners should receive instruction in their first language until they are proficient enough to learn via English instruction. -Multicultural education is most beneficial for students of color -Large numbers of students of color are improperly placed in special education classes by school personnel. -In order to be effective with all students, teachers should have experience working with students from diverse racial and ethnic backgrounds
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				<p>-Students should not be allowed to speak a language other than English while in school.</p> <p>-It is important to consider religious diversity in setting public school policy.</p> <p>-Multicultural education is less important than reading, writing, arithmetic, and computer literacy.</p>
<p>Policy Endorsements: School Desegregation and Affirmative Action: Policy Endorsement, School desegregation & Affirmative action rationales subscales (Hughes and Bigler, 2011)</p>	<p>(Hughes & Bigler, 2011)</p>	<p>Individual/Intrapersonal</p>	<p>Student</p>	<p>Policy endorsement</p> <ul style="list-style-type: none"> - What is your opinion about the policy presented in the video? - Do you think that school districts similar to this one should adopt a policy like the one in the video? - If this policy were adopted, would it help this school district and its students? <p>Affirmative action rationales</p> <ul style="list-style-type: none"> - This policy helps students who have been affected by racism in their own lives.

				<ul style="list-style-type: none"> - This policy helps make up for the fact that the college admission process can be easier for White students than students of color. - This policy helps make up for inequalities created by historical racism. <p>School desegregation</p> <ul style="list-style-type: none"> - This policy makes sure that children of all races have access to the same schooling opportunities and resources. - This policy will help children become more comfortable with kids from other races. - This policy makes learning environments more racially diverse, and kids learn better when they're in racially diverse classrooms.'
<p>Race, Racial Attitudes, and School Segregation Survey (RRASS) (Billingham and Hunt, 2016)</p>	<p>(Billingham & Hunt, 2016)</p>	<p>Individual/Intrapersonal</p>	<p>Parent</p>	<p>Visiting a Public School</p> <ul style="list-style-type: none"> - When you visit your local public school and look into whether it is suitable for your child, you find that: - You are greeted by a security guard and must pass through a metal detector, have your bags searched, and sign in at the front desk. - The last major renovation of the school's core facilities (classrooms, computer lab, auditorium, and gym) took place in 1996. - Out of 10 elementary schools in the district, the students in this school were ranked 3rd on the state standardized achievement exam.

<p>Racial and Ethnic Microaggressions Scale: Workplace and School Microaggressions subscale (REMS) (Nadal, 2011)</p>	<p>(Kang & Harvey, 2020)</p>	<p>Interpersonal; Institutional</p>	<p>Parent, Teacher</p>	<p>Component 6: Workplace and School Microaggressions;</p> <ul style="list-style-type: none"> -An employer or co-worker was unfriendly or unwelcoming toward me because of my race. -My opinion was overlooked in a group discussion because of my race. -I was ignored at school or at work because of my race. -Someone assumed that my work would be inferior to people of other racial groups. -An employer or co-worker treated me differently than White co-workers.
<p>Racial Attitudes Scale (Brigham, 1993)</p>	<p>(Kang & Harvey, 2020)</p>	<p>Interpersonal</p>	<p>Parent</p>	<p>Unequal Treatment</p> <ul style="list-style-type: none"> - Others expecting your math ability to be inferior because of your race - Not being taken seriously in math classes because of your race - Your math ideas or opinions being minimized, ignored, or devalued because of your race - Being treated as if you were not mathematically capable because of your race
<p>Racial Dehumanization of Students Scale</p>	<p>(Bentley-Edwards et al., 2020)</p>	<p>Individual/Intrapersonal; Institutional</p>	<p>Student, Teacher</p>	<p>Asks teachers to assess the school's perception of Black and Latino students as less smart, receiving more discipline, more difficult to engage, and more scary than other students. One item is "Other teachers in my school are afraid of many of the Black and Latino students."</p>

<p>Racism and Inequity Beliefs (RIB) Questionnaire (Legette et al., 2021)</p>	<p>(Legette et al., 2021; Legette et al., 2023)</p>	<p>Systematic; Individual/Intrapersonal</p>	<p>Teacher</p>	<p>School Inequity subscale</p> <ul style="list-style-type: none"> - In general, racial/ethnic minorities do not work as hard in school as White children. - In general, racial/ethnic minorities do not work value education as much as White children. - In general, most racial/ethnic minority parents are NOT involved in their child's schooling. - In general, racial/ethnic minorities receive the same academic preparation as white children. (Reverse coded). - In general, teachers treat students differently based on race. - In general, racial/ethnic discrimination is a factor in Black kids' lower placement in honors classes. - In general, racial/ethnic discrimination is a factor in Black kids' suspensions.
<p>Schedule of Racist Events (Landrine and Klonoff 1996),</p>	<p>(Berkel et al., 2006; Brody, et al., 2006; Sharma et al., 2019; Simons et al., 2003)</p>	<p>Individual/Intrapersonal; Institutional</p>	<p>Parent</p>	<ul style="list-style-type: none"> -How many times have you been treated unfairly by teachers and professors because you are Black? -How many times have you been treated unfairly by institutions (schools, universities, law firms, the police, the courts, the Department of Social Services, the Unemployment Office and others) because you are Black?

<p>School climate came from Ruck and Wortley's (2002) questionnaire and research from the National School Climate Center (Cohen et al. 2009)</p>	<p>(Pena-Shaff et al., 2019)</p>	<p>Individual/Intrapersonal</p>	<p>Student</p>	<ul style="list-style-type: none"> - Do you think teachers at your school treat students from your racial group better, worse or the same as students from other racial groups. - Do you think students from your racial group are more likely to be suspended than students from other racial groups for engaging in the same types of behavior.” - Do you think students from your racial group are more likely to have the police called on them than students from other racial groups? - If the police were called to your school, do you think they would treat students from your racial group better, worse or the same as students from other racial groups? - In general, students of different races usually hang out with students of the same race. - I am concerned about my personal safety when I'm at school. -Fighting among students is common at my school,” and “many students carry weapons school.
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<p>School Climate for Diversity Scale—Secondary (Byrd, 2017)</p>	<p>(Byrd, 2017; Byrd & Legette, 2022; Golden & Byrd, 2022)</p>	<p>Institutional; Interpersonal; Individual/Intrapersonal</p>	<p>Student</p>	<p>Quality of Interaction</p> <ul style="list-style-type: none"> - Students of different races/ethnicities trust each other; - Students here like to have friends of different races/ethnicities; <p>Frequency of Interactions</p> <ul style="list-style-type: none"> - Students of different races/ethnicities study together; - Students of different races/ethnicities hang out together; - Students of different races/ethnicities work together in class; <p>Equal Status</p> <ul style="list-style-type: none"> - Students of all races/ethnicities are treated equally at your school; - The principals treat students of all races/ ethnicities fairly; - At your school, teachers are fair to students of all races/ethnicities; <p>Stereotyping</p> <ul style="list-style-type: none"> - Your racial or ethnic group is seen in stereotypical ways here; - Students here have a lot of stereotypes about your racial or ethnic group; - Teachers and principals believe negative stereotypes about your racial/ethnic group;
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			<ul style="list-style-type: none"> - Teachers are prejudiced against certain racial/ ethnic groups; - Your racial or cultural group is represented in stereotypical ways in textbooks and class materials; <p>Promotion of Cultural Competence</p> <ul style="list-style-type: none"> -Your classes teach you about diverse cultures and traditions; - You have learned about new cultures and traditions at school; - You have the chance to learn about the culture of others; - In school you get to do things that help you learn about people of different races and cultures; - Your textbooks show people of many different races/ethnicities; - At your school, they encourage you to learn about different cultures; <p>Cultural Socialization</p> <ul style="list-style-type: none"> - In your classes you've learned new things about your culture; - At your school, you have chances to learn about the history and traditions of your culture; - At your school, you have participated in activities that teach you more about your cultural background; <p>Critical Consciousness Socialization</p>
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			<ul style="list-style-type: none"> - Your teachers encourage awareness of social issues affecting your culture; - Teachers teach about racial inequality in the United States; - In your classes you have learned about how race/ ethnicity plays a role in who is successful; - You have opportunities to learn about social justice; <p>Mainstream socialization</p> <ul style="list-style-type: none"> - At school you learn what it means to be an American - Your school teaches you core American values - At your school, they encourage you to be proud of what people in the U.S. have accomplished - Your classes have taught you about what makes the United States unique from other countries in the world. <p>Colourblind Socialization</p> <ul style="list-style-type: none"> - At your school, people think race/ethnicity is not an important factor in how people are treated - People here (at school) think it's better to not pay attention to race/ethnicity . - Your school has a color blind perspective - Your school encourages you to ignore racial/ ethnic difference <p>Support for Positive Interaction</p>
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			<ul style="list-style-type: none">-Teachers encourage students to make friends with students of different races/ethnicities.-The principals like for students to have friends of different races/ethnicities.- Students here think it's good to study with people of different races/ethnicities.-Teachers and principals say it's good to be a diverse school.
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School Discrimination (Fisher, Wallace, and Fenton, 2000)	(Bennett et al., 2020; Wang & Huguley, 2012)	Institutional; Interpersonal	Student	Treated Unfairly at School as a Latino (Mexican or Spanish, etc.) - Discouraged from joining an advanced class - Given a lower grade than deserved - Wrongly disciplined or given an after-school detention - Assumed to have poor English
School Racial Coping (Bentley-Edwards et al., 2020)	(Bentley-Edwards et al., 2020)	Individual/Intrapersonal; Interpersonal	Teacher	Racial assertiveness: I have spoken up for my race when my group is being challenged at the school where I teach. Racial inhibition: I have had to swallow my anger about racial conflict in my school where I teach.
School Racial Threat adapted from (Bentley-Edwards et al., 2020)	(Stevenson et al., 2024)	Interpersonal; Institutional	Student	-I see stress from racial conflicts with other students as threatening. -I feel anxious when my teacher and I don't get along because of racial issues. -Stressful events in class related to race affect me negatively. -The racial events that happen in my school will affect my future.
School Racial Vigilance (Utsey et al., 2012)	(Stevenson et al., 2024)	Interpersonal; Institutional	Student	-When I am one of the few of my race in a group, I expect others to view me as a stereotype. -If a racial matter comes up while talking to my peers, I expect that it will end with conflict.

				<p>-I find myself at school wondering that something racist might happen at any moment</p> <p>-I am concerned that a student in my class might make a racist statement.</p> <p>-Sometimes I go to school hoping that my teachers don't say or do something racist.</p>
School-Based Racial Discrimination (Eccles, Wong, and Peck, 2006)	(Fike et al. 2023)	Interpersonal; Institutional	Student	<p>School-Based Racial Discrimination</p> <p>-At school, how often do you feel teachers call on you less often than they call on other children because you are Black</p> <p>The adolescents reported the frequency with which they experienced negative treatment at their school because of their race by their peers and by their teachers.</p> <p>The perceived discrimination by peers scale included three items that asked about the frequency they felt they got into fights, were not associated with, and were not picked for particular teams or activities because of their race.</p> <p>The perceived discrimination by teachers scale included items asking how often they felt that their teachers called on them less, graded them more harshly, disciplined them more harshly, discouraged them from taking a class, and thought they were less smart because of their race.</p>

<p>School/ Teacher Racial Encounter Stress Scale (STRESS)</p>	<p>(Bentley-Edwards et al., 2020)</p>	<p>Individual/Intrapersonal; Institutional</p>	<p>Teacher</p>	<ul style="list-style-type: none"> -I have resources available to me to overcome racial stress - when a student and I don't get along . -There is help available to me when my students think I might be racially biased . -There is someone I can turn to for help when I experience conflicts with my students of color. -I have the ability to overcome stress regarding teaching about racial matters . -I would rather not have to deal with the stress of teaching about racial topics . -I perceive teaching about racial matters in class as threatening. -I have what it takes to beat the stress of teaching about racial matters . -I have the skills necessary to overcome racial stress in my classroom. -I feel anxious when my students and I don't get along due to racial misunderstandings . -Most racially stressful events in my classroom end positively -My students challenge my authority as a teacher because of my race. -The racially stressful events in my classroom affect me when I am away from school. -Stressful events around race in school impact me greatly.
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				-Racial stress within my relationships with students at school has a negative impact on me
Social Distance (Williams et al., 2023)	(Williams et al., 2023)	Individual/Intrapersonal; Interpersonal	Student	How happy would you be to have a Latino [Black, White] ____”: (a) teacher, (b) friend, (c) neighbor, (d) doctor, and (e) babysitter. Items were administered once for each target race/ethnicity (15 questions total). Scores were reverse-coded so that higher scores indicated greater comfort with the target racial/ethnic group.
Students’ Awareness and Endorsement of Cultural Stereotypes About Race and Math (Augoustinos and Rosewarne, 2001).	(Cvencek et al., 2015)	Individual/Intrapersonal	Student	Students were instructed to circle the number corresponding to their answer, using a 5-point Likert scale that ranged from very bad at math to very good at math. For the awareness measure, the two items included in the analyses were: -I think most people in America believe that most Asian people are ____ -I think most people in America believe that most White people are ____

				<p>For the endorsement measure, the two items included in the analyses were:</p> <p>-In my opinion, most Asian people are _____</p> <p>-In my opinion, most White people are _____</p>
<p>Students' Perceptions of their Belonging, Motivation, and Academic Success (Liang and Zhang, 2009)</p>	<p>(Liang & Zhang, 2009)</p>	<p>Individual/Intrapersonal</p>	<p>Teacher</p>	<p>Self-reflections</p> <p>-I must examine my own cultural beliefs and attitudes to determine how they might impact my interactions with students</p> <p>-My lack of knowledge of students with different religious background from mine may negatively impact their learning experience</p> <p>-I know I will treat all children equally, despite of their race, culture and language differences</p> <p>-I don't need to learn about diversity because I will treat all people the same</p> <p>-As a teacher, I must consider the advantages or disadvantages I have experienced because of my race</p> <p>Teacher beliefs</p> <p>-First language other than English should be included in school, not just at home</p> <p>-Religious differences should be acknowledged at school, not just at home.</p> <p>Teacher expectations</p>

				<p>-Achievement among minority students is related to the teacher's academic expectations of these students</p> <p>Actions to challenge social injustice</p> <p>-I will challenge my students' treatment of children who do not speak good English</p> <p>-Students will not be permitted to use poor English to communicate in my classroom</p>
Support for Cultural Pluralism (Brand et al., 2003)	(Brand et al., 2003)	Institutional	Student	<p>Support for Cultural Pluralism</p> <p>-Your teachers show that they think it is important for students of different races and cultures at your school to get along with each other.</p> <p>-Students of many different races and cultures are chosen to participate in important school activities.</p> <p>-You get to do something which helps you learn about students of different races and cultures at your school.</p> <p>-You work with students of different races and cultures in a school activity.</p>

<p>Teacher Candidates' Perceptions About Adolescents Based on the Adolescents' Physical Characteristics: Studying Teacher Expectations (DeCastro-Ambrosetti and Cho, 2011)</p>	<p>(DeCastro-Ambrosetti & Cho, 2011)</p>	<p>Individual/Intrapersonal</p>	<p>Teacher</p>	<p>Used pictures of four racial groups to ask</p> <p>Academic success</p> <ul style="list-style-type: none"> -Identify which student is most likely to excel in academics -Identify which student is most likely to attend an Ivy League college such as Yale or Harvard <p>Athletic success</p> <ul style="list-style-type: none"> -Identify which student is most likely to excel in athletics <p>Perceived as outsiders, identify which student is most likely to:</p> <ul style="list-style-type: none"> -Join a gang, get involved in drugs, and, finally, commit a crime before graduating -Involved in drugs -Most likely to commit a crime before graduating from high school <p>Academic adversity</p> <ul style="list-style-type: none"> -As most likely to become a parent before high school graduation -As most likely to dropout of high school <p>Challenging classroom authority</p> <ul style="list-style-type: none"> -Most likely to cause trouble in the classroom -Least likely to cause trouble in the classroom
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<p>Teacher Discrimination Scale (Eccles, 1997)</p>	<p>(Butler-Barnes et al., 2022; Kyere et al., 2023)</p>	<p>Institutional; Interpersonal</p>	<p>Student</p> <ul style="list-style-type: none"> - Teachers call on you because of your race or gender. - Teachers grade you harder because of your race or gender. - You were disciplined because of your race or gender. - Teachers think you are less smart because of your race or gender. - How much do you worry: You will be discriminated against at school because of your race? - At school, how often do you feel that teachers grade you harder than they grade other kids because of your race? - At school, how often do you feel that you get disciplined more harshly by teachers than other kids do because of your race? - At school, how often do you feel that teachers call on you less often than they call on other kids because of your race? - At school, how often do you feel that teachers think you are less smart than you really are because of your race? - How often have you felt that teachers/counselors discourage you from taking certain classes because of your race? - How often have you felt like you are not picked for certain teams or other school activities because of your race? - How often have you felt that you get in fights with some kids because of your race? - How often have you felt that kids do not want to hang out with you because of your race?
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				<p>- Think about this past school year. In your 8th grade school, how often was there racial tension between school staff members and students of different racial backgrounds?</p> <p>- Think about this past school year. In your 8th grade school, how often was there racial tension between students of different racial backgrounds?</p>
Teacher Colleague Racial Conversation Scale	(Bentley-Edwards et al., 2020)	Interpersonal; Institutional	Teacher	-My fellow teachers talk about racial discrimination
Teacher Racial Discrimination Experience (Bentley-Edwards et al., 2020)	(Bentley-Edwards et al., 2020)	Interpersonal	Teacher	<p>-I have been mistreated by members of other races.</p> <p>-I have been mistreated by members of my own race.</p>

<p>Teachers languages ideologies Beliefs about characteristics of language users (Metz, 2019)</p>	<p>(Metz, 2018; Metz, 2019)</p>	<p>Individual/Intrapersonal</p>	<p>Teacher</p>	<ul style="list-style-type: none"> - Other teachers think poorly of students who speak other dialects of English. - Standard English is necessary for academic settings. - English teachers should help students use Standard English instead of other dialects of English. - Speaking Standard English at job interviews conveys intelligence and education. - To be successful, students should only use Standard English. - English teachers should teach students to only use Standard English. - English teachers should teach students to understand and appreciate many dialects of English. - English teachers should help students use a wide range of dialects for different purposes. - English teachers should help students understand the differences between dialects of English.
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<p>Teachers Race Talk Survey (TRTS) (Milner IV, 2017)</p>	<p>(Alvarez & Milner IV, 2018; Milner IV, 2017)</p>	<p>Individual/Intrapersonal</p>	<p>Student, Teacher</p>	<p>I believe race plays a role in the educational experiences of my (current/future) students.</p> <p>I believe the topic of race is important to discuss with the students in my (current/future) classroom.</p> <p>I believe that teachers should discuss racism and racial discrimination with their students.</p> <p>I believe teachers should discuss recent instances of violence against Black people with their students (e.g., Trayvon Martin, Eric Garner, Michael Brown, Philando Castile).</p> <p>I believe teachers should discuss recent violence against police officers with their students (e.g., the police shooting in Dallas, TX). I feel prepared to have conversations about race in my classroom.</p> <p>I believe my teacher training program prepared me to discuss race in my classroom.</p> <p>I believe my students' parents/guardians would support conversations about race in my classroom.</p> <p>I believe the administration at my school supports conversations about race inside the classroom.</p> <p>I believe that it is my responsibility to help my students acquire the skills to critically analyze and respond to social injustices.</p> <p>I feel prepared to help my students acquire the skills to critically analyze and respond to social injustices.</p>
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				I believe the administration and teachers at my school would be supportive of student organizing and activism.
Teachers Support subscale from the Inventory of School Climate adapted from (Brand et al., 2003)	(Oberoi & Trickett, 2018)	Interpersonal	Student	-Teachers provide accurate and undistorted information about Islam.
Teaching About Race/Racism (Brooks and Martin, 2023)	(Brooks & Martin, 2023)	Interpersonal; Institutional	Teacher	-How often do you teach about the history of race/racism in your course curriculum ? -How often do they teach about whiteness in their course curriculum?
<p>Note: If the study author did not cite another article or explain who developed the measure, the assumption was made that the scale was developed by the study authors. We made every effort to get the list of relevant items by going to the original articles that cited the scale or outside databases cited by the study authors. However, at times only sample items and not the entire list was available</p> <p>N=50</p>				

Table A.2. Each measure used in the study and its reliability and validity rating

Name	Internal Consistency	Criterion-Related Validity	Construct Validity
Acculturative Hassles adapted (Vinokurov et al., 2002)	A	A	A
Attributions of Mathematical Excellence Construct (Jacobson et al., 2022)	S	S	P
Awareness of structural racism (Seider et al., 2018)	U	A	A
Bias-based bullying (BB) (Vigna et al., 2018)	U	A	A
Cognitive and Reflective Responses to Lessons (Hughes & Bigler, 2007)	U	A	A
Color-Blind Racial Attitudes Scales (COBRAS) (Neville et al., 2000)	P	A	U

Comfort level with individuals from different backgrounds (Riskowski, 2010)	A	A	A
Comprehensive Race Socialization Inventory (Lesane-Brown et al., 2005)	A	S	A
Critical Consciousness Scale (CCS) (Diemer et al., 2017)	P	S	P
Critical Reflection Achievement Gap Attributions (Banales et al., 2019)	P	A	P
Cultural Socialization Measure (Lee et al., 2006)	P	A	U
Difficulty with Racial Dialogue Scale (Bentley-Edwards et al., 2020)	P	A	A
Experiences of Discrimination Based on Gender or Race adapted by (Coppur-Gencturk, et al., 2023)	P	A	A

Everyday Discrimination Scale (Seaton et al., 2008)	P	A	A
Index of Race-Related Stress (Seaton, 2003)	P	A	P
Language Attitude Teachers Survey-Revised (LATS-R) adapted by B. B. Flores and Smith (2008).	U	A	U
Middle School Social Distance Scale based on the Bogardus Social Distance Scale (Bogardus, 1933)	A	A	A
No name: School climate came from Ruck and Wortley's (2002) questionnaire and research from the National School Climate Center (Cohen et al. 2009).	U	U	A
Perceived Discrimination based on ethnic group membership (Faircloth & Hamm, 2005)	P	P	A

Perceived Discrimination Scale (PDS). (Phinney, 1998)	A	A	A
Perceived Discrimination Scale (Romero & Roberts, 2003)	P	A	A
Perceived Ethnic Discrimination (Kulis et al., 2009)	P	A	A
Perceived institutional discrimination (Hope & Jagers, 2014)	P	A	A
Personal and Professional Beliefs About Diversity Scale (Pohan & Aguilar, 1994)	P	S	A
Policy Endorsements: School Desegregation and Affirmative Action (Hughes & Bigler, 2011)	P	A	A

Race, Racial Attitudes, and School Segregation Survey (RRASS) (Billingham and Hunt, 2016)	A	A	A
Racial and Ethnic Microaggressions Scale (REMS) (Nadal, 2011)	P	A	A
Racial Attitudes Scale (Brigham, 1993)	P	A	A
Racial Dehumanization of Students Scale (Bentley-Edwards et al., 2020)	P	A	A
Racism and Inequity Beliefs (RIB) Questionnaire (Legette et al., 2021)	P	P	P
Schedule of Racist Events (Landrine & Klonoff, 1996),	P	S	A
School Climate for Diversity Scale—Secondary (Byrd, 2017),	P	A	P

School Discrimination (Fisher, et al., 2000)	P	S	P
School Racial Coping (Bentley-Edwards et al., 2020)	P	A	A
School Racial Threat adapted from Bentley-Edwards et al., 2020)	P	S	A
School Racial Vigilance (Utsey et al., 2012)	P	S	A
School/ Teacher Racial Encounter Stress Scale (STRESS) (Bentley-Edwards et al., 2020)	P	A	P
School-Based Racial Discrimination (Eccles et al., 2006)	P	A	A
Social Distance (Williams, Bigler & Ramirez, 2023)	P	A	A

Students' Awareness and Endorsement of Cultural Stereotypes About Race and Math (Augoustinos & Rosewarne, 2001).	A	S	A
Students' Perceptions of their Belonging, Motivation, and Academic Success (Liang & Zhang, 2009)	S	A	S
Support for Cultural Pluralism (Brand et al., 2003)	U	S	S
Teacher Candidates' Perceptions About Adolescents Based on the Adolescents' Physical Characteristics (DeCastro-Ambrosetti & Cho, 2011)	A	A	A
Teacher Colleague Racial Conversation Scale (Bentley-Edwards et al., 2020)	U	A	A
Teacher Discrimination Scale (Eccles, 1997)	P	S	P

Teacher Racial Discrimination Experience (Bentley-Edwards et al., 2020)	P	A	A
Teachers languages ideologies Beliefs about characteristics of language users (Metz, 2018)	P	A	A
Teachers Race Talk Survey (TRTS) (Milner IV, 2017)	A	A	A
Teachers Support subscale from the Inventory of School Climate adapted from (Brand et al., 2003)	P	A	A
Teaching About Race/Racism (Brooks and Martin, 2023)	A	A	A

N = 50