Evading Race: STEM Faculty Struggle to Acknowledge Racialized Classroom Events

Gretchen P. King,† Tatiane Russo-Tait,‡ and Tessa C. Andrews§*

†Owens Institute for Behavioral Research, ‡Department of Cellular Biology, and §Department of Genetics, University of Georgia, Athens, GA 30602

ABSTRACT

Undergraduate science, technology, engineering, and mathematics (STEM) classrooms are not race-neutral spaces, and instructors have the power to center racial equity and inclusion in their instructional practices. Yet how instructors think about race and racism can impact whether and how they adopt inclusive practices. We examined how 39 undergraduate STEM instructors noticed anti-Black racialized events that were experienced by students in classroom narratives. We created narrative cases that described multiple common, harmful anti-Black racialized experiences based on extant research and guidance from an expert advisory board. Instructors responded to cases by describing the problems they noticed. Using frameworks of racial noticing and color-evasive racial ideology, we conducted qualitative content analysis of instructor responses. Color-evasive racial ideology was pervasive, with most responses (54%) avoiding any discussion of race, and few responses acknowledging race or racism in more than one event (10%). We characterized six forms of color-evasiveness. This study adds to a growing body of literature indicating that color-evasion is pervasive in STEM culture. Instructors would benefit from professional development that specifically aims to counter color-evasiveness and anti-Blackness in teaching. Furthermore, STEM disciplines must pursue systemic change so that our organizations value, expect, promote, and reward the development and enactment of a critical racial consciousness.

INTRODUCTION

Science, technology, engineering, and mathematics (STEM) fields have long been perceived as environments in which the best and brightest can succeed regardless of race. In reality, STEM fields are not meritocratic (McGee, 2020; Posselt, 2020; Blair-Loy and Cech, 2022), and racism impacts students' experiences, creates inequities, and excludes students (Solórzano *et al.*, 2000; Harrison and Tanner, 2018; Harrison *et al.*, 2019; Lee *et al.*, 2020; Allen *et al.*, 2022; Stanton *et al.*, 2022). Black students, in particular, face the pervasiveness of anti-Blackness in all aspects of society, including in their education (Dumas, 2016). To succeed in STEM, Black students must endure stereotype management (McGee and Martin, 2011), stereotype threat (Steele, 2011), microaggressions in classrooms and on campus (Riegle-Crumb *et al.*, 2019; Solórzano *et al.*, 2000; Lee *et al.*, 2020; Allen *et al.*, 2022; Stanton *et al.*, 2022), and racist institutional norms (Harper, 2012b). Despite these considerable challenges, Black students succeed in our educational systems due to their own internal strengths and strategic responses to ubiquitous forms of racism (e.g., McGee and Martin, 2011; Harper, 2012a; Strayhorn, 2015; Stanton *et al.*, 2022). However, asking Black students to rely on their internal strengths is yet another inequity because sustaining resilience in response to anti-Black STEM environments comes at a cost to health and well-being (Bair and Steele, 2010; McGee, 2020).

Instructors have the power and responsibility to center racial equity and inclusion in their instructional practices. Ninety percent of students who left STEM fields

reported that instructor practices contributed to their decision to leave (Seymour *et al.*, 2019), suggesting that faculty can help retain students in STEM through their classroom practices. One common suggestion is for faculty to incorporate more-inclusive teaching strategies into their classrooms (Tanner, 2013; Killpack and Melón, 2016). However, faculty who overlook racism in the science classroom less frequently adopt inclusive teaching practices than faculty who embrace the differences between students, including racial differences (Aragón *et al.*, 2016). Instructor beliefs about diversity are often the first obstacle to adopting new practices (Thoman *et al.*, 2021). In addition, because STEM is socially constructed as objective and meritocratic (Posselt, 2020), some faculty believe STEM to be race neutral (Haynes and Patton, 2019). Therefore, the addition of inclusive teaching practices is not sufficient (Calabrese Barton and Tan, 2020), and faculty must also be able to notice and address racial phenomena in their classrooms.

Racial Noticing

Creating equitable and inclusive STEM classrooms relies on racial noticing (Shah and Coles, 2020). Racial noticing emerged from the teacher noticing literature, which is a conceptualization of expertise that focuses on how teachers notice and respond to particular events while in the midst of teaching (e.g., Sherin *et al.*, 2011). Racial noticing is the process of attending to, interpreting, and formulating responses to racial phenomena in the classroom (Shah and Coles, 2020). This construct assumes that racism is ubiquitous in everyday life, including in STEM classrooms, because society continues to be deeply and inherently racist (Ladson-Billings, 1998). Racial phenomena that occur in the classroom can be implicitly or explicitly racist and can occur at the level of individual's identity and positionality, within social interactions, and in structural practices and norms in the classroom (Shah and Coles, 2020). For example, Black students may be positioned as less academically able by an instructor or other students (e.g., Allen *et al.*, 2022). Explicitly practicing racial noticing may improve these abilities among teachers (Shah and Coles 2020).

Color-Evasive Racial Ideology

The ability to notice racialized events is made harder by color-blind racial ideology. A color-blind racial ideology explains racial inequalities by acknowledging the inequality but denying that it is about racism and instead providing a different explanation (Bonilla-Silva and Dietrich, 2011; Bonilla-Silva, 2018). For example, a professor who attributes the lack of racial diversity in STEM to individual interests of students of color, rather than larger systemic issues, would be using a color-blind frame and simultaneously absolving themselves of any responsibility for trying to remedy a lack of diversity in STEM (Russo-Tait, 2022). In this paper, we use Annamma *et al.*'s (2017) expansion to color-evasive racial ideology. Conceptualizing this racial ideology as color-evasiveness has two major affordances. First, by using "evasiveness" instead of "blindness," it eliminates the ableist language that equates blindness with a deficit. Second, the word "evade" captures the active behavior one must engage in to avoid acknowledging racism as a driver for racial inequality. We use the following definition of color-evasive racism: the intentional act of avoiding or minimizing the racism in racialized events or societal inequities by placing other factors at the

forefront as an explanation of the event (Annamma *et al.*, 2017). We use color-evasive terminology unless we are drawing directly on work that employs color-blind terminology.

Color-blind racial ideology has become so embedded in society that Bonilla-Silva argues it is now the dominant racial ideology in the United States (2001; Bonilla-Silva, 2018; Bonilla-Silva and Baiocchi, 2001). That is, color-evasive ideology permeates our cultural beliefs and systems, and manifests in all levels of society—from our various social institutions to interpersonal interactions and individual ideals. The commonality and acceptance of color-evasive racial ideology is seen in the way that it is taught to our children (Vittrup, 2016); integrated into our legal system (Annamma *et al.*, 2017); and widely documented in K–12 education (Kohli *et al.*, 2017; Wilt *et al.*, 2022), higher education (Yosso *et al.*, 2004; Crenshaw *et al.*, 2019), and social science and education research (Bonilla-Silva and Baiocchi, 2001; Harper 2012b). Color-evasive narratives work to normalize and justify racial inequality in society and maintain the white supremacist power structure, regardless of an individual's egalitarian beliefs or intentions (e.g., Wilt *et al.*, 2022). Individuals and organizations relying on a color-evasive racial ideology "do not see race." This removes the stigma and personal burden of being seen as racist, while perpetuating racial advantages for white people. It also contributes to an environment in which many people in the United States are uncomfortable discussing race and racism.

STEM faculty commonly employ color-evasive ideologies and lack racial consciousness, even when they hold progressive ideals and value diversity, equity, and justice (e.g., Charbeneau and Chesler, 2015; Haynes and Patton, 2019; Russo-Tait, 2022). Enactments of color-evasive ideology include the belief that STEM classrooms are race-neutral spaces in which every student has equal opportunities to succeed. Using color-evasive ideology, one can explain the lack of diversity in the STEM workforce by putting the onus on individual students' interests, choices, or behaviors, as well as perceived deficiencies in cultural or academic backgrounds, rather than identifying and addressing the root causes of inequities (Bonilla-Silva, 2018; Russo-Tait, 2022). Color-evasive beliefs are harmful to students of color because they deny that negative racialized experiences occur (Johnson, 2007; McNair *et al.*, 2020). This sidesteps any personal obligation to address these problems and ultimately keeps these students from experiencing equitable learning opportunities and inclusive learning environments. Thus, to create just and equitable learning environments for STEM undergraduates, faculty need additional learning and development opportunities. The field currently lacks empirical investigations of how undergraduate STEM faculty notice and reason about racialized events in classrooms. Filling this gap is important for creating teaching professional development opportunities tailored to the current thinking of STEM faculty.

Anti-Blackness

We also ground our research in anti-Blackness. This framing was necessary, because we intentionally brought the attention of faculty to the experiences of Black students in STEM classrooms. Reckoning with these experiences requires "confronting the specificity of anti-blackness" (Dumas and Ross, 2016, p. 416), which is more than racism against Black people. Anti-blackness is born from the historical truth that Black

people were brought to the United States as property and posits that Black people still exist as slaves in the American subconscious, to be possessed and having little right to exist for themselves (Dumas and Ross, 2016). Thus, though chattel slavery may be over, Black people continue to be positioned as less than human in American society. In contrast, whiteness continues to be seen as valued property (Harris, 1993) and symbolizes what is normal, pure, and deserving (Bell, 1993; Dumas and Ross, 2016). This manifests today in the ways that people living in America are socialized to empathize with the pain of white people, while ignoring or even blaming Black people for their own suffering and oppression. In the context of STEM, we can see how Black students are positioned in relation to the so-called achievement gap (Le and Matias, 2019; Shukla *et al.*, 2022) as well as in the myriad ways their culture, language, and ways of being and knowing are devalued (Carlone and Johnson, 2007; Morton *et al.*, 2019; McGee, 2020; Madkins and Morton, 2021). This makes sense when one considers that the culture of STEM is inextricably linked to whiteness (Le and Matias, 2019; Morton and Nkrumah, 2021). Whiteness in STEM manifests in how the values, norms, and practices of white people are normalized as the universal standard to which everyone should strive, thereby positioning non-white people as inherently inferior or abnormal. This can be hard to see as a white person, because whiteness is often masked and left unquestioned (Le and Matias, 2019). This normalization of whiteness "means that Whites do not believe that they are actively investing in White supremacy or racism, which keeps oppression intact" (Le and Matias, 2019, p. 20). STEM culture remains anti-Black (Cedillo, 2018) by normalizing the cis hetero white man as the standard (Morton and Nkrumah, 2021) and by upholding white values, norms, and practices that are not only exclusionary to, but devaluing of Black people (Cedillo, 2018). Anti-blackness, therefore, is an illuminating frame for scholars and faculty to consider the everyday manifestations of marginalization and dehumanization that Black students experience in STEM classrooms (Morton *et al.*, 2022).

This study examined how STEM instructors recognized and interpreted anti-Black racialized events in authentic classroom cases. Undergraduate STEM instructors read and responded to cases about one day in class. A case-based approach can represent the authentic messiness of a classroom environment, while also presenting all participants with the same stimuli to elicit their thinking (Bryan and Tippins, 2005). This study was guided by the question: To what extent and in what ways do faculty notice anti-Black racialized events in STEM classrooms? We aimed to understand the manifestations of color-evasiveness that faculty employ when they consider everyday instances of anti-Blackness in STEM classrooms. Understanding how STEM instructors respond is a starting point for eliminating (in) action in STEM classrooms that creates racially inequitable and unjust learning environments.

METHODS
Researcher Positionality
As education researchers, it is essential that we engage in reflexivity about our social identities to appropriately situate ourselves in relation to our research context. Reflexivity helps researchers be cognizant of how our social positions may be informing our perspectives and biases in ways that affect research design, data analysis, and interpretation of findings (Milner, 2007; Tuhiwai-Smith, 1999). Below, each coauthor shares how their social identities and related experiences as non-Black researchers inform their commitments to and challenges in engaging this research project.

G.P.K. identifies as a cisgender white woman who was raised in the rural south. She first remembers recognizing her identity as white while reading American Girl books: the character Addy shed light on issues of slavery and the American Civil War. While the historical fictionalized account raised G.P.K.'s awareness of racial differences and the injustices of slavery, it did not prepare her to grapple with modern systemic racism. G.P.K. vividly remembers being explicitly taught that it was impolite to notice and name race. Although she recognized her identity as white during elementary school, it was years before she recognized her own socialization into a color-evasive and anti-Black society. After the murders of George Floyd and Breonna Taylor, she closely followed the conversations that Black students had on Twitter. Those conversations about inequities and marginalization within the classroom depicted an urgent need in higher education. This study was originally planned to be professional development for instructors around inclusive teaching practices. While thinking about classroom inclusion, G.P.K. pondered how whiteness influenced her research, teaching, and learning. She read and listened to Black scholars and thought critically about her own identity, color-evasiveness, and anti-Blackness. As she listened and learned, it felt particularly important to help other instructors center the voices of Black students in their own learning, which led to the development of the narrative cases. G.P.K. recognizes her racial noticing skills are still new and continues to develop them by being critical of her own responses, talking with others who have more experience and skill, and continually reading and listening. In this study, she was particularly conscious to always keep the advisory board's voices in mind and relate her analysis to research literature.

Like G.P.K., T.C.A. identifies as a cisgender white woman. She is a STEM faculty member and a multigenerational college graduate. These identities are interrelated, because T.C.A. was able to develop academically, achieve, and be seen as deserving of her accomplishments with no recognition of the unearned white privilege that made this possible. As an early-career scholar, she moved from Montana, where less than 1% of people are Black, to Georgia, where more than 33% of people are Black, which sparked T.C.A.'s awareness of her own identity as white. She began to prioritize learning about anti-Blackness after the murder of George Floyd and other Black citizens by the police. Due to her described positionality, she needed considerably more reading, reflecting, and learning from others to begin to see her own and others' enactments of color-evasiveness and anti-Blackness. She relies heavily on the work of Black scholars and authors to gain insight into the experiences of anti-Blackness that people endure in and out of STEM and to better see enactments of whiteness. Noticing and responding remain nascent skills that she deploys inconsistently, while continuing to learn and reflect on how she can disrupt whiteness and anti-Blackness in her spheres of influence. Collaborating with the advisory board and analyzing and interpreting responses of STEM faculty with coauthors provided new opportunities for T.C.A. to reflect on her own color-evasiveness and anti-Blackness. Finally, T.C.A. shares similar positions with many of the

participants in this study. She has racial privilege, wields power as a faculty member and STEM professional, and has extensive teaching experience. These common experiences may lead her to empathize with the participants, which can both aid and obscure data interpretation.

T.R.-T.'s concerns for conducting research that sheds light into hegemonic ideology such as color-evasiveness and anti-Blackness in STEM are rooted in her lived experiences as a cisgender, heterosexual, Latinx woman who emigrated to the United States from Brazil in her late teens. Her proximity to whiteness in a so-called "racial democracy" during her formative years implicitly taught her to hold color-evasive and anti-Black sentiments that kept her from recognizing systemic racism. After moving to the United States, she was introduced to deficit narratives about Latinx people that bore striking resemblance to the discourse about Afro-Brazilians. This revelation, combined with her own subsequent experiences at the intersection of xenophobia, racism, and sexism (e.g., lowered expectations of her intellectual ability) and bearing witness to the exclusionary racialized experiences of Black and Latinx students in STEM, motivated her to engage in justice-oriented research and teaching. She pursued a PhD to learn more about the root causes of racial inequities in STEM education. As someone who did not grow up experiencing the sustained dehumanizing conditions in K–12 STEM education in the United States and who was socialized in anti-Blackness, T.R.-T. recognizes that she will never be able to fully see and understand all possible manifestations of anti-Blackness in the lives of people in the Black diaspora—and therefore, she can still inadvertently contribute to it. To address this, she consistently engages in self-reflection and tries to learn from the teachings of Black scholars. She also recognizes that the liberation of people of color is inextricably linked, and she engages in her work in solidarity with other scholars of color to collectively resist and disrupt white supremacy in STEM (Miles *et al.*, 2019) so that all students of color can have access to equitable learning experiences and outcomes.

The authors worked to negate their socialization in anti-Blackness in this work in several ways. First, we relied heavily on the lived experiences of Black students to create the cases that participants analyzed, including experiences described in published research and the perceptions and priorities of an advisory board of Black student-scholars. Relying heavily on the expertise of others was essential for creating narrative cases that centered the voices and experiences of Black students in STEM and not our conceptions of these experiences. Second, we sought feedback on the paper from two scholars who use anti-Blackness as a frame for their work. Though these scholars were not Black (one identifies as Filipino-American and one as Southeast Asian), their experiences thinking about and recognizing anti-Blackness allowed them to provide valuable feedback. Third, we analyzed participants' responses to the cases collaboratively and iteratively, engaging in ongoing self-reflection and returning to the literature about color-evasiveness and anti-Blackness repeatedly to problematize our interpretations.

Participants and Context

This study took place at a large, research-intensive university in the southeastern United States. We recruited participants through learning communities that were engaged in improving undergraduate teaching in STEM courses. Participants ($n = 39$) taught in the life sciences, physical sciences, mathematics, engineering, and STEM education. Participants had a range of teaching experience and position types, including research-intensive and teaching-intensive positions. We did not collect demographic information in order to encourage candor among participants by protecting their identities. However, participants were likely representative of the institution. In 2021, university faculty were 68% white, 13% Asian, 5% Black, and 4% Hispanic (UGA Fact Book, 2021). Though STEM can be less racially diverse than other disciplines in higher education, the learning communities were more racially diverse than their STEM departments. Participants responded to one or two online surveys in Spring 2021. Thirty-nine instructors completed at least one survey, and 22 completed both surveys, totaling 61 responses. This study was reviewed and determined exempt by the Institutional Review Board (no. STUDY00006754).

Data Collection

We elicited data on whether participants noticed and problematized racialized events in STEM classrooms and whether they engaged in color-evasiveness by asking them to analyze written cases within surveys. This section describes the creation of the cases, the content of the cases, and the surveys used to gather participants' analyses of the cases.

We wrote two narrative cases (Bryan and Tippins, 2005) for this study that described the experiences of students in one day of class in a large undergraduate science course. We define a case as a short story (~650 words) that richly depicts a moment in time for the purpose of analysis. We designed the cases to authentically represent the messiness of a typical classroom, using the research literature, our experiences as instructors and students, and students' experiences. In other words, there were many things to notice in the cases. The anti-Black racialized events were designed to be the focus, but the case also described instructors using structures that can foster inclusive and equitable classrooms (e.g., Tanner, 2013), as well as missed opportunities to use such practices. The cases offered basic background information about the course and included information about the race and pronouns of each student mentioned in the case. Anti-Black racialized events formed the backbone of each case, and participants' analyses of racialized events is the focus of this paper.

We developed descriptions of anti-Black racialized events informed by prior research findings and a local expert advisory board. We began by compiling a list of potential racialized events from research about experiences of Black students at predominantly white institutions (PWIs; Solórzano *et al.*, 2000; Stanton *et al.* 2022). We then relied on an advisory board to help us develop narrative cases that depicted common and realistic racialized events in STEM classrooms. The advisory board included five Black STEM undergraduates who were co-researchers in participatory action research studying the success of Black science students in the U.S. Southeast. The advisory board's expertise, as researchers and as Black individuals with lived experiences of exclusion in STEM at a PWI, was critical in developing racialized events for the cases. The advisory board expanded, refined, and prioritized the list of potential racialized events and provided feedback on the cases that described the

TABLE 1. Brief descriptions of the racialized events in cases 1 and 2

Event name	Description
Case 1: Follows Sam, a Black student, through an introductory biology class	
Isolated	White group mates leave Sam out of group discussions and do not actively involve or acknowledge her contributions.
Spokesperson	Her group expects Sam to answer questions about the Henrietta Lacks (a Black woman) case, because she is Black.
Stereotyped	Sam asks a question about the assignment. In his reply, Dr. Y tells Sam that being an athlete must be difficult and she must not have time to study. Sam is not an athlete.
Unfairly Graded	On a group assignment, Sam receives a different grade than her group for the same work.
Case 2: Follows Spencer, a Black student, through an introductory chemistry class	
Ignored	Spencer expresses an idea, which Alex echoes, resulting in praise from the instructor to Alex.
Dismissed	Another student tells Spencer he should attend tutoring when he questions an idea.
Disrespected	Dr. Z turns her back to Spencer as he asks a question after class. She does not understand his question and assumes he has not read the class material.
Gaslit	Spencer states that he is feeling racism in class, and classmate Logan insists that chemistry is just hard.

events. During each meeting, the advisory board had time to meet as a group without the researchers present, which provided space for them to discuss the events and cases without having to worry about power or racial dynamics (Blackwell, 2010). The advisory board members were provided a stipend for their work.

After finalizing the cases with the advisory board, we asked a group of biology education researchers to complete a survey that asked them to analyze a case, as participants would. We sought their feedback about the cases and the survey. These researchers were faculty and graduate students; most were white women. We sought their feedback because collectively they had extensive experience as instructors of large lecture classes, expertise in critical approaches and inclusion and exclusion in STEM, and survey research experience, and they were familiar with the learning community members. Their feedback was helpful in thinking about how the cases would be perceived by participants. As a result of their feedback, we made minor wording changes in the cases, without altering the racialized events developed and refined in collaboration with the advisory board. We also fine-tuned the survey questions and format.

The two cases each include four events (Table 1) in which racism plays a role. Readers may notice additional racialized events in the cases, notice gendered events, or struggle to recognize an event as racialized. We consider it critical that the advisory board viewed these events as racialized and that these events largely mirror the documented exclusionary experiences and interactions of Black students described in the research literature. The full cases, with each racialized event highlighted, are available in Appendix A in the Supplemental Material.

Participants analyzed the cases in an online survey. Each survey asked the participant to read one case with the following instructions: "This case study of a college classroom includes events based on the experiences of real students and faculty. Please read the case and pay attention to whether all students in the course feel welcome, feel included, and have the same opportunities for success." The survey posed three questions (see full survey in Appendix B in the Supplemental Material), and most of the data for this study were offered in response to this question: "Name up to 5 problematic things you noticed in this classroom. Explain WHY each of these are a problem."

We asked all participants in six learning communities to respond to two surveys, one with case 1 and one with case 2, in a random order and with at least 4 weeks separating the two surveys. We randomly assigned each learning community to receive case 1 or case 2 in the first survey and the other case in the second survey. This design resulted in close to the same number of participants analyzing each case (case 1, $n = 34$; case 2, $n = 27$) and some participants analyzing both cases ($n = 22$). Responses could not be linked to participant identity. We treat multiple responses from the same participant as independent, because we wanted to ascertain whether and how they attended to each racialized event in each case.

Data Analysis

We conducted qualitative content analysis of survey responses to characterize how participants noticed racialized events, including evidence of color-evasiveness. The coding process included three stages, each of which was iterative and collaborative (Hsieh and Shannon, 2005). First, we identified where each response mentioned one of the racialized events, using the events in Table 1 as an a priori coding scheme. We allowed for the fact that participants could briefly or vaguely refer to an event. Second, we open-coded the ways in which participants recognized or evaded the role of race in the event, informed by color-evasive and color-blind framing (Annamma et al., 2017; Bonilla-Silva, 2018). This process relied on constant comparison as we read, reread, and discussed each response (e.g., Charmaz, 2006; Birks and Mills, 2011). At least two authors coded each response independently, and we discussed all disagreements to reach consensus. We developed code descriptions, applied them to data, and then revised the code descriptions based on our discussions. We reanalyzed data as codes evolved. In the third stage, we read all data aligned with each code to ensure that we clearly defined the boundaries between codes and compared all data coded the same way. We then developed themes from the finalized codes that describe the patterns of color-evasion and racial noticing identified in the data. This process resulted in seven themes that captured how participants noticed and evaded race (see Appendix C for full code descriptions with an example from the data). We also determined the frequency with which each racialized event was noticed and acknowledged as racialized. We were blind to the racial identity of participants, because we did not collect those data, and therefore our analysis did not consider whether and how participants' racial identities impacted their responses.

The trustworthiness of our qualitative analyses derives from constant comparison and transparency about our methods, positionality, and reflexivity (e.g., Guba, 1981; Anfara *et al.*, 2002; Shenton, 2004). Constant comparison requires iteratively and continually making comparisons within data (e.g., Charmaz, 2006; Birks and Mills, 2011). Multiple authors analyzed all of the data, and our iterative approach to theme development ensured that we reanalyzed responses multiple times. Because we analyzed data independently and then discussed disagreements, multiple people brought their own perspectives to the data and collaboratively made sense of the data. We have written detailed methods and described our own positionality in order to allow readers to consider how our approaches and perspectives may have influenced the findings and interpretations presented.

Limitations

This qualitative study characterizes the racial noticing of a group of STEM instructors at one institution, and this group may not be representative of all STEM faculty. Each of these instructors had chosen to be involved in a long-term teaching professional development experience. Therefore, these instructors likely place more value on teaching and continuously improving their teaching than other faculty at research-intensive institutions. This research closely scrutinizes the thinking of these participants, producing informative results, but these findings are not generalizable to all STEM faculty.

There are also limitations of our study approach that warrant consideration. We elicited racial noticing abilities and color-evasive ideology using written narrative cases about the negative racialized experiences of Black students at a PWI. The responses of participants cannot be separated from the content of the cases. These cases did not address the experiences of students with other racial identities or the role of intersectionality in racialized experiences and instructors' abilities to notice these events, nor did they contain positive representations of racialized experiences within the STEM classroom. Therefore, the findings of this work provide insight about noticing negative racialized experiences of Black students.

Using surveys places some limitations on the comprehensiveness and nuance present in the data we analyzed about the racial noticing abilities of participants. Participants may have felt rushed through the survey or may have taken a triage approach, focusing on the problem(s) that seemed most important or most immediately addressable. This would result in participant providing responses that only partially represented their abilities and ideas. Additionally, while surveys allow for data collection from a greater number of participants due to their ease, they do not allow for pointed follow-up questioning. In particular, we note that the absence of the acknowledgment of the role of race or racism in our data does not mean that the participant was not considering race and racism as factors in the events. If participants do not discuss race or racism in their responses, it could be because they did not notice it or because they noticed it and chose not to write about it. In the case of the latter, however, we argue that reticence to bring up racism is an incarnation of a color-evasive ideology.

With these limitations in mind, we invite readers to contemplate the following findings of this research.

FINDINGS AND DISCUSSION

Participants in this study analyzed cases that were deliberately written to highlight anti-Black racialized events in STEM classrooms. Our broad findings indicate that, while some responses noted the role of race or racism occasionally, all responses exhibited color-evasiveness. Out of the 61 survey responses, 54% did not mention race at all ($n = 33$), relying entirely on color-evasiveness, 30% ($n = 18$) named race when describing one out of four events in a case, and 16% ($n = 10$) acknowledged race and/or racism in more than one event in a case. Each of the events was recognized as racialized in some responses, but no responses addressed the role of race in all four events in a case.

We begin by describing the ways in which responses exhibited racial noticing abilities in STEM classroom contexts. We present these data first, despite their rarity, to enable readers to contrast noticing and evading race in these data. Then, we characterize the different forms of color-evasiveness present in participants' responses. We rely on quotes to illustrate racial noticing and color-evasiveness; we edited quotes lightly for spelling, punctuation, and grammar. Finally, we describe how participants noticed some events more readily than others, and similarly recognized racism more readily in some events than others. We present discussion alongside evidence of our findings, because we expect readers to benefit from the chance to immediately consider interpretations of these data. We invite readers to keep the study sample in mind when considering findings. Participants had elected to participate in long-term teaching professional development and were predominantly, but not exclusively, white.

Some Participants Engaged in Racial Noticing

Overall, less than half of responses acknowledged the role of race or racism in a case, and typically only for one of four racialized events. Some responses indicated that participants had attended to the race of case characters (e.g., by including the race of the student), but did not elaborate on why racialized events were problematic. For example, this response mentions race but does not discuss it further:

> Dr. Z shows a different level of enthusiasm to white students' questions vs. the Black student's question.

This response identified that Dr. Z was preferencing the white student's question over the Black student's question but provided no additional information about why the respondent felt this was problematic, even though the survey question asked them to explain why the event was problematic. It was unclear whether participants offering responses like this did not consider the consequences of racism for the Black student in the case or believed the negative impact was implied in their statements.

Other responses identified race and addressed how the racialized event was problematic. For example:

> The discussions seem to be dominated by white students, which is a problem since it makes other students feel like, at best, spectators whose contributions and needs aren't valued. The instructor should arrange for opportunities for different students to speak, for instance by having post-group work presentations rather than depending on voluntary hand-raising.

While this response acknowledges race, it is important to point out that it also effectively "othered" any non-white person by combining them into the "other students" category. This suggests that this participant may not be practiced at talking about race, but is thinking about, noticing, and proposing responses to racialized events in a STEM classroom.

A few responses described racialized events and named racism as the problem that was occurring in the event:

> Dr. Y's comment to Sam about being an athlete is thinly veiled racism. This is most problematic because it involves a direct communication from Dr. Y to Sam, it's a personal judgment of Sam, it's influencing Dr. Y's perception of Sam, and it was overheard by the rest of the group and may influence their perception of Sam or at least her comfort level in the group. Dr. Y needs to avoid expressing any assumptions about his students' personal lives or abilities and should take some implicit bias training and think deeply about where these assumptions are coming from.

This response described the complexity of the stereotyped event and provided a robust description of the problems with stereotyping students. Responses like these, that acknowledged the role of race and racism, were not common. More often, participants did not discuss racism that they noticed in a case.

In considering examples of racial noticing, it stands out that no response discussed the role of race in all four events in a case. Looking across responses to a case, at least one participant acknowledged the role of race for each event, indicating that all events could have been noticed as racialized and yet were not. We interpret this as evidence of the power of color-evasive socialization that occurs in the United States. This socialization makes it difficult for those with racial privilege, such as white people, to notice and appreciate the role of race and racism in everyday interactions and circumstances and makes it tempting to overlook, minimize, or explain away racialized events (Bonilla-Silva, 2018). Furthermore, in addition to color-evasiveness, faculty are encultured to view STEM as meritocratic, meaning that a person's success or failure results from their abilities and efforts. Research has shown that STEM faculty who hold these views are not as able to recognize exclusionary climates, regardless of their own social identities and experiences with discrimination (Cech *et al.*, 2018).

Participants Used Various Forms of Color-Evasiveness

Over half of responses included only color-evasive interpretations of a case, and all responses exhibited some color-evasiveness. The events in the cases center the experiences of Black students in STEM classrooms at PWIs. Both prior research into the experiences of Black students (e.g., Solórzano *et al.*, 2000; Stanton *et al.*, 2022) and the Black students on our advisory board identified the events as racialized. Therefore, not recognizing them as such can be interpreted as a form of color-evasiveness. Here, we describe the ways that participants engaged in color-evasion through what they wrote and did not write in their responses as they analyzed cases. We identified three main forms of color-evasiveness: sidestepping race, erasing race, and rejecting the task. Erasing race had four distinct forms: restating the event without race, focusing on the importance of all students, excusing the instructor's behavior, and recognizing harm to the student while ignoring the cause or actor. We describe each form of color-evasiveness next.

Participants Sidestepped Discussions of Race and Racism. Some responses used racial proxies to describe the events in the cases. These included words like "appearance," "background," and "stereotype," rather than words that directly address race or racism, like "Black," "white," "race," or "racist." The proxies that responses included can be associated with race but also may be applicable to other identity characteristics, such as gender or class. Because the cases emphasized identity characteristics related to race, we assumed that responses used these words as proxies for race. The use of racial proxies minimizes the relevance of race in the event and allows responses to discuss race without explicitly acknowledging it. Proxies are also problematic, because they imply that it is wrong to use words like "Black" or to otherwise notice and name a student's race, which is part of socialization into color-evasive ideology. For example, some participants chose to use words like "appearance" as a proxy for race:

> Making assumptions about a student's status as an athlete based presumably on their appearance or understanding of the content being discussed can be damaging/alienating to the student.

This response, and others like it, recognized how this racist interaction could impact the student targeted (Sam), but did so without explicitly acknowledging that racism was a factor. That is, they did not identify anti-Black racist stereotyping, thereby ignoring the racialized nature of the interaction. Obscuring race in this way is color-evasive, because it is unwilling to notice and name racism, thereby minimizing it. One cannot confront and remediate racist events and their impacts without first acknowledging the events. Further, the implication is that this mistreatment could be due to any misguided assumption about anyone's appearance.

Another way responses sidestepped racism was by focusing on potential perceptions of the instructor's actions. One response acknowledged the Ignored event (when the instructor praised Alex for repeating Spencer's answer; Table 1), expressing concern about how the instructor was perceived:

> The teacher did not acknowledge students' contributions. The teacher should have thanked both Spencer and Alex for making the same contribution. The teacher not acknowledging both students may make the teacher seem biased.

The language used in the response suggests that the participant thinks that seeming biased is more problematic than the impact of ignoring the contribution of a Black student. The idea that seeming racist is highly offensive is a hallmark of a color-evasive ideology (Dovidio *et al.*, 2017). Thinking more about how to avoid the appearance of racism than about identifying and actively combating racism in ourselves and others is a form of color-evasive racism.

In some instances, responses used vague terminology that invited doubt about whether they were noting racism or something else. For example, one response discussed how the instructor had "preconceived notions" about Alex, an Asian student, and Spencer, a Black student,

> The instructor appears to have preconceived notions of both Spencer and Alex's abilities and has decided that Alex would more likely be correct.

It is unclear whether "preconceived notions" is meant to be understood as "racial stereotypes" or something else. This response successfully evaded discussing race explicitly but did so in a way that allows for conflicting interpretations. A person who is aware of racial stereotypes and bias could view these words as acknowledging racial stereotypes, but a person who enacts more color-evasive ideologies might accept the instructor's stereotyping as related to something else about the student, such as past course performance. This response sidesteps acknowledging pervasive stereotypes around skills and abilities that could have influenced how the instructor in the case perceived both students (Shah and Coles, 2020). This response is problematic because it allows the instructor to avoid the actual problem in the classroom: Students of different races are given different opportunities to contribute and be recognized.

Participants Erased the Concept of Race when Considering a Racialized Event. Erasing race, in its various forms, was the most common form of color-evasiveness in our data. These responses omitted the idea of race entirely when describing a racialized event, not mentioning race or using racial proxies. This is important, because the events in the cases were deliberately racialized, and therefore participants had to actively and intentionally avoid bringing up race or racism in their analysis. Responses erased race in a variety of ways including: restating the event without addressing race, emphasizing that all students matter, explaining or excusing the instructor's behavior, and ignoring the cause or perpetrator of harm.

Participants Erased Race by Restating the Event without Addressing Race. Many responses erased race from the cases by describing the events in the cases without any reference to race or racism. When discussing the Ignored event, a response included the following:

> Dr. Z neglected Spencer's comments and contributions of recognizing the mistakes in the discussion but granted the credit to Alex who just repeated Spencer's opinion. That obviously disengaged Spencer eventually.

This response paraphrased the case, while explaining how the interaction impacted Spencer. Another response expressed thoughts in a similar way when recounting the Unfairly Graded event that happened to Sam, "The instructor dismissed her concern that she received a lower grade than her group mates."

These responses effectively erased racism from the events by focusing on the individuals without their respective races. By not naming the characters' races, responses circumvented the need to acknowledge important racial power dynamics that operate in everyday interactions and erased the student's racial identity. This is a common way in which white culture manifests in STEM, by refusing to discuss inequality in terms of groups, and instead focusing on individuals. This is harmful to Black students' science identities, feelings of belonging, and persistence in STEM and creates additional obstacles to student persistence that they must overcome (Hurtado *et al.*, 2011; Harrison and Tanner, 2018; Morton *et al.*, 2019).

Participants Erased Race by Emphasizing the Importance of All Students. Another way of erasing race was to shift the focus from an event that happened to an individual Black student to how the event *could* happen and be detrimental to *any* student. This is color-evasiveness, because it implies all students have the same experiences, regardless of race. Further, it ignores the role that anti-Blackness played in the event and diminishes the experience of the specific student highlighted in the case. Prompted by the Disrespected event, a response described the instructor turning her back on Spencer in this way:

> Treating students waiting to talk to her differently, students may experience this as unjust and feel marginalized or unempowered.

This response evaded the racialized nature of the event by abstracting Spencer's specific situation to discuss students in general. The instructor had just finished enthusiastically answering a white student's question, and then turned her back to Spencer, a Black student, while dismissing his question because she did not understand it. Commenting on the same event, another response emphasized that Dr. Z's treatment of students asking a question would impact all students poorly:

> Professor Z spends time after class answering Jordan's question when other students who were waiting in line have not gotten that far in the problem—the other students will feel overlooked and become frustrated. The students may also lose confidence because they don't understand a basic principle and the professor has moved ahead, leaving them behind.

This response named the white student (Jordan), but abstracted Spencer's experience as "other students waiting in line." Another response described the event in this way: "The end of the class—it was unfortunate that Dr. Z left early. Again, all students are important." This insistent language turned a racialized event into something "unfortunate" that could have happened to any student through the emphasis that "all students are important."

None of these responses acknowledged the specific ramifications of this event on Spencer as a Black student. Participants employing this form of color-evasiveness appeared to recognize and value inclusive teaching practices but seemed focused on the principle of equality (e.g., treating everyone the same), rather than equity (e.g., recognizing that people have different circumstances and may be differently affected by the same treatment). These participants did not recognize how exclusionary behaviors can have a more damaging effect on students who have been marginalized in STEM environments, in PWIs more generally, and who have experienced anti-Blackness regularly throughout their lives.

When participants overlook the experience of a Black student, they are not acknowledging that Black students can experience the classroom differently as a result of anti-Black racism. This thinking, whether explicit or implicit, bears some resemblance to the rhetoric of All Lives Matter. All Lives Matter is a response to the Black Lives Matter movement. The Black Lives Matter movement was created by Alicia Garza, Patrisse Cullors, and Opal Tometi, as a response to the acquittal of George Zimmerman of the murder of Trayvon Martin. Black Lives Matter calls upon all people to recognize that "Black lives are systematically and intentionally targeted for demise" and that Black lives lost deserve justice and are worth grieving and honoring (https://blacklives-matter.com/herstory). On social media and in other spaces, some people responded to Black Lives Matter with All Lives Matter sentiments. On the surface, All Lives Matter could seem to serve as a reminder that all lives have value, but in reality, it de-centers the Black experience and uses color-evasive language to silence those who challenge anti-Blackness (Orbe, 2015). Similarly, responses that focused more generally on all students, rather than the specific experience of a Black student being analyzed in the case, ignored the ways in which the struggles of Black students in STEM classrooms are different from other students. We have no reason to conclude that any participants personally subscribe to the All Lives Matter sentiment, but their response to racialized events suggests that they are, at least unconsciously, dismissing the ways in which anti-Blackness can affect the experiences of Black students in STEM classrooms.

This particular form of color-evasive behavior is difficult to notice and call out, because on the surface the instructors seem to be looking out for the good of all students. We are not suggesting that considering all students is a poor pedagogical practice, but we want to be clear: When considering a series of anti-Black racist events experienced by a student, pivoting to discuss all students in general is an enactment of color-evasive racism.

Participants Erased Race by Excusing Instructors' Behaviors. Another way responses erased race and engaged in color-evasion was to offer excuses for the instructor. This occurred in a few different ways. In some cases, responses indicated that the case authors had not provided enough detail for them to make a judgment about the instructor's behavior:

> The interaction of Alex with Spencer and Dr. Z [is a problem]. There is certainly more information needed about this exchange. For instance, we don't know if Dr. Z heard Spencer or not.

This response indicates more information is needed to determine the instructor's intentions. Another response similarly noted that there was insufficient information to judge the instructor's behaviors by stating, "Dr Y assumes [Sam] is an athlete, maybe because she is black, not clear." This response noticed race in this event, but avoided the risk of discussing race by using qualifications (i.e., "maybe," "not clear"). This acts to create something like plausible deniability for the instructor's behavior. Another response stated that,

> The teacher assumes details about students or he just confused students. Not hard to do, but took it as fact. And the student, [feeling] already uncomfortable in the class setting, was not confident enough to correct the teacher.

This response both excuses the instructor by providing an alternative, harmless explanation for the instructor's behavior ("just confused students") and also suggests that the student lacked the confidence needed to correct the instructor, which overlooks the considerable power differential between instructors and students in a classroom.

While the instructor's thought processes certainly matter, we suggest that, by engaging in these arguments, participants were able to avoid centering the negative racialized outcome of the event, which is the same for the student regardless of the instructor's intentions. When a student wonders whether the instructor meant to cause harm, it can exacerbate anxiety and stress and lead to stereotype threat and racial battle fatigue. These experiences can eventually dissuade students of color from remaining in STEM majors (Steele, 2011; McGee, 2020; Stanton *et al.*, 2022).

Some responses excused the instructor's behavior by explaining that the racialized events were outside the instructor's realm of control. This serves to absolve the instructor of responsibility and guilt. For example, a response offered multiple solutions to the problems presented in the case and also absolved the instructor in this way,

> So much of what is happening is outside of the instructor's ability to detect it, such as the group dynamic. There [are] good practices for constructing groups, but none is a silver bullet. Maybe a mid-semester check in about how things are going in groups?

Certainly, some of the events presented in the case could be out of the instructor's view at any given time. However, structural changes to the classroom and regular check-ins with students can help minimize these events. Therefore, while this participant recognized a problem and provided a potential structural solution, they are also erasing race by providing the instructor with an excuse.

All responses that excused the instructor's behavior acknowledged that there were problems in the classroom, but ultimately empathized with or excused the instructor's actions. They classified the instructor's actions as understandable, acceptable, or positioned the problems as being outside instructor control. It is possible that participants recognized their own classroom practices in the case and inferred that they, themselves, could be guilty of similar racist behavior. This may lead to defending the instructor in order to preserve their own identities as "not racist." An insidious role of color-evasive ideology is to absolve our responsibility for disrupting racism and to maintain our own positive self-image as "not racist" (Bonilla-Silva, 2018; Russo-Tait, 2022).

Participants Recognized the Harm to the Student but Ignored the Cause and/or Actor. Another color-evasive move evident in some responses was recognizing the harm to a Black student, while also obscuring or overlooking the actor or cause that directly resulted in that harm. Responses acknowledged the racialized event while avoiding accusations that anyone or anything caused the event. In describing the Isolated event (when Sam's group regularly excluded her from group work or discussions), one response noted,

Sam was never an active participant in her group before this day. She was not getting the benefit of group work."

This response positioned Sam as the actor, which implied that she was responsible, and placed no responsibility with the group or the instructor to include Sam. It is deeply problematic to place the blame on the student experiencing racism, though this often occurs in light of color-evasiveness and anti-Blackness. This is color-evasive and anti-Black racism, because it positions the Black student as the de facto problem, rather than the racialized interpersonal dynamics and/or structural classroom policies that are causing her group to exclude her. Employing this type of color-evasiveness gives instructors permission to put the onus on their students when anti-Blackness manifests in interactions rather than acknowledging the racialized events and structuring their courses to mitigate them.

Another response positioned the Black student's feelings as the problem with no mention of the instructor as the actor. The response said, "Spencer is being ignored and says he feels racism." Emphasizing that Spencer "feels" racism minimizes Spencer's lived experiences of anti-Blackness by disregarding his interpretation of the event as racist and removes the need to consider the actor. Minimizing racialized events by questioning the validity of claims of discrimination by Black people is a common enactment of color-blind racism (e.g., Bonilla-Silva, 2018). Questioning whether racism played a role often results from our belief that our own perception of events is accurate and objective, while at the same time assuming that a Black person's perception is subjective and flawed. Yet, as a Black person, Spencer is more experienced and capable of noticing racism than most white people, whose racial privilege largely prevents them from experiencing or noticing the many subtle and everyday enactments of racism.

Other responses did not blame the victim, but still ignored the causes of harm in the racialized events. For example, one response stated:

It is frustrating when a student was assumed to be an athlete only because of his/her appearance.

This response uses passive language and odd sentence construction to maneuver around the issue of who acted in this situation. This response completely erases the instructor as an actor in this racialized event, while also using "appearance" as a racial proxy. Ignoring the cause and actors in these racialized events means that no one is responsible for the problem or for fixing the problem. The result of this line of thinking is that no change needs to occur, because no racist acts are actually being committed.

Participants Rejected the Premise That Race Was Relevant in the STEM Classroom. One response in our sample asserted that race was not relevant to the events in the case. When asked what problematic things they noticed in the classroom, a participant who read case 2 (Table 1) wrote:

I did not notice any significant problems. The author tries to point out color and race to steer the reader, but the situation sounds like a typical day.

In the same response, the only suggestion for improvement included was "Remove the 'white,' 'black,' and 'Asian' from the story." This response seems to indicate that Spencer's experiences of being ignored, dismissed, disrespected, and gaslit are inconsequential. Furthermore, the response noticed race and determined that it was irrelevant information in considering Spencer's experiences, even though Spencer names racism as a cause of his experiences.

Though this form of color-evasiveness was rare in our sample, it is worth considering because of the harm it could cause students. Additionally, this type of response may be more common in other samples of STEM faculty. The rejection of race as relevant to the events in the case should not be unexpected, as color-blind ideology allows those who use it to deny the salience of race and racism in any location in society in service of anti-Blackness (Bonilla-Silva, 2018). An instructor who is unwilling to consider racism when it is explicitly named as the problem by the student is demonstrating powerful color-evasiveness and seems unlikely to recognize enactments of racism in their own classroom. Importantly, higher endorsement of color-evasive attitudes (exemplified here by the outright rejection to engage in reflection about race/racism) are positively associated with racial bias (Neville, 2000). Therefore, this dismissive color-evasive attitude is particularly problematic for educators, because they may be more likely to engage in the same types of exclusionary behaviors described in the cases.

Participants Noticed and Recognized Race in Some Events More Readily Than Others. Though the predominance of color-evasiveness is the most important finding of this study, the frequency with which events were noticed and recognized as racialized lends some additional insights. Out of the total number of participants who read and responded to a case, we counted the number who noticed each racialized event (i.e., mentioned the event in their written analysis) and the number who acknowledged race in the event (i.e., named race or racism directly). Because each participant responded to each case only once, these data are presented by participant rather than by response. Figure 1 displays the percentage of participants who noticed each event and acknowledged race, by event, for case 1 and case 2.

Our data allow us to consider differences across events in how often participants named race or racism when noticing the event. The frequency with which participants named the role of race in an event was independent of the frequency with which they identified an event as problematic (Figure 1). Most events were rarely described by participants as racialized, even when they were commonly noticed (Figure 1). This finding emphasizes both how color-evasiveness makes it challenging to attend to race and racism in a classroom setting, and how often a student may be experiencing STEM as an exclusionary space, while their instructors remain unaware of the harmful effects of color-evasiveness and anti-Blackness on their students. Avoiding noticing race in the classroom keeps instructors complicit in systemic racism rather than enabled to act as disruptors to racism, regardless of good intentions (Annamma *et al.*, 2017).

One event that offers an intriguing result is Spokesperson. Most participants who noticed the Spokesperson event also described the role of race in the event ($n = 9$ out of 11, 82%). This is a much greater proportion than for any other event. One
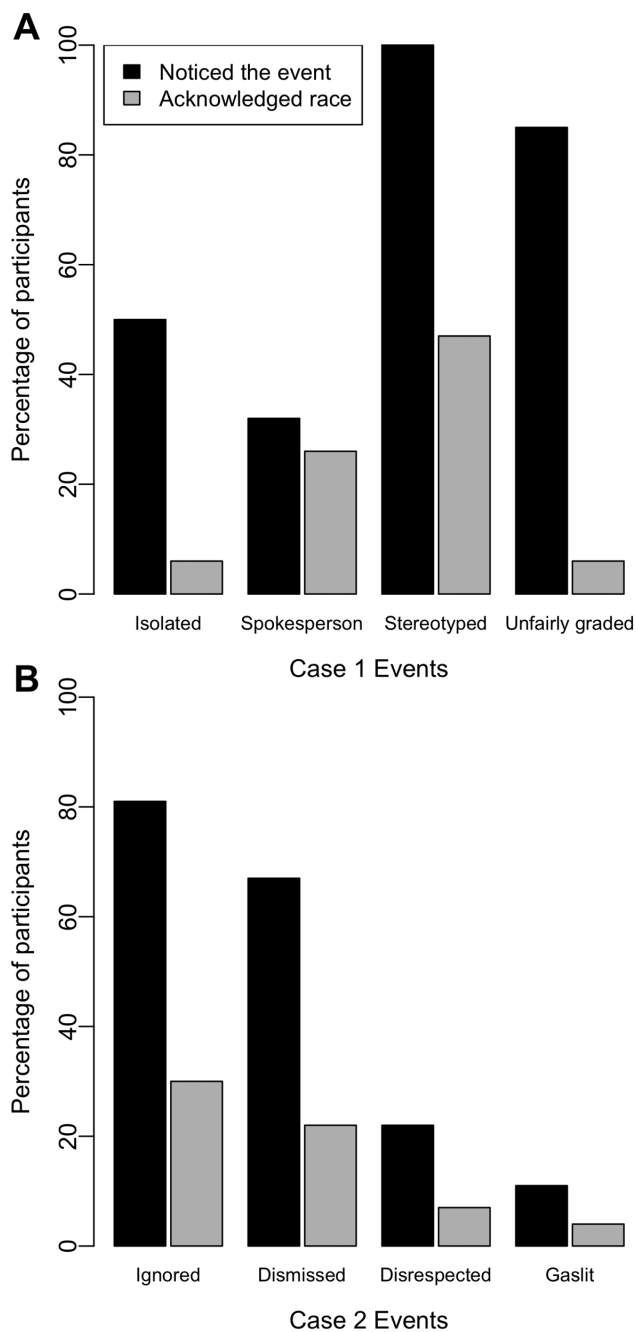
FIGURE 1. Percentage of participants who noticed each racialized event (i.e., mentioned the event in their written analysis) and acknowledged the role of race in the event (i.e., named race or racism directly) when analyzing, by racialized event in case 1 (A) and case 2 (B). Table 1 describes each event.

possible explanation is that this event was noteworthy only to participants who were deliberately paying attention to the role of race. However, our data do not support this hypothesis. Only three of the nine participants who acknowledged race for the Spokesperson event also acknowledged race for other events, and those only noticed one other event (always the Stereotyped event). Therefore, these participants did not display greater racial noticing abilities than other participants. Another possi-

ble explanation is that this incarnation of racism (i.e., someone being asked to speak on behalf of their entire race) has been pointed out frequently and therefore may be more familiar to participants and easier to notice. Further research is necessary to test this hypothesis. If supported, one implication would be that STEM instructors need opportunities to consider different examples of racism and anti-Blackness, so they are better able to recognize them. It would be valuable to discover which sorts of events are more easily acknowledged as racialized in order to support STEM instructors to develop racial noticing in more and less obvious situations.

CONCLUSIONS AND IMPLICATIONS

This is the first study to characterize enactments of color-evasiveness among STEM faculty in response to anti-Black classroom events. Even among this sample of STEM faculty who were actively engaged in improving their teaching, color-evasion was pervasive. A hallmark of color-evasive ideology is that individuals notice and respond to overt expressions of racism but struggle to notice and respond to the subtle but ubiquitous incarnations of racism in contemporary society (Dovidio *et al.*, 2017; Bonilla-Silva, 2018). Our findings align with these expectations; instructors were much more likely to describe the role of race for events that were overtly racist, such as the Stereotyped event, and much less likely to acknowledge the role of race in the more subtle racism in other events, such as the Disrespected event. If evasiveness occurs when asked to consider cases that simplify and clarify what is occurring, it is even more likely to occur when STEM instructors encounter racialized events in real and complex educational contexts.

Color-evasiveness is particularly harmful in education, because it is an obstacle to recognizing inequities within a STEM classroom and removes the individual responsibility for instructors to work to remedy racial inequities in learning environments (Thoman *et al.*, 2021). Concerningly, the findings of this study echo other studies demonstrating that color-evasive racism is prevalent among university STEM faculty (Charbeneau and Chesler, 2015; Haynes, 2017; Haynes and Patton, 2019; McNeill *et al.*, 2022; Russo-Tait, 2022). Given that color-evasive racial ideology is deeply embedded within our society—and is manifested in STEM culture via meritocratic and identity-neutral beliefs (Posselt, 2020; Blair-Loy and Cech, 2022; McNeill *et al.*, 2022)—it is not surprising that STEM faculty bring this enculturation into their teaching. Yet this can be hard to recognize in ourselves, because color-blind ideology positions racism as being solely performed by racists, not by well-meaning individuals who have been socialized in a racist system (Bonilla-Silva, 2018). Thus, color-evasiveness makes it challenging to see our own enactments of color-evasion as racist. Additionally, racism is more difficult to notice for those unaccustomed to considering racism as part of daily life, and many STEM faculty enjoy racial privilege that protects them from daily encounters with racism. Nonetheless, hidden structures within societal narratives about race and racism can only be dismantled by uncovering and addressing them explicitly. Avoiding talking about race is an action that individuals choose, whether consciously or not (Annamma *et al.*, 2017). Therefore, it is within individuals' power to choose to be more intentional in noticing and pushing back on racism, including color-evasive racism, within their own

behaviors and their classrooms. This study and other work demonstrating the pervasiveness of color-evasiveness have implications for instructors, teaching professional development, and STEM disciplines. What changes can contribute to STEM instructors noticing racialized events within their classrooms and responding productively?

Implications for Teaching Professional Development and Instructors

Enabling STEM faculty to create equitable learning environments for Black students will require new approaches to teaching professional development. Though additional research is needed to uncover the full sense-making of color-evasive responses to classroom events, what is clear from this study and other research is that individuals must grapple with their biases and societal enculturation to determine how to best counter a color-evasive ideology and develop a critical racial consciousness (e.g., Haynes and Patton, 2019; Thoman *et al.*, 2021; McNeill *et al.*, 2022; Russo-Tait, 2022). Equitable STEM teaching depends on faculty being aware of their own racial identities, privilege, and color-evasiveness. One way to build this awareness is to learn how racial privilege, and specifically whiteness, is enacted in our teaching and what transformations are needed to counter anti-blackness in education. We suggest a few resources that have aided our own thinking: Johnson (2007), Charbeneau and Chesler (2015), Haynes (2017), Tuitt *et al.* (2018), Haynes and Patton (2019), McNair *et al.* (2020), Powell *et al.* (2021).

Equitable instruction also relies on STEM instructors taking responsibility to work to better understand the experiences of Black students in STEM. By deliberately considering how racism impacts racially minoritized students' experiences in the classroom, STEM instructors may be able to learn to counter the color-evasive mindsets they have been socialized in and work to mitigate racism in their classrooms. Yet racial privilege makes individuals less likely to realize when those events are occurring. Reading about the experiences of Black students in undergraduate STEM classrooms can help build awareness of the types of racism encountered by Black students in these spaces. These articles have rich descriptions, often using students' own words: Solórzano *et al.* (2000), McGee and Martin (2011), Strayhorn (2015), Lee *et al.* (2020), Allen *et al.*, (2022), and Stanton *et al.* (2022).

In addition to readings, there are tools that can make racialized experiences more evident. One such tool is EQUIP (Equity Quantified in Participation; Reinholz *et al.*, 2019), a classroom observation tool that disaggregates participation by race, gender, or other social identities of students (https://www.equip.ninja). Teaching professional development programs can guide instructors to use EQUIP, reflect on data from their classrooms, and make immediate changes in their instruction (e.g., Christensen *et al.*, 2022; Reinholz *et al.*, 2022).

Teaching professional development opportunities in which STEM faculty grapple with their biases and social enculturation and learn about the experiences of Black students should be widely available and participation should be incentivized and rewarded. University offices may need to form new partnerships to create these opportunities for faculty to develop critical racial consciousness that they enact in their teaching. Currently, professional development that helps faculty learn about and recognize unconscious bias and privilege may be offered by offices charged with supporting diversity, equity, and inclusion on campus, whereas professional development that helps faculty develop teaching knowledge and skills may be offered by centers related to teaching and learning. These offices can collaborate to bring these missions together and can look to existing models to support faculty in countering color-evasiveness in their teaching. For example, the deep teaching model lays out a sequential approach to faculty development. Instructors develop their self-awareness and empathy for their students first, which provides a foundation for evidence-based instruction, cultivating a trusting classroom climate and leveraging networks for students' well-being and success (Dewsbury, 2020). Furthermore, scholar Chayla Haynes developed a theoretical framework to explain how levels of racial consciousness influence white faculty's teaching behaviors (Haynes, 2017; Haynes and Patton, 2019). This framework can guide teaching professional development that aims to promote racial consciousness among white faculty with the goal of supporting equitable outcomes for Black students.

Some readers may wonder what could have gone differently in the specific events in the cases. The negative racialized events analyzed in this study, which echo the experiences of many Black students in PWIs, might have been prevented by different classroom structures and instructional strategies. By considering some of the racialized events, we briefly give an example of each and point readers toward relevant resources. The Isolated event in case 1 may have been avoided by using instructor-created groups and guiding students to interact productively and equitably (e.g., Tanner, 2013; Stanton *et al.*, 2022). By creating groups, an instructor can minimize the discomfort students may feel when they must find peers with whom to work and can prevent situations in which a Black student is "picked last" for groups and therefore positioned as an unwanted outsider. Another structure instructors can add to their course to minimize isolation of Black students within small groups is to explicitly teach students how to work in groups and/or to assign roles so that all students have a particular way in which to contribute (Wilson *et al.*, 2017). The Ignored event could have been mitigated if the instructor had been cautious with praise and not judged student responses (Aronson *et al.*, 2002; Tanner, 2013; Eddy *et al.*, 2015). In general, we encourage instructors to think carefully about how they interact with students and what implicit messages they may be sending (Harrison and Tanner, 2018). To read more about various strategies that could help structure a course more equitably, we suggest: Dewsbury and Brame (2019), Wilson *et al.* (2017), and Tanner (2013).

We want to offer one caution to instructors and teaching professional development programs. This caution is born from scholarship about color-evasive and color-blind ideology (Annamma *et al.*, 2017; Bonilla-Silva, 2018; Wilt *et al.*, 2022): Good intentions and a welcoming persona are not enough to create equitable and justice-oriented STEM learning environments for Black students (e.g., Haynes and Patton, 2019). Racism permeates our society and therefore is also present in our higher educational systems and other systems students navigate on a daily basis. Accumulating evidence suggests that we, as STEM faculty, should assume that we enact color-evasive racism in our teaching. This is a problem, because color-evasive racism makes us complicit in perpetuating racist structures and

incapable of dismantling this system. The instructors depicted in the cases undermined their good intentions with the assumptions they unknowingly made (like the Stereotyped and Disrespected events) and the interactions they overlooked or chose to ignore (like the Isolated and Unfairly Graded events). As STEM instructors ourselves, we believe that we need to continuously work to recognize our racial identities, privilege, and color-evasiveness so that we can move from best intentions to anti-racist outcomes.

Implications for STEM Disciplines

This study adds to the growing body of literature indicating that color-evasion is pervasive in STEM culture. Therefore, while it is important to engage individual faculty about color-evasion and anti-Blackness, it is also crucial to pursue systemic change toward organizations that value, expect, promote, and reward the development and enactment of a critical racial consciousness. We provide two overarching ideas for systemic change and suggest ways that STEM departments, universities, professional societies, and funding agencies could make progress.

First, organizations can work toward countering color-evasiveness and anti-Blackness in STEM disciplines by creating policies that set expectations for STEM professionals to develop a critical racial consciousness (Dowd and Bensimon, 2015). This includes expectations for learning about historical and contemporary enactments of racism in STEM and expectations for continuous reflection on our own positionality and privilege. Setting these expectations for learning and growth for all STEM professionals would require making these learning opportunities part of the standard training for undergraduates, graduate students, and faculty. For example, STEM departments may be able to adopt and adapt successful models for changing undergraduate and graduate curricula to include these expectations. Disciplines within education, humanities, and social sciences have already begun to integrate these expectations into their professional training, and STEM departments could learn from their progress and develop new collaborations to this end. As another example, universities could change expectations for undergraduate core curricula to go beyond the neoliberal multicultural courses (Sleeter, 2018) to specifically address racism (Dowd and Bensimon, 2015). Professional societies could create professional development to support faculty in developing a critical racial consciousness. Societies could also set the expectation that both leaders and honorees in the society be active participants in this professional development. Societies will likely need to pay expert consultants or recruit leaders with expertise in racism and anti-Blackness in order to achieve necessary transformations. Funding agencies, such as the National Science Foundation and National Institutes of Health, have their own levers due to the considerable funding they provide for graduate training in the United States. They could expect departments receiving funding to support graduate students (e.g., training grants, research grants) to require all trainees and mentors to regularly participate in these learning opportunities. Finally, appropriate formative and summative evaluation measures must be developed for changes that departments, universities, professional societies, and funding agencies undertake to ensure that the intended outcomes are achieved (Whittaker and Montgomery, 2014). The "Equity Score Card" is one such tool that measures changes and areas for improvement in relation to equity at various levels of an institution (Dowd and Bensimon, 2015).

Second, organizations can work toward dismantling whiteness in STEM disciplines by incentivizing the work necessary for this revolution with rewards and recognition. Universities, departments, and professional societies can ask themselves: What mechanisms do we use to assign prestige to work? What mechanisms do we use to provide monetary reward for work or accomplishments? How can those same mechanisms be used to assign prestige and provide monetary reward (or release time) for work that disrupts whiteness? As one example, membership in the National Academy of Sciences is widely seen as one of the highest honors of scientific work, and this honor provides members with power and prestige in their disciplines, universities, and departments. What if some members were selected based on their contributions to countering color-evasiveness and anti-Blackness in the sciences? As another example, faculty are evaluated for their contributions to research for promotions and tenure. What if faculty contributions to disrupting whiteness in the research enterprise in their disciplines were viewed as evidence of excellence in research? Given the pervasiveness of color-evasive ideology in society and among STEM disciplines, moving toward a future where color-evasiveness is atypical among STEM faculty will require fundamental shifts in what disciplines and organizations value, reward, respect, and tolerate—and policies and procedures are important levers to motivative this cultural change and hold people accountable for new expectations (Stewart and Valian, 2018).

Implications for Research

While higher education scholarship has documented many problems in relation to color-evasion, there is nevertheless little work that systematically captures how color-evasiveness manifests in STEM classrooms. Though this study was limited to narratives about interactions in a classroom setting, other work focusing on problematizing the meritocratic and objective ethos of STEM indicate that color-evasive beliefs are not constrained to classrooms. Color-evasiveness also emerges in other contexts of faculty work, including research, admissions decisions (Posselt and Grodsky, 2017; Posselt, 2020), and departmental interactions (Cech et al., 2018; Blair-Loy and Cech, 2022). Therefore, color-evasiveness among faculty may be harming graduate students, other faculty, and university staff—and these contexts deserve research attention.

Importantly, additional research should investigate how much more difficult racial noticing is while teaching. Instructors struggled to notice racism when it was blatantly described in a case, and a case necessarily simplifies the complexity of a classroom. In a real classroom, the instructor would not have the same access to students' thoughts, and they would be interacting with and managing many more students, the content, and the learning opportunities they are creating.

Finally, more work is needed to understand how faculty can be supported to develop racial noticing abilities. Shah and Coles (2020) created a racial noticing intervention with pre-service K–12 teachers. The multiweek intervention occurred within an existing course that taught educational approaches (i.e., a methods course). Shah and Coles (2020) found that even with their most racially conscious teachers, all participants had oversights or expressed color-blind ideologies. Importantly, their

work demonstrated that the intervention worked better for some more than others (Shah and Coles, 2020). Undergraduate STEM instructors differ from K–12 teachers in a variety of ways, including in the amount of teaching-specific training they received, but existing work suggests that long-term, intensive, and ongoing intervention may be necessary for adequate learning (e.g., Shah and Coles, 2020; Henderson *et al.*, 2011; Philip, 2011)

Final Words

Due to the predominance of color-evasiveness in the United States in general, and STEM culture in particular, many STEM faculty have been socialized to avoid noticing and talking about race. But if we do not notice and talk about race, we cannot do anything to dismantle racism. In particular, color-evasive racism minimizes the dehumanizing impact of the anti-Black experiences that Black students have to endure. Current and historical racism, discrimination, and violence against Black people make it imperative that faculty discard the mistaken assumption that STEM classrooms are race-neutral spaces and instead work to acknowledge racism in all its forms. This will require accepting the discomfort that comes with learning to notice and address exclusionary racialized and anti-Black events in our classrooms and disciplines. It will also require being ever-mindful of the color-evasive traps we may heedlessly embrace.

REFERENCES

Allen, D., Dancy, M., Stearns, E., Mickelson, R., & Bottia, M. (2022). Racism, sexism and disconnection: Contrasting experiences of Black women in STEM before and after transfer from community college. *International Journal of STEM Education*, *9*(1), 1–21.

Anfara, V. A. Jr., Brown, K. M., & Mangione, T. L. (2002). Qualitative analysis on stage: Making the research process more public. *Educational Researcher*, *31*(7), 28–38. https://doi.org/10.3102/0013189X031007028

Annamma, S. A., Jackson, D. D., & Morrison, D. (2017). Conceptualizing color-evasiveness: Using dis/ability critical race theory to expand a color-blind racial ideology in education and society. *Race Ethnicity and Education*, *20*(2), 147–162. https://doi.org/10.1080/13613324.2016.1248837

Aragón, O. R., Dovidio, J. F., & Graham, M. J. (2016). Colorblind and multicultural ideologies are associated with faculty adoption of inclusive teaching practices. *Journal of Diversity in Higher Education*, *10*(3), 201. https://doi.org/10.1037/dhe0000026

Aronson, J., Fried, C. B., & Good, C. (2002). Reducing the effects of stereotype threat on African American college students by shaping theories of intelligence. *Journal of Experimental Social Psychology*, *38*(2), 113–125. https://doi.org/10.1006/jesp.2001.1491

Bair, A. N., & Steele, J. R. (2010). Examining the consequences of exposure to racism for the executive functioning of Black students. *Journal of Experimental Social Psychology*, *46*, 127–132. https://doi.org/10.1016/j.jesp.2009.08.016

Bell, D. (1993). *Faces at the bottom of the well: The permanence of racism*. New York: Basic Books.

Blair-Loy, M., & Cech, E. A. (2022). *Misconceiving merit: Paradoxes of excellence and devotion in academic science and engineering*. Chicago: University of Chicago Press.

Birks, M., & Mills, J. (2011). *Grounded theory: A practical guide*. London, UK: Sage.

Blackwell, D. M. (2010). Sidelines and separate spaces: Making education anti-racist for students of color. *Race Ethnicity and Education*, *13*(4), 473–494. https://doi.org/10.1080/13613324.2010.492135

Bonilla-Silva, E. (2018). *Racism without racists: Color-blind racism and the persistence of racial inequality in the United States* (5th ed.). Lanham, MD: Rowman & Littlefield.

Bonilla-Silva, E., & Baiocchi, G. (2001). Anything but racism: How sociologists limit the significance of racism. *Race and Society*, *4*(2), 117–131. https://doi.org/10.1016/S1090-9524(03)00004-4

Bonilla-Silva, E., & Dietrich, D. (2011). The sweet enchantment of color-blind racism in Obamerica. *Annals of the American Academy of Political and Social Science*, *634*(1), 190–206. https://doi.org/10.1177/0002716210389702

Bryan, L. A., & Tippins, D. J. (2005). The Monets, Van Goghs, and Renoirs of science education: Writing impressionist tales as a strategy for facilitating prospective teachers' reflections on science experiences. *Journal of Science Teacher Education*, *16*(3), 227–239. https://doi.org/10.1007/s10972-005-3567-8

Calabrese Barton, A., & Tan, E. (2020). Beyond equity as inclusion: A framework of "rightful presence" for guiding justice-oriented studies in teaching and learning. *Educational Researcher*, *49*(6), 433–440. https://doi.org/10.3102/0013189X20927363

Carlone, H. B., & Johnson, A. (2007). Understanding the science experiences of successful women of color: Science identity as an analytic lens. *Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching*, *44*(8), 1187–1218.

Cech, E. A., Blair-Loy, M., & Rogers, L. E. (2018). Recognizing chilliness: How schemas of inequality shape views of culture and climate in work environments. *American Journal of Cultural Sociology*, *6*(1), 125–160.

Cedillo, S. (2018). Beyond inquiry: Towards the specificity of anti-blackness studies in STEM education. *Canadian Journal of Science, Mathematics and Technology Education*, *18*(3), 242–256.

Charbeneau, J., & Chesler, M. A. (2015). Racial practices in the classroom: White faculty's pedagogical enactments that reproduce and/or transform white dominance. In Chesler, M. A., & Young, A. A. Jr. (Eds.), *Faculty identities and the challenge of diversity* (pp. 109–128). New York: Routledge.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. London, UK: Sage.

Christensen, J., Shah, N., Ortiz, N. A., Stroupe, D., & Reinholz, D. L. (2022). Tracking inequity: An actionable approach to addressing inequities in physics classrooms. *Physics Teacher*, *60*(6), 414–418.

Crenshaw, K. W., Harris, L. C., HoSang, D. M., & Lipsitz, G.((2019). *Seeing race again: Countering colorblindness across the disciplines*. Oakland, CA: University of California Press.

Dewsbury, B., & Brame, C. J. (2019). Evidence based teaching guide: Inclusive teaching. *CBE—Life Science Education*. Retrieved January 18, 2023, from https://lse.ascb.org/evidence-based-teaching-guides/inclusive-teaching

Dewsbury, B. M. (2020). Deep teaching in a college STEM classroom. *Cultural Studies of Science Education*, *15*(1), 169–191. https://doi.org/10.1007/s11422-018-9891-z

Dovidio, J. F., Gaertner, S. L., & Pearson, A. R. (2017). Aversive racism and contemporary bias. In Sibley, C. G., & Barlow, F. K. (Eds.), *The Cambridge*

handbook of the psychology of prejudice (pp. 267–294). Cambridge, UK: Cambridge University Press. https://doi.org/10.1017/9781316161579.012

Dowd, A. C., & Bensimon, E. M. (2015). *Engaging the "race question": Accountability and equity in US higher education*. New York, NY: Teachers College Press.

Dumas, M. J. (2016). Against the dark: Antiblackness in education policy and discourse. *Theory into Practice*, *55*(1), 11–19. https://doi.org/10.1080/00405841.2016.1116852

Dumas, M. J., & Ross, K. M. (2016). "Be real Black for me": Imagining BlackCrit in education. *Urban Education*, *51*(4), 415–442.

Eddy, S. L., Converse, M., & Wenderoth, M. P. (2015). PORTAAL: A classroom observation tool assessing evidence-based teaching practices for active learning in large science, technology, engineering, and mathematics classes. *CBE—Life Sciences Education*, *14*(2), 1–16. https://doi.org/10.1187/cbe.14-06-0095

Guba, E. G. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. *ECTJ*, *29*(2), 75–91. https://doi.org/10.1007/BF02766777

Harper, S. R. (2012a). *Black male student success in higher education: A report from the National Black Male College Achievement Study*. Philadelphia: Center for the Study of Race and Equity in Education, University of Pennsylvania Graduate School of Education.

Harper, S. R. (2012b). Race without racism: How higher education researchers minimize racist institutional norms. *Review of Higher Education*, *36*(1), 9–29. doi: 10.1353/rhe.2012.0047

Harris, C. I. (1993). Whiteness as property. *Harvard Law Review*, *106*(8), 1707–1791.

Harrison, C., & Tanner, K. D. (2018). Language matters: Considering microaggressions in science. *CBE—Life Sciences Education*, *17*(1), 1–8. https://doi.org/10.1187/cbe.18-01-0011

Harrison, C. D., Nguyen, T. A., Seidel, S. B., Escobedo, A. M., Hartman, C., Lam, K., … & Tanner, K. D. (2019). Investigating instructor talk in novel contexts: Widespread use, unexpected categories, and an emergent sampling strategy. *CBE—Life Sciences Education*, *18*(3), 1–23. https://doi.org/10.1187/cbe.18-10-0215

Haynes, C. (2017). Dismantling the white supremacy embedded in our classrooms: White faculty in pursuit of more equitable educational outcomes for racially minoritized students. *International Journal of Teaching and Learning in Higher Education*, *29*(1), 87–107.

Haynes, C., & Patton, L. D. (2019). From racial resistance to racial consciousness: Engaging white STEM faculty in pedagogical transformation. *Journal of Cases in Educational Leadership*, *22*(2), 85–98. https://doi.org/10.1177/1555458919829845

Henderson, C., Beach, A., & Finkelstein, N. (2011). Facilitating change in undergraduate STEM instructional practices: An analytic review of the literature. *Journal of Research in Science Teaching*, *48*(8), 952–984. https://doi.org/10.1002/tea.20439

Hsieh, H. F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, *15*(9), 1277–1288. https://doi.org/10.1177/1049732305276687

Hurtado, S., Eagan, M. K., Tran, M. C., Newman, C. B., Chang, M. J., & Velasco, P. (2011). "We do science here": Underrepresented students' interactions with faculty in different college contexts. *Journal of Social Issues*, *67*(3), 553. doi: 10.1111/j.1540-4560.2011.01714.x

Johnson, A. C. (2007). Unintended consequences: How science professors discourage women of color. *Science Education*, *91*(5), 805–821. https://doi.org/10.1002/sce.20208

Killpack, T. L., & Melón, L. C. (2016). Toward inclusive STEM classrooms: What personal role do faculty play? *CBE—Life Sciences Education*, *15*(3), es3, 1-9. https://doi.org/10.1187/cbe.16-01-0020

Kohli, R., Pizarro, M., & Nevárez, A. (2017). The "new racism" of K–12 schools: Centering critical research on racism. *Review of Research in Education*, *41*(1), 182–202. https://doi.org/10.3102/0091732X16686949

Ladson-Billings, G. (1998). Just what is critical race theory and what's it doing in a nice field like education? *International Journal of Qualitative Studies in Education*, *11*(1), 7–24. doi: 10.1080/095183998236863

Le, P. T., & Matias, C. E. (2019). Towards a truer multicultural science education: How whiteness impacts science education. *Cultural Studies of Science Education*, *14*(1), 15–31.

Lee, M. J., Collins, J. D., Harwood, S. A., Mendenhall, R., & Huntt, M. B. (2020). "If you aren't White, Asian or Indian, you aren't an engineer": Racial microaggressions in STEM education. *International Journal of STEM Education*, *7*(1), 1–16. https://doi.org/10.1186/s40594-020-00241-4

Madkins, T. C., & Morton, K. (2021). Disrupting anti-blackness with young learners in STEM: Strategies for elementary science and mathematics teacher education. *Canadian Journal of Science, Mathematics and Technology Education*, *21*(2), 239–256.

McGee, E. O. (2020). Interrogating structural racism in STEM higher education. *Educational Researcher*, *49*(9), 633–644. https://doi.org/10.3102/0013189X20972718

McGee, E. O., & Martin, D. B. (2011). "You would not believe what I have to go through to prove my intellectual value!" Stereotype management among academically successful Black mathematics and engineering students. *American Educational Research Journal*, *48*(6), 1347–1389. https://doi.org/10.3102/0002831211423972

McNair, T. B., Bensimon, E. M., & Malcom-Piqueux, L. (2020). *From equity talk to equity walk: Expanding practitioner knowledge for racial justice in higher education*. Hoboken, NJ: Wiley.

McNeill, R. T., Leyva, L. A., & Marshall, B. (2022). "They're just students. There's no clear distinction": A critical discourse analysis of color-evasive, gender-neutral faculty discourses in undergraduate calculus instruction. *Journal of the Learning Sciences*, *31*(4–5), 630–672.

Miles, M. L., Buenrostro, P. M., Marshall, S. A., Adams, M., & McGee, E. O. (2019). Cultivating racial solidarity among mathematics education scholars of color to resist white supremacy. *International Journal of Critical Pedagogy*, *10*(2), 97–125.

Milner, IV, H. R. (2007). Race, culture, and researcher positionality: Working through dangers seen, unseen, and unforeseen. *Educational researcher*, *36*(7), 388–400.

Morton, T. R., Gee, D. S., & Woodson, A. N. (2019). Being vs. becoming: Transcending STEM identity development through Afropessimism, moving toward a Black X consciousness in STEM. *Journal of Negro Education*, *88*(3), 327–342. https://www.muse.jhu.edu/article/802617

Morton, T. R., Miles, M.L., Roby, R. S., & Ortiz, N. A. (2022). "All we wanna do is be free": Advocating for Black liberation in and through K–12 science education. *Journal of Science Teacher Education*, *33*(2), 131–153. doi: https://doi.org/10.1080/1046560X.2021.2008096

Morton, T. R., & Nkrumah, T. (2021). A day of reckoning for the white academy: Reframing success for African American women in STEM. *Cultural Studies of Science Education*, *16*(2), 485–494.

Neville, H. (2000). Construction and validation of the color-blind racial attitudes scale (CoBRAS). *Journal of Counseling Psychology*, *47*(1), 59–70. https://doi.org/10.1037/0022-0167.47.1.59

Orbe, M. (2015). #AllLivesMatter as post-racial rhetorical strategy. *Journal of Contemporary Rhetoric*, *5*(3/4), 90–98.

Philip, T. M. (2011). An "ideology in pieces" approach to studying change in teachers' sensemaking about race, racism, and racial justice. *Cognition and Instruction*, *29*(3), 297–329. https://doi.org/10.1080/07370008.2011.583369

Posselt, J. R. (2020). *Equity in science*. Stanford, CA: Stanford University Press.

Posselt, J. R., & Grodsky, E. (2017). Graduate education and social stratification. *Annual review of sociology*, *43*, 353–378.

Powell, C., Demetriou, C., Morton, T. R., & Ellis, J. M. (2021). A CRT-informed model to enhance experiences and outcomes of racially minoritized students. *Journal of Student Affairs Research and Practice*, *58*(3), 241–253.

Reinholz, D. L., Bradfield, K., & Apkarian, N. (2019). Using analytics to support instructor reflection on student participation in a discourse-focused undergraduate mathematics classroom. *International Journal of Research in Undergraduate Mathematics Education*, *5*, 56–74.

Reinholz, D. L., Reid, A., & Shah, N. (2022). Not Another bias workshop: Using equity analytics to promote antiracist teaching. *Change: The Magazine of Higher Learning*, *54*(4), 11–17.

Riegle-Crumb, C., King, B., & Irizarry, Y. (2019). Does STEM stand out? Examining racial/ethnic gaps in persistence across postsecondary fields. *Educational Researcher*, *48*(3), 133–144. https://doi.org/10.3102/0013189X19831006

Russo-Tait, T. (2022). Color-blind or racially conscious? How science faculty make sense of racial/ethnic underrepresentation in STEM. *Journal*

of Research in Science Teaching, *59*, 1822–1852. https://doi .org/10.1002/tea.21775

Salvatore, J., & Shelton, J. N. (2007). Cognitive costs of exposure to racial prejudice. *Psychological Science*, *18*, 810–815. https://doi.org/10.1111/ j.1467-9280.2007.01984.x

Seymour, E., Hunter, A. B., Harper, R. P., & Holland, D. G. (2019). *Talking about leaving revisited: Persistence, relocation, and loss in undergraduate STEM education*. Cham, Switzerland: Springer Nature.

Shah, N., & Coles, J. A. (2020). Preparing teachers to notice race in classrooms: Contextualizing the competencies of preservice teachers with antiracist inclinations. *Journal of Teacher Education*, *71*(5), 584–599. https://doi.org/10.1177/0022487119900204

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information*, *22*(2), 63–75. doi: 10.3233/ EFI-2004-22201

Sherin, M. G., Jacobs, V. R., & Philipp, R. A. (2011). *Mathematics teacher noticing: Seeing through teachers' eyes*. New York: Routledge.

Shukla, S. Y., Theobald, E. J., Abraham, J. K., & Price, R. M. (2022). Reframing educational outcomes: Moving beyond achievement gaps. *CBE—Life Sciences Education*, *21*(2), es2.

Sleeter, C. E. (2018). Multicultural education past, present, and future: Struggles for dialog and power-sharing. *International Journal of Multicultural Education*, *20*(1), 5–20.

Solórzano, D., Ceja, M., & Yosso, T. (2000). Critical race theory, racial microaggressions, and campus racial climate: The experiences of African American college students. *Journal of Negro Education*, *69*(1/2), 60–73. http://www.jstor.org/stable/2696265

Stanton, J. D., Means, D. R., Babatola, O., Osondu, C., Oni, O., & Mekonnen, B. (2022). Drawing on internal strengths and creating spaces for growth: How Black science majors navigate the racial climate at a predominantly white institution to succeed. *CBE—Life Sciences Education*, *21*(1), ar3, 1–20. https://doi.org/10.1187/cbe.21-02-0049

Steele, C. M. (2011). *Whistling Vivaldi: How stereotypes affect us and what we can do.* New York: Norton.

Stewart, A. J., & Valian, V. (2018). *An inclusive academy: Achieving diversity and excellence*. Cambridge, MA: MIT Press.

Strayhorn, T. L. (2015). Factors influencing Black males' preparation for college and success in STEM Majors: A mixed methods study. *Western Journal of Black Studies*, *39*(1), 45–63.

Tanner, K. D. (2013). Structure matters: twenty-one teaching strategies to promote student engagement and cultivate classroom equity. *CBE—Life Sciences Education*, *12*(3), 322–331.

Thoman, D. B., Yap, M. J., Herrera, F. A., & Smith, J. L. (2021). Diversity interventions in the classroom: From resistance to action. *CBE—Life Sciences Education*, *20*(4), ar52. doi: 10.1187/cbe.20-07-0143

Tuhiwai-Smith, L. (1999). *Decolonising methodologies: Research and indigenous peoples*. New Zealand: University of Otago Press.

Tuitt, F., Haynes, C., & Stewart, S. (2018). Transforming the classroom at traditionally white institutions to make Black lives matter. *To Improve the Academy*, *37*(1), 63–76.

UGA Fact Book. (2021). *Full-time professorial faculty by rank and ethnicity Fall 2021*. Retrieved January 18, 2023, from https://oir.uga.edu/factbook/

Vittrup, B. (2016). Early childhood teachers' approaches to multicultural education & perceived barriers to disseminating anti-bias messages. *Multicultural Education*, *23*, 37–41.

Whittaker, J. A., & Montgomery, B. L. (2014). Cultivating institutional transformation and sustainable STEM diversity in higher education through integrative faculty development. *Innovative Higher Education*, *39*(4), 263–275.

Wilson, K. J., Brickman, P., & Brame, C. J. (2017). Evidence based teaching guide: Group work. *CBE—Life Science Education*, Retrieved January 18, 2023, from http://lse.ascb.org/evidence-based-teaching-guides/group -work

Wilt, C. L., Annamma, S. A., Wilmot, J. A., Nyegenye, S. N., Miller, A. L., & Jackson, E. E. (2022). Performing color-evasiveness: A DisCrit analysis of educators' discourse in the U.S. *Teaching and Teacher Education*, *117*, https://doi.org/10.1016/j.tate.2022.103761

Yosso, T. J., Parker, L., Solórzano, D. G., & Lynn, M. (2004). Chapter 1: From Jim Crow to affirmative action and back again: A critical race discussion of racialized rationales and access to higher education. *Review of Research in Education*, *28*(1), 1–25. https://doi.org/10.3102/ 0091732X028001001