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RESEARCH ARTICLE

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Exploring racial equity in the science education journal review process

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Abstract

Across a broad range of disciplines, research has found that inequity is systemic in the journal review process. Collectively, however, this study does not specifically examine racial inequity. Moreover, literature on the peer review process in science education, in particular, does not foreground equity as a subject of study. The present study aims to address this void by examining racial equity in the peer review process with a specific focus on journals in science education. Data are collected from lead editors of major science education journals through the form of interviews, focus groups, and critical arts-based methods. The two research questions driving data collection are (a) In what ways does the science education journal peer review process promote racial equity? and (b) How are science education journal editors' perceptions of racial inequity reflected in the peer review process? McNair and colleagues' racial equity framework informs the explorations of journal review in science education from the lead editors' perspectives. From our findings, we offer four suggestions for moving toward greater racial equity in the science education peer review process.

KEYWORDS

peer reviewers, racial equity, science education

1 | INTRODUCTION

It could be argued that over the past 30 years or so, the science education community has become increasingly committed to equity. There are several institutional developments that reflect this ongoing, collective commitment. These include the publication of multiple special issues on urban science education (Barton & Tobin, 2001; Barton et al., 2001; Tobin & Barton, 2001); the creation of the journal *Cultural Studies in Science Education* (Roth & Tobin, 2006); an increase in published research on women and an increase in female lead authors (Joslin et al., 2008); the formation of several equity-oriented organizations and events within science education research organizations (e.g., the Equity and Ethics committee, CADASE, LARIG and ISK Research Interest Groups, and the annual equity dinner were all formed in the National Association of Research in Science Teaching during this period); establishment of Science Educators for Equity, Diversity, and Social Justice as an equity-focused professional association; an increase in the number of science education scholars of color; and an increase in publications on equity-related issues.

Drawing on this ongoing, collective commitment to equity, this article aims to explore equity in the science education journal review process. We are particularly interested in racial equity and understanding how the journal review process shapes equity in our published work.

2 | LITERATURE REVIEW

2.1 | Equity in the journal review process

Scholars from a broad array of disciplines take up the issue of equity in journal review. For example, Haffar et al. (2019) conducted a comprehensive review of articles in the PubMed database that explore bias in the peer review process. They develop a model based on this study and identify seven types of peer review bias. These are (a) failure of peer reviewers to assess the quality of studies, (b) poor reproducibility among reviewers, inability to recruit knowledgeable reviewers, attrition of reviewers, (c) reviewers forcing changes (additional adjustment, post hoc subgroup analyses, deleting or combining outcomes), (d) bias due to author characteristics (previous work, stature, affiliation, nationality, language, or sex), (e) bias due to reviewer characteristics (idiosyncratic strictness vs. leniency, cultural), (f) result-based bias (confirmation bias, conservatism), and (g) conflict of interest (p. 672).

Haffar and colleagues' fourth type of bias, *bias due to author characteristics*, is reiterated in disciplines outside of medicine. Maas et al. (2021) surveyed 13 leading journals in conservation biology, evolution, and ecology to identify the top authors in those journals over the 74-year period from 1945 to 2019. They found that of the top publishing authors, women comprised only 11% and authors from the Global South represented fewer than 25%. The authors also note that the rate of authorship changed very little over 74 years. Similarly, Heath-Stout (2020) reports gender disparity in authors published in the *Journal of Field Archaeology (JFA)*. Upon examining article submissions, peer review and publication patterns at *JFA* over the 3-year period from 2016 to 2019, Heath-Stout concluded that the gender imbalance present in publication patterns was due to a lower submission rate rather than bias in the review process. By contrast, Tompkins et al. (2017), examining reviewers in computer science, did find bias in the review process. In a controlled study, one group reviewing under single-blind conditions was able to see author information. A second group reviewing under double-blind conditions was not able to see author information. The researchers found that single-blind reviewers were significantly more likely to recommend acceptance for papers from highly regarded authors, universities, and companies.

Haffar and colleagues' fifth type of bias, *bias due to reviewer characteristics*, is also reiterated in other disciplines. Lievano-Latorre et al. (2020) examined the editorial board membership of 31 biodiversity conservation journals. They found that women comprised only 28.7% of the board members. Murray et al. (2018) examined all submissions made to the noted biomedical journal *eLife* between 2012 and 2017. They found that women comprised only 21% of the peer reviewers and about 25% of the reviewing editors. They also found that fewer than

2% of peer reviewers and reviewing editors were based in developing countries. In addition to this gender and geographic imbalance, the researchers found that the composition of the review team significantly influenced publication decisions. First, all male review panels were more likely to accept papers with a senior male author. Second, review panels were more likely to accept papers from developing countries if a member of the review panel was also based in the authors' home country.

In a summary of Murray et al., Chawla (2018) points out that a challenge of the double-blind peer review process is that many academic fields are so small that it is fairly easy for reviewers to guess the authors of blinded submissions. A study by Teplitskiy et al. (2018) provides insight into another way that reviewer characteristics might lead to bias. Examining the reviews of nearly 8000 neuroscience manuscripts, the researchers found that reviewers show substantial favoritism to authors who are in (or nearer to) the reviewers' professional networks. Teplitskiy et al. (2018) explain that this result may not reflect quid pro quo practices on the part of reviewers as much as a tendency to see greater merit when authors share "schools of thought" with the reviewer.

2.2 | Peer review in science education

In science education specifically, there are relatively few articles published on the journal review process. Many of those that are published can be found in a special issue of *Research in Science Education* guest-edited by Roth and Tobin (2002). The articles addressing peer review in science education differ from the scholarship presented earlier in that the science education scholarship does not foreground equity in the journal review process as a primary topic of interest. Although some of the science education literature touches on equity-related topics, we find it more useful to see this study as existing on a continuum ranging from those which treat the peer review process as *unproblematic* to those with treat the review process as *problematic*.

Baker (2002) provides an example of work nearer to the unproblematic end of the continuum. Baker served as editor of the *Journal of Research in Science Teaching* from 2001 to 2006 and in her article, she provides an overview of the review process. The article serves as a useful guide that describes how to submit manuscripts, provides common reasons for rejections, and explains how to read and respond to editorial decision letters. The article concludes with a discussion of the role the review process plays in shaping the field. Tobin (2002) provides another example of scholarship nearer to the unproblematic end of the continuum. In his article, Tobin uses an autobiographical narrative to explore various milestones in his own career where he took on peer review roles. He also reflects on the experiences that supported his ability to take on those roles. Tobin discusses the power dynamics between the reviewer and the reviewed. He closes with suggestions as to how peer review can be enacted more equitably.

Barton et al. (2002) write an article that is nearer to the *problematic* end of the continuum. In their article, the authors draw from an experience with a participatory research project to illustrate how the purposes and goals of participatory research are hampered by practices that prevail in the peer review process. The authors push readers to "grapple with epistemological tensions" inherent in a peer review process that in some ways frustrates the outcomes that the science education community professes to value. These ends of the continuum are augmented by articles which focus on various aspects of the peer review process and provide varying levels of critique. For example, Osborne and Brady (2002) argue that the function of peer review be re-envisioned from that of gatekeeping to that of supporting author development. Eisenhart (2002) foregrounds the tension between upholding traditional standards (thereby stifling innovation) and promoting innovative ideas (thereby weakening traditional standards). She goes on to argue for a re-envisioning of what constitutes merit in educational research.

There are four insights that can be drawn from this study that are particularly germane to the present study. The first is that inequity is pervasive throughout the journal review process. Inequity is found in almost all phases of the process from editorial board composition, manuscript submission, reviewer composition, reviewer evaluation of manuscripts, and ultimately publication. The second is that inequity is systemic. It is deeply embedded in many of

the structures that serve as the foundation of the peer review process. The third is that inequity has been limited in focus. The treatment of inequity in the journal review process has largely focused on issues of gender and geography. Drawing from the articles reviewed, there has been no focus on racial inequity. Fourth, inequity has not been addressed in science education. Many of the science education articles that address the journal peer review process offer critique or suggest modifications to the process, and some of these articles touch on equity as part of their critiques and suggested modifications. However, none of them foreground equity in the journal review process as a primary topic of interest. The present study draws on existing work by (a) adopting a framework that outlines pervasive and systemic manifestations of inequity, (b) foregrounding racial equity as an area of focus, and (c) specifically addressing the peer review process in science education journals.

3 | THEORETICAL FRAMEWORK

3.1 | Defining equity

In their book, *Culture*, from the *Equity 101* series, Linton and Davis (2013) define equity as "…justice, fairness, and freedom from bias and favoritism…" While this characterization of equity resonates with the intuitive sense that many have about equity, it fails to tackle a common tension. Specifically, should equity be characterized by equal (or even proportionate) outcomes or should it be characterized by equal (or equally applied processes or procedures).

Faculty at the University of Southern California's Center for Urban Education have, for years, worked to assist colleges and universities to implement more equitable practices for oppressed racial and ethnic groups. Drawing on the insight generated through this study, McNair et al. (2020) offer the following three-part articulation of equity.

- Equity is a means of corrective justice (McPherson, 2015) for the educational debt (Ladson-Billings, 2006) owed to the descendants of enslaved people and other minoritized populations willfully excluded from higher education.
- Equity is an antiracist project to confront overt and covert racism embedded in institutional structures, policies, and practices.
- Equity lets practitioners see whiteness as a norm that operates, unperceived, through structures, policies, and practices that racialize the culture and outcomes of higher education institutions (pp. 20–21).

This articulation resonates with the present study in three ways. First, the authors foreground people of African descent, which as we have shown is a group overlooked in extant work on inequity in the peer review process. This theoretical foregrounding supports our efforts to foreground racial inequity empirically. Second, the authors' framing of equity as a means of corrective justice moves beyond the previously mentioned tension between equal outcomes and equitable processes. Corrective justice implies that it is insufficient to move forward as though making things "equal," is tantamount to ensuring equity. Third, the authors acknowledge that racism is embedded in institutional structures, policies, and practices and moves toward identifying mechanisms by which racism is enacted through those structures, policies, and practices. This approach closely mirrors our own approach to addressing racism through science education research (e.g., Mutegi, 2013; Mutegi & Momanyi, 2020; Mutegi et al., 2018).

3.2 | Barriers to equity

In addition to offering a three-part articulation of equity, McNair et al. (2020) provide a framework that identifies 10 obstacles that inhibit organizations' efforts to achieve racial equity. These obstacles are (1) Claiming to Not See Race, which is *a systemic unawareness that policies and practices disadvantage minoritized scholars*; (2) Not Being Able or

Willing to Notice Racialized Consequences, which is *a rejection of the possibility that racism is a cause of inequity*; (3) Skirting Around Race, which refers to *a reluctance to talk about race in a clear and direct manner by (a) avoiding naming specific racial groups (e.g., Black, Latino, etc.) and (b) using euphemistic labels (e.g., at-risk, minority etc.)*; (4) Resisting Calls to Disaggregate Data by Race and Ethnicity, which is *the practice of collecting and reporting data on various racial and ethnic groups together under a common label (e.g., underrepresented minority), rather than exploring the nuance of various groups*; (5) Substituting Race Talk with Poverty Talk, which is *an insistence that socioeconomic status is of greater consequence to equity than race*; (6) The Pervasiveness of White Privilege and Institutionalized Racism, which is *a tendency of Whites to rely on institutional policies, practices, and social norms to ensure maintenance of the status quo and suppression of progress toward equity*; (7) Evasive Reactions to Racist Incidents, which is *a denial of deep-seated institutional racism in the face of racist incidents*; (8) The Incapacity to See Institutional Racism in Familiar Routines, which is *the failure to see and problematize the form of racism that is created and reinforced through everyday practices*; (9) The Myth of Universalism, which is *the assumption that Whites and people of color have the same realities, [and] the same experiences in the same contexts*; and (10) Seeing Racial Inequities as a Reflection of Academic Deficiency, which is *a deficit-minded perspective that tends to problematize the minoritized and not the system*.

4 | METHODS

4.1 | Research questions

To move toward a deeper understanding of the role of the peer review process in supporting or inhibiting racial equity, the present study aims to answer two questions. First, "In what ways does the science education journal peer review process promote racial equity?" Second, "How are science education journal editors' perceptions of racial inequity reflected in the peer review process? The first question is aimed at helping us to determine the institutional structures in place to support racial equity in the peer review process. The second question helps us to assess a second institutional structure: the values guiding the peer review process as expressed by journal editors.

4.2 | Methodology

This study draws from the theoretical assumptions of two methodological approaches. The first is ethnography. Creswell (2012) points out that ethnography is aimed at "…describing, analyzing, and interpreting a culture-sharing group's shared patterns of behavior, beliefs, and language that develop over time" (p. 462). The present study draws from ethnography in as much as it aims to describe the journal peer review process (with its attendant patterns of behavior and belief) of the science education research community (a culture-sharing group).

The second methodological approach from which this study draws is critical theory and critical arts-based methods. Drawing on these two schools of thought, we sought to articulate the participants' implementation of racial equity. Critical theory is a methodology that pursues social justice by challenging unequal power dynamics in social, political, and cultural structures (Steinberg & Kincheloe, 2010). According to Horkheimer critical theory represents three criteria: (1) it must be explanatory, (2) practical, and (3) normative, occurring at the same time (Berendzen, 2017). Critical arts-based research is a methodology with a political agenda to uncover the subjugated peoples and voices (Bagley & Castro-Salazar, 2012). Weaving together critical theory and critical arts-based research to investigate racial equity in the peer review process, serves to extend the insight that lead editors can provide on the peer review process. Our use of these methodological approaches compliments our work in other studies where we have used ethnography (e.g., Lewis & Collins, 2001; Mutegi et al., 2019) and critical arts-based methods (Nkrumah, 2021) to explore issues of racial equity in science education.

TABLE 1 Demographic of participants

Demographic category	Number of participants
Race/ethnicity	
African American	1
White	5
Gender	
Male	3
Female	3
Institutional Carnegie classification	
R1	2
R2	2
D/PU	1
N/A	1
Rank	
Assistant Professor	1
Associate Professor	1
Professor	4

Note: D/PU, Doctoral/Professional Universities; R1, very high research activity; R2, high research activity.

4.3 | Research participants

We approached 26 scholars who served as lead editors of science education research journals either currently or within the past 5 years. We invited these lead editors to serve as informants for the study. We use the term "lead editors" to characterize those editors or co-editors who bear ultimate responsibility for managing the review process. Lead editors might be considered editors-in-chief and are distinguished from managing editors, executive editors, associate editors, and those serving in other editorial roles. The 26 lead editors represented 12 science education journals. These were *Cultural Studies of Science Education* (CSSE), *Electronic Journal for Research in Science and Mathematics Education* (EJRSME), *Innovations in Science Teacher Education* (ISTE), *International Journal of Science Education* (IJSE), *International Journal of Science and Mathematics Education* (IJSME), *Journal of Research in Science Teaching* (JRST), *Journal of Science Education and Technology* (JSET), *Journal of Science Teacher Education* (JSTE), *Research in Science Education* (RISE), *Science Education* (SE), *Science and Education* (S&E), and *Studies in Science Education* (SSE).

A total of six lead editors agreed to serve as informants for the study. Table 1 provides a summary of informant demographics obtained at the time of the interviews.

4.4 | Data collection and analysis

4.4.1 | Informant interviews

Each participant took part in a 75–90-min interview. Interviews were conducted by the first author (Nkrumah) who met with informants remotely via videoconferencing software. Interviews began with an arts-based activity.

Informants were given the following invitation "Using Jamboard, draw the ideal-not manuscript reviewer. Below the illustration provide a brief description of the characteristics of the ideal-not reviewer and provide the reasons they would not be an ideal reviewer." Jamboard, is a digital whiteboard-style tool that enables users to draw, write notes, and post images. Following the invitation, informants were given 15 min to work on their drawing, after which they were asked to share their drawing and explain its meaning. The Jamboard drawing was intended to stimulate editors thinking and generate discussion about reviewers and the review process. It also served as an entry point into conversations around equity in the review process and a referent throughout the interview.

Following the drawing activity, Nkrumah's semistructured interview was organized around seven prompts. These were (a) Tell me about your practice of leading, mentoring, and/or teaching in Science, Technology, Engineering, and Mathematics (STEM) that promotes equity; (b) What is your understanding of the under-representation of published articles by marginalized groups (i.e., African American, Native American, Latinx, women) in STEM; (c) Describe your review process of articles related to promoting equity in STEM education; (d) Have you been able to identify and confront inequities in the review process for science or STEM articles; (e) What learning experiences do you think should be provided in the recruitment of editors that will increase equity; (f) What do you perceive as the greatest challenge editors face when trying to identify reviewers who are equitable; and (g) What do you see as the greatest contribution in your role as an editor to promote equity thus far.

4.4.2 | Informant focus group

After all one-on-one interviews were completed, informants were invited to take part in a focus group session. The focus group followed Hennink's (2014) articulation of focus group discussions in that it (a) focused on a specific topic, in this case, equity in the peer review process, (b) sought to uncover a range of perspectives and experiences, (c) fostered a nonthreatening group environment, and (d) encouraged discussion between participants rather than with the moderator (p. 2).

Like the informant interviews, the focus group was also conducted remotely via videoconferencing software. It began with individual introductions that included information about each lead editors' demographic positionality (e.g., identified gender, race, and ethnicity), and years of experience in editorial roles. Immediately after the introductions, Nkrumah described the format of the focus group session. In alphabetical order, each lead editor's Jamboard drawing was used as a prompt for discussion among the other lead editors. In this way, informants did not participate in the portion of the discussion initiated by their own drawing. Upon showing informants a drawing, Nkrumah asked, "What does this drawing suggest about the review process to you?" Discussion around each drawing lasted from 8 to 10 min. Since the interview protocol was semistructured, we asked follow-up questions to understand the role of equity in decision-making on manuscript submissions.

All data collection events (i.e., informant interviews and informant focus groups) were video recorded. They were transcribed upon completion of each event. Informants received one $50 gift certificate for completion of the interview, and one $50 gift certificate for completion of the focus group.

4.5 | Data analysis

Interviews and focus group data were analyzed using qualitative methods. We reviewed the data from the transcripts populated from the Zoom video and audio recordings. First, we worked independently to open code the interviews before meeting to compare and discuss the results. The open coding and discussion process were repeated over four to five virtual meetings between 90 and 120 min at a time. We documented the coding for the six interviews and focus group on a shared google document. For the open coding of interviews and focus group data, we coded and wrote themes separately using the interview questions to organize the information on the

google doc. Through this iterative process, we realized strong coherence between the themes we identified in the data and the obstacles to racial equity, presented by McNair et al. (2020). We then matched exemplars from our data to each of the 10 obstacles.

4.6 | Presentation of findings

The presentation of findings is organized according to the 10 obstacles to equity described by McNair et al. (2020) framework. In presenting the findings, we provide summative commentary to each of the 10 obstacles. Although the commentary presented is drawn from our interview and focus group data, we do not present direct quotes from informants. The reason for this style of presentation is two fold. First, we want to ensure the anonymity of informants. As mentioned, in identifying the study informants, we invited lead editors of science education journals. This is a very small and highly visible population. It is our sense that by providing direct quotes, informants would be readily identifiable by readers. Second, we want to ensure that findings focus on the peer review process as the unit analysis rather than the individual informants' ideas or experiences.

As we present summative commentary to each of the 10 obstacles, we (a) adopt a composite voice, focusing on common threads of informants' experiences, and insight rather than differences; (b) prioritize the peer review process as the subject of study; and (c) use both examples and counterexamples to generate an idea of what typically happens in the science education peer review process.

5 | FINDINGS

5.1 | Obstacle #1—Claiming to not see race

The first obstacle, *claiming to not see race*, is *a systemic unawareness that policies and practices disadvantage minoritized scholars*. At the level of the individual, this obstacle characterizes the colorblind ideology that is reflected when a person claims that they "don't see color." However, institutionally this obstacle characterizes policies and practices that allow organizations to "not see color." Our informants helped us to identify a number of policies, practices, and conventions that embody this obstacle and contribute to inequity in the peer review process. We will provide two examples. First, journals have a practice of working to ensure that manuscripts published are "of interest to our readers." And while there is certainly a good reason for this practice, the net effect is that manuscripts on topics of interest by non-White scholars are harder to get published in certain journals (Participant C, pp. 169–171). Second, journals have methodological and conceptual conventions to which manuscripts should adapt, and manuscripts that do not approximate those conventions are less likely to be published (Participant A, p. 194). Often, manuscripts by non-White scholars are perceived as falling outside of those conventions (Participant D, pp. 146–150).

Both of these examples illustrate how non-White scholars are disadvantaged by policies and practices that never overtly address their non-Whiteness. Instead, the policies and practices hone in on reader interest and stylistic convention, which whether intentioned or not can become proxies for race.

5.2 | Obstacle #2—Not being able or willing to notice racialized consequences

The second obstacle, *not being able or willing to notice racialized consequences*, is *a rejection of the possibility that racism is a cause of inequity* (p. 22). One example of how this obstacle manifests itself in the journal review process can be found in how we make sense of racial disparity. Our informants described a tendency of reviewers focusing

on shortcomings of writing when examining scholarship presumed to be from racial minorities or nonnative English speakers (Participant F, pp. 183–184). This example is a close corollary to the example provided in the first obstacle. While under the first example, writing style becomes a proxy for race that ensures disparity through policy, here writing style supplants racism as an explanation for disparity.

It is not our intent to suggest that quality writing is not an important consideration in the journal review process. However, another way of regarding this study would be to (a) recognize the benefits that derive from linguistic diversity, and (b) use that diversity (and the review process) as a starting point for strengthening the written scholarship of the science education community.

5.3 | Obstacle #3—Skirting around race

The third obstacle, *skirting around race*, is *a reluctance to talk about race in a clear and direct manner by (a) avoiding naming specific racial groups (e.g., Black, Latino, etc.) and (b) using euphemistic labels (e.g., at-risk, minority etc.)*. This obstacle is a prevalent barrier in the science education journal review process inasmuch as it reflects a collective tendency to avoid addressing "racial" inequity in favor of addressing the supposed causes of disparity. For example, rather than foreground the low number of articles published by scholars of African descent, editorial board discussions shift toward the need to (a) encourage "people" to write more, or (b) be more proactive in introducing students to science education associations. (Participant A, pp. 195–196). In other spaces, racial inequity is understood as a function of "people" (a) not being present in certain disciplines in high numbers, or (b) not being in academic positions that allow them time to write academic articles (Participant C, pp. 143–145).

On one hand, these shifts in focus from racial inequity toward the needs and conditions of "people" could be seen as an effort to move toward solutions. However, even as a corrective measure, the failure to speak clearly about race illustrates a tendency to assume deficiency and incompetence without strong evidentiary support. These rhetorical shifts also reveal indirectly, an understanding that race is a key determinant of success in science education despite the explicit failure to address race directly.

5.4 | Obstacle #4—Resisting calls to disaggregate data by race and ethnicity

The fourth obstacle, *resisting calls to disaggregate data by race and ethnicity*, is *the practice of collecting and reporting data on various racial and ethnic groups together under a common label (e.g., underrepresented minority), rather than exploring the nuance of various groups*. This obstacle, not itemizing race and ethnicity data, is a profound barrier in the review process when framing and assessing for racial inequity. For example, racially homogenizing the non-White scholar's data lowers expectations to know "the percentage" or "look at it" on an individual level (Participant F, p. 209). Labeling practices of data that categorize the diminutive sample sizes for non-White scholars' "mirror what you see" in science education.

While the intake process of "numbers" represents the participation according to race, the collection and presentation of the data matters more (Participant F, p. 210). Setting up systems, to gather the data from individuals and not disaggregate the information becomes an obstacle that positions non-White scholars and their contributions as insignificant to the advancement of science education.

5.5 | Obstacle #5—Substituting race talk with poverty talk

The fifth obstacle, *substituting race talk with poverty talk*, is *an insistence that socioeconomic status is of greater consequence to equity than race*. In the context of the journal review process, this obstacle is a barrier in cases where

the individual lacks the racial competence needed to foster racial equity. For example, utilizing review protocols that omit a racial lens for cultural and linguistic scholars, tend to be a critique of the culture represented by the author in comparison to the White culture that identify limitations in (a) the "ability" to write well, (b) produce "accurate" information, or (c) constructing of "vague" expressions (Participant A, pp. 191–192). Substituting in other social factors like poverty to explain the source(s) for racial inequity norm habits to ignore the influence of race in journal reviews.

Often standardized policies and practices to encourage racial equity, discourage the identification of racial inequity embedded in the new methods that exclude non-White scholars in the journal review process. References such as, "underrepresented groups" from editors about the review process acknowledges an awareness of disparities writ large (Participant A, p. 192). The choice not to engage in race/racism talk reveal indirectly, a reluctance to implicate race as a primary barrier for "underrepresented groups" engagement in science education despite evidence of race impacting racial equity.

5.6 | Obstacle #6—The pervasiveness of White privilege and institutionalized racism

The sixth obstacle, *the pervasiveness of White privilege and institutionalized racism*, is *a tendency of Whites to rely on institutional policies, practices and social norms to ensure maintenance of the status quo and suppression of progress toward equity*. This obstacle is a critical barrier to racial equity initiatives in the science education review process mediated through direct actions that both allow legacies and resources to dictate the scope of social change in organizational structures impacted by overt acts of racism. Dominant racial ideologies shape the work objectives, for example, failing to acknowledge the unequal power dynamics benefiting White scholars, structures the critique of scholarship by non-Whites toward cultural assimilation through imposed standards to model "the kings English" writing style (Participant A, p. 192). Another line of thought interprets requiring racial equity training as an "inconvenient truth" added to (a) the begging for volunteers who receive no compensation and (b) the hours spent reviewing a manuscript (Participant C, pp. 288–289).

The two examples demonstrate how maintenance of the status quo disenfranchise manuscript submissions by non-White scholars that adhere to guidelines not designed for culturally and linguistically diverse writers. The guidelines readily permit othering and equity training loopholes. Even if unintentional, these policies and practices center whiteness.

5.7 | Obstacle #7—Evasive reactions to racist incidents

The seventh obstacle, *evasive reactions to racist incidents*, refers to *a denial of deep-seated institutional racism in the face of racist incidents*. Building on obstacle #6 maintenance of the status quo, this obstacle spotlighting behaviors that do not acknowledge racial inequity is a common barrier in the journal review process. As an example, not holding reviewers accountable when their actions promote racial inequity, instead, editors could assume that the reviewer's feedback is (a) coming from a good place but not necessarily know the negative implications, (b) supposed to be constructive but sometimes it comes across as it is not, or (c) it could just be bad writing (Participant F, pp. 177–181).

Apparent in this example is how the "racialized" experience of non-White scholars are identified by practices as not exhibiting racism. By contrast, practices focus on reviewers' personality and tone. Even if critical feedback is meant to be helpful, the word choice can reflect systemic racist ideologies.

5.8 | Obstacle #8—The incapacity to see institutional racism in familiar routines

The eighth obstacle, *the incapacity to see institutional racism in familiar routines*, refers to *the failure to see and problematize the form of racism that is created and reinforced through everyday practices*. The most pronounced

exemplar of this obstacle is the fact that, generally speaking, science education journals have no institutional practice of collecting data that would help us to better assess and understand racial inequity in the journal review process. Data on submitting authors (e.g., racial identification, position in authorship list, frequency of submission, institutional affiliation, years in the profession), on manuscript reviewers (e.g., racial identification, quality and quantity of reviewers' assessments), and on disposition of manuscripts submitted would allow journal editors and editorial review boards to identify patterns and to make editorial decisions that could lead to greater equity.

Current prevailing practice is that some of these data are collected, but much of it is not. And there is no institutional practice of applying insight from such data to making the journal review process more equitable (Participant F, pp. 169–170). As a consequence, our efforts to improve equity in our journal review process are made without the benefit of data informed insight.

5.9 | Obstacle #9—The myth of universalism

The ninth obstacle, *the myth of universalism*, refers to *the assumption that Whites and people of color have the same realities, [and] the same experiences in the same contexts*. This obstacle is reflected in the appearance of equity that marks the journal review process. The blinded submission of manuscripts, the allocation of submissions to associate editors with expertise in given areas, the solicitations of peer reviewers based on their expertise, and the blinded reviews all lend to the sense that the journal review process is equitable. However, as we have seen, inequity is interwoven within the fabric of our professional lives and an equitable process does not correct or undo those embedded inequities.

Here, a counterexample might better illustrate how to work around the myth of universalism. Understanding that scholars of color work amidst systemic inequity a journal, could modify its journal review process. As part of this process the journal could identify implicit rules and norms and provide guidance to authors making these rules and norms explicit (Participant B, pp. 161–163). The journal could be more proactive in conceptualizing the peer review process as serving as a conduit for moving papers with strong potential to the canon of published work, rather than serving as a gatekeeping function aimed at keeping work out (Participant D, pp. 252–253). The journal could consider racial identification and equity orientation in addition to expertise when assigning reviewers to manuscripts.

These counterexamples represent initiatives undertaken by individual editors, who adopt them to push against the norm and move toward greater equity. As such, these counterexamples help us to see that on one hand that normal practice does reiterate the myth of universalism. On the other hand, these counterexamples help us to see a broader range of what is possible in the peer review process.

5.10 | Obstacle #10—Seeing racial inequities as a reflection of academic deficiency

The 10th obstacle, *seeing racial inequities as a reflection of academic deficiency*, reflects *a deficit-minded perspective that tends to problematize the minoritized and not the system*. We found no examples of this obstacle in our data. The absence of any such data leads us to conclude that this obstacle is not a substantial barrier to equity in the science education peer review process.

6 | CONCLUSIONS AND IMPLICATIONS

In sum, it is clear through the insight garnered from our informants that racial inequity is embedded throughout the science education peer review process. What is more, we have also seen that in many respects the challenges facing the journal peer review process in science education are not very different from those identified in other fields. As

we have seen our data underscore examples of inequity that fit nine of the ten obstacles that comprise the framework laid out by McNair et al. (2020). However, what these data do not underscore is the degree to which lead editors struggle to make the science education peer review process more equitable and the two tensions that permeate that struggle.

The first tension is the institutional structure within which the peer review process takes place. This structure is comprised of organizations with a vested interest in the peer review process. This would include professional associations and publishers that sponsor journals, publishers that own journals, and universities that rely on journals for warehousing our collective knowledge and assessing productivity. In addition to organizations, are individual (or loosely collected) people with a vested interest in the peer review process. This includes university faculty and other researchers who produce and consume new knowledge, and persons charged with making evaluative judgments about the work of their peers. The institutional structure also includes the formal and informal measures by which we determine the quality and quantity of scholarly productivity. This includes the various indices that rank journals (e.g., SciMago, or ISI), and those that rate researcher productivity (e.g., h-index; g-index; i10-index).

To a large degree lead editors' decisions are influenced and sometimes constrained by this institutional structure. For example, the push to ensure high numbers of submissions, and high numbers of citations is aimed at keeping the journal ranking as high as possible among competing journals. A second example can be found in the constraints of the platforms provided by publishers. Here, editors are limited to the metrics collected through the platform when seeking to make data informed editorial decisions. So, publisher platforms will often collect data on the time a manuscript is in the review process (from submission to final decision or publication). However, these platforms rarely collect data on the racial demographics of authors making submissions.

The second tension is the drive among the lead editors and editorial review boards to move toward greater equity in the science education journal peer review process. Our data provide numerous instances of informants looking for ways to cajole institutional structures to realize more equitable outcomes. Here, we find editors taking on (in addition to their editorial responsibilities) tasks such as recruiting more non-White reviewers to broaden and diversify the reviewer pool, or personally mentoring authors who receive rejections, but who have promising research ideas. In some instances, entire review boards allocate time to discussing strategies or implementing short-term or localized measures in hopes of realizing greater equity. While these efforts are noteworthy and noble, they do little to change the institutional structures in which racial inequity is embedded. Following this approach, editors' efforts are like the punishment of Sisyphus and every 5 years or so, it starts afresh with the influx of new editorial leadership. This approach all but guarantees that we will not realize wholesale systemic change. Bearing these two tensions in mind, we conclude by offering four suggestions for moving toward greater racial equity in the science education peer review process.

The first suggestion is to develop criteria that peer reviewers must meet before being accepted as peer reviewers (Tobin, 2002). These criteria could include experiential requirements, training requirements or some combination of the two. It might also entail a period of conducting peer reviews in collaboration with more experienced peers. It should certainly include a component wherein peer reviewers are exposed to the role of the peer review process in ensuring equity in published work. What happens currently is that lead editors and associate editors are pressed to identify peer reviewers from a limited pool. Peer reviewers are selected based largely on willingness to review and on self-reported expertise. This first suggestion is consistent with how scholars are appointed (or elected) to leadership positions in many of our professional associations or granted the ability to direct dissertations in many universities.

The second suggestion is to broaden the pool of available reviewers by incentivizing peer review. This is a necessary correlate to the first suggestion. Incentives can take the form of formal recognition by journals, awards from journals or associations, meaningful quantification of the peer reviewer responsibility such that it weighs more heavily in peer evaluation decisions such as promotion and tenure. Incentives can also be monetary such that an accumulation of a certain number of reviews is acknowledged by monetary compensation. What happens currently is that there is little acknowledgment and no reward for the labor-intensive work of conducting peer reviews. As a

consequence, the pool of reviewers from which editors can draw is small and the number of non-White, equity-minded reviewers is even smaller. A larger pool provides a needed resource that better positions us to move toward greater equity in the journal peer review process.

The third suggestion is to make modifications to standard procedures and collectively push publishers to integrate these modifications in their platforms. One standard procedure that could be implemented is the collection and public reporting of equity data. Currently, there is no widespread practice of collecting or reporting racial equity data. Our informants described how this lack of data prevents informed decision-making on the part of lead editors and editorial review boards. However, the lack of data has other effects. It also prevents informed decision-making on the part of scholars seeking venues for their manuscripts. Additionally, the practice of collecting and reporting equity data would likely serve as a reminder of the value placed on equity by the community that supports the journal. This suggestion would require a collective push to enjoin specific publishers in modifying their platforms to support planned modifications. We support a "collective" push to emphasize that an appeal to the publisher would be much more effective coming from a community (such as a professional association) rather than one or two lead editors.

The fourth suggestion is to establish spaces for nonhierarchical, collective planning sessions on identifying and implementing strategies that could lead to greater equity. Such planning sessions should include editors of all levels, authors, potential authors, and reviewers. This suggestion grew out of our experience observing the focus group held with the lead editors. It became clear (and some editors explicitly acknowledged) that although the editors experienced similar opportunities and challenges, there was no shared space in which they could benefit from the synergy of addressing those opportunities and challenges collectively. For our informants, the focus group became a shared space on a very small scale. In fact, each of the four suggestions presented in this section was addressed in some way through that focus group discussion.

By involving participants beyond lead editors, this collective planning approach that we are suggesting has the potential benefit of synergy as described, but also creates a space for mutual learning. Here, scholars who have not yet taken on editorial responsibilities have an opportunity to gain greater insight into what the publication process looks like from editors' perspectives. The inverse is also true as scholars who are far beyond the early challenges of getting the first few papers in print have opportunities to learn of challenges facing new scholars and to be reminded of challenges that may be long forgotten. It also provides a space for implicit rules and cultural norms (which are sometime not shared with non-White scholars) to be addressed in a more explicit way. These are just a few suggestions of measures that have the potential to move the science education community toward greater equity in our published work. We are not under the illusion that these are quick or easy fixes. Attempting to address systemic inequity is difficult and demanding work. However, we are encouraged by the sustained engagement of our colleagues. What is more, we are hopeful that with the type of ongoing, collective commitment we have witnessed over the past 30 years, we are certain to see continued improvement in the future.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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