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Gender and Race in the International Sciences: Organizational Practices of Diversity

In/visible: The intersectional experiences of women of color in science, technology, engineering, mathematics, and medicine in Australia

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Abstract

It is now well-established that science, technology, engineering, mathematics, and medicine (STEMM) institutions globally should invest in building diverse and inclusive workforces. However, women of color remain underrepresented in STEMM in Australia and their organizational experiences are under-researched. To address this gap, we used a qualitative approach to explore the complex intersections of race/ethnicity and gender that may contribute to women's underrepresentation in Australian STEMM. Primary data encompassed interviews with 30 self-identified women of color working in academia, industry, and government STEMM organizations. We drew on intersectionality theory to explore participants' experiences of their working environments and grounded theory in our analysis. This article focuses on an understudied area related to the maintenance of white male power in STEMM and everyday experiences of "in/visibility"—the paradoxical space of invisibility and hypervisibility that women of color occupy within STEMM fields. For example, various features of women of color's identities, such as physical appearance, cultural background, accent, and name, led to participants feeling "different" and hypervisible in STEMM workplaces in Australia, in which the stereotype of a white

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male scientist predominates. Women also felt hypervisible as race/gender tokens when they were expected to do the diversity work of the institution. In contrast, participants felt invisible when they were professionally and socially excluded from networking events, such as after-work drinks. Women of color's experiences of having to work much harder than white colleagues to gain recognition of their organizational value also contributed to feelings of invisibility. The study findings provide deep insight into Australian STEM cultures by foregrounding how in/visibility shows up in the experiences of women of color. This study builds on our understanding of women's STEM careers as inextricably linked to intersectional features of social identity and white masculine power dynamics in organizations and society more broadly. We conclude by advocating for a more nuanced understanding of "women in STEM" in Australia (e.g., via more sophisticated data collection and analysis) to ensure that national policies and initiatives benefit all women.

KEYWORDS

code-switching, exclusion, hypervisibility, invisibility, tokenism

1 | INTRODUCTION

For several decades, significant scholarly attention has been directed toward improving gender equity in Science, Technology, Engineering, Mathematics, and Medicine (STEMM) fields (Schmidt et al., 2020).¹ While researchers are now adopting an intersectional lens (see Banda, 2020; Castro & Collins, 2021; Mattheis et al., 2019; Metcalf et al., 2018; Wilkins-Yel et al., 2019), a key limitation of the bulk of the existing research has been its treatment of "women in STEM" as a homogenous group, in which the experiences of straight, white women have been implicitly interpreted as representative of all women. Until the 2000s, women of color were often excluded from study designs and/or the racial and ethnic composition of study samples were not discussed (Johnson, 2011). This historical approach failed to recognize the differing experiences of marginalization for women whose identities encompass more than one of these categories (Moore & Nash, 2021).

Despite decades of investment in gender equity, the Australian STEM workforce remains dominated by cisgender, white men (Office of the Chief Scientist, 2020). The association of whiteness and maleness with organizational leadership underpins the persistent marginalization of people of color in Australian STEM. In line with the tenets of critical race theory, we argue that science in Australia remains a form of white male property (Mensah & Jackson, 2018). In this model, white men use and enjoy science to the relative exclusion of others. In other words, it is a closed culture for the privileged, which ultimately affects cultural discourses related to who is a scientist and what a scientist looks like. This context is essential in understanding how women of color develop a science identity and navigate their careers in white, male STEM workplaces.

White masculinity is further reinforced as the organizational norm via the exclusion of intersectional data from the study of the Australian STEM workforce. Current datasets are not sufficient for intersectional research or

policy development because the national administrative and statistical systems in relation to STEM education and/or the STEM labor market do not capture data on women's multiple social identities. Instead, data are collected only on sex-based categories, age, and country of birth (Office of the Chief Scientist, 2020). For example, we know that less than 1% of Aboriginal and Torres Strait Islander peoples in Australia hold a university STEM qualification compared to 5% of non-Indigenous people. Yet, there are no datasets on Aboriginal and Torres Strait Islander people and/or women working in STEM. Nevertheless, the significant under-representation of this group is suggested by the Australian government's commitment of \$25 million over 10 years to boost the STEM participation of Aboriginal and Torres Strait Islander girls and women (National Indigenous Australians Agency, 2021). The lack of intersectional data means that policies are developed in an evidence-vacuum. While programs and initiatives have led to some improvement for "women in STEM", white women have disproportionately benefited (Jovanovic & Armstrong, 2014).

Intersectional data is also not required for Australian anti-discrimination compliance measures. For example, the *Workplace Gender Equality Act* (2012) focuses on gender—a singular axis of identity—in the context of removing barriers to women's workforce participation. For compliance, the Act only requires non-public sector "relevant" employers (those with 100+ employees) to lodge annual reports on various gender equality indicators (e.g., wages) (Workplace Gender Equality Agency, 2022). However, "relevant" employers comprise only one-third of Australian businesses. Therefore, these reports are not representative. Moreover, the only publicly available data on "women in STEM" is undifferentiated because the Act homogenizes women's experiences by failing to orient workplace discrimination around intersections of disadvantage. This means that the unique experiences of women of color are impossible to detect (Blackham & Temple, 2020).

Beyond the absence of legislative requirement, the lack of intersectional STEM data is a product of Australia's position as a white, "post-racial" society, characterized by the erasure of race from the public lexicon and the deracination of relationalities. As Lentin (2016, p. 35) explains, in "post-racial" societies, "we have been left unable to speak about race". White Australians often fail to recognize themselves as raced and may evoke race-neutral discourse to frame career progression as the outcome of individual choices in race-neutral, meritocratic institutions (Moore, 2012). These discourses legitimate inequalities, rendering them difficult to articulate and address.

In Australia, where whiteness is normative, white people have little experience feeling uncomfortable based on race (Lentin, 2016). This results in white fragility—"a state in which even a minimum amount of racial stress becomes intolerable, triggering a range of defensive moves" (DiAngelo, 2011, p. 57). White fragility compounds the difficulties faced by women of color when drawing attention to racial microaggressions (Nash & Moore, 2020). Although "post-racial" societies are deracinated, Australia remains structured along racial lines, with racialized differences on a range of socio-economic indicators including health, life expectancy, education, employment, income, wealth, and interaction with the criminal justice system (Moore, 2021).

An intersectional approach to STEM data collection and analysis is essential in foregrounding the lived experiences of women of color, illuminating the implications of intersectional disadvantage in legal and policy discussions. With the exception of our own work (Moore & Nash, 2021), to our knowledge, there is no qualitative intersectional scholarship centering the experiences of women of color in Australian STEM. The bulk of qualitative literature on STEM in Australia focuses on the social and cultural analysis of gender. In addition, with notable exceptions (e.g., Wanelik et al., 2020), most scholarship about how women of color experience STEM workplaces originates in North America (e.g., Alexander & Hermann, 2016).

While we acknowledge the multiplicity of intersectional experiences of women in STEM in Australia, in this article, we focus on the racialized and gendered experiences of women of color. We use "women of color" to refer to women from non-dominant racial and cultural groups. The women in this study are not a monolithic group—they have differing national backgrounds, ethnicities, cultures, and religions. While some of these women may "pass" as white, their cultural expectations, names and accents marked them as "other" to the white masculine norms of STEM organizations in Australia. Through in-depth interviews with 30 self-identified women of

color working in Australian academic, industry, and government STEM organizations, we explore how participants experience STEM organizations that are dominated by white men. Drawing on critical black feminist scholarship, we use an intersectional approach to explore how the complexities of social identity, including race, gender, and nationality, shape the participants' sense of self and lived realities at work as scientists. In doing so, we analyze women's experiences through the construct of "in/visibility" to highlight power relations and to frame the ways in which participants' intersectional identities paradoxically position them as both hypervisible and invisible at work. We aim to demonstrate the intersectional complexities of Australian STEM and to draw out the implications of in/visibility and intersectional disadvantage. We conclude by advocating for a more nuanced understanding of "women in STEM" in Australia to ensure that national policies and initiatives benefit all women.

2 | INTERSECTIONALITY AS A FRAMEWORK FOR EXPLORING IN/VISIBILITY IN STEM

An extension of critical race theory, intersectionality allows us to look more deeply at questions of representation in STEM fields by describing the ways in which people and groups who hold marginalized identities can experience multiple forms of oppression within larger social, historical, political, environmental, and economic contexts (Crenshaw, 1989). Concerns about human differences and diversity, such as differences between groups of women, have been central in feminist scholarship within the social sciences and humanities disciplines historically. Intersectional approaches have also been widely used in the organizational studies literature to advance dialogs about social identity at work (see Rodriguez et al., 2016).

In contrast, STEM disciplines have rarely contended with social identity and the cultural environment of STEM institutions and intersectionality is underutilized (Mattheis et al., 2019). Like marginalized people in STEM, intersectionality theory has been rendered invisible (Settles et al., 2020). As Prescod-Weinstein (2017) observes, "there is a strange contradiction among scientists: Science is supposedly about asking questions, except about scientists and how science is done". In line with this view, Metcalf et al. (2018) argue that the slow uptake and application of intersectionality in STEM may emanate from the biased and exclusionary past of science itself, which poses challenges for acknowledging the lived experiences of different social groups. Acknowledging the experiences of marginalized groups would call into question the objectivity and meritocracy of STEM. Given that scholars from marginalized groups are the major contributors to intersectional research, the epistemic exclusion of intersectionality theory in STEM functions to protect white male power and maintain the status quo (Settles et al., 2020). As we discuss in forthcoming sections, women of color in STEM are constrained and influenced by these larger systems of white masculine power and the sociohistorical legacies of science as set against women's specific historical and political contexts when it comes to establishing their identities as scientists (see Carlone & Johnson, 2007).

3 | IN/VISIBILITY FOR WOMEN OF COLOR IN STEM WORKPLACES

In/visibility is a function of power in which people in dominant groups (e.g., white men) use power and privilege to render those in marginalized groups invisible or hypervisible (Lewis & Simpson, 2012). Feminist scholars identify several ways in which women of color are rendered "in/visible" (often simultaneously) at work. Visibility is "the extent to which an individual is fully regarded and recognized by others" (Settles et al., 2019, p. 63). As such, in/visibility, which encompasses invisibility and hypervisibility, reflects a white institutional lens and structures of race, gender, and culture, rather than how women of color understand themselves (McCluney & Rabelo, 2019). Writing from the UK, Puwar (2004) outlines several ways in which white masculinity is unmarked

and disembodied in organizational life and how this connects to women of color's institutional experiences. For example, spaces that appear neutral operate with racialized and gendered somatic norms. Puwar (2004) coined "space invaders" to describe bodies marked as different to somatic norms. For instance, in STEMM, white men are implicitly viewed as belonging to spaces of power and authority. However, masculine norms are also insecure (Lewis & Simpson, 2012). As Lewis and Simpson (2012, p. 147) suggest, the white male organizational norm is a "site of agitation and defensive action" as men seek to maintain the normalization of their privileged status, whereas people in marginalized groups challenge this privilege and reveal dominant practices. The mere presence of women of color in STEMM is inherently threatening and challenges the power of white male gatekeepers. When women of color move in these spaces, they are positioned as disruptive (Puwar, 2004). However, by challenging masculine norms, women of color also become hypervisible, re-confirming the whiteness of the space (see Ahmed, 2007).

Hypervisibility can position individuals as outsiders and subject to heightened scrutiny, which leads to mistakes being amplified (Settles et al., 2019). Paradoxically, hypervisibility is accompanied by invisibility in which "recognition, legitimacy, authority, and voice" is undermined (Settles et al., 2019, p. 63). To illustrate, the low proportion of women in color in Australian STEMM marks them as distinctive because of their gender and race (rather than their talents), leading to heightened scrutiny (Puwar, 2004). Simultaneously, their professional achievements become invisible which can leave women of color feeling pressure to minimize their gendered and racialized differences (Ong et al., 2011). For some women, visibility can, however, be pleasurable in that difference creates positive attention that can be used to challenge the status quo (Lewis & Simpson, 2012).

Beyond skin color, there are various contexts in which the status of women of color as "other" and hypervisible is conveyed. For instance, names and accents connote a range of information about identity, such as race, gender, and social class (Zhao & Biernat, 2017). As Ahmed (2007, p. 163) argues, having a foreign name can "slow you down" and make you a "stranger" even when you are at home. Research shows consistent name-based discrimination in English-speaking labor markets. Resumes with Arab-sounding names receive half the number of job call-backs compared to resumes with white-sounding names (Milkman et al., 2012). Moreover, although Asian people are often positioned in a privileged status as a "model minority" in which they are seen as universally successful financially, educationally, and professionally, stereotypical perceptions often position Asian women in STEMM as intellectually inferior, lacking mastery in the English language, and lacking leadership ambition (Castro & Collins, 2021). Consequently, to claim membership in STEMM, Asian women must work much harder than their white colleagues to prove themselves as capable (Chen & Buell, 2018). It is important to note that Asian women in STEMM are not a monolithic group—they experience distinct forms of marginalization in STEMM, within their own communities, and in society more broadly. For example, Southeast Asian Americans are often positioned as deviant and low-achieving in opposition to the "model minority" stereotype (Castro & Collins, 2021).

"Intersectional invisibility" (Ong et al., 2011) in STEMM occurs because women of color do not fit stereotypes for their respective identity groups—racial/ethnic minorities, women in STEMM, scientists. Thus, women with multiple marginalized identities are often misrepresented and misunderstood compared to stereotypical group members. For example, the traits of a scientist are implicitly associated with white masculinity (Moore & Nash, 2021). Scientists are perceived as highly agentic and career driven, aligning with stereotypical masculine characteristics of independence, intelligence, and assertiveness (Carli et al., 2016). Women of color's intersectional in/visibility in STEMM is amplified due to their positioning as "other" to this image and the poor racial literacy of most white Australians (Lentin, 2020).

Stereotyping reveals the paradox of in/visibility. Stereotyping occurs when social identity group memberships (race, gender) are visible, while individual or professional identities are invisible (Block et al., 2019). By entering white masculine domains, women of color are marked as different and become defined by their race/gender and constrained by various stereotypes. This situation is typical for women of color in STEMM organizations, in which their race and gender are salient while their position as scientists is insecure (Alexander & Hermann, 2016). Because their competence is doubted, women of color must consistently exceed expectations while being highly scrutinized by their white colleagues.

Stereotyping can also lead to treating women of color as tokens. As tokens, women face the “burden of representation” in which they have a responsibility to do well so that it does not reflect badly on others in their racial/gender group (Wilkins-Yel et al., 2019). When women are visible as tokens, aspects of their performance (e.g., leadership, technical abilities) can be eclipsed (Lewis & Simpson, 2012). On the flip side, being a token can also lead to “cultural taxation”—the additional workload women of color encounter “as members of a limited pool of people who represent diversity” within their workplace (Wijesingha & Ramos, 2017, p. 57). Cultural taxation encompasses mentoring (especially for students of color), sitting on committees (to demonstrate “diversity”) and being called on to address diversity issues within the institution. While institutions benefit from and expect these services, they typically are not included in job descriptions or rewarded. Nevertheless, while cultural taxation draws increased attention to gender and race, women's achievements can remain less visible (Rideau, 2021; Settles et al., 2019). For example, although women of color are more regularly being celebrated in STEMM in Australia to highlight “diversity” (on institutional websites, etc.), they are largely invisible in the everyday practices of organizations. Thus, the weight of whiteness often feels “overt and almost impenetrable” for women of color (Mirza, 2006, p. 105).

3.1 | Code-switching as a coping strategy for in/visibility

One response to hypervisibility is to seek out invisibility via code-switching to assimilate into the dominant culture. Women of color use situational “code switching” to mitigate their status as “space invaders” by accommodating the expectations, norms, and power hierarchies in particular social interactions to become socially invisible (Myers, 2020). For instance, African American scholars describe adopting specific linguistic styles to be accepted by white people in academia (Ferguson & Dougherty, 2021). Myers (2020, p. 115) observes, “...the notion of respectability is measured in my ability to both appear (straight hair, non-distinct clothing styles) and sound ‘White.’” Code-switching may also involve changing one's accent or name or conforming to white organizational norms to avoid discrimination. For example, normative male networking practices like drinking after work are problematic because they can reinforce differences if/when certain employees are positioned as “outsiders” (Arifeen & Syed, 2020). These norms can force women of color to adopt behaviors that may not be authentic for them, erasing their individuality. As Puwar (2004) suggests, when women of color engage in these performative norms by code-switching, they are measured against white male norms. While these gestures do not belong to women of color, they are “core features of their occupational scripts” (Puwar, 2004, p. 75). This experience can damage women of color's sense of authenticity and feelings of belonging within their workplaces.

4 | METHODOLOGY

This article examines the experiences of 30 women of color working in academia, industry, and government in STEMM organizations in Australia. Early in the research planning stages, we identified language, identity, and naming as potential issues for participant recruitment. It was important to use terms that are preferred by people in the relevant communities. Politically, “people of color” is an umbrella term that expresses solidarity with other non-whites. It is also used as a form of self-identification rather than being imposed. Given that identity is fluid, we wanted women to freely self-articulate intersectionality and marginality. However, we felt pressure from our university human ethics committee to recruit women using putatively apolitical expressions that are common in Australia, such as Culturally and Linguistically Diverse. From a critical race perspective, this term is problematic because racial references are absent and it categorizes people against a white norm which remains unmarked (Adusei-Asante & Adibi, 2018). This is for the comfort of white people (Lentin, 2016). We were concerned that potential participants may avoid contacting

us because the language in the research advertisement signaled a failure to understand these nuances or discomfort with race as a concept. Following numerous interactions with the ethics committee, we settled on advertisements that invited participation from women working in STEM fields who also identified as women of color and/or women from ethnically or culturally diverse backgrounds.

Fifty-four women responded to the research advertisements. We used a sampling matrix based on age, employment status/career point, geographic location, and organizational type to purposively select participants. Women who agreed to participate submitted consent forms. Author 2 conducted one semi-structured interview of up to one hour with each participant ($n = 30$ interviews) by Skype in 2019. Participants were asked about critical episodes that shaped their career, the influence of their racial or cultural background, their views on leadership, and factors that help or hinder visibly and culturally diverse women in science. All interviews were recorded with consent and transcribed verbatim.

Grounded theory is a qualitative methodology that emphasizes a systematic inductive approach to data collection and analysis, focusing on building theory from data rather than hypotheses (Corbin & Strauss, 1990). It was chosen because its inductive principles align with the exploratory aims of this research, allowing us to generate new knowledge about the experiences of women of color in STEM in an Australian context, where little research exists.

Following the grounded theory method, data were analyzed by Author 2 initially by open coding, or surface reading transcripts, taking note of any striking words, phrases, or themes. Once common themes were identified, thematic categories were created, and relevant data was coded into those categories. To ensure the validity of this thematic analysis and inter-coder reliability, Author 1 conducted additional analysis and provided feedback on the initial interpretation of the data. Together, we then coded the participants' discussions into themes. When exploring ways to interpret this data, Settles et al. (2019) was identified as a potentially useful framework because of the similarities between our themes and their conception of in/visibility. With this framework in mind, we revisited our findings and identified new ways to restructure the themes around intersectional in/visibility and build meaning from the findings. Here, we looked for complexities within/between the themes. We also discussed variations in the sample and how the data corresponded with the method and research aims. This study was approved by the University of Tasmania Human Research Ethics Committee. Data have been de-identified, and pseudonyms are used throughout.

Demographic information was collected in a voluntary questionnaire prior to the interviews. Participants in this study are aged between 22 and 60 years, with a mean age of 38. Women in the study come from 17 different countries, with only three being born in Australia and a further four in other countries in the Anglosphere (NZ, UK, USA). Participants drew on several racial, ethnic, and national self-identifications, including Chinese, Assamese, Indian, Malaysian, Burmese, South African, Fijian, Jamaican, Mexican, Spanish, Chilean, American, and mixed race. Most women worked in full-time, paid employment in skilled roles, positioning them occupationally as middle class. Given that women of color are significantly under-represented in Australian STEM, to protect confidentiality, we have provided limited information about participants' individual demographic details and professional fields.

Both authors are white women. During each phase of this research project, we met to discuss the implications of our racial identity. We are acutely aware that "research practices are generally, although most often unwittingly, implicated in the reproduction of systems of class, race, and gender oppression" (Kincheloe & McLaren, 2002, p. 105). Indeed, our previous research on women in STEM demonstrates this (Nash & Moore, 2019). We agreed to develop this project from a position of epistemic uncertainty. We wanted to provide a non-judgmental space for participants to share their experiences with the knowledge that we regularly reflected on our roles as antiracist feminists supporting social justice (Moore & Nash, 2021). However, we also agreed that allyship is active and that we wanted to leverage our positions of relative power and privilege as white cisgender women to disrupt the status quo in STEM by centering the stories of women of color. Dominant group members such as us have a responsibility to contribute to addressing inequity (Thorne, 2022). Leaving this type of research up to women of color would increase the cultural taxation they already experience.

5 | RESULTS AND DISCUSSION

Here, we explore three key themes generated from the analysis: (1) women's experiences of hypervisibility through tokenism and stereotyping; (2) women's experiences of invisibility through social and professional exclusion; and (3) how women managed both invisibility and hypervisibility via code-switching.

5.1 | Hypervisibility

Participants described the ways in which hypervisibility was a burden as it defined them in opposition to white masculinity. Participants noted that their racial/ethnic and gender identities followed them everywhere at work and had to be continually negotiated. For this group, hypervisibility was rarely experienced positively.

There were a whole lot of expectations and assumptions that were made [about me], and I found that my problems were mostly because I am female. And then the added complication of not being completely Aussie, even though I had been in Australia for 15 years... But my friend who had come from India to do her PhD really, really struggled. There would be people sniggering behind her back about the kind of food she had, the way she ate, the way she sat, the way she talked...

(Meera, age 33, born in India, academia)

This extract demonstrates how the bodies of women of color are positioned as "different" to a white male Australian norm. Meera flags the ways in which her perceived "Australianness" dictated her experiences of the workplace and the homogenizing effect of the uncritical stereotyping of women of color as "forever foreigners" (Castro & Collins, 2021, p. 47). In describing her friend, Meera provides a concrete example of how every behavior is scrutinized when you are hypervisible (eating, sitting, talking, etc.). Indian women are positioned as "other" and reduced to stereotypes. Participants who were born in Australia did not discuss facing these types of cultural barriers. This is presumably because having an Australian accent and being more attuned to cultural norms facilitated participant's acceptance in white STEMM workplaces. Indeed, lighter-skinned people of color have significant advantages in the Australian labor market.

As a woman of color, I would say [I haven't experienced discrimination as much] which is good. I wonder if an element of that is I have a mixed race background. My mum is from the Caribbean, but my father was white Australian, so I have light brown skin and colorism is a thing at play there. I potentially might not experience as much racism and microaggression because I have lighter brown skin.

(Astrid, age 28, born in Australia, academia)

However, lighter skinned people of color are often not seen as "legitimate" within their own communities (Hunter, 2007). These aspects of cultural differences are important in demonstrating how intersecting identities shape women's experiences at work. The closer women are to a white norm, the easier it is to access its privileges (Lewis & Simpson, 2012).

5.1.1 | Tokenism

Study participants also experienced hypervisibility when they were treated as race/gender tokens.

I am wheeled out regularly as, not only as the token women...but also the token woman of color to get the kind of ethnic diversity tick on things...The problem is there's not that many of you...you have to

fly your flag or be visible to students, to be a visible role model. What that means is minority groups... probably end up doing more than their fair share of mentoring or public engagement or outreach work...All those things that you don't get credit for in an academic environment. So, it takes away from your time doing research, publishing, putting good lectures together.

(Gabbie, age 44, born in UK, academia)

Here, Gabbie flags her experiences of cultural taxation. As she notes, being a “visible role model” can negatively impact promotion and other important academic activities as time is taken away from research—which is prioritized in the academic reward structure—and diverted to mentoring and serving on diversity committees to benefit the organization (Wijesingha & Ramos, 2017). Due to their intersecting identities, women of color often feel overburdened with their service demands and, as Gabbie implies, they are expected to be the “expert” on all marginalized social identities.

5.1.2 | Stereotyping

Several women described being confronted with distinctive forms of bias due to negative stereotypes based on their intersecting gendered, ethnic, and/or cultural identities. To illustrate, some women with East Asian backgrounds believed that they were rendered invisible by white men because of monolithic stereotypes of Asian women as passive and compliant (Castro & Collins, 2021). These stereotypes are consequential for women because they are not seen as leaders (Moore & Nash, 2021). Below, Meilin points to the ways in which negative stereotypes about Asian women are career limiting.

I remember having heated discussions with mentors and saying things like “I'm really displeased about x, y, z”.... And I think they are more taken aback by that because they are expecting me to comply with what they think is best...And I don't know how much of it is due to me being this little Asian woman who is trying to talk back...I think my gender is inseparable from the fact that I'm Asian, and I think being an Asian woman in particular, and a diminutive person, then I lack the physical presence of authority.

(Meilin, age 35, born in China, academia)

In this extract, Meilin expresses that her “gender is inseparable from the fact that I'm Asian”—blurring the possibility of causal arguments that easily connect race or gender to inequality. Her lived experience is that of a unique confluence of identities that cannot easily be untangled. Meilin also explains that her physical appearance does not give her the authoritative physical presence of white masculinity—the stereotypical image of a scientist. While stereotypes make women of color invisible in relation to the authority required for the job, physical markers like body size/height, accent, and hair style simultaneously make them conspicuous and detract from perceptions of professionalism in their workplace (Castro, 2012).

There is a perpetual, “I love your accent”...“I love the colour of your olive skin”, “I love the curls in your hair.” Right? Those are the three...And it's like, why do you have to bring up the colour of my skin all the time?...It's non-consequential to anything that I do.

(Ana, age 38, born in Spain, academia)

People do look down on me because...I'm a petite stature and I look much younger than I am now... If other people see me the first time, that sometimes they don't regard me as someone that has that much experience, which sometimes can be a disadvantage and also with accent as well.

(Cindy, age 44, born in Indonesia, academia)

I have kinky curly hair that's big and it's very obvious, and so stuff like that, where it's I just want to be naturally myself, or if I wear anything that has some sort of cultural significance, I know that it puts me in a box in some people's minds.

(Anneke, 22, born in South Africa, govt)

Here, women describe the intersection of effects of race/ethnicity, gender, and age in relation to the challenges they experience in being taken seriously as professionals in white male-dominated STEMM environments. Women of color who look younger are viewed as inexperienced. Women who are shorter in stature are infantilized. Similarly, Anneke, a South African woman, discusses how these effects are compounded when they reveal cultural markers. She is highly aware that her "kinky curly hair" disrupts white masculine expectations and is a professional liability (Castro, 2012).

However, at times, aspects of cultural difference were fetishized and sources of fascination as per Ana's comment about her skin color and hair style. The exoticism associated with Ana's "Europeanness" alongside her "olive skin" and accent is different to the stereotypes and assumptions associated with Anneke's hair. The curly hair of African women is often a different texture to that of their curly-haired white, Asian, or Latina counterparts, making it much more difficult to conform to white masculine workplace norms for appearance. Ana did not describe having to downplay her ethnic features or change her hairstyle whereas Anneke was highly aware of how her hair "put her in a box".

5.1.3 | Social and professional exclusion

Participants frequently felt hypervisible as well as professionally invisible. Being in/visible was painful because participants could not control their visibility. This experience is a function of white masculine power and the maintenance of the status quo in STEMM. Participants discussed their feelings of isolation and lack of belonging due to their intersectional identities. For example, women were routinely ignored and dismissed in meetings and their achievements went unrecognized compared to white colleagues (Wilkins-Yel et al., 2019).

We are not even tapped on the shoulder. And I see my white colleagues who haven't gotten that many publications or haven't done all this, and I've done all this...

(Gowri, age 46, academia)

I felt that I wasn't taken seriously because A: I was female, and B: because I was brown...the barrier of me being female, going ahead and being taken seriously by people who are mostly older white men.

(Meera, age 33, born in India, academia)

Adelita shared an important perspective about the culture of white power in STEMM and the unique position of women of color compared to white women in relation to in/visibility. Participants saw white women are closer to centers of white masculine power (Sanchez-Hucles & Davis, 2010).

My battle is not with the [white] men. It is with the men in terms of gender, but it's with the [white] women in terms of race...you try and get a foot in the door against those women and you're thrown out...I think I am probably an extreme threat...I'm well-qualified, have a senior position...but put me up against a white woman, and I'll die.

(Adelita, age 60, born in India, academia)

This in/visibility also translated to exclusion from organizational networking and social events and difficulties "fitting in". Networking in Australia especially relies on masculine cultural behaviors that are normalized such as drinking alcohol after work (Berger et al., 2015). Women of color are invisible when it comes to their cultural needs being accommodated.

Those [women] who are culturally diverse have to balance breaking down their ethnic needs, breaking against not only society as gender, but their own cultural background. The dilemma of fighting against the cultural context of their family...that is huge. You have to be one thing in your family and a different thing in the workplace...

(Shankari, age 53, born in India, academic, govt., industry)

Every Friday afternoon they would have drinks on the balcony. You had to be a drinker, which I wasn't. It was a bit hard to really be a part of the conversation...But then, afterwards, I didn't really enjoy beer which was the only drink on offer. And so, often you would find on the balcony it was just Aussies.

(Meera, age 33, born in India, academia)

I think as an Eastern person we give a lot of importance to family and we give a lot of importance to going home and spending time with family and weekends with family. And for us, family is not just husband and kids—it's extended family and we are used to that very broad network within our family. So that's why it's very challenging—like this after work [drinking] thing is very challenging for an Eastern person to go with.

(Danika, age 25, born in India, PhD student)

Our data show that women struggled with an organizational drinking culture because to participate, they had to sacrifice family time, and alcohol consumption was expected. For some, these expectations did not accord with their cultural values (Flores-Pereira et al., 2008). There is an unspoken expectation that the women will adapt to white masculine norms. Several South Asian women discussed the difficulty they had in reconciling their cultural identities with white masculine norms. Participants were aware that networking was beneficial for their career progression and failure to do so would exacerbate their exclusion. Consequently, they felt pressured to be “one of the boys” (e.g., by drinking beer) and overtly challenge their invisibility.

5.2 | Managing the paradox of in/visibility

5.2.1 | Code-switching

Participants were highly aware that being hypervisible made it more challenging for them to succeed because their identities acquire particular meanings in STEMM cultures that are deeply entrenched in white masculinity. Participants deployed “code-switching” to strategically “invisibilise” their perceived differences:

I'm fortunate because my parents decided to give their children English names. But my husband doesn't have an English name so when you put your CV in and try to contact people, I do feel sometimes there's a bit of barrier because they can't pronounce your name or your surname.

(Cindy, age 44, born in Indonesia, academia)

I added a westernised surname to my name. My legal name is [Indian name]. I said to my husband, “... Is it all right if I use you to make my name sound more westernised?” And the jobs get opened up...I added my husband's surname because I wasn't even getting on anyone's shortlist, despite having so many qualifications...And people would come and tell me, “Of you don't sound so Indian”—are you giving me a compliment?

(Gowrie, age 46, born in India, academia)

I can tell you that, earlier in my career, when I was still in my undergraduate degree, I worked really hard to get rid of my accent because I didn't want that to be the reason I didn't get jobs.

(Leticia, age 33, born in Mexico, industry)

I do spend a significant amount of time trying to figure out what clothes I should buy and how I can present myself...And even make up...I try to be sure it's a western type or not something I would normally wear.

(Danika, age 25, born in India, PhD student)

Here, women describe how their cultural/ethnic backgrounds impair their recognition as scientists. To cope, they code-switch to be taken seriously. Gowri's adoption of a westernized name and Leticia's attempt to manage her accent speaks to this intersectional discrimination and these women's understanding that if they reduce the salience of their difference, they will be rewarded in the labor market. Danika discusses her attempt to meet white norms regarding appearance to bolster her credibility.

Study participants described the emotional labor of assimilating with white male norms as physically exhausting and stressful.

I really had to work very hard to prove myself, that over the years I could enhance my skill, I would go for courses, ask for feedback...I think it's harder for non-whites within the industry...I very often do it very quietly as well, so people wouldn't know how difficult it was for me...

(Marissa, 42, born in Malaysia, industry)

I code-switch throughout the day with my language, with my behaviours and you know, all that kind of stuff. And it's draining. Absolutely draining. I come back home exhausted, and I take that mask off and I take a deep breath and I go okay, I can be myself now, you know?

(Gowrie, age 46, born in India, academia)

To be recognized as credible, participants reveal how they are scrutinized closely and must work extremely hard to suppress their stigmatized intersectional identities and conform to white male norms. In the extracts above, language is an especially powerful cultural marker that puts participants under pressure to assimilate (Puwar, 2004).

6 | CONCLUSIONS

In this article, we investigated the nuanced intersectional dynamics of race and gender by exploring the experiences of a group of 30 women of color working in Australian STEM. Specifically, we drew attention to the ways in which women's identities and the lack of structural representation of women of color in Australian STEM workplaces shaped how they were perceived and treated as scientists (McCluney & Rabelo, 2019). A unique aspect of this study is foregrounding in/visibility and how it shows up in the experiences of women of color and its association with the maintenance of white male power in STEM organizational cultures.

We drew on three key themes to articulate in/visibility experiences: hypervisibility through tokenism and stereotyping; invisibility through social and professional exclusion; and how women managed the paradoxes of in/visibility through code-switching. The value of an intersectional approach in this study is the exploration of the experiences of women of color within the white masculine norms of the STEM environments that they inhabited and that often constrained their ability to bring their whole selves to work. In other words, a key contribution is that we have been able to show the variety of ways in which women of color are marginalized as scientists when they come up against the supposedly meritocratic culture of science. Although women did not discuss the larger constructs of their

working environments explicitly, their rich and reflexive narratives suggest that they acutely felt the pressure to internalize white male norms and navigate multiple and simultaneous forms of alienation and isolation in STEM.

One key finding was that the interplay of in/visibility is such that as women of color challenged dominant norms (often by merely being present), they rendered themselves uncomfortably visible and exposed (Lewis & Simpson, 2012). Study participants were cognizant of the ways in which their bodies became hypervisible racialized and gendered objects and the impact of this on their recognition as professional scientists. Women in this study rarely attributed any extra benefit from hypervisibility, which we have observed in our other studies with white women in STEM (see Nash & Moore, 2019, 2020). Rather, hypervisibility marked participants as “other” in STEM organizations in which expectations about physical appearance and behavior are structured around the maintenance of white male power and science as white property. Women of color, in general, do not fit into the social or physical stereotype of scientists as white men. Thus, women regulated their appearance, voice, and mannerisms to fit white Australian cultural and gendered norms, especially if they were born overseas.

Although women found their own individual ways of coping, they were constantly reminded of their marginalized status. This points to the hidden ways in which discourses of meritocracy and individual choice mask the gendered/racialized power dynamics in STEM. In contrast, the labor of minimizing or hiding non-normative aspects of identity does not have to be performed by those whose identities match white male organizational norms. In/visibility within the cultural norm equates to power and privilege and acceptance in a culture of white men. Outside of the norm, in/visibility equates to exclusion and marginalization (Lewis & Simpson, 2012). Hypervisibility also generates burdens of representation and cultural taxation for women of color. Women in our study described being treated as tokens and carrying the load of their institution's “cultural” work.

A second key finding was that women found themselves simultaneously overexposed and erased. When the STEM gatekeepers were white men, participants were subject to defensive actions that positioned them as lacking the social capital necessary for a successful science career due to their intersecting identities. Being hypervisible also obscured women's professional achievements, while racial and gendered stereotypes led to heightened scrutiny. In the predominately white, masculine culture of Australian STEM organizations, women invested significant time and energy in managing negative stereotypes, which hindered their professional recognition. Participants were highly aware that infiltrating predominately white male networks (e.g., after-work drinking) was essential for their career progression (Arifeen & Syed, 2020). However, when women were allowed to enter sites of masculine privilege, several South Asian participants had to negotiate cultural/ethnic expectations of gender in their communities alongside gender expectations at work. Women's experiences of networking reveal the difficulties of challenging the norm and how “old boys” clubs' frame women of color as “other” (Lewis & Simpson, 2012). It also explains why it is more difficult for certain sub-groups of women of color to advance in STEM organizations (Sanchez-Hucles & Davis, 2010). To manage their paradoxical experiences of in/visibility, women invoked code-switching behaviors to be seen as credible scientists in white organizations. This included westernizing their names, eliminating foreign accents, and managing their appearance in specific ways to assimilate.

The experiences of in/visibility that we discuss in this article often reflect a lack of understanding rather than deliberate exclusion. Nevertheless, the impact of being marginalized is real, and the participants in our study were exhausted. This is important because persistence in STEM requires identification with STEM and STEM careers (Carlone & Johnson, 2007). Feeling validated in STEM is dependent on a range of social interactions at work. In this study, an intersectional lens provides a window into how specific groups of women negotiate STEM workplaces in the context of various embedded inequalities in relation to their social identities.

Adopting an intersectional perspective at the institutional level is critical because it can help to interrupt the normative whiteness of STEM (and other) institutions (Wilkins-Yel et al., 2019) and facilitate the development of policies based on data that reflect all STEM professionals. Our data point to shortcomings in current initiatives in Australia and elsewhere that are centered on greater numerical representation of women in STEM (e.g., pipeline initiatives) but do not destabilize the power dynamics that secure white male advantage and privilege in STEM environments. Our qualitative study provides rich insight into in/visibility as hidden practices that support a male

norm and how women of color cultivate a science identity in the face of discrimination and exclusion. However, without more quantitative studies providing baseline intersectional demographic data, qualitative investigations have significant limitations.

There is a clear and urgent need for the Australian government and STEM institutions to engage in data collection and analysis methods that account for the experiences of people in STEM who are multiply marginalized. Failing to collect intersectional data undermines broader equity in STEM discourses while also confirming Australian popular discourses that reiterate that race is not relevant (Lentin, 2020). Not collecting the relevant data might be read as a form of resistance to effectively tackling intersectional inequities. However, action is needed beyond merely providing intersectional "headcount" data; the systemic issues underlying the problems also need attention—representation can only take Australia so far. Simply collecting the data risks diluting complex conversations about intersectional disadvantage to short-term solutions rather than addressing longer-term systemic issues. Beyond race and ethnicity, more sophisticated data collection and analysis could significantly benefit women from other historically excluded groups, such as women with disabilities or those who identify as LGBTQIA+. It is not intersecting identities that are problematic in STEM, it is the structures and power dynamics that reproduce and reflect sexism, racism, homophobia, and ableism.

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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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ENDNOTE

¹ Organizations, government bodies, and authors use various acronyms to identify the diversity within science disciplines. STEM (originally SMET then METS) refers to science, technology, engineering, and mathematics. This term is preferred by government bodies in Australia. The additional "M" in STEM refers to medicine and is the acronym of choice for organizations in Australia who focus on gender equity, such as Women in STEM Australia and Science in Australia Gender Equity (SAGE). In this article, we use STEM except where the source we cite refers specifically to STEM.

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