



International Journal of
Gender, Science and Technology

<http://genderandset.open.ac.uk>

Women's experiences of racial microaggressions in STEM workspaces and the importance of white allyship

Robyn Moore, Meredith Nash

University of Tasmania, Australia

ABSTRACT

This article explores how gender interacts with race, ethnicity, and/or culture to structure the microaggressions experienced by visibly and culturally diverse women in Australian science, technology, engineering, mathematics, and medical (STEMM) organisations. Our aim is to disrupt the normative erasure of race from the workplace diversity context by focusing on these women's experiences. We conducted 30 semi-structured interviews with women in academia, industry, and government who self-identify as women of colour or as culturally diverse. We use an intersectional lens to show that the challenges experienced by visibly and culturally diverse women cannot simply be subsumed under gender. Rather, race and gender intersect to create overlapping and interdependent systems of discrimination and disadvantage. These issues are largely unintelligible in STEMM fields as science is positioned as gender- and race-neutral. Consequently, despite their devastating impact, racial microaggressions may be invisible to members of the dominant racial group—those most likely to be the peers and managers of visibly and culturally diverse women. White managers and peers can act as allies to women of colour in STEMM by respecting and amplifying their concerns. Learning to recognise and confront racial microaggressions can help make science workplaces more inclusive of all scientists.

KEYWORDS

Australia, culture, gender, race, whiteness, STEMM

Women's experiences of racial microaggressions in STEM workplaces and the importance of white allyship

Diversity initiatives within science, technology, engineering, mathematics, and medical (STEMM) organisations in the Global North are overwhelmingly focused on gender, with other aspects of identity sidelined. For example, the Athena SWAN (Scientific Women's Academic Network) institutional gender equity scheme has been adopted in the UK, Ireland, Australia, US, and Canada, and a similar award is being considered by the European Union (Nash et al., 2020; Schmidt et al., 2020). Similarly, the US National Science Foundation's ADVANCE program aims to support women in science fields (Rosser et al., 2019). These programs are designed to address the 'leaky pipeline'—a metaphor describing the loss of women at each transitional stage in a science career (Alfred et al., 2019; Metcalf, 2010). To illustrate, in Australia, women comprise 50% of science PhD graduates, but only 20% of senior academics (Prinsley et al., 2016). Worldwide, women comprise less than 30% of scientists engaged in research and development (Huang et al., 2020).

While there is a clear need to address gender equity in STEMM organisations, a blinkered focus on gender obscures other aspects of women's identities, such as race or sexuality, which can produce hostile working conditions for these women, undermine their identity as scientists, and impede professional advancement. For visibly and culturally diverse women (henceforth women of colour),¹ the pipeline problem is even more profound (National Science Foundation, 2019). For example, less than 3% of professors in STEMM fields in the US are women of colour (Ong et al., 2011).

In forthcoming sections, we review the relevant literature and discuss the findings of our qualitative interview study of 30 women of colour working in STEMM fields in Australia. We use intersectionality and grounded theory to explore the complex ways that gender interacts with race, ethnicity, and/or culture to structure the experiences of women of colour in STEMM organisations. Key themes include the intersections of gendered and raced microaggressions, difficulties negotiating racial microinsults, and supervisors and managers as allies. We argue that race and gender intersect to create overlapping and interdependent systems of discrimination and disadvantage. To conclude, we provide specific recommendations for how white people can act as allies to women of colour to leverage change in STEMM workplaces.

INTERSECTIONALITY

Intersectionality refers to interconnections between features of identity such as gender, race, class, age, sexuality, and ability (Crenshaw, 1989; Hanson, 2012). This concept enables the meaningful description of ways in which privilege and oppression intersect and how this informs individual experiences. From an intersectional perspective, gender equity cannot be effectively addressed unless it is understood within the broader context of overall social location (Leggon, 2010). However, most 'women in STEMM' initiatives focus exclusively on middle-class, heterosexual, white women (Jovanovic & Armstrong, 2014; Ong, 2005). This focus

constructs a 'social imaginary of a universal woman' within the sciences (Torres, 2012, p. 38), neglecting the complexity of women's lived experiences and erasing the experiences of women of colour. Privileging gender over other aspects of identity deletes any 'others' and positions the dominant group's experience as shared by all women (Sanchez-Hucles & Davis, 2010). This exemplifies the 'whitewash dilemma' (Holvino, 2010), whereby the experiences of white women are extrapolated to all women. For example, a survey of US women in astronomy and planetary science found that women of colour reported the highest rates of negative workplace experiences and are at a greater risk of both gendered and racial harassment (Clancy et al., 2017). As this example shows, women of colour face challenges that cannot simply be subsumed under gender. Indeed, 'women in STEMM' programs and policy initiatives that focus solely on gender have produced the unintended consequence of decreasing the progress of women of colour relative to white women—the main beneficiaries of these programs (Jovanovic & Armstrong, 2014; Ong et al., 2011).

Positioning white women as the 'universal woman' within science reflects the unmarked and unnamed nature of whiteness in dominant (white) discourse and institutions (Frankenberg, 1993). Science is positioned as race- and gender-neutral despite its evolution with a particular ideological framework based on a white, male, middle-class occupation (Hanson, 2012; Mattheis et al., 2019; Pawley & Tonso, 2011). The dominant image of scientists as white males actively discourages many women of colour from exploring science careers as they struggle to 'validate their identities as emerging scientists' (Ong et al., 2011, p. 184). US empirical research reveals that, for those who persist despite these obstacles, identifying as a woman of colour and a scientist often involves creative and painful practices of gender and racial passing (Alfrey & Twine, 2017; Mattheis et al., 2019; Ong, 2005). Scholars have shown that women 'undo' their gender, distance themselves from practices of femininity, or overemphasise masculine traits to 'fit in' (Cech, 2015; Hatmaker, 2013; Kmec, 2013; Powell et al., 2009). Similarly, women of colour assume 'the burden of responding to standards not traditionally designed for them' (Ong, 2005, p. 598). As Mattheis et al. (2019, p. 4) note, 'the pressure to conform or conceal aspects of identity is felt much more intensely by those whose identities fall farther outside the stereotype of a straight, cisgender, white, middle class, man'. In comparison to white women, the emotional labour involved in this identity work is heightened for women of colour who attempt to simultaneously embody the identities of 'ordinary' women, 'ordinary' persons of colour and 'ordinary' scientists (Ong, 2005).

Choroszwicz and Adams (2019) coined the term 'meta-work' to describe the labour undertaken by professionals to offset structural inequalities. Meta-work is 'hidden, invisible and laborious' (Choroszwicz & Adams, 2019, p. 3438). For example, in addition to normalising themselves, women of colour must 'work harder to prove their ability' (Choroszwicz & Adams, 2019, p. 3438). Managing their peers' and managers' perceptions of diminished competency places additional demands on those who are already marginalised. These demands accumulate over the career. In this article, we focus on the affective labour resulting from microaggressions.

MICROAGGRESSIONS

Despite Australia's positioning as a 'multicultural' society, racial inequality persists (Liu & Baker, 2016). The Australian STEM workforce is dominated by cisgender [white] men (Office of the Chief Scientist, 2020). Yet, the exclusion of intersectional data from the study of the STEM workforce reinforces whiteness as the organisational norm (Liu & Baker 2016). This 'silent association' (Liu & Baker, 2016, p. 421) of whiteness and maleness with organisational leadership underpins the persistent marginalisation of people of colour in Australian STEM contexts (Jayasuriya et al., 2003). Indeed, everyday racism permeates social and organisational relations. For instance, racial microaggressions intensify the burden of additional labour performed by women of colour in STEM organisations in Australia.

Racial microaggressions are 'brief and commonplace daily verbal, behavioral, and environmental indignities, whether intentional or unintentional, that communicate hostile, derogatory, or negative racial slights and insults to the target person or group' (Sue et al., 2007, p. 271). Racial microaggressions reflect and reproduce stereotypes about the recipient's racial group (Kim et al., 2019). Sue et al. (2007) identified three types of racial microaggressions. Microassaults are blatant racial comments or slurs. In contrast, microinsults convey hidden insulting messages, such as commending a person of colour for their spoken English. Lastly, microinvalidations negate the racial reality of a person of colour, such as denying the reality of racism in contemporary society.

Common racial microaggressions in work settings include being undermined, questioned about professional capabilities, and being publicly scrutinised by White colleagues (Arday, 2018). These exchanges are ubiquitous in daily conversations and interactions, and often seen as innocent and innocuous by those from dominant social groups. However, the cumulative effects of these seemingly minor events have a devastating impact — 'death by a thousand cuts' in the words of one of our research participants. While experiencing emotional and psychological distress in the aftermath of microaggressions, targets must modulate their emotional reactions and determine how best to respond. This additional cognitive and emotional labour spent ruminating on microaggressions is emotionally draining, can affect health, and may hinder work performance (Kim et al., 2019; Sue et al., 2007). Moreover, racial microaggressions contribute to the 'chilly climate' that women of colour experience in Australian STEM organisations, in which women feel incompatible with science's white, male culture (Kmec, 2013; Ong et al., 2011). 'Chilly climates', which are 'characterised by a subtle process of devaluation, lack of encouragement and recognition' (Reilly et al., 2016, p. 1026), are one of the key factors contributing to the 'leaky pipeline' in science (Alfred et al., 2019).

Microaggressions are subtle and often unintended, rendering them difficult to recognise and confront. People from targeted groups, such as women of colour, may describe a vague feeling that 'something is not right' (Sue et al., 2007, p. 277). In contrast, perpetrators often sincerely believe they have acted with good faith and are able to offer seemingly reasonable explanations for their behavior. This can lead members of dominant groups to perceive the targets of microaggressions as over-sensitive (Arday, 2018). As such, identifying and

responding to microaggressions is fraught. While this is true for all microaggressions, whether based on gender, sexuality, or other aspects of identity, there are additional factors which render addressing racial microaggressions in STEMM organisations particularly challenging—the construction of science as objective and the deracination of contemporary relationalities.

Socialisation in STEMM fields encourages belief in science as objective, which renders questions of different lived experiences unintelligible (Mattheis et al., 2019; Nash & Moore, 2019). As Ong (2005, p. 598) observes, '[m]atters of gender, race, ethnicity, social class, immigration status, and sexual orientation have no acknowledged place in this cultureless culture'. Science is characterized as value-free (Leggon, 2010). However, scientists' values, attitudes, and beliefs accompany them in their scientific endeavours (Hanson, 2012; Hubbard, 2001). In a similar way to unexamined heteronormative assumptions silencing conversations about gender and sexuality in STEMM workplaces (Mattheis et al., 2019), unexamined whiteness silences conversations about race in Australian STEMM workplaces. This can be further explained using Acker's (2006, p. 443) concept of 'inequality regimes', defined as 'loosely interrelated practices, processes, actions, and meanings that result in and maintain class, gender, and racial inequalities within particular organizations'. In neoliberal STEMM organisations, the inequality regimes which advantage particular groups of workers—those that are straight, white, middle-class, able-bodied and male (for exceptions, see Acker, 2006)—and disadvantage others are obscured (Morley, 2013). All individuals, regardless of gender, class, race, sexuality, or ability, are positioned as having equal opportunity to succeed. Within this framework, gendered (and other) inequalities are invisible and legitimated, rendering inequality more difficult to articulate and address (Sullivan & Delaney, 2016). In this context, women of colour may hesitate to tackle microaggressions, despite their devastating impact, due to the likelihood of their claims being doubted, and their response being perceived as too emotional, all of which undermine their credibility as scientists. Understanding this 'clash of racial realities' (Sue et al., 2007, p. 277) can assist white people to recognise that identity matters in STEMM due to the complex effects of gendered and racialised relational power dynamics.

Challenging racial microaggressions is also difficult in white, 'post-racial' societies like Australia due to the erasure of race from the public lexicon, and the deracination of relationalities (Goldberg, 2009). As Lentin (2016, p. 35) explains, in 'post-racial' societies, 'we have been left unable to speak about race'. In particular, white people often fail to recognise themselves as raced and may evoke colourblind discourse to frame career progression as the outcome of behavioural choices in race-neutral, meritocratic institutions (Bonilla-Silva, 2015; Moore, 2012). These discourses legitimate inequalities, rendering them difficult to articulate and address.

Moreover, in societies such as Australia where whiteness is normative, white people have little experience feeling uncomfortable based on race (Boutte & Jackson, 2014). 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 colour when drawing attention to racial microaggressions. As Jones and Norwood (2017, p.

2051) explain, 'any form of pushback may cause aggressors to blame these encounters on the very women they are attacking'.

Although 'post-racial' societies are deracinated, these societies are nevertheless structured along racial lines, with consistent, predictable, racialised differences on a range of socio-economic indicators—health, life expectancy, education, employment, income, wealth, and interaction with the criminal justice system (Moore, 2020). While racial microaggressions may seem innocuous, they occur within this context of systemic discrimination as well as overt racism in the workplace. Whether intended or not, microaggressions work in tandem with overt and/or systemic discrimination to reinscribe the marginalised status of targets. Dominant group members, especially anyone with a managerial or leadership position, hold social power (Drury & Kaiser, 2014; Patton & Bondi, 2015). They/we have a responsibility to use their/our status to create fairer workplaces (i.e. to become an ally).

ALLYSHIP

Allies are dominant group members—straight, white, male and/or Christian, depending on the context—who work in partnership with people from marginalised groups towards social justice (Patton & Bondi, 2015). Allies leverage their privileged status to raise the credibility of topics that are difficult to articulate. Whereas women of colour are likely to be doubted, and/or seen as over-sensitive, when calling out microaggressions, allies are afforded more credibility (Drury & Kaiser, 2014). This credibility is based on perceptions that, unlike targets, allies are unlikely to directly benefit from their actions, and are therefore not seen to be acting out of self-interest (Roy et al., 2009). For example, in workplace contexts, men are able to question legitimising beliefs, such as the myth of meritocracy, without their motives being doubted (Drury & Kaiser, 2014).

In the case of racial microaggressions, the credibility of white allies is augmented by their/our positioning as 'neutral and unsituated – human not raced' (Dyer, 1997, p. 4). Whereas people of colour are presumed to be representative of their racial group, white people are treated as individuals whose behaviour is objective, rational, and value-free (DiAngelo, 2011). Men are similarly positioned in comparison to women. Consequently, in science, white men are positioned as objective and neutral (Ong, 2005). When white men recognise and call attention to issues faced by women of colour and advocate on their behalf, they are less likely to be ignored or dismissed, especially by other men. White men's social position also means that, relative to women, they are penalised less for speaking out (Rasinski & Czopp, 2010).

Acting as an ally requires white people to develop awareness of their own cultural location and the biases they hold (Sue et al., 2007). This is an ongoing, iterative process. As Sue (2017, p. 709) notes, 'becoming a White ally is a monumental task that presents many internal (personal) and external challenges'. An important caveat for those aspiring to be allies is to be aware of how their/our attitudes and behaviour can reinscribe rather than reduce inequity. For example, Drury and Kaiser (2014, p. 645) distinguish between men working alongside women and 'engaging in benevolent sexism by acting unilaterally on women's behalf'. Similarly, Patton and Bondi (2015, p. 508) argue that help may be 'remedial (and

paternalistic) rather than genuinely supportive, respectful and empowering'. Acting in paternalistic ways enhances the status of the ally while reinscribing the racialised status quo. As dominant group members, allies are used to being in control and must remain vigilant to step back and create space for marginalised group members to lead (Boutte & Jackson, 2014). Being ready to follow others is especially important given that allies typically have less awareness of issues than the group with which they are aligned (Drury & Kaiser, 2014). To explore these issues, we asked:

- How do visibly and culturally diverse women in STEMM organisations negotiate their professional identities?
- What helps and/or hinders visibly and culturally diverse women's advancement in science?

METHODS

This article examines the experiences of 30 women of color working in academia, industry, and government in STEMM organisations in Australia. Fifty-four women volunteered to participate; we used a sampling matrix based on age, employment status/career point, geographic location, and organisational type to purposively select participants. Women who agreed to participate submitted consent forms. Author 1 (Robyn) 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 emphasises a systematic inductive approach to data collection and analysis focusing on building theory from data rather than hypotheses (Corbin & Strauss, 1990). Grounded theory was chosen because its inductive principles align with the exploratory aims of this research, allowing us to generate new theories about the experiences of women of colour in STEMM in an Australian context, where little previous research exists. Following the grounded theory method, data were analysed by Author 1 (Robyn) first by open coding, or surface reading transcripts, taking note of any striking words, phrases, or themes arising from the data. Once common themes were identified, thematic categories were created, and relevant data was coded to those categories. To ensure the validity of this thematic analysis and inter-coder reliability of the coding system, Author 2 (Meredith) conducted additional analysis, and provided critical feedback on the initial interpretation of the data. We discussed variations in the sample and how the data corresponded with the method and research aims. This study was approved by the University's Human Research Ethics Committee. Data have been anonymised 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). Most women worked in full-time, paid employment in skilled roles, positioning them occupationally as middle class.

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 of Kincheloe and McLaren's (2002, p. 105) caution that 'research practices are generally, although most often unwittingly, implicated in the reproduction of systems of class, race, and gender oppression'. Indeed, our previous research on women in STEMM demonstrates this (Nash & Moore, 2018). Due to factors beyond our control, our previous sample consisted of white women, thereby perpetuating the erasure of women of colour's experiences from our findings. We aspire to be allies to women of colour, while recognizing that the designation of ally is not ours to make (Brookfield, 2014). Drawing on Patton and Bondi (2015), we regularly reflect on our role in this space as we endeavour to support social justice without perpetuating inequity.

RESULTS & DISCUSSION

Data analysis led to the development of three key themes: the intersections of gendered and raced microaggressions, difficulties negotiating racial microinsults, and supervisors and managers as allies. We discuss these themes in turn.

The intersections of gendered and raced microaggressions

Many women in our study felt that gender and race acted in tandem to structure their workplace experiences. Some participants described experiences of being invisible and having to prove themselves in ways that are likely to resonate with white women:

They tend to assume that I don't know about things, so they'll kind of start explaining something to me and I'll say, "Yeah, that's fine, thanks, I actually know how that works because it's part of my job to understand it" and often they will just continue to tell me anyway. (Astrid, age 28, born in Australia)

I find it's harder, as a woman, in science and technology ... you're having to work a lot harder to prove yourself, that you are equal, that you have the same amount of skill ... I think it's because there's maybe that preconception that you are not as qualified or not as good, and you have to work yourself to overcome that barrier of preconception. (Marissa, age 42, born in Malaysia)

You say one thing, and some white male repeats exactly what you say, and then everybody looks at that white male, even though you're the one who said it. (Chantal, age 52, born in UK)

It is a challenge to work in STEMM and male dominated STEMM areas ... I would get contractors who would talk to my junior staff because they were white and male. The guys would say, "Actually, she is the one who has done the design," and the men would be pretty surprised. (Shankari, age 53, born in India)

In the extracts above, women of colour describe gendered experiences of being undermined and having their competence doubted. In response, these women feel as if they must perform additional labour to compensate. These experiences echo the literature examining the 'chilly climate' for white women working in male-dominated fields (Nash & Moore, 2019; Reilly et al., 2016; Savigny, 2014). However, women of colour face additional challenges based on their racial or cultural background:

When you have a different accent ... they underestimate you and they just think that you are not capable to perform ... You have to prove yourself before somebody actually believes what you're saying. (Brigitte, age 32, born in Columbia)

There is just another barrier to people actually making an effort to, kind of, treat you seriously ... We would have meetings with the supervisors and I would come up with an idea or a suggestion, and they would be curious to know as to how I came up with that idea ... I felt that personally I wasn't taken seriously because A: I was female and B: because I was brown. (Meera, age 33, born in India)

You have to walk a really fine line and, in a way, I feel as a woman you have to be better than your male counterparts and as a woman of colour you have to be even better than your white female counterparts. (Gabbie, age 44, born in UK)

The comments above demonstrate the intersectional nature of participants' experiences in STEMM organisations, suggesting that their racial or cultural identity compounds their gendered experiences. Echoing Choroszewicz and Adams' (2019) description of 'meta-work', women of colour describe having to perform additional affective labour to manage their colleagues' perceptions of their capabilities. This additional labour does not have to be performed by people from majority groups, such as white men.

Difficulties negotiating racial microinsults

Women of colour also experience microinsults. While these microinsults may not be intentional, they are nonetheless consequential. For example, women of colour working in science fields are consistently reminded that they are perceived as members of racial groups rather than individuals, demonstrating that their race and/or culture is salient for their colleagues:

I'd say I experience it near daily, meeting people, in a micro-aggression way. It's not very overt; it's just the language that we have here and asking like, "Where are you from?" ... it's more just a constant reminder that I am not thought of as Australian. (Anneke, age 22, born in South Africa)

There is a perpetual, "I love your accent," ... "I love the colour of your olive skin", "I love the curls in your hair." ... And it's like, "Why do you have to bring up the colour of my skin all the time? And I can't really tell you off, because you're trying to be nice, technically." It's non-consequential to anything that I do – the colour of my skin. (Maria, age 48, born in Spain)

Sometimes she confuses our names in talking to them ... we're seen as, oh, that's those Asian women. (Adelita, age 60, born in India)

Microinsults such as these remind women of colour that they are different to the 'pale and male' appearance of ordinary scientists (Ong, 2005, p. 597), operating to subtly challenge women of colour's 'competence and membership in the scientific community' (Ong, 2005, p. 593). However, as Maria notes, it is difficult to challenge microinsults because of their subtle and superficially polite nature, and the likelihood that the speaker holds no ill intent. As such, explaining to a colleague why their comments are inappropriate necessarily involves more than a pithy retort. Rather, a constructive conversation requires adequate time, sensitivity, and openness to being educated about different racial realities (Sue, 2017). In an organisational context characterised by normative whiteness and 'white fragility', alerting white colleagues to problematic aspects of a well-intended remark is likely to lead to backlash (Jones & Norwood, 2017). Indeed, initiating and managing these conversations is risky, emotionally draining, and a distraction from women of colour's work responsibilities (Jones & Norwood, 2017; Kim et al., 2019; Sue et al., 2007). These difficulties are compounded because women's experiences in science organisations position them as 'outsiders' to scientific endeavours (Kmec, 2013). However, these conversations are necessary to improve the 'chilly climate' in Australian STEMM organisations.

Microinsults based on gendered and racialised stereotypes also structure the expectations of the colleagues of women of colour. In this section, we discuss stereotypes of Asian women as deferential rather than assertive, and Black women as angry. While these stereotypes are contradictory, both position women of colour as unsuited to leadership:

Like eastern women are supposed to be submissive or stay at home, they don't expect them to take on leadership positions like your western woman ... there's already a pre-conceived notion about what I should be doing and no one expect me to go outside it. (Danika, age 25, born in India)

There tends to be this perception that, particularly in Asian women, you're not supposed to speak back or question anything. (Meilin, age 35, born in China)

Racial microaggressions demonstrate that women of colour are perceived by their colleagues from a racialised lens. Stereotypes are an integral component of these lenses. When colleagues' and/or supervisors' actions are based on racial/cultural

stereotypes, such as Asian women not possessing the social skills to be leaders, they are unlikely to sponsor women of colour for leadership training or relevant capacity-building secondments, thereby limiting these women's potential for career advancement (Kim et al., 2019).

The emotional labour of managing their colleagues' preconceptions and effecting change in a non-threatening manner diverts the attention of women of colour from their work and, as Shankari (age 53, born in India) observes, is 'exhausting':

Even these microaggressions, they can really wear you down. You know, you can really start to feel like you're not valued somewhere because ... it's the tenth time your manager said, "Oh don't worry about it, you're stressing out too much" ... And it makes you hone in on yourself as if there's something wrong with you and you almost start – I don't know – like gaslighting² yourself. (Astrid, age 28, born in Australia)

I've got two managers ... both older males, Caucasian. Some of the challenges in terms of not feeling like I'm being heard have meant that I can't talk to these two managers directly, I've had to reach out to other people to be able to bridge the gap. (Iliana, age 31, born in NZ)

It's like a constant managing up ... just fitting in and not being difficult, quietly getting your point across, slowly over time ... Sometimes I'll talk to some of my male colleagues, and they'll be like, "Oh well, why didn't you bring that up in the meeting?" Because they don't get penalised the way that we sometimes do when we raise difficult issues or objections. (Kelly, age 35, born in South Africa)

Let's be honest, by being vocal it actually doesn't win you any favours because you're seen as a troublemaker, so it's a really fine line. As an academic you want to be seen as professional, you want people to value your opinion and you don't want people to run out of the room the minute you walk in ... this is all down to mental loading as well, in the back of my mind I walk into a room and I'm evaluating who's in the room and I'm worrying if I speak out and say things will this jeopardise my career? (Gabbie, age 44, born in UK)

If we get angry, sometimes they might get a bit too threatened. So, doing things with a smile, and being pleasant, and being not overly kind of threatening. (Chantal, age 52, born in UK)

The women of colour we interviewed were extremely aware of the stereotypes, such as the 'angry black woman' (Jones & Norwood, 2017), held by their peers, and the potential risks of speaking out. As Kelly notes above, the penalties that women of colour experience when raising difficult issues are not shared equally by their white male colleagues. The stereotypes held by their colleagues have the potential to influence how women of colour's behaviour is interpreted. Those who are firmly enculturated in whiteness and who believe their institutions to be race- and gender-neutral meritocracies are likely to perceive women of colour who challenge this

narrative as over-reacting, ostensibly misreading the situation due to their gender, race and/or culture. Attempting to challenge these dominant narratives is fraught for women of colour who are positioned as partial and over-sensitive. Women describe feeling drained and overwhelmed yet feel compelled to act to improve their working conditions. In this way, women in our study experienced what Meyer (2003) refers to as 'minority stress' or the mental and physical toll that emerges from social and cultural structures (e.g. dealing with workplace microaggressions). Our participants discussed the necessity of acting strategically to instigate change over the long term.

Supervisors and managers as allies

Study participants identified strategies which had helped them manage the workplace challenges described above. Several women spoke about the difference made by supportive managers and/or mentors:

I would say, I've been lucky, I have had some very good supervisors like my PhD advisors, I had two female supervisors which I think is pretty unusual. But I look back at that and they just have been very supportive ... That's definitely helped me with my confidence in myself. (Jayanti, age 34, born in USA)

I've had a lot of amazing managers ... who have been very open to opportunity, tapped me on the shoulder for things, supported through. They've all been men. (Ivy, age 37, born in Australia)

Having a good long-life mentor and supervisor, that's a huge help because they can help you open your network, introduce you to people ... (Cindy, age 44, born in Indonesia)

I can wave as many flags as possible, but until a senior staff [member] or my team leader or someone else acknowledges it as well, then people start to notice. And I think once they notice, then all of a sudden, you are visible. And when they think about, oh, what does this person do, then you're more likely to get promotions. (Chantal, 52, born in England)

Supportive managers and supervisors improve the environment for women of colour in STEMM organisations by recognising their abilities and supporting their career progression. To varying extents, this relieves women of colour from having to prove themselves. Interestingly, many women in this study used words such as 'fortunate' or 'lucky' to describe their position of having a supportive manager, suggesting that this is seen as exceptional rather than standard.

Our participants observed that the majority of managers are white men, and they identified the importance of self-reflection for this group:

There are so many white male managers and they do have so much power and they're really the ones who need to be exposed to bias

training, being made aware of any inherent biases that they might have. (Astrid, age 28, born in Australia)

And as much as they're [white men] always trying to be seen to be doing the right thing, they don't quite understand what they're supposed to be doing ... And they don't seem to be able to grasp that they're not nearly as open-minded as they think they are ... And they still don't understand that there's all these barriers to success. (Kelly, age 35, born in South Africa)

If you are not from a minority group, be it a female group or the LGBT group or a person of colour, you are actually in your own little bubble, completely oblivious to what people encounter on a day to day basis. People really do need to have it spelled out because you can't understand something you've never encountered on a daily basis because in your bubble it's not real. (Gabbie, age 44, born in UK)

These participant comments are supported by scholarly literature on the 'knowledge gap' between research, managers, and team members (Sue et al., 2007). In particular, Sue et al. (2007, p. 271) argue that white allies need to develop an understanding of themselves as 'racial/cultural being[s] and of the biases, stereotypes, and assumptions that influence worldviews'. White allies also need to understand common issues in STEMM workplaces for women of colour as well as research-based solutions (Jovanovic & Armstrong, 2014). While the women we interviewed identified the need for this self-awareness, they also questioned the effectiveness of mainstream organisational diversity training programs which are meant to increase knowledge of the relevant issues and change behaviours:

You go to sessions about diversity and they're all full of people who, you know, they're essentially preaching to the converted ... they're rolling it out to students and they're rolling it out to staff, but they're not rolling it out to the leadership. (Meilin, age 35, born in China)

I think that the organisations will rise to the challenges, but it requires the strength of women and people to constantly fight, and that is exhausting. These micro-aggressions that constantly bring you down ... It is that conversation I had with my boss the other day. He had been on some sort of gender awareness or bias training, and he tried to preach to me ... I just looked at him and went, "So, you are a 50-year old woman, are you, who is small and Indian and brown? Is that what you are going to tell me?" He looked at me a bit surprised. I said, "You know, I go through it every day. Every single day is a challenge". (Shankari, age 53, born in India)

We have these endless workshops on unconscious bias and cultural sensitivity and I've not seen anything that comes back and what behaviours have changed as a result of this. (Adelita, age 60, born in India)

These participant comments align with recent research that demonstrates the often limited impact of organisational diversity training. For example, Chang et al. (2019) found that diversity training seminars can increase knowledge about relevant issues, but they rarely change the behaviour of men or white employees overall. As participants like Kelly observed, white men believe themselves to be relatively advanced in terms of their gendered and racial awareness, yet demonstrate poor understanding of the issues, and also rarely act on them. This suggests that better organisational approaches need to be taken, especially for people in leadership positions, as noted by Meilin. For instance, the literature shows that more effective strategies for eliminating gender or racial bias include increased contact between diverse groups/teams of employees, in-house mentoring programs, and changing the culture of organisations through targeted hiring and recruitment (Dobbin & Kalev, 2016).

Women of colour were explicit in their endorsement of the latter strategy, noting that improving workplace culture is crucial to address the culture of Australian STEMM institutions:

... work on workplaces and workplace culture being just actually more inclusive. (Astrid, age 28, born in Australia)

I think the most helpful thing is when culturally non-diverse people get to learn about their bias ... The other thing that I think is very helpful is when you can develop a culture where things can be called out. (Leticia, age 33, born in Mexico)

... the career strategies are usually focused on you as a person and they're not about changing the environment. (Meilin, age 35, born in China)

Women in our study pointed to the importance of addressing the wider culture in STEMM organisations, by strategies such as helping their white peers and managers to become more self-aware of their own privilege and the barriers facing women of colour in STEMM. This awareness can help shift the focus of diversity initiatives from 'fixing the women' (Fletcher, 2004) to addressing organisational cultures, as dominant group members learn to recognise how social and institutional structures have shaped their worldview and experiences.

CONCLUSION

This study fills existing knowledge gaps by exploring how 30 women of colour experience Australian STEMM workplaces. We found that race and gender structured women's experiences of the workplace—microaggressions and microinsults were common to the group. Participants also highlighted the additional emotional labour required to gradually improve their working conditions. Examples of this 'meta-work' include women's attempts to overcome racial/cultural and gendered stereotypes and/or to prove their competence and value in institutions dominated by white men.

Understanding the experiences of women of colour is important because there is a disparity between how members of dominant and marginalised groups experience STEM workplaces. The knowledge gap is exacerbated in STEM fields because science in Australia and elsewhere tends to be positioned as value-free and objective, which renders the experiences of minority groups unintelligible to majority group members. As the group holding institutional power in STEM, white allies are crucial to leveraging change. Yet, white people are often the least likely to recognise microaggressions and their own implication in creating a 'chilly climate' for women of colour in STEM.

Initiatives to increase diversity in Australian STEM organisations may be successful in attracting scientists from diverse backgrounds. However, without a concurrent focus on addressing the institutional climate, these initiatives are unlikely to be effective at retaining scientists who feel incompatible with the organisational culture. For example, institutions need to broaden their scope beyond addressing overt racism, (hetero)sexism and so on, to focus on the subtle microaggressions that members of marginalised groups contend with daily.

While women of colour may be highly motivated to improve their working conditions, this study shows that they must act judiciously to ensure their careers are not jeopardised or that the situation is not inflamed. Negotiating the 'minefield' of racial microaggressions is highly skilled, affective labour for which most women have not been trained. This study reveals that it places additional demands on women of colour's time and distracts from their work responsibilities. Women of colour are subject to a unique form of external stress that results from the larger systems of power and oppression (namely, whiteness intersecting with gender) in their workplaces. This leaves women of colour vulnerable to experiencing microaggressions and other forms of intersectional discrimination based on both gender and race.

The ability of women of colour to successfully address these issues is severely curtailed due to their positioning as partial and over-sensitive. Importantly, the burden of educating white people should not be the responsibility of people of colour. White leaders are powerfully positioned to share this burden by working as allies to women of colour. Allies can be instrumental in amplifying the concerns of women of colour and reducing their workplace stress. Allies are seen as more credible by other dominant group members because they are not considered to be acting out of self-interest. Moreover, the costs of confronting racial microaggressions are fewer for allies. An important caveat in this regard is to work alongside women of colour rather than taking over. Allies are likely to have far less understanding of the relevant issues than the groups with which they are aligned. Allies occupy positions of social dominance and need to consistently reflect on their/our positionality to ensure they/we are supporting equitable outcomes rather than unintentionally perpetuating racial inequity.

ENDNOTES

¹ Where possible, we eschew the term 'diverse' as it positions some individuals as non-normative while leaving normative positions unexamined.

² Gaslighting is a psychological term in which accurate information is withheld and/or false information provided resulting in the victim becoming anxious, confused, and sceptical of their own memories (Abramson, 2014).

REFERENCES

- Abramson, K. (2014). Turning up the lights on gaslighting. *Philosophical Perspectives*, 28, 1-30.
- Acker, J. (2006). Inequality regimes: Gender, class, and race in organizations. *Gender & Society*, 20, 441-464
- Alfred, M. V., Ray, S. M., & Johnson, M. A. (2019). Advancing women of color in STEM: An imperative for U.S. global competitiveness. *Advances in Developing Human Resources*, 21, 114-132. <https://doi.org/10.1177/1523422318814551>
- Alfrey, L., & Twine, F. W. (2017). Gender-fluid geek girls. *Gender & Society*, 31, 28-50. <https://doi.org/10.1177/0891243216680590>
- Arday, J. (2018). Dismantling power and privilege through reflexivity: Negotiating normative whiteness, the Eurocentric curriculum and racial micro-aggressions within the academy. *Whiteness and Education*, 3, 141-161. <https://doi.org/10.1080/23793406.2019.1574211>
- Bonilla-Silva, E. (2015). The structure of racism in color-blind, "post-racial" America. *American Behavioral Scientist*, 59, 1358-1376. <https://doi.org/10.1177/0002764215586826>
- Boutte, G. S., & Jackson. T. O. (2014). Advice to white allies: Insights from faculty of color. *Race Ethnicity and Education*, 17, 623-642. <https://doi.org/10.1080/13613324.2012.759926>
- Brookfield, S. (2014). Teaching our own racism: Incorporating personal narratives of whiteness into anti-racist practice. *Adult Learning*, 25, 89-95. <https://doi.org/10.1177/1045159514534189>
- Cech, E. (2015). Engineers and engineeresses? Self-conceptions and the development of gendered professional identities. *Sociological Perspectives*, 58, 56-77. <https://doi.org/10.1177/0731121414556543>
- Chang, E. H., Milkman, K. L., Gromet, D. M., Rebele, R. W., Massey, C., Duckworth, A. L., & Grant, A. M. (2019). The mixed effects of online diversity training. *PNAS*, 116, 778-7783. <https://doi.org/10.1073/pnas.1816076116>
- Choroszewicz, M., & Adams, T. (2019). Gender and age in the professions: Intersectionality, meta-work, and social change. *Professional & Professionalism*, 9, 3432-3535. <https://doi.org/10.7577/pp.3432>

- Clancy, K. B. H., Lee, K. M. N., Rodgers, E. M., & Richey, C. (2017). Double jeopardy in astronomy and planetary science: Women of color face greater risks of gendered and racial harassment. *Journal of Geophysical Research: Planets*, 122, 1610-1623. <https://doi.org/10.1002/2017JE005256>
- Corbin, J. M., & Strauss, A. (1990). Grounded theory research: Procedures, canons, and evaluative criteria. *Qualitative Sociology*, 13, 3-21 (1990). <https://doi.org/10.1007/BF00988593>
- Crenshaw, K. (1989). Demarginalizing the intersection of race and sex: A Black feminist critique of antidiscrimination doctrine, feminist theory, and antiracist politics. *University of Chicago Legal Forum*, 139-67.
- DiAngelo, R. (2011). White fragility. *International Journal of Critical Pedagogy*, 3, 54-70.
- Dobbin, F., & Kalev, A. (2016). Why diversity programs fail. *Harvard Business Review*. <https://hbr.org/2016/07/why-diversity-programs-fail>
- Drury, B. J., & Kaiser, C. R. (2014). Allies against sexism: The role of men in confronting sexism. *Journal of Social Issues*, 70, 637-652. <https://doi.org/10.1111/josi.12083>
- Dyer, R. (1997). *White*. Routledge.
- Fletcher, J. (2004). The paradox of postheroic leadership: An essay on gender, power and transformational change. *Leadership Quarterly*, 15, 647-61. <https://doi.org/10.1016/j.leaqua.2004.07.004>
- Frankenberg, R. (1993). *White women, race matters: The social construction of whiteness*. University of Minnesota Press.
- Goldberg, D. T. (2009). *The threat of race: Reflections on racial neoliberalism*. Wiley-Blackwell.
- Hanson, S. L. (2012). Science for all? The intersection of gender, race and science. *The International Journal of Science in Society*, 3, 113-136.
- Hatmaker, D. (2013). Engineering identity: Gender and professional identity negotiation among women engineers. *Gender, Work & Organization*, 20, 383-396. <https://doi.org/10.1111/j.1468-0432.2012.00589.x>
- Holvino, E. (2010). Intersections: The simultaneity of race, gender and class in organization studies. *Gender, Work & Organization*, 17, 248-277. <https://doi.org/10.1111/j.1468-0432.2008.00400.x>
- Huang, J., Gates, A. J., Sinatra, R., & Barabási, A. (2020). Historical comparison of gender inequality in scientific careers across countries and disciplines. *PNAS*, 9, 4609-4616. <https://doi.org/10.1073/pnas.1914221117>
- Hubbard, R. (2001). Science, facts, and feminism. In M. Wyer, M. Barbercheck, D. Giesman, H. O. Ozturk, M. Wayne (Eds.), *Women, science, and technology: A reader in feminist science studies* (pp. 148-154). Routledge.
- Jayasuriya, L., Walker, D., & Gothard, J. (Eds.) (2003). *Legacies of White Australia: Race, culture and nation*. University of Western Australia Press.

- Jones, T., & Norwood, K. (2017). Aggressive encounters & white fragility: Deconstructing the trope of the angry black woman. *Iowa Law Review*, 102, 2017-2070.
- Jovanovic, J., & Armstrong, M. A. (2014). Mission possible: Empowering institutions with strategies for change. *Peer Review*, 16, 21-24.
- Kim, J. Y. J., Block, C. J., & Nguyen, D. (2019). What's visible is my race, what's invisible is my contribution: Understanding the effects of race and color-blind racial attitudes on the perceived impact of microaggressions toward Asians in the workplace. *Journal of Vocational Behavior*, 113, 75-87.
<https://doi.org/10.1016/j.jvb.2018.08.011>
- Kincheloe, J. L., & McLaren, P. (2002). Rethinking critical theory and qualitative research. In Y. Zou & E. T. Trueba (Eds.), *Ethnography and schools: Qualitative approaches to the study of education* (pp. 87-138). Rowman & Littlefield.
- Kmec, J. A. (2013). Why academic STEM mothers feel they have to work harder than others on the job. *International Journal of Gender, Science and Technology*, 5, 79-101.
- Leggon, C. B. (2010). Diversifying science and engineering faculties: Intersections of race, ethnicity, and gender. *American Behavioral Scientist*, 53, 1013-1028.
<https://doi.org/10.1177/0002764209356236>
- Lentin, A. (2016) Racism in public or public racism: Doing anti-racism in 'post-racial' times. *Ethnic and Racial Studies*, 39, 33-48.
<https://doi.org/10.1080/01419870.2016.1096409>
- Liu, H., & Baker, C. (2016). White knights: Leadership as the heroicisation of whiteness. *Leadership*, 12, 420-448.
- Mattheis, A., Cruz-Ramírez De Arellano, E., & Yoder, J. B. (2019). A model of queer STEM identity in the workplace. *Journal of Homosexuality*.
<https://doi.org/10.1080/00918369.2019.1610632>
- Metcalfe, H. (2010). Stuck in the pipeline: A critical review of STEM workforce literature. *InterActions: UCLA Journal of Education and Information Studies*, 6, 1-20. Retrieved from <https://escholarship.org/uc/item/6zf09176>
- Meyer, I. H. (2003). Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence. *Psychological Bulletin*, 129, 674-697. <https://doi.org/10.1037/0033-2909.129.5.674>
- Moore, R. (2012). Whitewashing the gap: The discursive practices of whiteness. *International Journal of Critical Indigenous Studies*, 5, 2-12.
- Moore, R. (2020). Whiteness=politeness: Interest-convergence in Australian history textbooks, 1950-2010. *Critical Discourse Studies*, 17, 111-129.
<https://doi.org/10.1080/17405904.2019.1637760>
- Morley, L. (2013). The rules of the game: Women and the leaderist turn in higher education. *Gender and Education*, 25, 116-131.
- Nash, M., Grant, R., Lee, L. M., Martinez-Marrades, A., & Winzenberg, T. (2020). An exploration of perceptions of gender equity among SAGE Athena SWAN self-

assessment team members in a regional Australian university. *Higher Education Research & Development*. <https://doi.org/10.1080/07294360.2020.1737657>

Nash, M., & Moore, R. (2018). An evaluation of a leadership development programme for women in STEMM in Antarctica. *The Polar Journal*, 8, 110-125. <https://doi.org/10.1080/2154896X.2018.1468629>

Nash, M., & Moore, R. (2019). 'I was completely oblivious to gender': An exploration of how women in STEMM navigate leadership in a neoliberal, post-feminist context. *Journal of Gender Studies*, 28, 449-461. <https://doi.org/10.1080/09589236.2018.1504758>

National Science Foundation. (2019). Women, minorities, and persons with disabilities in science and engineering. ncses.nsf.gov/pubs/nsf19304/digest

Office of the Chief Scientist (2020). Australia's STEM workforce. Australian Government. https://www.chiefscientist.gov.au/sites/default/files/2020-07/australias_stem_workforce_-_final.pdf

Ong, M. (2005). Body projects of young women of colour in physics: Intersections of gender, race and science. *Social Problems*, 52, 593-617. <https://doi.org/10.1525/sp.2005.52.4.593>

Ong, M., Wright, C., Espinosa, L. L., & Orfield, G. (2011). Inside the double-bind: A synthesis of empirical research on undergraduate and graduate women of color in science, technology, engineering, and mathematics. *Harvard Educational Review*, 81, 172-208. <https://doi.org/10.17763/haer.81.2.t022245n7x4752v2>

Patton, L. D., & Bondi, S. (2015). Nice white men or social justice allies? Using critical race theory to examine how white male faculty and administrators engage in ally work. *Race Ethnicity and Education*, 18, 488-514. <https://doi.org/10.1080/13613324.2014.1000289>

Pawley, A., & Tonso, K. L. (2011). "Monsters of unnaturalness": Making women engineers' identities via newspapers and magazines (1930-1970). *Journal of the Society of Women Engineers*, 20, 50-75.

Powell, A., Bagilhole, B., & Dainty, A. (2009). How women engineers do and undo gender: Consequences for gender equality. *Gender, Work & Organization*, 16, 411-428. <https://doi.org/10.1111/j.1468-0432.2008.00406.x>

Prinsley, R., Beavis, A.S., & Clifford-Hordacre, N. (2016). Busting myths about women in STEM. Report for the Office of the Chief Scientist, Canberra, ACT.

Rasinski, H. M., & Czopp, A. M. (2010). The effect of target status on witnesses' reactions to confrontations of bias. *Basic and Applied Social Psychology*, 32, 8-16. <https://doi.org/10.1080/01973530903539754>

Reilly, A., Jones, D., Vasquez, C. R., & Krisjanous, J. (2016). Confronting gender inequality in a business school. *Higher Education Research & Development*, 35, 1025-1038. <https://doi.org/10.1080/07294360.2016.1138453>

Rosser, S. V., Barnard, S., Carnes, M. & Munir, F. (2019). Athena SWAN and ADVANCE: Effectiveness and lessons learned. *Lancet*, 393, 604-08. [https://doi.org/10.1016/S0140-6736\(18\)33213-6](https://doi.org/10.1016/S0140-6736(18)33213-6)

- Roy, R. E., Weibust, K. S., & Miller, C. T. (2009). If she's a feminist it must not be discrimination: The power of the feminist label on observers' attributions about a sexist event. *Sex Roles*, 60, 422–431. <https://doi.org/10.1007/s11199-008-9556-6>
- Sanchez-Hucles, J. V., & Davis, D. D. (2010). Women and women of color in leadership: Complexity, identity, and intersectionality. *American Psychologist*, 65, 171-181. <https://doi.org/10.1037/a0017459>
- Savigny, H. (2014). Women, know your limits: Cultural sexism in academia. *Gender and Education*, 26, 794–809. <https://doi.org/10.1080/09540253.2014.970977>
- Schmidt, E. K., Ovseiko, P. V., Henderson, L. R., & Kiparoglou, V. (2020). Understanding the Athena SWAN award scheme for gender equality as a complex social intervention in a complex system: Analysis of Silver award action plans in a comparative European perspective. *Health Research Policy and Systems*, 18. <https://doi.org/10.1186/s12961-020-0527-x>
- Sue, D. W. (2017) The challenges of becoming a white ally. *The Counselling Psychologist*, 45, 706-716. <https://doi.org/10.1177/0011000017719323>
- Sue, D. W., Capodilupo, C. M., Torino, G. C., Bucceri, J. M., Holder, A. M. B., Nadal, K. L., & Esquilin, M. (2007). Racial microaggressions in everyday life: Implications for clinical practice. *American Psychologist*, 62, 271–286. <https://doi.org/10.1037/0003-066X.62.4.271>
- Sullivan, K. R., & Delaney, S. (2016). A femininity that 'giveth and taketh away': The prosperity gospel and postfeminism in the neoliberal economy. *Human Relations*, 70, 836-859.
- Torres, L. E. (2012). Lost in the numbers: Gender equity discourse and women of colour in science, technology, engineering and mathematics (STEM). *International Journal of Science in Society*, 3, 33-45.