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Résumé de l'article

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Abstract

Building on Milkman, Akinola, and Chugh (2015), this article presents data from an experiment conducted in Australia that included fictional emails from prospective students seeking a meeting with faculty members. The results show significantly different responses from faculty depending on the student's name and association with a racialized group. While the study reveals evidence of racial bias, there is, contrary to previous studies, little evidence of gender bias. Additionally, the study concludes that gender or racial diversity at the university or discipline level is not associated with lower rates of bias. Additional exploratory analysis further examines the data for evidence of change processes, including the interaction of gender and racial diversity, and lower rates of bias among more junior academics.

Résumé

Cet article se fonde sur Milkman, Akinola, et Chugh (2015) pour présenter des données provenant d'une expérience australienne consistant en courriels fictifs d'étudiants potentiels cherchant à rencontrer des professeurs. Les résultats indiquent des réponses très différentes de la part des professeurs selon le nom de l'étudiant et son association à un groupe racisé. Bien que l'étude révèle un parti pris basé sur la race,

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il y a, contrairement aux résultats de certaines études antérieures, peu d'indications de parti pris basé sur le genre. Cette étude conclut en outre que la diversité de genre ou de race présente dans une université ou discipline ne se traduit pas par un taux de préjugés plus bas. D'autre part, une analyse exploratoire supplémentaire examine les données obtenues pour apprendre s'il apparaît des processus de changement, y compris dans les interactions entre préjugés de genre et de race, et des taux de préjugés plus bas parmi les universitaires plus jeunes.

Keywords / Mots clés : implicit bias, higher education, bias, equity, diversity / biais inconscient, enseignement supérieur, biais, équité, diversité

Introduction

There has been a growing movement to address gender and racial bias and inequality within the higher education sector globally, including campaigns to decolonize academia and the curriculum (Rodriguez, 2018; Muldoon, 2019), efforts to address systemic racism in higher education institutions (Arday & Mirza, 2018; Ahmed, 2006), and institutional commitments such as the Athena Swan charter to improve gender equality. Carey, Clayton, and Horiuchi (2020) show that students at U.S. universities favour diversity and increasing the representation of under-represented groups. Despite these advances, there is also evidence that higher education remains dominated by White men, and, increasingly, White women (Johnson & Howsam, 2020). Scholars of Black, Indigenous, and other racialized minorities continue to face obstacles to inclusion (Henry, Dua, James, Kobayashi, Howard Ramos, & Smith, 2017; Bailey, 2015; Arday & Mirza, 2018; Rollock, 2023).

While there is a growing body of scholarship mapping the "equity myth" within higher education (Henry et al., 2017), in terms of hiring practices and experiences of discrimination in academia, less attention has been paid to the potential gender and racial biases that prospective scholars face when seeking to enter academia as doctoral students. Since the pathway to an academic career usually requires a doctoral degree, it is important to understand if bias operates along this pathway. Barriers for prospective PhD students impact the composition of academic fields and how scholarship is taught, but also have compounding effects, including conveying and reifying a particular sense of who succeeds and "belongs" in academia.

One of the few studies of bias in pathways into doctoral programs focused on the United States and found systematic and concerning racial and gender discrimination (Milkman, Akinola, & Chugh, 2015). Building on this work, as well as an emerging body of literature examining implicit bias, racism, and discrimination in higher education, this study provides evidence that the response rate and type of responses to potential PhD students are impacted by indicators of the race of the prospective student. In doing so, we show that there are unequal pathways into higher education and racial discrimination may limit students' access to academia.

Australian higher education is a case study with global relevance. Australian universities are similar to those in countries typically categorized as Western in that they have historically had an over-representation of men and European White ethnicities

among academic staff. Researchers recently concluded that higher education in Australia is dominated by leaders with backgrounds that are "WEIRD: Western, educated, industrialised, rich and democratic," noting that "of the 699 governing council roles across Australia's 41 universities, 94 percent of the incumbents had Caucasian and British backgrounds" (Law & Croucher, 2020, n.p.). Although all eight of the Australian universities included in the study make explicit commitments to diversity and inclusion, these institutions collect or publish limited data on student or faculty demographics. This lack of data reflects wider trends within higher education to collect and make publicly available little or no data that could measure or verify equity and diversity commitments (Smith, 2016; 2019).

Australia is also an appropriate case because it helps expand the knowledge base beyond the United States and United Kingdom, which are by far the most common higher education systems to be the subject of evidence-based studies of discrimination. Australian higher education has witnessed decades-long efforts to improve gender equity (Costa & Sawer, 2019; Sawer & Curtin, 2016), but there has been less movement toward the goal of reducing racial or ethnic bias and an absence of racial affirmative action policies in Australia, in contrast to a range of comparable countries (Hasan & Nussbaum, 2012; Stulberg & Chen, 2014). Exceptions include efforts by Universities Australia, a body considered the "voice of Australia's universities," to recruit Indigenous students and students from low socio-economic status (SES) backgrounds.[1] The success of these initiatives has been vigorously questioned and critiqued, especially from racialized communities (Trudgett et al 2020; Taylor et al. 2019; Watego 2018). Australia is also a useful case study because, similar to other national contexts, securing the agreement of a potential PhD supervisor is typically a pre-requisite for admission to a PhD program, enhancing the importance of the initial communications with a potential PhD supervisor.

This study is not an exact replication of Milkman, Akinola, and Chugh's design or case; rather, it makes several important methodological contributions that have led to original findings. First, the study sought to establish a causal link between emails with prospective-student names associated with different racialized identities and male or female gender, and the likelihood of a potential PhD supervisor a) responding to the inquiring student, and b) expressing willingness to meet to discuss supervision. That is, the authors consider not only whether discrimination or bias is evident in response/non-response patterns to prospective students, but also whether bias is reflected in the qualitative nature of the responses that were sent. By studying both response rates and positive responses, a significant difference in both was observed, depending on the implied racial identity of students' names; however, the perceived gender of a prospective student does not seem to significantly impact response rates in the expected direction.

Our second methodological contribution was to analyze differences in bias among academics based on gender, rank, race, and institutional diversity, which we argue offers information key to efforts to advance equity in higher education. Our study provides insights into the gender and racial diversity—or lack thereof—of Australian academics and helps answer the question of whether more diverse units display less bias towards prospective students. These findings have potential to feed

into processes of change, including implications for education policy prescriptions. This study finds little evidence of institution-focused processes of change. Rather, the substantially lower rates of bias among more junior faculty members across institutions suggests changing professional or societal norms may be the source of sector-wide change.

The authors recognize that terms associated with race, gender, and equity are political and constantly evolving. This article draws from Henry, Dua, James, Kobayashi, Howard Ramos, and Smith (2017) and uses the terms *racialization* and *racialized* to refer to both the practice and outcome of categorizing individuals within racial-ethnic groups. *Gender* is defined in this article as a socially constructed set of expectations typically associated with masculinity, femininity, and individuals sexed as men and women. Finally, the authors build on research that uses the term *implicit bias*, opting instead for the term *bias*, which centres the person experiencing the bias, or discrimination, rather than the presumed intent of the individual exhibiting bias. It is not possible to decipher from the study data whether the bias observed is implicit (unconscious) or explicit (deliberate). The rationale for the use of these terms is expanded later in this article.

Materials and methods

The methodological challenge of studying bias

There are three common methodological approaches to studying bias: 1) the use of an Implicit Association Test (IAT); 2) case studies that include opinion survey polls and studies using observational data, such as statistics collected by government agencies; and 3) randomized experiments or studies that involve a level of deception whereby participants are not fully aware of the issue being studied. This study is of the third type, building on existing scholarship that uses experimental methods. It is largely modelled on Milkman, Akinola, and Chugh's (2015) study, which tested a large sample of professors (n = 6500) from U.S. universities to see what biases existed in PhD candidate selections. The study included emails from supposed prospective students, which were identical, except for the student's name. These names were vetted to ensure they consistently signaled different gender and racial identity. Milkman, Akinola, and Chugh found that faculty, particularly those from higher-paying disciplines and private institutions, were most receptive to White male applicant inquiries. The study also found that female or minority staff held similar biases, showing greater representation cannot be assumed to reduce discrimination. The study was grounded in implicit bias research indicating White males are associated with positive stereotypes (Cuddy, Fiske, & Glick, 2007; Devos & Banaji, 2005).

There are several other studies of bias in higher education that this experiment builds upon. Moss-Racusin, Dovidio, Brescoll, Graham, and Handelsman (2012) conducted a smaller sample (n = 127) study focused on a university science lab manager position. The findings showed that faculty members given identical curricula vitae (CVs) with male or female names rated male applicants for the position higher, deemed males more competent, and offered them a higher starting salary and more career mentoring. Similarly, Steinpreis, Anders, and Ritzke (1999) found that both male and female academic psychologists were more likely to want to employ a male

early career researcher (ECR) than an equally qualified female ECR. Boliver (2016) used observational data to show that British ethnic minority applicants to highly selective universities were less likely to be offered places than White British applicants with the same grades, even taking account of the higher competitiveness of degree programs preferred by minority applicants.

Study design

Acknowledging the potential challenges associated with experimental studies of bias, this study was designed to detect systemic bias at informal pathways to academia. As indicated, the authors drew inspiration from the Milkman, Akinola, and Chugh (2015) experiment, and made adjustments for the Australian context. They also increased measurement precision by coding not only response/non-response, but also negative, inquiring, or receptive responses. Specifically, responses that agreed to a meeting with the fictitious prospective student (receptive) or requested further information (inquiring) were coded as "positive," while those declining a meeting, we coded as "non-positive." Automated replies were treated as non-responses. Additional biases were identified within the responses based on these categories. The study received approval from the University of Sydney Human Research Ethics Committee prior to its launch in 2017. The remainder of this section outlines the four methodology stages and addresses some limitations and unexpected challenges.

The sampling frame for the study was academic staff ranked Senior Lecturer or above, on the main campuses of the Group of Eight (Go8), which includes eight of Australia's leading research-intensive universities. These are the Australian National University, Monash University, University of Adelaide, University of New South Wales, University of South Australia, University of Sydney, University of Western Australia, and University of Queensland (these are labelled arbitrarily with numbers in the analysis to avoid focus on individual institutions).

Australian academic ranks Associate Lecturer and Lecturer were not included because scholars at these levels are unlikely to supervise PhD students. Random sampling was not employed from this frame. Rather, as is common with email-based audit studies (e.g., Alizade & Ellger, 2022; Epstein, Bode, & Connolly, 2021; Kalla, Rosenbluth, & Teele, 2017), emails were sent to the entire sample frame. Two reasons for this practice are that neither the effectiveness of spam filters nor the response rates to email messages could be accurately anticipated beforehand, meaning the field experiment is at risk of insufficient statistical power. Both factors were considerations for the study.

Even though the carefully assembled sampling frame should capture the entire population of interest for the study (level C-E academics on the main campuses of Go8 universities), results are still considered estimates. This is because, as Cox (2011) points out, it is important to consider "temporal characteristics of the target population" (p. 876). The study results are estimates of the results that would have been obtained in the subsequent days, weeks, or months following the study. However, the sample is highly representative of C-E academics at the main campuses of these universities in the subsequent close periods, and statistical inference can be used to estimate the uncertainty around the data points.

One of the elements of the Milkman, Akinola, and Chugh study the authors wanted to emulate was to determine if there was a difference in response rate, depending on the race or gender identity of faculty members. Following the approach of Henry et al. (2017) and Johnson and Howsam (2020) in their diversity audits[2] of public universities in Canada, coders assessed staff images, names, and bios from publicly available staff profile pages and coded each academic according to gender and racialized identity. An intercoder reliability of 98 percent was achieved and in the few cases where there was discrepancy between coders, a third coder was included to make a final determination.

The second methodology step required choosing prospective student names that would signal appropriate racial and gender identities. Available Australian student demographic data were considered, as were the authors' personal impressions from working within Australian universities over many years, to determine which ethnoracial groups we hoped to signal with the prospective student names. Prospective student names were tested with graduate students to ensure that the chosen names were associated with our anticipated gender and racial groups, specifically, male and female for White -European, Australian Indigenous, South Asian, Chinese, and Arab racialized identities. This process drew from established methods (Gaddis & Ghoshal, 2020), and the authors acknowledge the limitations and politics of using names to signal gender and racialized groups, particularly for Indigenous communities.[3]

The third step was to compose and send emails from the fictitious students to Go8 academics. The emails were identical except for the name of the fictitious student interested in doctoral studies. The email template was composed with several goals: to seem authentic, clearly indicate that the writer was an Australia-based student with fluent-level English skills, convey an interest in the recipient's own research, and convey urgency by indicating the writer was on campus for a window of several days. The full text of the email template is available in the supplemental online material (SOM). On June 26, 2017, emails were sent at about 1 per second to 7240 academics throughout the eight universities. Assignment into the treatment groups was done via "round robin" style randomization (ensuring even groups). Thus, each email recipient was equally likely to fall into any of the treatment groups. All emails were sent within a three-hour period. The Information Communication Technology (ICT) specialists at the authors' (then) home institution, the University of Sydney, were consulted to minimize the rate that spam filters would catch the emails, although they advised that regardless of the measures taken, some non-trivial rate was very likely.

The fourth step of the study involved sending a debrief email to all the faculty members to whom emails had been sent. The approved ethics protocol was for a debrief one week after the initial contact; however, the debrief was sent one day after the initial contact, due to an unexpected development. Information Communication Technology staff at one university in the study (coded as University 5) made contact with ICT at University 5 and indicated that some academic staff had noticed the identical text of several emails due to the centralized PhD recruitment system in their academic unit. Although this was only one query from one university, we concluded that data gathered after this discovery would become increasingly questionable. Therefore, the debrief emails were sent roughly 24 hours after the initial emails, end-

ing the data collection phase. Fortunately, there had already been sufficient responses over the first 24 hours to provide usable data.

While the study period was shorter than planned, it does not fundamentally impact the validity of the data. It is possible that some recipients perceived the emails as questionable/spam/phishing due to identification of multiple similar emails within an academic unit or among some colleagues; however, randomization of the treatment ensures that the choice not to respond due to such concerns of inauthenticity would not be correlated with the treatment (see SOM for balance test). In short, a faculty member should be no more or less likely to think an email from Melissa Smith is spam compared to an email from Omar al-Haddad.

Moreover, of 6928 emails sent (excluding withdrawals, see below), 2986 (43.1%) elicited a reply during the period of study (24 hours), and 2469 (35.6%) received a positive reply. These are relatively high response rates, which provide ample data for the study (see SOM for power calculations). To ensure the data collected was not negatively impacted by the decision to end the study within 24 hours or by the potential that University 5 emails were identified as spam, several internal tests of the data were conducted. The authors found that the results changed little when examining shorter periods, including responses received within 6 hours and 12 hours—long before any indication that the emails were flagged as suspicious at one university. Results were similarly unchanged when all data for the University 5 were removed from the study (see SOM for these analyses). In particular, the Positive reply rates for most non-White representative names remain statistically significant in their lower values compared with the White male and female representative names at the 6- and 12-hour thresholds, and excluding University 5.

In addition to the issue of multiple emails from prospective students coming to a centralized intake system at one institution, a second unanticipated element of the data collection process was the negative reaction by many academics following the debrief email. After the debrief emails were sent, the authors' university- the University of Sydney- received nearly 500 queries about the study. Although some of these expressed support, interest, and enthusiasm, others raised concerns, including about the use of deception in the study, and some asked to have their data withdrawn.

Both researchers named in the debrief (Megan MacKenzie and Ben Goldsmith) were copied into some of the complaint emails, often strongly worded, from faculty around the country. Moreover, the more junior author, Megan MacKenzie, at the time a Senior Lecturer, received a number of calls from faculty across the country that ranged from expressing concern, to outright threats of consequences for her career.

Due to the number of complaints, the university initiated a review of the study involving both internal and external assessments. The conclusion was that the approved ethics protocol had been followed. There were 312 individuals who requested their data be withdrawn from the study. These data were withdrawn, representing 4.3 percent of the emails sent.

With a dataset of 6928, 43.1 percent of which are responses (receptive, inquiring, or negative), the authors are confident about the validity of the data even with the withdrawal of this relatively small portion. This confidence is supported by analysis of the similarity of the remaining dataset (n = 6928) to the full dataset (n = 7240) (permitted

by the University of Sydney). In this analysis, it was found that removal of the 312 withdrawals does not meaningfully change the distribution of the treatments, or the gender, ethnicity, academic rank, or field of the remaining observations. There is no statistically significant difference in response rates in the pre- and post-withdrawal data across the treatments, and the results obtained are highly consistent across the pre- and post-withdrawal data. Given that the authors were permitted to retain 95.7 percent of the data, this is not surprising, but important to have established.

A third issue with the audit study data has to do with the effectiveness of spam filters at the different universities. While seven of the universities appeared to have very similar spam filter systems, one, University 3, appears to have blocked a much larger portion of the messages. Specifically, while response rates ranged from 48.1 to 53.8 percent for the others, University 3 academics responded to only 4.5 percent of the total emails sent (i.e., 40 of 922 emails) to that institution. Nevertheless, it was decided not to exclude University 3 from the analysis, since the research design did not anticipate any criteria for exclusion based on anomalous response rates. The authors are confident this does not bias the results since they are very similar if it is removed from the analysis (see SOM).

Theory and hypotheses

This analysis is centred on patterns of racial and gender bias in Australian higher education. Building on scholarship that uses the term *implicit bias*, the authors make a theoretical claim about the limits of this term. The term *implicit bias* is designed to refer to unconscious bias, or discriminatory tendencies that individuals might have, yet not be aware of. There is contestation about the nature of implicit bias, including whether and how to distinguish implicit bias from racism and sexism (e.g., Chun & Feagin, 2019). The authors have chosen to use the term *bias* instead, recognizing that it is not possible to determine whether the bias found in the study signals unconscious or overt sexist and racist beliefs of faculty members.

The authors further acknowledge that bias can have complex roots based on assumptions about particular groups. For example, reluctance to consider a prospective PhD student with a non-White sounding name might be based on secondary assumptions about English language skills or prior training. As noted, we designed the treatment email to guard against such assumptions. The text was identical across all treatment names and written in clear, concise, grammatical English. The email also signaled that the student had completed study in Australia, both by stating "I have recently finished my honour's degree" and by being sent from a University of Sydney email address. Nevertheless, we cannot make claims about the cognitive causal mechanisms of the bias we observe in the response patterns. Using the term *bias* therefore centres those experiencing discrimination through bias, rather than the presumed intent of those exhibiting bias.

Finally, as indicated in the methods section, the diversity audit method was used. The authors reaffirm the theoretical and ethical validity of this method. As stated by Johnson and Howsam (2020) and Henry et al. (2017), there is a politics to identifying individuals and self-identification is preferable. Moreover, the authors agree that "lumping together" racialized groups "does a serious disservice to the understandings

of ethno-racial positioning" in universities (Henry et al., 2017, p. 30). They also acknowledge that gender is not binary and that gendering an individual based on external identifying factors can be problematic, particularly for non-binary or gender non-conforming individuals. This imperfect method was used for two main reasons. First, as indicated earlier, these methodologies have been developed because of the lack of publicly available and more nuanced demographic data. They provide imperfect but useful data for research focused on bias. As Johnson and Howsam (2020) argue, such baseline data are "crucial to evidence-based policy" (p. 679). Second, as Henry et al. (2017) note, public academic websites are the "face" of the university and the information about faculty provided on those websites represents material prospective students will engage with. It is reasonable to assume that prospective students will make similar assessments about the race and gender identity of faculty as our researchers.

Grounded in this approach to these key concepts, the present study sought to examine gender and racial bias in higher education in Australia. They initial hypotheses were patterns of bias, both in the response rates and the rates of positive responses.

H1a: Australian academics will exhibit gender bias in their responsiveness to prospective PhD students.

H1b: Australian academics will exhibit racial bias in their responsiveness to prospective PhD students.

H2a: Australian academics will exhibit gender bias in the positive or negative nature of their responses to prospective PhD students.

H2b: Australian academics will exhibit racial bias in the positive or negative nature of their responses to prospective PhD students.

While expectations were not developed about the nature of the bias expected for any particular groups, guided by the existing literature and the patterns that emerged in the data, in much of the analysis below racialized groups are divided into White and non-White fictitious student names.

In addition to exploring bias toward students with names that were gendered and representing various racialized groups, this study investigated whether bias was associated with the diversity of faculty members. This analysis helps inform some implications for education policy, which are elaborated in the concluding section. If bias and diversity are negatively associated, this is potential evidence in support of mechanisms of institutional change. That is, either diversity reduces bias or reducing bias enhances diversity (or both). However, if levels of bias do not vary with diversity, this is evidence supporting alternative explanations for variation in diversity, such as internal practices and systems. Another possibility is that bias and diversity are positively associated. In such instances, bias may be a reaction to (increasing) diversity, in which case change is perceived to be a threat to a previously dominant or declining dominant group.

We present two sets of hypotheses focused on two levels of analysis: academic disciplines and universities. We also present a third set of hypotheses considering the interaction of these levels. Specifically, the authors hypothesize that more diverse universities interact with discipline diversity to impact the degree of bias at the discipline level, because the disciplines are embedded in broader organizational environments of (non-)diversity.

H3a: Disciplines with more gender diversity will show less gender bias.
H3b: Disciplines with more racial diversity will show less racial bias.
H4a: Universities with more gender diversity will show less gender bias.
H4b: Universities with more racial diversity will show less racial bias.
H5a: University- and discipline-level gender diversity reduce discipline-level gender bias.
H5b: University- and discipline-level racial diversity reduce discipline-level racial bias.

Further exploratory analysis is also used to advance some theoretical propositions for future study. We examine whether bias varies across different academic ranks, and whether overall institutional diversity (gender and race) has an association with lower bias. The appearance of differences in bias based on the gender or race of the academics is examined.

Results

This study uses three sets of data. First, the data collected via a diversity audit of public faculty profiles on Australian university websites is an important contribution in and of itself given the absence of existing public data related to the racial and gendered composition of higher education. Second, results based on the rate of reply to the treatments is presented, following previous studies, which assume that a lower reply rate indicates bias. The authors code a variable for Response with a value of 1 if any (non-automated) response was received to an email within the first 24 hours of the study, otherwise 0. However, as noted the nature of the reply, either receptive, inquiring, or negative, is also coded. This allows a more precise measure of bias, based on active positive responses (receptive or inquiring) or active negative responses (decline a meeting/supervision) or non-response. The authors code a variable Positive Response as 1 if either an inquiring or receptive response was received within 24 hours, otherwise 0. Data including the nature of the response to fictitious students provides a more precise indicator of bias, since it measures bias including active negative responses rather than assuming that any response signals openness to the prospective student. Notably, some faculty members may have indeed been busy or otherwise unable to meet with students and a negative response is not a definitive indicator of discrimination. However, given the randomized treatments, in the absence of bias based on student names there should be no difference in the negative response rates to different fictitious students. Again, using the names in the study as examples, there should be no difference in the number of faculty too busy, or simply unable to meet Melissa Smith compared to Omar al-Haddad. Indeed, additional bias is found in the active negative responses, which closely matches the non-response pattern, but compounds the effect.

The following section presents the diversity-audit data collected on faculty gender and racial distribution, followed by the audit-study data on rate of reply and nature of reply, illustrating the compounding effect. The rest of the article then tests the remaining hypotheses, relying on the Positive Response rates, because they more precisely reflect the existing bias (however, the results change little if only the simple response rate is used).

Diversity of faculty members in Australia's Group of Eight

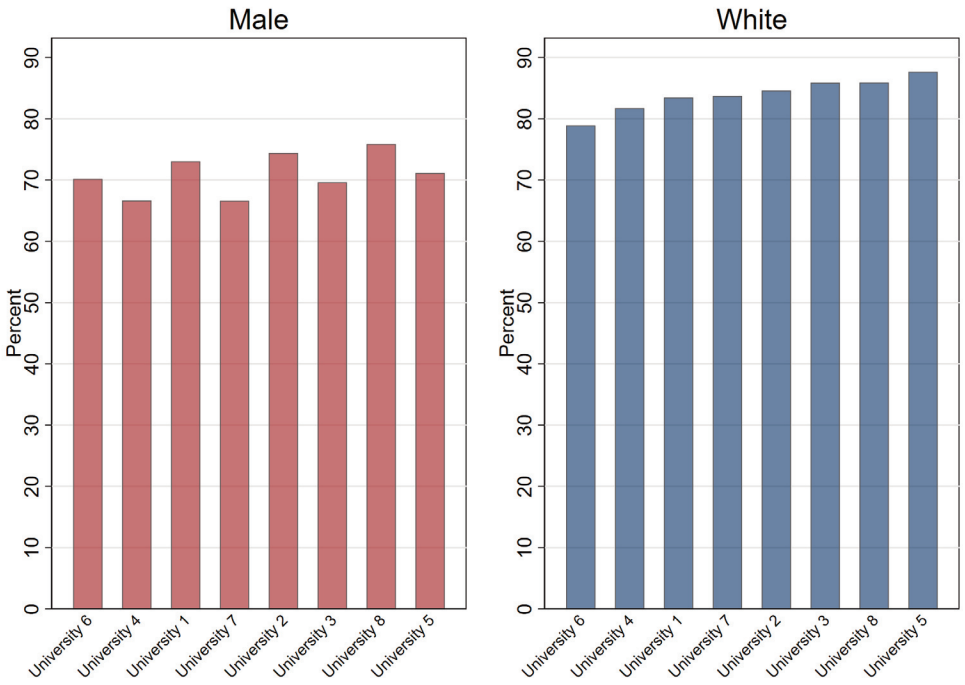
Table 1 and Figures 1–3 present data on the gender and racial distribution across faculty members at Australia's Group of Eight universities, based on our diversity audit. While the authors coded for several racialized categories, the data are presented using "White" and "non-White" categories. This, of course, "lumps" several racialized groups of individuals together, which is problematic; however, it provides important insights into the Whiteness of Australian higher education. Table 1 presents these data together, showing the distribution of males and White faculty across the eight universities. Since it is not this article's purpose to highlight differences among Go8 universities, but rather to point to sector-wide patterns, the universities are not individually identified in the analysis. They are arbitrarily numbered University 1–8.

Table 1. Gender, race, and rank distributions

	Number of academics	Percent of sample
Male	4866	70.24
Female	2062	29.76
Non-White	1123	16.21
White	5805	83.79
Senior Lecturer	1945	28.07
Associate Professor	1941	28.02
Professor	3042	43.91
Total	**6928**	**100**

Figure 1 shows the distribution in gender and racial diversity among the Group of Eight universities.

Figure 1. Distribution of males and Whites across the eight universities



Figures 2 and 3 break gender and race down by academic rank and university. This illustrates how diversity declines in most universities amongst the senior rankings of faculty members.

Figure 2. Percentage of male faculty at each of the Group of Eight Australian universities across academic career stage

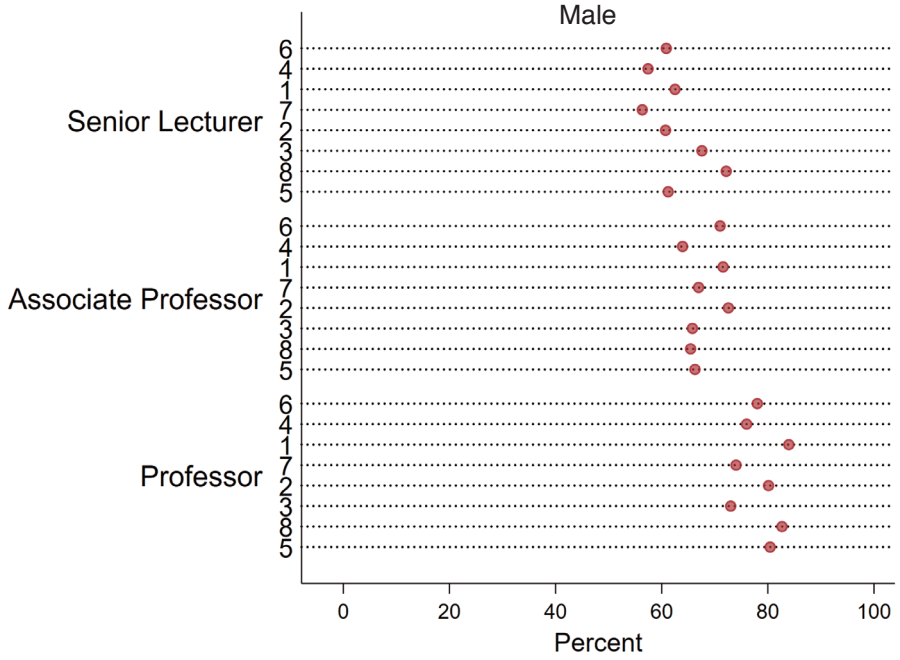
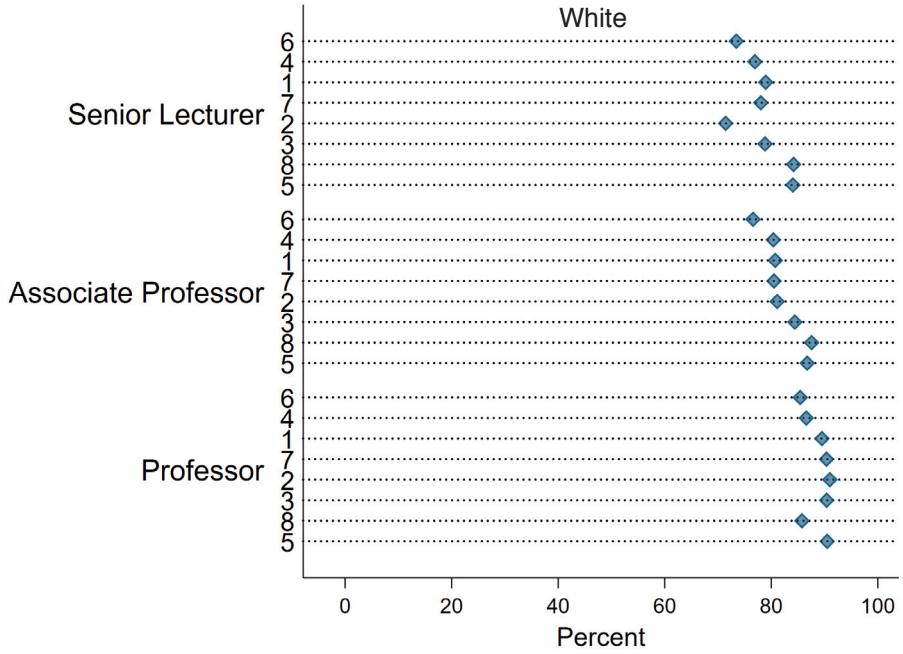


Figure 3. Percentage of male faculty at each university across academic career stage



Note: this low resolution file will display pixelated unless replaced. This renders at **76 pixels/per inch** at this size, where **300** pixels per inch is ideal.

Overall, the data confirm that women and non-White racialized groups are substantially underrepresented as faculty members in higher education. This underrepresentation increases at each level of seniority. The findings provide additional nuanced understanding, including that there is evidence of reduced skew at more junior ranks for gender, while there appears to be less evidence of this for race. This is consistent with Johnson and Howsam's (2020) finding that gender representation was improving in Canadian higher education institutions, while racial diversity was not.

These differences between academic ranks may indicate progress toward gender equality in recruitment, since more junior staff are likely to have been hired more recently. However, they may also indicate greater attrition of women and racialized faculty from the profession, or greater difficulty in achieving promotion, or some combination of these factors. In any case, the Professoriate represents about 44 percent of academic staff above the more junior levels in our sample, and thus diversity among this senior group is important for university diversity overall.

Evidence of bias in response to prospective PhD students

Using data from the audit study, this section presents the results testing Hypotheses 1a and 1b: Australian academics will exhibit gender or racial bias in their responsiveness to prospective PhD students. Figure 4 (left panel) shows the response rate for each of the 10 treatment groups, representing five racialized groups with a female and male name for each. For this and subsequent analyses, the authors use marginal effect plots based on probit models to depict the response rates. Figure 4 includes 95% confidence intervals around each data point, and dashed lines for the confidence interval of the White male treatment. Academic ranks are labelled by their standard letter categorizations: C for Senior Lecturer, D for Associate Professor, and E for Professor.

Figure 4. Response rates to prospective PhD students

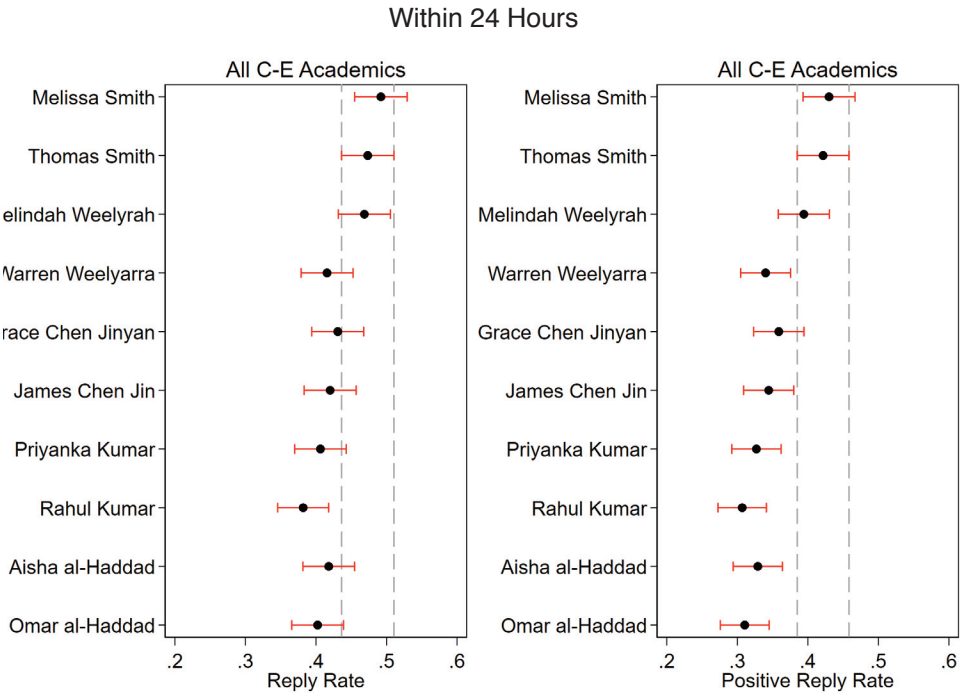


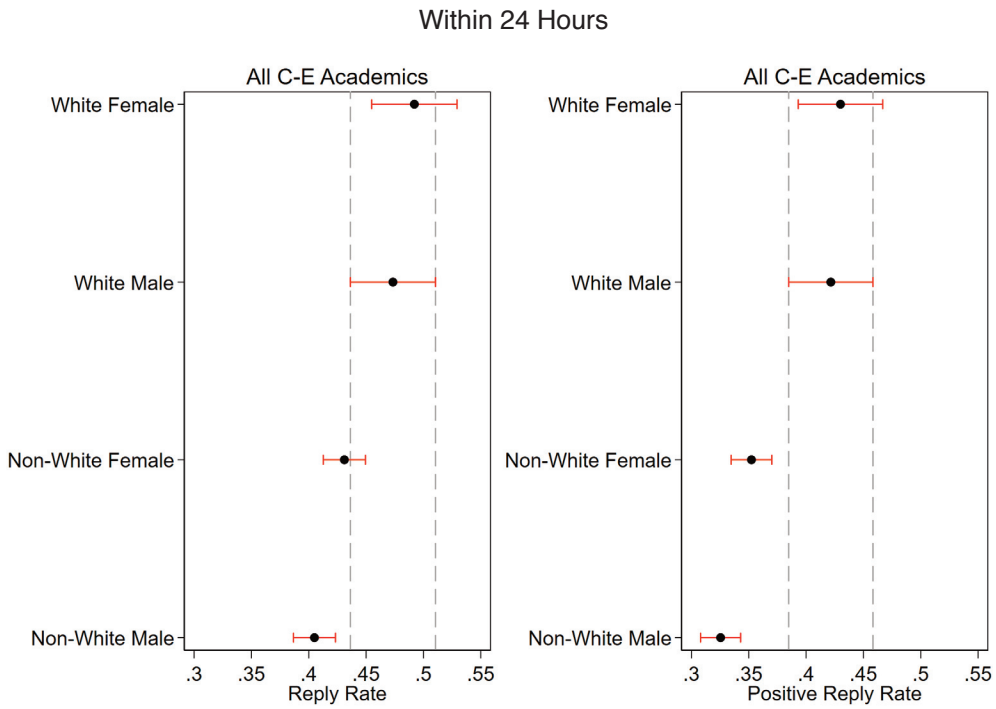
Figure 4 also presents data (right panel) testing the second set of hypotheses, H2a and H2b: Australian academics will exhibit gender or racial bias in the positive or negative nature of their responses to prospective PhD students.

The patterns are similar in the left and right panels of Figure 4. The treatment effects appear to be driven mainly by racial category, with male and female names within each category clustering together. A possible exception to this is for Australian Indigenous category names, in which the male name appears to elicit considerably more bias than the female name. More generally, the female names seem to have

slightly higher response and positive-response rates within each racialized pair. But the 95 percent confidence bars tend to overlap for almost all the non-White names, suggesting that while there may be distinctions in the degree of bias, the dominant difference is between White and non-White names. The effects are of greater magnitude, and more often statistically significant in their difference from the White male representative name (Thomas Smith), when the Positive reply rate is used as the outcome variable. This affirms the authors' decision to measure both reply rates and the content of the reply, including Positive responses versus declining to meet students. The findings indicate that bias is reflected in academics' responses that decline to meet with a prospective student, something which would go undetected if the reply rates alone were used. In short, emails from prospective students with non-White names were less likely to receive a response and more likely to receive a decline response.

There is clear evidence of bias against non-White names, consistent with previous studies of bias in higher education. Gender, however, appears to exhibit a slight pro-female bias. Figure 5 confirms both these patterns with pooled racial categories, showing higher average response rates for White and non-White female names relative to White and non-White male names. For the simple response rates, non-White females are not significantly different from White males, although this is not the case for the positive-response rates. The corresponding *t*-tests are highly significant for the White versus non-White treatments: Reply rate difference in means = 0.07, t = -4.84 ($p < 0.0000$, df = 6926); Positive Reply rate difference in means = 0.09, t = -6.54 ($p < 0.0000$, df = 6926). But they are also significant for the male versus female treatments, with higher means for female names: Reply rate difference in means = 0.03, t = 2.20 (p = 0.0280, df = 6926); Positive Reply rate difference in means = -0.02, t = 2.14 (p = 0.0322, df = 6926).

Figure 5. Treatment effects for pooled gender and race categories



Institutional diversity and bias

We now turn to an analysis of the hypotheses regarding discipline and university-level diversity. These leverage our ability to measure gender and racial diversity based on the diversity audit, to assess the degree to which diversity at the discipline or university level might condition the bias measured by the audit study. This analysis potentially allows us to gain greater insight into policies that might lead to reduced bias in academia. Tables 2 and 3 present the variation in racial and gender diversity by discipline and university, respectively using the diversity audit data. They also show the positive response rates from the audit study of all academics within each discipline or university. No clear patterns associating diversity and bias emerge, but probit models can be used to more rigorously assess the hypotheses.

Table 2. Racial and gender diversity by discipline

		Positive reply rate		
% White	**Discipline**	**Non-White treatment**	**White treatment**	**White advantage**
93.05	Art, music, design	0.33	0.41	0.08
91.53	Law	0.32	0.48	0.17
90.65	Science	0.38	0.49	0.12
88.97	Medical	0.30	0.33	0.03
88.82	Arts and social sciences	0.38	0.50	0.12
72.05	Business, commerce, economics	0.32	0.37	0.05
66.61	Engineering and computers	0.33	0.42	0.09
% Male		**Female treatment**	**Male treatment**	**Male advantage**
85.87	Engineering and computers	0.37	0.32	– 0.05
79.47	Science	0.41	0.39	– 0.02
71.36	Business, commerce, economics	0.35	0.32	– 0.03
64.17	Art, music, design	0.38	0.31	– 0.07
63.89	Medical	0.30	0.31	0.01
59.07	Law	0.39	0.31	– 0.08
57.28	Arts and social sciences	0.41	0.40	– 0.01

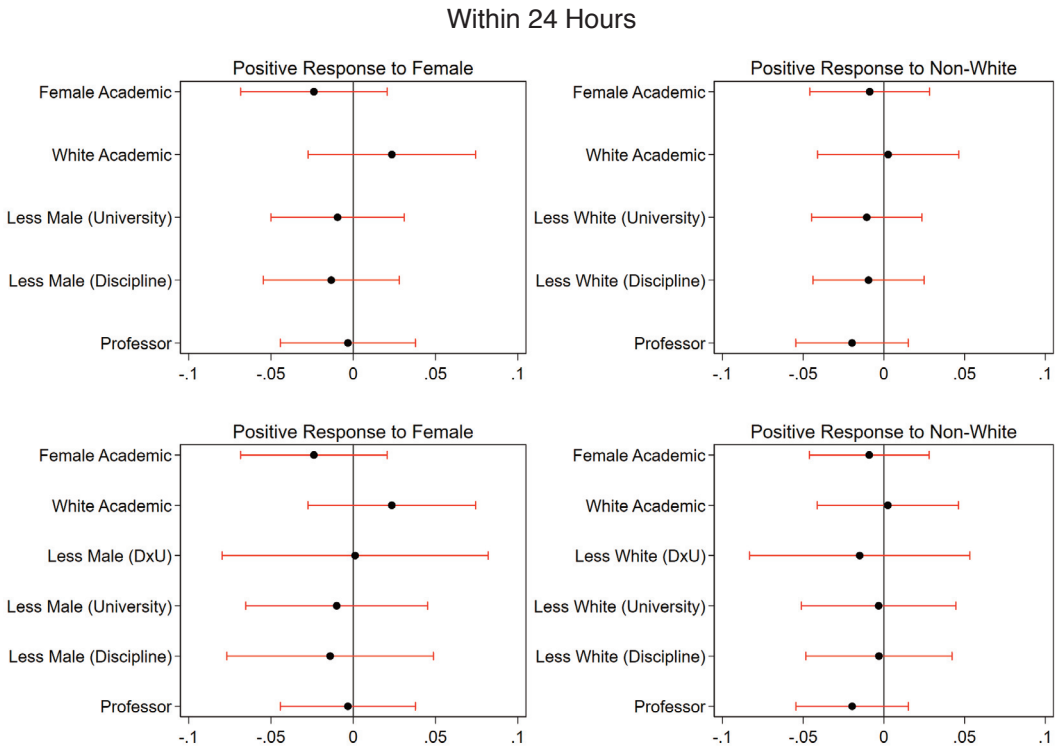
Table 3. Racial and gender diversity by university

		Positive reply rate		
% White	**University**	**Non-White treatment**	**White treatment**	**White advantage**
87.66	University 5	0.33	0.41	0.08
85.93	University 8	0.37	0.39	0.02
85.90	University 3	0.03	0.01	– 0.02
84.62	University 2	0.38	.051	0.13
83.73	University 7	0.44	0.56	0.12
83.45	University 1	0.40	0.56	0.16
81.75	University 4	0.39	0.45	0.06
78.91	University 6	0.38	0.53	0.15
% Male		**Female treatment**	**Male treatment**	**Male advantage**
75.88	University 8	0.39	0.36	– 0.04
74.41	University 2	0.44	0.37	– 0.07
73.05	University 1	0.46	0.40	– 0.06
71.13	University 5	0.34	0.36	0.03
70.20	University 6	0.42	0.40	– 0.02
69.63	University 3	0.06	0.00	– 0.06
66.67	University 4	0.40	0.40	– 0.01
66.61	University 7	0.46	0.47	0.01

Note: these tables were rebult from picture-based tables. Please proof carefully.

H3a and H3b focus on discipline-level diversity, H4a and H4b on university-level diversity, and H5a and H5b on the interaction of the two. The findings show no support for a clear linkage between gender diversity at either institutional level and lower gender bias, nor do they show clear support for racial diversity at either institutional level and lower racial bias. This is seen in Figure 6, which presents the results of four probit models. These models code binary (1, 0) dependent variables of positive responses to female students out of all positive responses in the left panels, and positive responses to non-White students out of all positive responses in the right panels. Dummy variables are coded for disciplines and for universities with below-median portions of male or White academics. Thus, positive coefficients indicate higher positive response rates to females or non-Whites for more diverse units. The authors also control for whether the individual respondents are female, White, or full professors, since these may be related to both institutional diversity and the degree of bias. There is clearly no statistically significant relationship between institutional diversity at either level and gender or racial bias toward the fictional students (upper left and right panels). This result fails to support any of the hypotheses H3a, H3b, H4a, or H4b.

Figure 6. Gender or racial diversity association to gender or racial bias



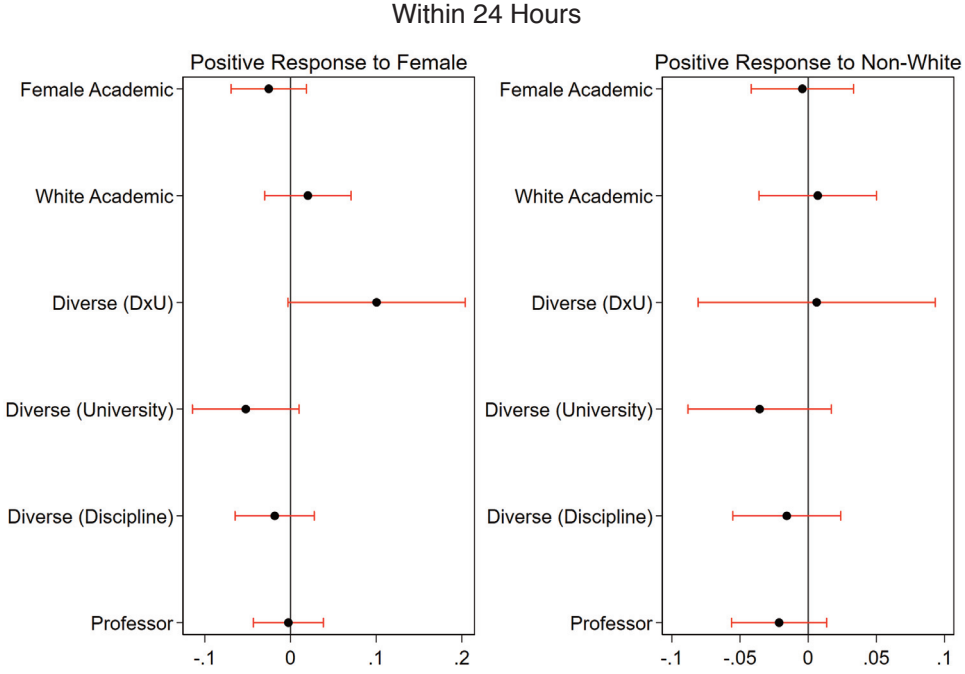
Similarly, the bottom left and right panels do not show any impact on either gender or racial bias when considering the interaction of each type of diversity across institutional levels. Thus, H5a and H5b fail to find any support.

While these results suggest a disconnect between bias and diversity when each characteristic (gender or race) is examined separately, additional exploratory analysis is warranted before making cautious inferences about policy or underlying causal processes. The exploratory analysis below presents additional results that provide a basis for further theorizing, considering overall institutional diversity and academic rank.

Exploratory analysis

This section first examines whether *overall* institutional and disciplinary diversity is associated with reduced bias. We define diversity as having majority-group percentage below the median for males *and* for White faculty. The results (Figure 7) show that overall diversity has a negative association with gender bias (left panel). That is, when both the university and the discipline fall below the median values for majority group dominance, there is a higher rate of positive responses to female prospective students that falls just short of conventional levels of statistical significance (p = 0.057). But there is no effect on the positive response rate to non-White prospective students (right panel).

Figure 7. Overall diversity association to bias



These results are somewhat puzzling since the fact of racial diversity remains disconnected from the evidence in our experiment regarding rates of racial bias. Nevertheless, the connection between overall institutional diversity (at the university and discipline level) and lower rates of gender bias in responses to the fictional students is consistent with an argument that gender bias has to some extent been more effectively addressed in higher education than racial bias. This is explored further in the discussion section.

Figure 8 illustrates the degree of bias across racial and gender treatment groups for Senior Lecturer/Associate Professors (C-D) and for Full Professors (E), respectively. Both groups appear to exhibit some racial bias, but the degree of bias is greater and statistically significant for Full Professors (see SOM for analysis for each treatment group by rank).

Similar analyses break down the audit study data by academics' gender (Figure 9) and race (Figure 10). These show that male and female academics exhibit similar levels of racial bias and a similar absence of statistically significant gender bias (Figure 9), while non-White academics exhibit no negative racial bias and positive

racial-gender bias toward White female prospective students (Figure 10). The negative racial bias appears to sit overwhelmingly with the White academic staff—a notable difference between this study and that of Milkman, Akinola, and Chugh (2015). These patterns deserve further exploration and theorizing.

Figure 8. Positive response rates by academic rank

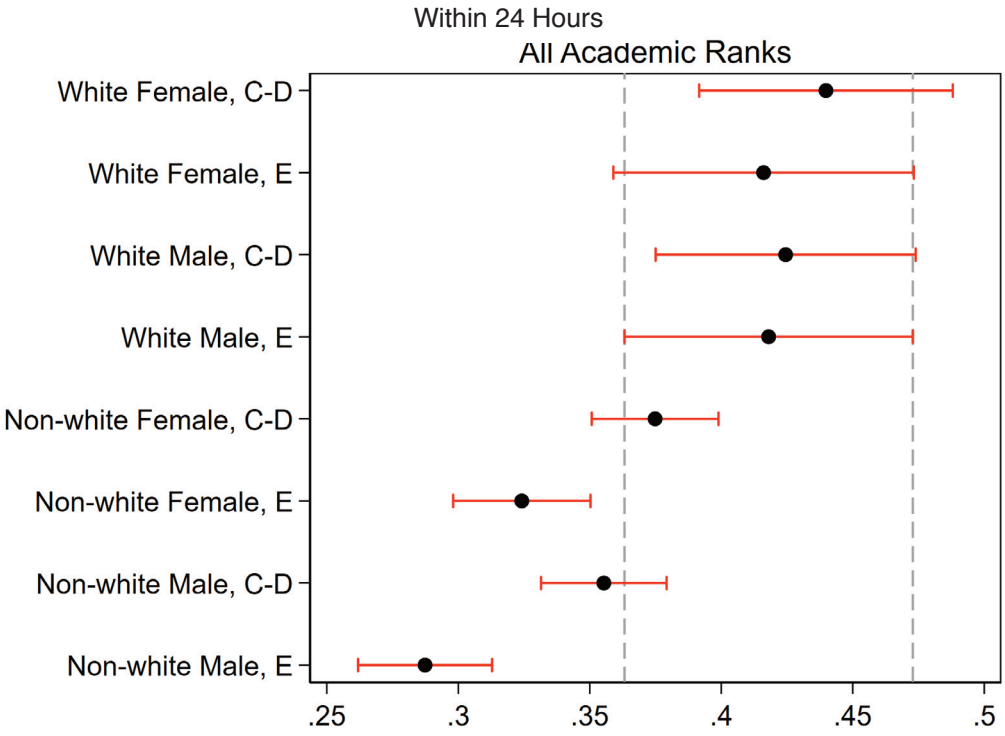


Figure 9. Positive response rates by gender of academic

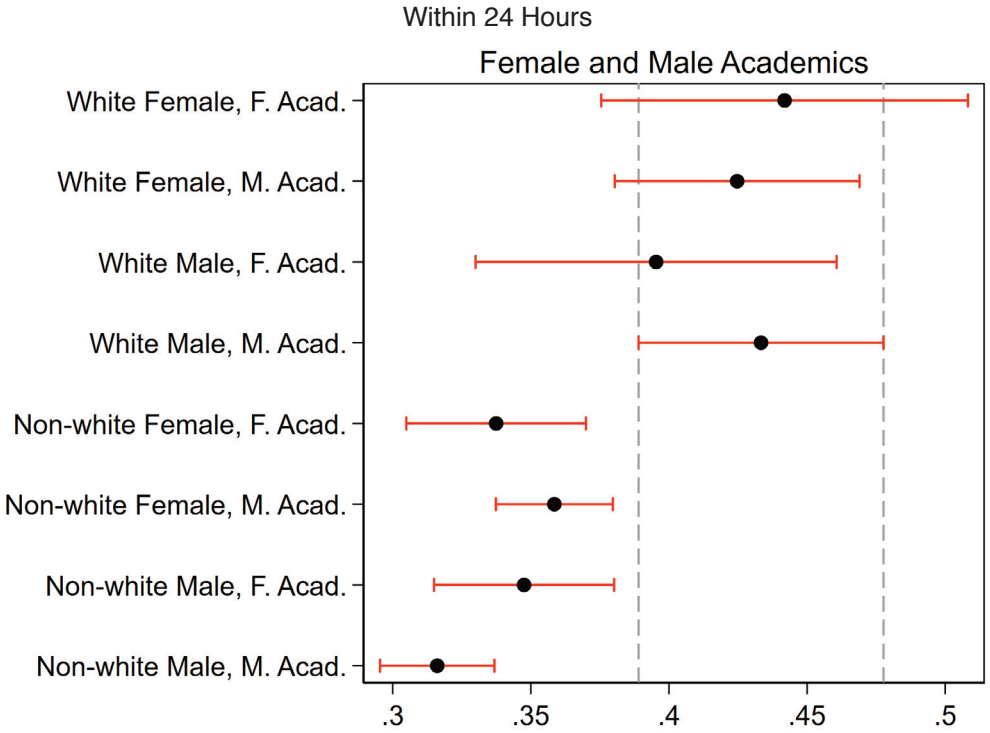
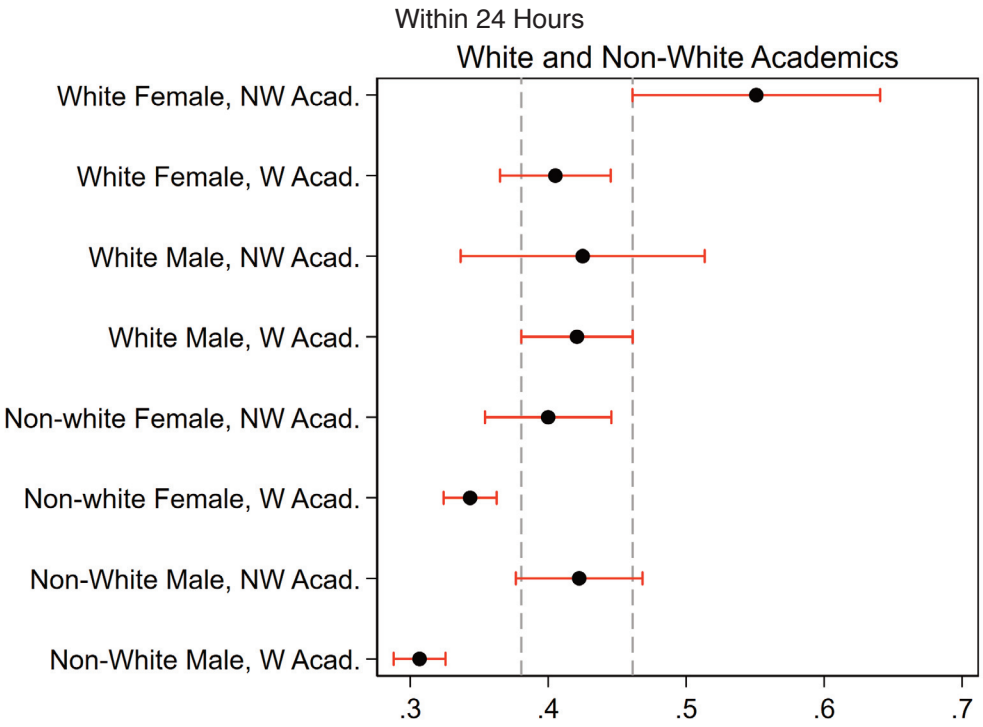


Figure 10. Positive response rates by race of academic



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Conclusions and policy implications

The first conclusion is that the response rates (43.1%) and positive response rates (35.6%) over a 24-hour period are generally high. Australian academics substantively appear open and responsive to all groups. However, there is clear evidence of bias. Contrary perhaps to the relative prominence of the issues in public discussion (e.g., Carrington & Pratt, 2003; Costa & Sawer, 2019), the authors find little evidence of gender bias, but strong evidence of racial bias. Put simply, the most dramatic gap was in the positive response rates to fictitious student Melissa Smith, as compared with Omar al-Haddad. Further, there is no clear association between each type of diversity and a corresponding lower level of bias towards prospective students. Disciplines or universities with greater gender balance do not overall exhibit less gender bias, and disciplines or universities with greater racial diversity do not overall exhibit lower racial bias.

This is surprising and disheartening to the extent that it does not support a virtuous circle between inclusive policies (or outcomes) and attitude change. It may indicate deeper institutional structures that frustrate efforts to achieve equity and diversity. Milkman, Akinola, and Chugh (2015) found that bias was evident among female and non-White U.S. academics. However, the current study also controlled for academics' race and gender and still found no association between diversity and lower incidence of bias (with one possible exception).

The exploratory analysis, however, does suggest paths forward toward better understanding the process of bias reduction in higher education, with implications for higher education policy. The data point to pockets of preferential treatment or 'positive bias' for women in institutional settings of holistic diversity (in this case, both gender and racial diversity). However, the authors find no evidence of an analogous pattern regarding non-White prospective students.

An important factor therefore may be the raising of awareness through multiple channels about male dominance of Australian academia and gender bias and sexism. As noted, there have been efforts to diversify Australian universities. From at least the 1970s, social scientists have pushed for greater gender equity in Australia (Costa & Sawer, 2019; Sawer & Curtin, 2016). It appears that concerted efforts over many years have begun to make a difference and reduce gender bias in Australia's research universities. Evidence from our diversity audit also supports this contention, showing that the gender balance is less unequal below the rank of Full Professor. Evidence for a similar pattern regarding racial diversity is only weakly apparent.

Further, there is evidence of generational variation in bias. Racial bias is most pronounced among Full Professors. Assuming that junior faculty do not become more biased as they rise (either by attrition or attitude change), this suggests a potential slow movement toward reducing racial bias and increasing racial diversity in the Australian academy.

One significant finding that demands further attention is the pronounced bias against male Australian Indigenous names. This reinforces longstanding claims that systemic racism against Indigenous students persists despite institutional claims and efforts to recruit them. As Bodkin-Andrews and Carlson (2016) argue, Aboriginal and Torres Strait Islander peoples have not only been excluded from educational opportunities, but their knowledge and identity have also been marginalized. This marginalization has led some to view educational institutions as sites of cultural violence. Efforts to diversify and retain Indigenous students may pay insufficient attention to this history, attributing Indigenous attrition to social and financial barriers rather than institutional racism or inadequate support. Our findings underscore the need to address ongoing faculty bias and the potential shortcomings of current inclusion strategies for Indigenous students.

There are several implications for policies aimed at reducing gender and racial bias in higher education. First, there can be heterogeneous manifestations of bias, or its reduction, such that substantial bias may exist for some groups, while other types of groups have seen bias reduced. In the Australian case, it seems that racial bias persists, while gender bias does not manifest in this study. Policies aimed at reducing bias should therefore be multifaceted and target the types of bias that empirical examination shows are prevalent, and not (only) general principles of equity and inclusion. For this to be effective, universities must first understand the nature of bias within their institutions.

Second, there is no evidence that more diverse institutional settings regarding a specific group are associated with lower levels of bias toward that group. For example, members of a racially diverse academic discipline are not less likely to exhibit racial bias. This suggests that efforts to attain a "critical mass" of women or racialized faculty or socialization into a diverse environment, including greater contact with diverse colleagues, are not sufficient to reduce bias. Rather, more deliberate and ongoing policies such as training or education might be needed to affect attitudes.

Third, it appears that sustained efforts from within institutions to address gender bias have been successful, while there remains less evidence of such sustained effort to address racial bias and discrimination in the Australian case. We note that efforts

to reduce gender bias were led largely through the spread of norms by scholars, and less so by the introduction of rules by university administrators. The rules eventually came in some areas, such as hiring and promotion practices, to counteract any gender bias, but this tended to follow widespread acceptance of the norm. As far as we are aware, none of the Group of Eight had explicit rules about gender balance in PhD student recruitment at the time of the study. This reaffirms the need for ongoing targeted efforts to reduce racial bias in higher education, as well as reflection on relative resistance to addressing racial bias compared to gender bias.

Fourth, generational change appears to be an effective vehicle for bias reduction. The Level C and D academics in our study exhibit less bias than Level E academics. While creating this generational change in bias reduction is probably beyond the scope of higher education policy, harnessing and reinforcing it is well within that scope. A key policy consideration is how to ensure retention of more junior staff who may not conform to existing norms or culture created by more senior staff.

Ultimately, this research highlights the predominance of White faculty members at all levels of the university and clear evidence of systemic bias against racialized prospective students. Simply hoping for generational change is unlikely to address these signs of systemic bias; evidence suggests that more widespread and wholesale efforts are needed to pursue equity and diversity in the academy.

Notes

1. Higher Education Participation and Partnerships Program (HEPPP). The Indigenous Student Success (ISSP): https://www.universitiesaustralia.edu.au/policy-submissions/diversity-equity/
2. A diversity audit involves descriptive data collection, while an audit study (Gaddis, 2018) is a type of field experiment often used to assess bias.
3. Given that this study includes Australian Indigenous names, it is important to acknowledge the politics of selecting and using "Indigenous sounding" names. Questioning an individual's "Aboriginality" has often been used to diminish or cast doubt on that individual's identity (Hollinsworth et al., 2020). This is in a broader context of White Australian practices and policies that have historically been dominated by efforts to appropriate and subjugate Australian Indigenous identity and culture, including through dispossession, segregation, institutionalization, and the forced separation of children from their families.

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