Gender and Racial/Ethnic Disparities in Rates of Publishing and Inclusion in Scientific Review Processes

Abstract

Sexism and racism in academia have contributed to women and people of color being underrepresented at increasing levels of the academic hierarchy. We investigated whether people with socially marginalized identities experience disparities regarding rates of publishing and inclusion in the scientific review process. Using a sample of academics in psychology departments at research-focused universities in the United States (n = 885), we found gender disparities for PhD holders and racial/ethnic disparities for graduate students. Specifically, female PhD holders and graduate students of color reported fewer publications and were less likely to be included in the scientific review process—compared with male PhD holders and White graduate students, respectively. Differences in research activity by gender and race/ethnicity in a contemporary sample of psychologists reflected a "leaky pipeline" that persists in psychology departments.

Keywords: psychology; sexism; racism; research universities; academic pipeline

Public Significance Statement

Sexism and racism persist in academic settings. Within the context of research-focused universities, women and people of color likely experience barriers that impede their research productivity and exclude them from being involved in the scientific review process.

Introduction

Sexism and racism pervade academic settings. In psychological science, the Society of Personality and Social Psychology (SPSP) recently conducted a Diversity and Climate survey to assess gender and racial/ethnic differences in their organization. According to their report, significantly more women and people of color reported that they "experienced an incident where [they] were treated in a disrespectful or discriminatory manner" at the 2018 academic conference (Garcia et al., 2019, p. 14). Regarding career advancement, women and people of color were more likely to report that they did not have enough opportunities to advance their career, had fewer opportunities to collaborate professionally, and had fewer opportunities to engage in professional networks—compared with men and White people, respectively (Garcia et al., 2019). Barriers such as these can prevent scholars from engaging with research at levels that are expected for career advancement at research universities. Evidencing this, Gruber et al. (2020) detailed how women—particularly women of color—face gaps regarding career advancement (e.g., publication and citation rates), financial compensation, and service assignment and practices. In the present study, we analyzed secondary data to assess whether rates of publication and inclusion in the scientific review process vary by gender and by race/ethnicity.

Sexism and Racism Contribute to a Leaky Academic Pipeline

Sexist and racist attitudes, behaviors, and practices support the supremacy of men and White people over women and people of color and can be subtle or overt (e.g., condescending or offensive comments, power-differential flirtations, exclusion from activities). Sexism and racism in the workplace hinder the professional progress of women and people of color via experiences of marginalization, discrimination, and microaggressions (Marbley et al., 2011). For example, academic settings that are sexist or racist can be a pathway toward women and people of color

leaving. Regarding sexism, Biggs et al. (2018) found that relatively greater sexism at academic conferences (which were more prevalent in conferences with larger men-to-women representation) inhibited women's speaking up at meetings or commenting during presentations—this silencing predicted women's intentions to exit academia. Similarly, racial battle fatigue (i.e., a form of emotional, psychological, and physiological distress resulting from consistent exposure to racial microaggressions and marginalization; Smith et al., 2007) may be associated with leaving academia. Exploring how racial battle fatigue can impede the tenure and promotion process of Black academic faculty, Arnold et al. (2016) found that faculty of color are subjected to entrapments (e.g., institutionalized practices that promulgate inequities), being out of place (e.g., physically out of place from lack of representation and visibility as well as psychologically out of place because of being misunderstood and excluded), and pseudo-policy or hidden directives (e.g., failing to conform to stereotypes, being seen as non-collegial, publishing in "less prestigious" journals because of the specialized research topic that may be largely devalued by the profession as a whole). Overall, sexism and racism at the individual and organizational levels can lead to "leaky academic pipelines" (APA, 2017).

The term leaky academic pipeline typically refers to the underrepresentation of women and people of color at increasing levels of the academic hierarchy (Alper & Gibbons, 1993; APA, 2017; Ceci & Williams, 2011; Estrada et al., 2011; Ginther et al., 2018). Although this underrepresentation from undergraduate to graduate degrees has faded over time, the leaky academic pipeline after earning a doctoral degree persists (Miller & Wai, 2015; National Science Board, 2018). Gasser and Shaffer (2014) proposed a model reflecting women's career development in academia as well as their experiences that may contribute to this "leaky academic pipeline." After first describing the various aspects associated with career development

leading to pursuing a doctoral degree, this model posited that whether women—particularly women of color—progress through the stages of an academic career depends on their academic duties, academic environment, individually centered variables, resources, and social variables (Gasser & Shaffer, 2014). Barriers in each of these domains can impede aspiring academics who are women or people of color at research institutions—examples include greater expectations regarding service and teaching (Harley, 2008), mentoring graduate students with more intense needs (Blake-Beard et al., 2011), and impaired cognitive performance associated with the stress of dealing with microaggressions and discrimination in the workplace (Salvatore & Shelton, 2007). Each of these experiences and others reduce the time, energy, and focus women and people of color are afforded to devote to research. As a consequence, one of the reasons that more women or people of color are not being hired or promoted and are being forced out of research-focused academic settings relatively diminished research production (Bird, 2011; Williams & Ceci, 2015).

Gender and Racial/Ethnic Disparities in Markers of Academic Career Advancement

Publishing research is typically an integral part of career advancement at universities prioritizing research, and inequality in the academy extends to research activity, the publication process, and publication productivity (Boschini & Sjogren, 2007; Smith, 2008). For instance, women are underrepresented as authors in psychology journals relative to the proportion of women in psychology departments (Bird, 2011; West et al., 2013). Further, gender and race/ethnicity are associated with scientific impact of publications and number of publications per year, with women and people of color being disadvantaged (White et al., 2020). Even controlling for impact (i.e., h-index), men are promoted with tenure more quickly than are women (White et al., 2020).

Another potential marker of successful career advancement is inclusion in scientific review processes (e.g., serving on grant review committees, editorial boards). Indeed, lack of inclusion is yet another barrier for women and people of color in academia (Gasser & Shaffer, 2014). In many fields, men continue to be more likely to be on journal editorial boards (e.g., Cho et al., 2014; Metz & Harzing, 2009) and are also more likely to be invited to review papers (e.g., Fox et al., 2015; Lerback & Hanson, 2017). In psychology, the APA (2017) estimated that about 40% of those involved in the scientific review process of its journals are women; however, women only compose 18% of the 50 APA journal editors. Sexist and racist barriers to academic career advancement may manifest in disparities regarding outcomes such as rates of publishing and inclusion in scientific review processes.

Previous work on the gender and racial/ethnic discrepancies across these markers of academic career advancement has primarily inferred people's gender and race/ethnicity based on names or pictures (e.g., Bird, 2011; West et al., 2013; White, 2020), which may not reflect people's actual identities as validly or reliably as self-reported identities. Further, these studies did not capture the age of participants, which is an important potential confounding variable to consider because the academic pipeline has become less "leaky" over time (Gruber et al., 2020; National Science Board, 2018). For example, potential group differences in rates of publishing or inclusion in scientific review processes today may represent a carry-over effect that is the consequence of participants having experienced sexism and racism in the past. We addressed these limitations in the present study.

Present Study

The present study relied on a secondary analysis of data from a larger project aimed at assessing the effects of linguistic sexism in academic writing (Willis & Jozkowski, 2019). That

study focused on academic psychologists recruited from research universities across the United States (US) because previous evidence indicated that peer-reviewed psychology journals had high rates of linguistic sexism (Willis & Jozkowski, 2018). Further, because experience with and exposure to academic writing was relevant to that study, we asked our sample of academic psychologists to report their number of publications and whether they had served as a reviewer or editorial board member for an academic journal.

We used these pre-existing data to examine differences in rates of publishing and inclusion in the scientific review process across gender and race/ethnicity. In addition to providing an updated account, this study extends previous work in two ways: (1) using self-reported data to determine gender and racial/ethnic identity and (2) including age as a covariate to account for potentially disparate generational effects. Expecting to corroborate past work on the effects of sexism and racism regarding academic career advancement, we made the following predictions:

Hypothesis 1: Controlling for age, women would report fewer publications than men and people of color would report fewer publications than White people.

Hypothesis 2: Controlling for age, women would report less involvement in scientific review processes than men and people of color would report less involvement than White people.

Method

Sample and Procedure

In 2018, we recruited participants from all research universities in the US (i.e., R1, R2, and R3 according to the Carnegie Classification of Institutions). For every institution in these categories, we compiled a list of all faculty email addresses provided by the psychology

department websites. We sent each faculty member a recruitment script that included a link to the survey, which directed them to an informed consent page and provided directions for participation. In the recruitment email, we also encouraged faculty members to forward this invitation to their colleagues and graduate students.

Overall, 1,374 academics began participating in this study. The analytic sample comprised academics in the United States who completed measures assessing each of the variables of interest for the present study (n = 885). This sample was 57.5% female (n = 509) and on average 42.1 years old (SD = 14.1). Regarding racial/ethnic identity, 86.0% of participants (n = 761) indicated that they were non-Latinx White or European American. Regarding their career stage, 72.9% were PhD holders (n = 645); the rest were graduate students (n = 240). See Table 1 for further sociodemographic characteristics by subdiscipline in psychology.

The survey was administered online using Qualtrics Survey Software. Participants first read an online informed consent form and indicated their consent by continuing the study. Next, they completed items related to their sociodemographic characteristics and professional academic attainment. Data collected from this study were confidential. All procedures involving interaction with human participants were approved by the university's institutional review board.

Measures

Sociodemographic characteristics. To assess participants' sociodemographic characteristics, we asked them to indicate their age, gender, racial/ethnic identity, and role at the university. Three sociodemographic variables of interest were dichotomized. Gender was coded as women [n = 509] versus men [n = 376]; participants were able to list another gender, but none did. Racial/ethnic identity was coded as people of color (i.e., American Indian or Alaskan Native [n = 7], Asian or Asian American [n = 30], Black or African American [n = 33], Hispanic or

Latin American [*n* = 46], Middle Eastern or Middle Eastern American [*n* = 6], Native Hawaiian or Pacific Islander [*n* = 2], other race/ethnicity [*n* = 10]) versus White people (i.e., non-Latinx White or European American [*n* = 761]). Role at the university was coded as graduate student (i.e., master's student [*n* = 22] or doctoral student [*n* = 218]) versus PhD holder (i.e., postdoctoral researcher [*n* = 13] or faculty member [*n* = 632]). Each of these dichotomous variables were dummy coded: gender (men = 0, women = 1), race/ethnicity (people of color = 0, White = 1), and career stage (graduate student = 0, PhD holder = 1). Age was measured continuously in years. Finally, participants responded to an open-ended that asked them to indicate their subdiscipline in psychology.

Number of publications. We measured number of publications by asking, "How many peer-reviewed research articles have you published?" Participants were specifically asked to provide a number rather than a range.

Inclusion in scientific review processes. We asked, "Which positions have you held for a peer-reviewed academic journal? Select all that apply." Response options included "Reviewer," "Editorial board," and "Editor-in-chief." For graduate students, this variable was dichotomized to indicate whether they have been a reviewer for an academic journal; for PhD holders, it indicated whether they have been involved in the editorial process. We condensed these responses by career stage due to the distribution of responses in our sample: 30.0% of graduate students had been reviewers, but only 0.8% had been involved in the editorial process; 94.0% of PhD holders had been reviewers, but only 56.6% had been involved in the editorial process. As such, there was not adequate variability to test for any associations regarding (1) involvement in the editorial process for graduate students or (2) involvement as a reviewer for PhD holders.

Analysis

Regarding number of publications (i.e., a continuous variable), we ran a Pearson's correlation to test the bivariate association with age, independent samples *t*-tests to test the bivariate associations with gender and race/ethnicity independently, and then regression models to test the concurrent effects of age, gender, and race/ethnicity. The numbers of publications were distributed differently by gender and race/ethnicity; thus, we used Welch's *t*-tests for unequal variances. Further, because this dependent variable (i.e., number of publications) was a count type without negative integers, we used negative binomial regression models (Gardner et al., 1995). Negative binomial models were favored over Poisson models because number of publications was overdispersed—meaning its variance exceeded its mean (Coxe et al., 2009). Unlike Poisson-distributed regression models, a pseudo-R^2 cannot be calculated for negative binomial models (Coxe et al., 2009). Thus, we employed the likelihood ratio test (LRT) to assess the goodness of fit for the model (White & Bennetts, 1996). The LRT test statistic follows a chi-square distribution; a significant test statistic indicates that the addition of a set of predictors resulted in a better model fit than the model that did not include those predictors.

Regarding involvement in peer review (i.e., a dichotomous variable), we ran a point-biserial correlation to test the bivariate association with age, chi-squared tests of independence to test the bivariate associations with gender and race/ethnicity independently, and then a logistic regression model to test the concurrent effects of age, gender, and race/ethnicity.

Because we assessed variables related to professional attainment, we ran analyses separately by career stage: graduate student and PhD holder. All tests were evaluated at an

α-level of .05. We used a Bonferroni correction for each independent samples *t*-test and chi-squared test of independence because we conducted these in pairs; thus, the significance threshold for these tests was set to $p < .025$ (i.e., .05/2). We reported incident rate ratios (IRRs) for the negative binomial regression models and odds ratios (ORs) for the logistic regression models. We also calculated effect sizes: Cohen's *d* for *t*-tests, Cramér's V (φ_C) for chi-squared tests of independence, and Nagelkerke's R^2 (pseudo-R^2) for logistic regressions. Sensitivity power analyses for our hypothesis tests indicated that we were adequately powered to detect the effect sizes reported in this study ($1 - \beta \geq .96$). All analyses were conducted using SPSS 25 or G*Power.

Results

Descriptive statistics for each variable of interest are presented by psychological subdiscipline in Table 1. Based on the participants who identified their subdiscipline ($n = 752$), the five subdisciplines that were most represented in our sample were clinical ($n = 157$; 20.9%), social ($n = 125$; 16.6%), developmental ($n = 88$; 11.7%), cognitive ($n = 80$; 10.6%), and industrial/organizational ($n = 70$; 9.3%) psychology. Further, 99 participants (13.2%) indicated that they work within multiple subdisciplines of psychology. Unfortunately, our cell sizes were not large enough to test the regression models that were designed to answer the present study's research questions by subdiscipline. Therefore, the number of publications and inclusion in scientific review processes were aggregated across subdisciplines and are presented by gender, race/ethnicity, and career stage in Table 2.

Gender and Race/Ethnicity by Career Stage

Regarding gender, 70.8% ($n = 170$) of the graduate students in our sample were women; however, only 52.6% ($n = 339$) of the PhD holders were women. This difference was statistically

significant, $\chi^2(1) = 23.91$, $p < .001$, $\varphi_C = .16$. Regarding race/ethnicity, 19.6% ($n = 47$) of the graduate students in our sample identified as people of color; however, only 11.9% ($n = 77$) of the PhD holders did. This difference was also statistically significant, $\chi^2(1) = 8.49$, $p = .004$, $\varphi_C = .10$.

Female graduate students ($M = 27.4$ years) and male graduate students ($M = 28.1$) were similar in age, $t(238) = 1.03$, $p = .304$, $d = .15$. However, female PhD holders ($M = 44.6$ years) were significantly younger than male PhD holders ($M = 50.62$), $t(599) = 6.22$, $p < .001$, $d = .49$. Gender and race/ethnicity were not significantly associated for either group, χ^2s$(1) \leq .74$, ps $\geq .391$, φ_Cs $\leq .04$.

Hypothesis 1: Number of Publications

Graduate students. The average graduate student reported having 2.86 publications ($SD = 4.57$). For graduate students, age was significantly correlated with number of publications, $r = .35$, $p < .001$. Female graduate students ($M = 2.77$) did not have significantly fewer publications than male graduate students ($M = 3.09$), $t(85) = .38$, $p = .705$, $d = .06$. But graduate students of color ($M = 1.32$) had significantly fewer publications than White graduate students ($M = 3.24$), $t(224) = -4.51$, $p < .001$, $d = .52$.

In a negative binomial regression model that included age, gender, and race/ethnicity as predictors of number of publications, age and race/ethnicity were significant, $\chi^2(3) = 42.92$, $p < .001$ (Table 3). Controlling for age and gender, White graduate students published at a rate that was 2.2 times greater than graduate students of color, IRR = 2.24, $p < .001$.

PhD holders. The average PhD holder reported having 47.11 publications ($SD = 58.38$). For PhD holders, age was significantly correlated with number of publications, $r = .49$, $p < .001$. Female PhD holders ($M = 35.04$) had significantly fewer publications than male PhD holders (M

= 60.47), $t(551) = 5.57$, $p < .001$, $d = .44$. Further, PhD holders of color ($M = 33.06$) had significantly fewer publications than White PhD holders ($M = 49.01$), $t(123) = -2.95$, $p = .004$, $d = .31$.

In a negative binomial regression model that included age, gender, and race/ethnicity as predictors of number of publications, age and gender were significant, $\chi^2(3) = 280.54$, $p < .001$ (Table 3). Controlling for age and race/ethnicity, male PhD holders published at a rate that was 1.3 times greater than female PhD holders, IRR = 1.34, $p < .001$.

Hypothesis 2: Inclusion in Scientific Review Processes

Graduate students. Regarding involvement in the peer-review process, 30.0% of graduate students reported having been a reviewer for an academic journal. For graduate students, age was significantly correlated with being a reviewer, $r = .16$, $p = .014$. Female graduate students (28.8%) were as likely as male students (32.9%) to report being a reviewer, $\chi^2(1) = .38$, $p = .535$, $\varphi_C = .04$. But graduate students of color (10.6%) were significantly less likely to report being a reviewer than White graduate students (34.7%), $\chi^2(1) = 10.43$, $p = .001$, $\varphi_C = .21$.

In a logistic regression model that included age, gender, and race/ethnicity as predictors of having been a reviewer, age and race/ethnicity were significant, $\chi^2(3) = 17.71$, $p < .001$, pseudo-$R^2 = .10$ (Table 4). Controlling for age and gender, White graduate students were 4.5 times more likely than graduate students of color to have been a reviewer for an academic journal, OR = 4.45, $p = .003$.

PhD holders. Regarding involvement in the peer-review process, 56.6% of PhD holders reported having been editor-in-chief or on an editorial board for an academic journal. For PhD holders, age was significantly correlated with being involved in the editorial process, $r = .30$, $p <$

.001. Female PhD holders (49.6%) were significantly less likely to report being involved in the editorial process than male PhD holders (64.4%), $\chi^2(1) = 14.38$, $p < .001$, $\varphi_C = .15$. But PhD holders of color (55.8%) were not less likely to report being involved in the editorial process than White PhD holders (56.7%), $\chi^2(1) = .02$, $p = .888$, $\varphi_C = .05$.

In a logistic regression model that included age, gender, and race/ethnicity as predictors of having been editor-in-chief or on an editorial board, age and gender were significant, $\chi^2(3) = 65.06$, $p < .001$, pseudo-$R^2 = .13$ (Table 4). Controlling for age and race/ethnicity, male PhD holders were 1.5 times more likely than female PhD holders to have been involved in the editorial process for an academic journal, OR = 1.45, $p = .029$.

Discussion

Sexist and racist barriers continue to impede the academic career advancement of women and people of color (i.e., the academic pipeline continues to leak). These barriers can lead to disparities regarding publications in peer-reviewed journals, which are vital for graduate students to progress in research-focused academic positions and for those in faculty positions to achieve successful tenure or promotion at research institutions (Boyer, 1990; Hancock et al., 2013). Attitudes and beliefs grounded in sexism and racism may also prevent the inclusion of women and people of color in important aspects of scientific review processes. Based on data from psychology faculty and graduate students, we found that women and people of color reported diminished experience with scholarly activities that are traditionally valued in academia. That we found these disparities to be significant even while controlling for age suggests that they are not carry-over effects from a problem of the past (Miller & Wai, 2015; National Science Board, 2018). Therefore, sexism and racism continue to negatively affect aspiring scholars and established academics who are women or people of color.

Regarding gender, we did not find evidence that female graduate students differed from their male peers on number of publications or involvement in peer review, but we found that female faculty members and postdoctoral researchers reported fewer publications and were less likely to have been on an academic journal's editorial board compared with their male colleagues. That we only found evidence of gender disparities after graduate school reflects an ongoing discussion on the barriers women face with regard to becoming and remaining academic faculty members. There is evidence that gender differences in academic advancement after graduate school likely are not due to research topics; women and men undertake similar research topics within psychology (König et al., 2015) and report similar levels of research interest and competence (van Anders, 2004). Instead, women are subjected to specific barriers after earning their doctoral degree, according to Gasser and Shaffer's (2014) model of academic career advancement. For example, this model posited that systematic gender differences in academic duties can impede women's research productivity. Indeed, female faculty members are pressured—internally and externally—to devote disproportionally greater time commitments to the roles of teaching and committee work (West et al., 2013) as well as advising and mentoring (Hanasono et al., 2019). Societal barriers such as gendered expectations regarding household duties and parenting as well as poor policies regarding maternity and family leave further inhibit women's academic career advancement. Indeed, women are more likely to report that plans for parenthood negatively affect their intention to pursue an academic career even though men are as likely to plan to have children (van Anders, 2004). These gendered barriers and others (e.g., sexist academic environment, individually centered variables, access to resources; Gasser & Shaffer, 2014) may explain why women in our study had published fewer articles than men and were less likely to have been included in scientific review processes.

As for race/ethnicity, that 86% of our sample identified as White corroborates previous evidence that only one in 10 clinical psychology faculty members were people of color (White et al., 2020). Further, we found that graduate students of color reported diminished experience with publishing and inclusion in the scientific review processes compared with their White peers, but these racial/ethnic disparities did not persist after earning a doctorate degree. In graduate school, such opportunities are largely a function of mentorship; students who receive strong research mentorship are more involved in scientific activities valued by the academy than those who do not receive such mentorship (Hollingsworth & Fassinger, 2002). While faculty of color tend to attract and mentor more graduate students of color (Brunsma et al., 2017), the impetus to reduce racist barriers to the career progression of graduate students of color should not rest on these faculty members alone. Rather, larger academic structures (e.g., universities and academic research organizations) must aim to support the career advancement of all graduate students and promote environments that support people of color. Evidencing the work that continues to be needed in this regard, results from SPSP's Diversity and Climate survey indicated that people of color felt as though their identity was devalued by SPSP more than White people (Garcia et al. 2019). Researchers have demonstrated that White faculty members can be effective mentors for students of color and posited that matching students with mentors based on personality characteristics as well as needs and wants may be better than relying on sociodemographic variables like race/ethnicity (Blake-Beard et al., 2011).

Recommendations

While the present study's data only demonstrate gender and racial/ethnic disparities in two aspects of a much more complex process that is academic career advancement, other researchers have proposed several mechanisms by which the academic pipeline continues to leak

as well as corresponding ways to patch said pipeline. In addition to Gasser and Shaffer's aforementioned theoretical model, Liu et al. (2019) described primary barriers at three key stages of the academic pipeline (i.e., selection, retention, promotion) and reviewed potential interventions for each. First, implicit biases (e.g., gendered and racial/ethnic stereotypes) in the academic hiring process that favor men and White people may be reduced via implicit bias training, targeted hiring, and increasing search committee diversity. However, the latter increases burden on women and faculty of color who may be underrepresented in departments and, thus, disproportionately asked or expected to serve in this service capacity. Once hired, faculty members who are women or people of color may be isolated within their academic community because their scholar identities are overshadowed by their gender or ethnic identities, which differ from those of the stereotypical scientist (i.e., a White man). Liu et al. (2019) suggested that interventions to reduce this barrier to retention include creating social support networks and mentorship programs. Finally, these researchers discussed how institutional administrative expectations (e.g., additional service obligations) can impede the promotion of academic faculty who are women or people of color. To address this barrier, Liu et al. (2019) recommended establishing transparent and equal workload distributions and highlighted the problems with endorsing strategies such as expecting women or faculty of color to simply refuse additional service requests or formally rewarding service work. Future work should examine the effectiveness of these proposed interventions at improving outcomes related to the academic career advancement of women and people of color (e.g., rates of publishing, inclusion in scientific review processes).

Limitations

Many of our study's strengths have corresponding limitations. The self-reported data we collected complemented bibliometric data used in previous studies on similar topics (e.g., Bird, 2011; West et al., 2013, White et al., 2020). But self-reported data on professional outcome attainment—like all self-reported data—are subject to biases such as social desirability and memory errors. For example, it may be that male PhD holders and White graduate students are more likely to over-report their number of publications and inclusion in scientific review processes—or that female PhD holders and graduate students underreport. Further, while our analyses benefited from having age as a covariate, years in the profession would have been a better control variable (Miller & Wai, 2015).

We only assessed two types of marginalized identities and were unable to adequately assess their intersection due to restricted statistical power. However, because our descriptive statistics indicated that PhD holders who were women of color reported the lowest frequencies regarding number of publications and inclusion on editorial boards, further work on this intersection of gender and race/ethnicity is warranted—especially because the compounding systematic disadvantages from intersecting marginalized identities compose a key mechanism for why women face various gender gaps in psychological science (Gruber et al., 2020). Future research on disparities in academia should also investigate differences in scholarly activities based on other underrepresented identities. For example, previous research suggests that sexual orientation and gender identity minorities are less represented than expected in scientific disciplines (Hughes, 2018). Other social groups that experience structural barriers regarding career advancement as an academic include disability identity, parental status, and socioeconomic status (Garcia et al., 2019).

Next, the present study relied on a secondary dataset that only included two potential markers of academic career advancement (i.e., publishing and inclusion in scientific review processes). Future studies should be specifically designed to investigate the barriers women and people of color face along the academic pipeline, as well as related outcomes and effectiveness of potential interventions. For example, other markers of academic career advancement that are afflicted by gender and racial/ethnic disparities include authorship order (West et al., 2013) and research funding (Bornmann et al., 2007; Ginther et al., 2018).

Finally, our findings are only generalizable to psychology departments at research universities in the United States. Faculty expectations regarding research activity are certainly different at other types of universities and in other departments. Further, the academic culture in the United States (1) pressures academics to publish, (2) relies more on early career researchers, and (3) encourages long-distance collaborations (Fanelli et al., 2017). It might be that gender and racial/ethnic disparities manifest differently in other parts of the world.

Conclusion

Sexist and racist barriers to academic career advancement likely persist given the disparities we found in the present study even after controlling for age. Until research universities and their psychology departments acknowledge these barriers and effectively implement more equitable policies, the academic pipeline may continue to leak women and people of color after they earn their doctorate degrees.

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Table 1

Descriptive Statistics by Subdiscipline in Psychology

Subdiscipline	*n*	Age *M* (*SD*)	PhD holder *n* (%)	Women *n* (%)	People of Color *n* (%)	Publications *M* (*SD*)	Peer Reviewer *n* (%)	Editorial board *n* (%)
Clinical	157	39.5 (13.4)	100 (63.7)	101 (64.3)	21 (13.4)	35.8 (67.0)	105 (66.9)	58 (36.9)
Social	125	40.1 (13.9)	89 (71.2)	73 (58.4)	21 (16.8)	27.5 (44.2)	99 (79.2)	43 (34.4)
Developmental	88	41.9 (12.1)	70 (79.5)	67 (76.1)	15 (17.0)	26.7 (28.6)	71 (80.7)	36 (40.9)
Cognitive	80	46.6 (13.7)	71 (88.8)	29 (36.3)	6 (7.5)	45.1 (61.6)	74 (92.5)	45 (56.3)
Industrial	70	36.0 (13.0)	32 (45.7)	40 (57.1)	16 (22.9)	15.3 (27.4)	42 (60.0)	20 (28.6)
Bio-/Neuro-	40	43.1 (13.2)	29 (72.5)	20 (50.0)	2 (5.0)	35.2 (30.6)	32 (80.0)	16 (40.0)
Education	16	37.4 (13.1)	10 (62.5)	11 (68.8)	3 (18.7)	8.6 (15.8)	7 (43.8)	2 (12.5)
Experimental	16	43.6 (15.8)	11 (68.8)	6 (37.5)	2 (12.5)	43.2 (65.3)	10 (62.5)	4 (25.0)
Health	14	44.4 (16.3)	11 (78.6)	11 (78.6)	2 (14.3)	65.6 (136.2)	11 (78.6)	5 (35.7)
Forensic	12	43.6 (15.8)	7 (58.3)	9 (75.0)	2 (16.7)	18.8 (28.0)	7 (58.3)	4 (33.3)
Quantitative	9	46.0 (17.5)	9 (100.0)	2 (22.2)	1 (11.1)	37.6 (37.4)	9 (100.0)	4 (44.4)
Personality	7	44.3 (20.0)	4 (57.1)	1 (14.3)	0 (0.0)	89.7 (88.5)	6 (85.7)	4 (57.1)
Community	7	40.6 (14.0)	4 (57.1)	5 (71.4)	2 (18.6)	16.9 (15.1)	6 (85.7)	3 (42.9)
Multiple	99	39.6 (12.3)	74 (74.7)	49 (49.5)	15 (15.2)	38.0 (47.2)	79 (79.8)	48 (48.5)
Other	26	45.3 (16.7)	19 (73.1)	16 (61.5)	6 (23.1)	36.1 (47.4)	20 (76.9)	14 (53.8)
Not Identified	133	49.4 (14.7)	105 (88.2)	69 (58.0)	14 (8.4)	49.0 (55.5)	99 (83.2)	61 (51.3)
TOTAL	**885**	**42.1 (14.1)**	**645 (72.9)**	**509 (57.5)**	**124 (14.0)**	**35.1 (53.6)**	**677 (76.5)**	**367 (41.5)**

Table 2

Descriptive Statistics for Professional Attainment by Gender, Race, and Career Stage

Outcome Variable	Sociodemographic Identity	Graduate Students (n = 240)	PhD Holders (n = 645)
Number of Publications *M* (*SD*)	Woman of color	1.6 (1.7)	23.6 (23.0)
	Man of color	0.6 (0.8)	45.6 (56.5)
	White woman	3.1 (3.7)	36.7 (50.2)
	White man	3.6 (7.1)	62.3 (66.7)
Served as a Peer Reviewer *n* (%)	Woman of color	3 (8.6)	39 (88.6)
	Man of color	2 (16.7)	28 (84.8)
	White woman	46 (34.1)	275 (93.2)
	White man	21 (36.2)	263 (96.3)
Served on an Editorial Board *n* (%)	Woman of color	0 (0.0)	20 (45.5)
	Man of color	0 (0.0)	23 (69.7)
	White woman	1 (0.7)	148 (50.2)
	White man	1 (1.7)	174 (63.7)

Note. Women of color (n = 79). Men of color (n = 45). White women (n = 430). White men (n = 331).

Table 3

Negative Binomial Regression Analysis of Age, Gender, and Race to Predict Number of Publications

	Graduate Students (n = 240)				PhD Holders (n = 645)			
Predictor	*B* (*SE*)	95% CI	IRR	*p*-value	*B* (*SE*)	95% CI	IRR	*p*-value
Step 1								
Age	.08 (.02)	[.04, .11]	1.08***	<.001	.04 (.00)	[.04, .05]	1.05***	<.001
Gender	.15 (.17)	[-.18, .48]	1.16	.369	-.30 (.07)	[-.43, -.16]	.74***	<.001
Race	.81 (.21)	[.40, 1.23]	2.25***	<.001	.14 (.10)	[-.06, .35]	1.15	.165

Note. B = unstandardized coefficient; *SE* = standard error; 95% CI = 95% confidence interval for the unstandardized coefficient; IRR = incident rate ratio. Reference group was men for gender and people of color for race/ethnicity.

***$p < .001$.

Table 4

Logistic Regression Analysis of Age, Gender, and Race to Predict Involvement in Peer Review

	Graduate Students (n = 240)				PhD Holders (n = 645)			
Predictor	*B* (*SE*)	OR	95% CI	*p*-value	*B* (*SE*)	OR	95% CI	*p*-value
Step 1								
Age	.07 (.03)	1.07*	[1.01, 1.13]	.025	.05 (.01)	1.05***	[1.04, 1.07]	<.001
Gender	-.12 (.32)	.89	[.48, 1.65]	.699	-.37 (.17)	.69*	[.49, .96]	.029
Race	1.49 (.50)	4.45**	[1.67, 11.86]	.003	-.18 (.26)	.77	[.51, 1.38]	.478

Note. B = unstandardized coefficient; *SE* = standard error; 95% CI = 95% confidence interval for the unstandardized coefficient; OR = odds ratio. Reference group was men for gender and people of color for race/ethnicity.

*$p < .05$; **$p < .01$; ***$p < .001$.