Received: 20 April 2020 | Revised: 16 June 2020 | Accepted: 3 July 2020

DOI: 10.1002/jclp.23029

WILEY

RESEARCH ARTICLE

Race, gender, and scholarly impact: Disparities for women and faculty of color in clinical psychology

Susan W. White | **Mengya Xia** | **Gabrielle Edwards**

Department of Psychology, Center for Youth Development and Intervention, University of Alabama, Tuscaloosa, Alabama, USA

Correspondence
Susan W. White, 200 Hackberry Lane, 101 McMillan Bldg., Tuscaloosa, AL 35487 USA.
Email: Swwhite1@ua.edu

Abstract

Objective: We sought to determine if gender and race are associated with scientific impact, scholarly productivity, career advancement, and prestige.

Methods: Publicly available data on publications, h-index, advancement, and prestige were assessed across core faculty in all American Psychological Association-accredited clinical psychology programs at R1 institutions in the United States (87 programs, 918 scientists).

Results: There were significant effects of both gender and race on productivity and impact, which were most apparent among the most senior faculty. Men and white faculty in associate and full professor ranks had higher scholarly productivity and impact. Among associate professors, men were more likely to get tenure earlier, even when controlling for scientific impact (h-index). Neither gender nor race was associated with prestige among full professors.

Conclusion: These findings, along with under-representation of non-White faculty across levels (11.2%) and women at the full professor level (42.8%), suggest disparities in academic clinical psychology that must be addressed.

KEYWORDS

diversity, gender, inequity, race, scientific impact

1 | INTRODUCTION

Historically, female and non-White psychologists have been underrepresented in science (Burrelli, 2008). There are systems and policies in place in academic psychology, like all facets of society, which maintain racism and sexism. Structural sexism and racism can encompass institutional policies and procedures that, usually quite unintentionally, perpetuate gender and race inequity in pay, status, and prestige (Homan, 2019). Such processes and policies in academia may include, among others, requirements for faculty of color on search committees regardless of expertise fit with the search, an assumption of equivalence (neutrality) across faculty with respect to non-work demands, and use of impact metrics (e.g., h-index) in promotion decisions without consideration of approved "stop the clock" periods.

Investigations of gender and racial inequity, in relation to productivity and impact in academia, have been conducted in nearly all subdisciplines of psychology and have included multiple metrics (e.g., number of publications, field advancement). Findings with respect to gender's effects have not been entirely consistent, but have generally suggested that gender inequity exists. For instance, although the majority of psychology PhDs are earned by women, women are not proportionally represented in the highest ranks of academia (Geraci, Balsis, & Busch, 2015). Among researchers in Spain, females were less frequently either first or corresponding author, than would be expected based on the representation in the field (Barrios, Villarroya, & Borrego, 2013). Using a random sample of tenured professors at the Associate or Full Professor level, a gender effect on h-index has been found, with males having a higher mean h-index (Geraci et al., 2015). Among industrial and organizational psychologists, there is evidence that males have higher publication output (König, Fell, Kellnhofer, & Schui, 2015). Nosek et al. (2010) found that, among social/personality psychologists, gender/race accounted for 2% of the variance in impact. Women and minority faculty were also less frequently in senior (full professor) positions. Recent research has shown that publication gender gap in psychology persists, especially when considering nuances in how one publishes, with the gap being widest within high-impact journals and at the last-author position (Odic & Wojcik, 2019). Other research, however, has found no gender difference in scholarly productivity among school psychologists, once seniority (rank) was considered (Watkins & Chan-Park, 2015). Watkins and Chan-Park concluded that gender was not a major influence on research productivity; however, in the context of other research indicating greater attrition with advancing career stage among women (Huang, Gates, Sinatra, & Barabási, 2020), it seems plausible that the effect of gender may not be fully appreciated when examining productivity *only* within-rank.

There is evidence that many subdisciplines of psychology are gradually becoming more gender diverse (Watkins & Chan-Park, 2015). In a study published just over a decade ago (Stewart, Wu, & Roberts, 2007), among the 70 most productive academic clinical psychologists in the country based on the number of articles published (number of publications in a 5-year period), only nine faculty (12.8%) were women. Recent estimates indicate there are approximately three female graduate students in psychology for every male (Fowler et al., 2018), reflecting a decade-long trend of women being more likely to enter the discipline and seek advanced degrees (Burrelli, 2008) and Watkins and Chan-Park (2015) found more female than male faculty at the ranks of assistant and associate, but not full professor. There are also indications that the field is on a trajectory toward greater gender equality with respect to productivity, prestige, and impact (Barrios et al., 2013; König et al., 2015), as evidenced by research showing lack of a gender effect when examining these metrics among graduate students (König et al., 2015). Collectively, these findings may suggest a cohort effect, or possibly just reflect life stage differences in men and women (e.g., women taking on more extra-career responsibilities after tenure), which may perpetuate across cohorts. Regardless, with greater diversification, inequities in eminence and productivity may shrink in the coming years. Unfortunately, relative to evidence of greater gender diversification, the research base on increasing racial diversification is scant.

In contrast to the sizeable research on the gender gap in academia generally, and psychology specifically, there has been very limited research on the influence of race/ethnicity. White faculty have been found to exert greater scholarly impact than non-Whites (Nosek et al., 2010), which is consistent with findings from other disciplines

indicating that race is associated with academic productivity. In criminology, African American authors have been found to be underrepresented in scholarly journals (del Carmen & Bing, 2000). Across disciplines, African Americans and Hispanics are underrepresented, relative to census statistics (Blackburn, Wenzel, & Bieber, 1994). Indeed, racial and ethnic minorities comprise less than one-fifth of the psychology workforce, although the field is becoming more diverse (American Psychological Association [APA], 2015). It is important to consider gender and race intersectionally, given they may exert compound of additive effects on impact. For instance, whereas women are the minority in the STEM fields of science, technology, engineering, and mathematics, making up just 26% of tenured STEM faculty, only 2% of tenure track or tenured faculty are women of color (Ginther & Kahn, 2012). Given this, it is plausible that women who are in a racial or ethnic minority group face a compound challenge with respect to academic inequity.

To the authors' knowledge, prior work has not examined the effects of gender and race on multiple indices of scientific impact among faculty in clinical psychology. Across specializations, clinical graduate programs are among the most female-dominated; approximately 78% of doctoral students in clinical programs are female (Fowler et al., 2018). As the discipline of clinical psychology grows more racially diverse and female-dominated, it is important to understand to what degree gender and race might influence professional advancement. If disparities are found to exist, such information will hopefully inform possible changes in policies and structures that might perpetuate inequity.

The goal of this study was to determine the degree to which gender and race play a role in scholarly impact. By examining scholarly productivity (i.e., publications), advancement (i.e., time to advancement/tenure, time to full), prestige (i.e., distinguished or endowed position), and impact (h-index) within-rank, we can examine potential cohort effects. For instance, perhaps gender has less import at the assistant level, given that younger psychologists are more likely to be female and minority (APA, 2015). Our goal, therefore, was to test gender and race effects on productivity, impact, career advancement, and prestige in three groups: assistant, associate, and full professor. We hypothesized that race and gender would explain statistically significant variance in impact, productivity, advancement, and prestige at the associate and full professor levels. We did not make similar a priori hypotheses about the assistant professor level, given prior research showing greater diversity at the assistant level and lack of gender effects among graduate students (König et al., 2015).

2 | METHOD

2.1 | Sample

Consistent with prior research, we focused only on tenured or tenure-track (as of August 1, 2019) core faculty (with Ph.D., Psy.D., or M.D.) in clinical psychology Ph.D.-granting institutions. Retired or emeritus faculty and adjunct, teaching-only, research-only, or clinical-only faculty were not included. Given the focus on research productivity and impact among academic researchers, we limited the search to institutions that were designated by Carnegie and Mellon as "R1" institutions in 2018 (n = 131), of which 87 institutions have an APA-accredited clinical psychology program that grants the Ph.D. (updated August 21, 2019). We used the core faculty in these 87 clinical psychology programs as our analytic sample (n = 918).

2.2 | Metrics and data collection

There are many possible indicators of scholarly impact one can identify in the literature. We identified four constructs and five specific indicators: Scholarly productivity (1: Average per-year publications), scientific impact (2: h-index), advancement (3: Years to tenure following degree; 4: Years to full professor following degree), and prestige (5: Named/endowed position). The *average number of publications per year* (following year in which terminal

degree was awarded) is the indicator of productivity. The *h-index* was developed to provide a metric via a single number that captures productivity and impact based on the number of citations (Hirsch, 2005). These two indicators were gleaned from Google Scholar directly.

The third construct is advancement (i.e., *years to tenure* and *years to full professor*). Advancement was measured via (1) years to tenure was calculated using the formula (year of promotion to Associate w/Tenure—Year of Ph.D.) and (2) years to full professor was calculated using the formula (year of promotion to Full—Year of Ph.D.). Given that tenure is typically tethered to promotion to associate in the United States, we inferred that "associate" implied "with tenure," even if not explicitly stated. We were also interested in prestige. Prestige was operationalized as having been, or current being, in a named and/or *endowed* position, or holding a *distinguished* professorship (1 = *yes*, 0 = *no*). Years to tenure, years to full professor, and having endowed position were gleaned from publicly available curriculum vitae (CV), which were searched online (e.g., department websites).

Rank information was taken from publicly available CVs and department websites, including assistant professor (n = 176), associate professor (n = 260), full professor (n = 479), and missing (n = 3). Gender and race were determined based on judgments of physical characteristics from images posted on publicly available department websites. In cases in which either gender or race was ambiguous, the consensus among the authors was achieved. Gender was coded as binary: Female (0) or male (1); one faculty's gender was unavailable, and was coded as missing. Race was operationalized as (1) Black (n = 40, 4.4%), (2) White (n = 809, 88.1%), (3) Asian (n = 37, 4.0%), (4) Hispanic (n = 24, 2.6%), (5) other/unknown (n = 2, 0.2%) when a judgment could not be made confidently and missing when race information was unavailable (n = 6, 0.7%). Because the determination of others' gender and race, based on publicly available data alone, can be flawed, using a randomly selected subsample (n = 93), we compared our derived judgments to any data we could glean from the internet (e.g., CV, website, and personal pronoun list) that would indicate self-identified race or gender. None of the faculty had clearly disclosed race information; of those who disclosed gender data, we had 100% agreement with the described gender, although only 58 faculty listed any such information about gender. Because of the extremely small subsamples in Black, Asian, Hispanic, and other/unknown categories, our ability to analyze by the group was prohibited. As such, all non-White subjects were recoded into one category, so that race became binary: Non-White (0) or White (1); six faculty's race was coded as missing. Because information on Google Scholar is constantly updating, we pulled all impact metrics in a short period of time to ensure the effect of time was minimal. Data were pulled in a 10-day period from January 4 to January 14, 2020.[1]

2.3 | Data analysis

Whereas much of the prior research has focused only on senior/full professors to draw comparisons (e.g., h-index), in part because the number of women in scientific psychology has only gradually increased, it has been recommended that productivity statistics should be examined within rank (Eagly & Miller, 2016). Moreover, it has been suggested that career stage be considered because women/minorities tend to be at lower levels of advancement, partly as a function of the broadening diversity over time and cohort (Nosek et al., 2010). However, it has been demonstrated that women experience greater attrition with advancing career stage (Huang et al., 2020), which may partly explain why some studies (e.g., Watkins & Chan-Park, 2015) have not found gender effects within the highest career ranks. Therefore, it is important to investigate gender and race effect in the overall sample as well as their effects within rank.

We examined the effects of gender and race on each outcome of interest (i.e., indicators of scholarly productivity, impact, advancement, and prestige) in the overall sample and then by rank (i.e., in subgroups of assistant professor, associate professor, and full professor, respectively) when data is available and analyzable. Specifically, gender and race effects on publication and h-index were analyzed in the overall sample and three subgroups by rank individually. Their effects on years to tenure were analyzed in the overall sample (excluding untenured assistant professor) and then in the subgroups of associate professor and full professor individually. Finally, gender

and race effects on years to full professor and having an endowed position were only analyzed in the full professor subgroup. Years after obtaining Ph.D. were controlled in models estimating publication, h-index, and having endowed position; h-index was controlled when estimating years to tenure and years to full.

Considering there may be variations of gender and race effect on each outcome by institutions, multilevel models were conducted in R version 3.6.1 to account for potential individual nested within institution effects. Multilevel linear regressions in R package "nlme" (Pinheiro, 2020) was used for analyzing gender and race effect on the average number of publications per year, h-index, years to tenure, and years to full, as outcome indicators are continuous variables. Random intercept and only significant random slopes by the institution were estimated in the model with respective outcomes for the sake of model parsimony and optimal model fit. Significant random effect test was done by using "ANOVA" command in "car" package (Fox & Weisberg, 2019). As having endowed position or not was a binary variable, logistic regression was used in the first step to determine significant fixed effects. Then a multilevel logistic regression was used for analyzing gender and race effects on having endowed the position with estimating random effect for intercept and slopes that were significant in the first step. This was done by using "mixed_model" command in R package "GLMMadaptive" (Rizopoulos, 2020), and set model category as binomial.

For each set of analyses, main effect model that included gender, race, and the control variable was estimated in the multilevel model first. Next, an additional interaction term between gender and race was added in the main effect model. If the interaction effect was not significant and its model fit was not better than the main effect model, only the main effect model was reported. Model fit comparison was based on the statistical fit criteria, including Akaike information criterion (AIC; Akaike, 1974) and Bayesian information criterion (BIC; Schwarz, 1978). Lower AIC and BIC indicate a more optimal model fit. We adopt a conventional p value of .05 for statistical significance, but also consider effects that almost approached significance ($p < .065$) within the rank subsample analyses, given lower n within these models.

3 | RESULTS

Table 1 provides descriptive information on all variables in the full sample as well as in assistant professor, associate professor, and full professor groups. In the full sample, 50.8% of the faculty were female, and 11.2% were non-White. As for gender and race distribution within rank, the percentage of female faculty declined with advancing rank: Assistant professor (65.1%), associate professor (56.5%), and full professor (42.8%). Percentages of non-White faculty in assistant professor (13.1%) and in associate professor (13.6%) groups were higher than that in the full professor group (9.2%), $\chi^2(1) = 3.922$, $p = .048$. Regarding outcomes, full professors on average had higher scholarly productivity, greater impact, shorter time to get tenure, and more prestige than an associate professor; associate professors, on average, had higher scholarly productivity, greater impact, and more prestige than assistant professors. Mean publications per year (with standard deviation in parentheses) by level showed an increase with advancing career stage: Assistant: 5.72 (4.15), associate: 5.50 (3.35), and full: 7.70 (5.62).

When comparing model fit between main effect model and the model with interaction terms between gender and race in each set of analyses, the main effect models all appeared to have a better model fit (i.e., lower AIC, BIC). None of the interaction effects in tested models were significant. Therefore, we reported the main effect model results for each domain.

3.1 | Scholarly productivity

Standardized coefficients of multilevel linear regressions on number of publications for the full sample and by rank are shown in Table 2. In the full sample, gender ($\beta = .18$, $p < .001$) and race ($\beta = .14$, $p < .001$) were significant predictors of number of publications per year when controlling for years after obtaining Ph.D. ($\beta = .03$, $p = .409$), with

TABLE 1 Descriptive information for all variables

	Predictors and control variable[a]			Scholarly productivity	Impact	Advancement		Prestige
	Female (*N* = 917)	Non-White (*N* = 912)	Years post-Ph.D. (*N* = 828)	Publications per year (*N* = 669)	h-Index (*N* = 696)	Years to tenure (*N* = 463)	Years to full professor (*N* = 267)	Endowed (*N* = 880)
	% (*n*)	% (*n*)	Mean/Median/*SD*	Mean/Median/SD	Mean/Median/*SD*	Mean/Median/*SD*	Mean/Median/*SD*	% (*n*)
All (*N* = 918)	50.8 (466)	11.2 (102)	21.28/19.00/12.42	6.64/5.38/4.87	38.48/31.00/26.11	7.89/7.00/2.59	14.33/14.00/4.29	18.0 (158)
Assistant (*N* = 176)	65.1 (114)	13.1 (23)	6.86/6.00/3.68	5.72/4.80/4.15	17.51/14.00/11.78	–	–	2.3 (4)
Associate (*N* = 260)	56.5 (147)	13.6 (35)	16.54/14.00/7.65	5.50/4.64/3.35	26.39/25.50/9.37	8.35/8.00/2.74	–	3.9 (10)
Full (*N* = 479)	42.8 (205)	9.2 (44)	29.53/29.00/10.05	7.70/5.93/5.62	54.47/47.00/26.97	7.65/7.00/2.49	14.33/14.00/4.29	32.1 (144)

[a]Female (i.e., gender) and non-White (i.e., race) are predictors of all multilevel models. Years post-PhD is a control variable in the multilevel model when the outcome is an indicator of Scholarly Productivity (i.e., Publications), Impact (i.e., h-index), and Prestige (i.e., Endowed), but it is not a control variable when the outcome is Advancement (i.e., years to full professor).

TABLE 2 Parameter coefficients in each multilevel model

	Publications per year	h-Index	Years to tenure	Years to full professor	Endowed
Full sample ($N = 918$)	β (SE)				B (odds ratio)
Intercept	.01 (0.05)^{r}	.07 (0.05)^{r}	.03 (0.06)^{r}	–	–
Gender	.18** (0.04)^{r}	.09** (0.03)^{r}	.11* (0.05)^{r}	–	–
Race	.14** (0.04)^{r}	.09** (0.03)^{r}	.10 (0.06)^{r}	–	–
Control variable†	.03 (0.04)	.65** (0.04)^{r}	−.23** (0.05)^{r}	–	–
Assistant professor ($N = 176$)	β (SE)				B (odds ratio)
Intercept	.06 (0.10)^{r}	.09 (0.12)^{r}	–	–	–
Gender	.03 (0.08)	.04 (0.06)	–	–	–
Race	.06 (0.08)	.14* (0.06)^{r}	–	–	–
Control variable†	.28** (0.09)^{r}	.42** (0.10)^{r}	–	–	–
Associate professor ($N = 260$)	β (SE)				B (odds ratio)
Intercept	−.11 (0.08)^{r}	.05 (0.08)^{r}	.01 (0.11)^{r}	–	–
Gender	.16* (0.07)^{r}	.15† (0.08)^{r}	−.19* (0.08)^{r}	–	–
Race	.14* (0.06)^{r}	.17* (0.08)^{r}	.19* (0.09)^{r}	–	–
Control variable†	−.47** (0.07)^{r}	.19* (0.09)^{r}	.07 (0.08)	–	–
Full professor ($N = 479$)	β (SE)				B (odds ratio)
Intercept	−.03 (0.06)^{r}	.00 (0.07)^{r}	−.03 (0.06)	−.07 (0.07)^{r}	−4.12** (0.02)^{r}
Gender	.21** (0.06)^{r}	.10* (0.05)^{r}	−.07 (0.06)	−.09 (0.07)^{r}	0.44 (1.55)
Race	.20** (0.05)^{r}	.12* (0.05)^{r}	.03 (0.07)	.07 (0.07)	0.30 (1.34)
Control variable[a]	−.10* (0.05)^{r}	.41** (0.06)^{r}	−.27** (0.06)^{r}	−.35** (0.07)^{r}	0.09** (1.09)^{r}

Note: Superscript letter "r" indicates that the random effect was significant and was estimated in the respective model.

[a]The controlling variable in multilevel models of publications, h-index, and endowment was years after obtaining a Ph.D.; the controlling variable in the multilevel model of advancement (i.e., years to tenure and years to full professor) was h-index.

$^{\dagger}p < .065$.

$^{*}p < .05$.

$^{**}p < .01$.

men and White faculty having more publications. Associations were different when testing within rank. At the level of assistant professor, neither gender ($\beta = .03$, $p = .670$) nor race ($\beta = .06$, $p = .437$) significantly predicted productivity. At the level of associate professor, both gender ($\beta = .16$, $p = .015$) and race ($\beta = .14$, $p = .015$) were associated with productivity, with men and white faculty publishing more. At the level of full professor, both gender ($\beta = .21$, $p = .001$) and race ($\beta = .20$, $p = .002$) significantly predicted the number of publications per year, with men and White faculty having a larger number of publications. In summary, more senior faculty exhibited greater influence of gender and race on their scholarly productivity. Figures 1-3 provide results at each level – assistant, associate, and full.

3.2 | Impact

In the overall sample, gender ($\beta = .09$, $p = .004$), race ($\beta = .09$, $p = .001$), and years after obtaining Ph.D. ($\beta = .65$, $p < .001$) were significant predictors of h-index, with men and white faculty getting a higher h-index. When looking

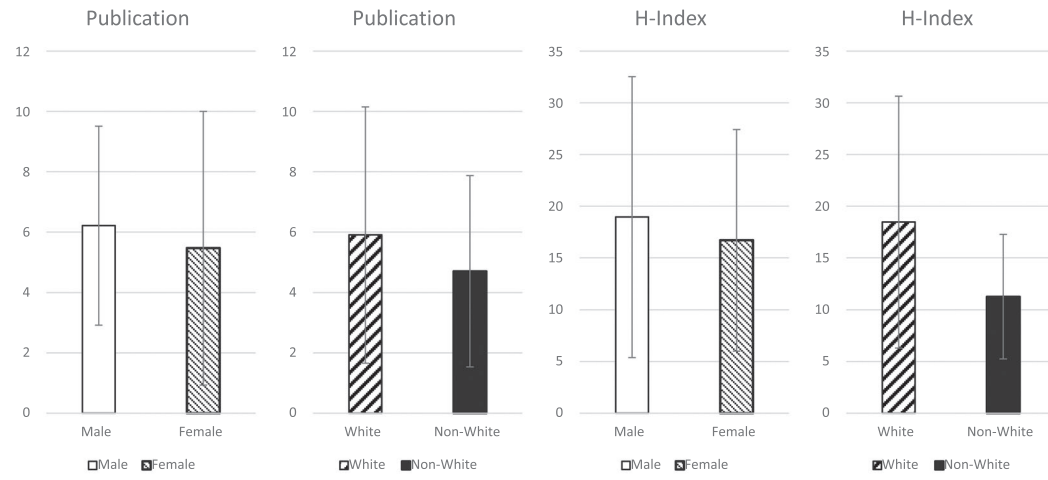

FIGURE 1 Gender and race differences on scholarly productivity and impact at the assistant professor level

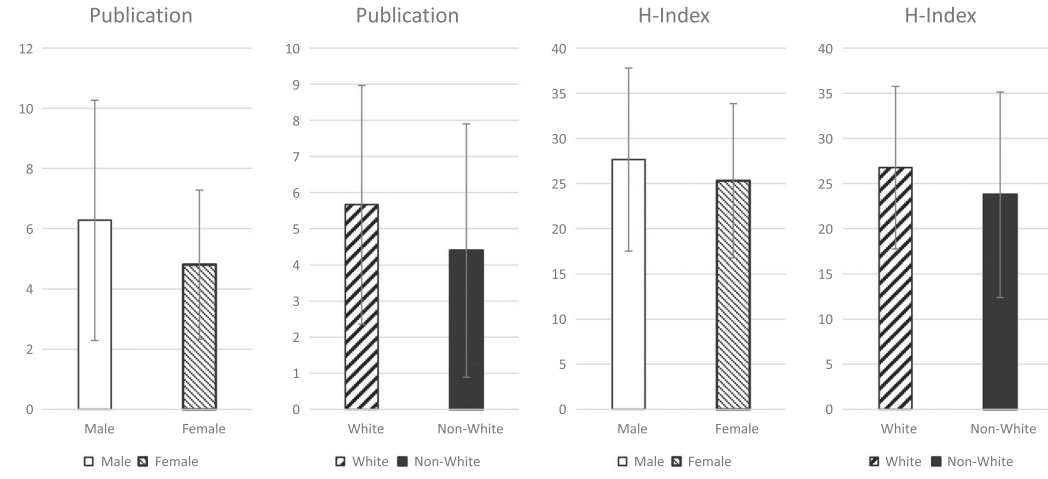

FIGURE 2 Gender and race differences on scholarly productivity and impact at the associate professor level

at the standardized coefficients within rank, race ($\beta = .14$, $p = .014$) significantly predicted h-index in the assistant professor group, but gender ($\beta = .04$, $p = .484$) was not a significant predictor. In the associate professor group, race ($\beta = .17$, $p = .037$) was a significant predictor for h-index, and gender ($\beta = .15$, $p = .063$) was marginally associated with h-index, with men and white faculty having a higher h-index. In the full professor group, both gender ($\beta = .10$, $p = .043$) and race ($\beta = .12$, $p = .019$) significantly predicted h-index, with men and white faculty having a higher h-index than women and non-White faculty. Overall, race's effect on scholarly impact was significant across ranks, and gender's effect seemed to grow with advancing career stage.

3.3 | Advancement

Our first indicator of advancement was years to tenure for associate professor and full professor subgroups. In the overall sample (excluding assistant professor), both gender ($\beta = -.11$, $p = .031$) and h-index ($\beta = -.23$, $p < .001$) were

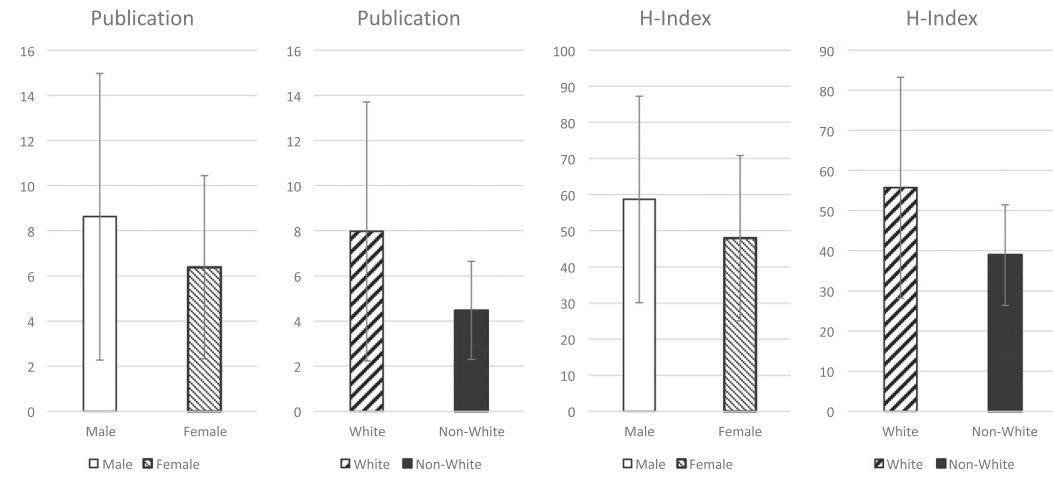

FIGURE 3 Gender and race differences on scholarly productivity and impact at the full professor level

significant predictors of years to tenure, with men obtaining promotion earlier than women, but race was not a significant predictor ($\beta = .10$, $p = .097$). For the standardized coefficients within rank, gender significantly predicted years to promotion (tenure) after receipt of the terminal degree in the associate professor group ($\beta = -.19$, $p = .022$) but not in the full professor group ($\beta = -.07$, $p = .247$). Among associate professors, men obtained promotion earlier than women even when controlling for their scholarly impact (i.e., h-index). Although race was predictive of years to tenure ($\beta = .19$, $p = .040$) in the associate professor group, this result needs to be interpreted with caution. With a nonsignificant correlation between race and years to promotion ($r = .12$, $p = .156$) in the associate professor subsample, it is likely that race's effect in the multiple linear regression was over-estimated when having gender as a confounding variable. With respect to our second indicator of advancement, years to full for full professor, when controlling for h-index ($\beta = -.35$, $p < .001$), neither gender ($\beta = -.09$, $p = .164$) nor race ($\beta = .07$, $p = .323$) significantly predicted years to promotion of full professor after receipt of the terminal degree.

3.4 | Prestige

Unstandardized *B* and odds ratio were reported in the multilevel logistic regression model for full professor. After controlling for years after Ph.D. ($B = 0.09$, $p < .001$), neither gender ($B = 0.44$, $p = .105$) nor race ($B = 0.30$, $p = .563$) significantly predicted past/current possession of endowed position.

4 | DISCUSSION

It can be informative to consider the sociopolitical context in which our benchmarks of academic success and scholarly impact operate. If metrics indicative of impact differ by gender or race/ethnicity, further examination of potential disparities and the reasons that underlie them is warranted. We hypothesized that gender and race would influence scholarly productivity, impact, and prestige at the associate and full levels. Results partially support these hypotheses, with different patterns of inequity across the career stage. There were significant race effects on scientific impact, favoring white faculty, whereas the effects of both race and gender on productivity were apparent primarily at the most advanced career stage. Men and White full and associate professors had more publications per year and higher h-index, although gender's effect at the associate level on h-index was at the trend level.

Although White assistant professors had a significantly stronger impact (h-index) than non-White peers, there were no other gender or race effects within the assistant professor subgroup. At the associate professor level, gender predicted time to promotion with tenure, controlling for h-index.

Across all career stages, impact, as measured by h-index, was associated with race, favoring White faculty. Regarding scholarly productivity, which is tethered to h-index calculation, race and gender predicted the number of publications among full and associate professors. Among associate professors, men were promoted with tenure earlier than were female peers. This is not explained by men's higher impact on average, as h-index was controlled for statistically, which suggests that gender disparity in career advancement exists. We can only speculate on the reasons for gender's effect on productivity and advancement. Prior research has shown that across most disciplines, including psychology, men tend to self-cite more than women (Cameron, White, & Gray, 2016; Eagly & Miller, 2016), which boosts one's citation count and h-index. Additionally, men tend to specialize more than women, and greater scientific specialization is associated with a higher rate of publication (Leahey, 2006). Differential attrition from science by gender must also be considered, as attrition has been, and continues to be, higher for women with advancing career stage (Cameron et al., 2016; Pell, 1996; Xu, 2008). A recent study of over 1.5 million authors across disciplines (e.g., chemistry, psychology, engineering) found that gender differences in productivity are largely attributed to career trajectory, specifically gaps in productivity and dropout from academia among women (Huang et al., 2020). There is some evidence that the combination of sexual dimorphism in self-citation and attrition, or periods of relative inactivity in productivity, contributes to observed gender effects in the academic impact that favor men (Cameron et al., 2016; Mishra, Fegley, Diesner, & Torvik, 2018). Additionally, results are consistent with prior research (Huang et al., 2020) showing greater attrition with advancing career stage for women. The sample as a whole was 50.8% female, which is identical to the proportion of women in the United States (CDC, 2020). However, from assistant to full professor level in this cross-sectional sample, we see a 22% drop in the proportion of female faculty (65.1% of assistant professors and 42.7% of full professors are women), which is consistent with prior research indicating differential attrition by gender with advancing career stage (Huang et al., 2020).

Among full and associate professors, White faculty had more publications per year and a higher h-index than non-White peers. Replication of this finding, and the race effect on productivity, is needed to understand the effects of race among senior-level researchers. Perhaps there is less consideration of diversity issues post-tenure, or diminished support for diverse faculty with advancing career stage. Although race exerted significant effects only for the constructs of productivity and impact, caution in interpretation is urged given limited statistical power. We assert that the mere composition of our sample is concerning and is sufficient impetus for serious consideration of racial disparities in academia in clinical psychology. Only 11.2% of the sample was non-White, which is considerably lower than the US census estimate of 23.5% non-White (CDC, 2020).

Our results speak to the import of academic rank when considering the role of gender and race. The rank of associate professor is considered a midcareer stage in academia and, in the United States, is generally tethered to tenure attainment. For many academics, this career stage can be a professional stalling point and a period of heightened career dissatisfaction with limited professional support (Wilson, 2012). Many associate professors struggle with the juxtaposition of increased demands for service alongside diminished institutional support for research (Baker, Pifer, & Lunsford, 2016). Among women in academia, this career stage also often coincides with new motherhood, and perceived work-life balance is predictive of one's intention to stay in academia (Lindfelt, Ip, Gomez, & Barnett, 2018).

The study's primary limitations relate to data ascertainment, specifically reliance on publicly available data sources. Inferences about both gender and race were made based on photographs and names, the latter only for gender. Although we used a consensus approach to reach agreement on codes, such inferences are certainly not error-proof. Another sample-related limitation is a function of the nature of the tenure “up or out” system. If a person did not get tenure, they would not be in this sample (at the associate or full). This may explain, in part, why some race and gender effects apparent with advancing career stage are not present among assistant professors. Yet another

limitation stems from the constantly changing nature of data (e.g., publications change on a daily basis) and the imperfect nature of online sources (e.g., google scholar). For instance, some faculty update their publicly available CV regularly, whereas others might do so only occasionally. Also, some CVs did not contain all metrics of interest (e.g., administrative positions) and Google Scholar is not error-free. For instance, occasionally an article will be listed twice or a scholar might get "credit" for another's paper by error. Finally, results likely do not generalize to all of academic psychology. We sampled only clinical faculty at R1 institutions, to have some level or equitability or research expectation, given our constructs of interest. These limitations notwithstanding, to the authors' knowledge, this study is the first examination of the effects of gender and race on academic advancement within clinical psychology. It is also the first to examine prestige in addition to productivity, impact, and advancement.

The findings of this study should raise concern among academic clinical psychology programs and faculty. First, the limited number of non-White faculty in our sample is concerning; only approximately one in 10 faculty are non-White. Inadequate representation of faculty of color seems especially problematic for the full professor group, where the non-White faculty are least represented and had a lower h-index and lower publication rate. There is considerable evidence for gender disparities in academic clinical psychology. Women, especially at the associate level, appear to have lower scholarly productivity and impact, and slower career advancement, than men. Inequality and lack of opportunity among faculty and students of color and among women affect academic climate adversely (Williams, 2019). Gender and race inequity is also detrimental to science. The field's representation sends a message about what is valued in clinical science to future, potential scholars in our field. Under-advancement and under-recognition of women and minority faculty may serve to maintain challenges faced by most departments with recruiting promising diverse candidates. It is also conceivable that certain areas of scientific inquiry are overlooked if they are more likely to be relevant to and studied by investigators who are underrepresented proportionally. We encourage departments and institutions to consider gender and diversity equity when making policies about research support, especially for those at the associate rank.

ACKNOWLEDGEMENT

Scientific editing by Timothy Elliott.

ENDNOTES

[1] One department had data downloaded 3-weeks later, in Feb 2020, because of a data collection error.

ORCID

Susan W. White http://orcid.org/0000-0002-6274-3147

REFERENCES

Akaike, H. (1974). A new look at the statistical model identification. *IEEE Transactions on Automatic Control*, *19*(6), 716–723. https://doi.org/10.1109/TAC.1974.1100705

American Psychological Association (APA). (2015). *2005–13: Demographics of the U.S. Psychology Workforce*. Retrieved from https://www.apa.org/workforce/publications/13-demographics/index

Baker, V., Pifer, M., & Lunsford, L. (2016). Faculty challenges across rank in liberal arts colleges: A human resources perspective. *The Journal of Faculty Development*, *30*(1), 23–29.

Barrios, M., Villarroya, A., & Borrego, Á. (2013). Scientific production in psychology: A gender analysis. *Scientometrics*, *95*(1), 15–23. https://doi.org/10.1007/s11192-012-0816-4

Blackburn, R., Wenzel, S., & Bieber, J. P. (1994). Minority vs. majority faculty publication performance: A research note. *The Review of Higher Education*, *17*(3), 271–282. https://doi.org/10.1353/rhe.1994.0017

Burrelli, J. (2008). Thirty-three years of women in S&E faculty positions, *Statistics, 1958 (Table 1)* (pp. 1–10). Arlington, VA: National Science Foundation.

Cameron, E. Z., White, A. M., & Gray, M. E. (2016). Solving the productivity and impact puzzle: Do men outperform women, or are metrics biased? *BioScience*, *66*(3), 245–252. https://doi.org/10.1093/biosci/biv173

del Carmen, A., & Bing, R. L. (2000). Academic productivity of African Americans in criminology and criminal justice. *International Journal of Phytoremediation*, *21*(1), 237–249. https://doi.org/10.1080/10511250000084891

CDC (2020). *United States Census Bureau quick facts*. Retrieved from https://www.census.gov/quickfacts/fact/table/US/PST045219

Eagly, A. H., & Miller, D. I. (2016). Scientific eminence: Where are the women? *Perspectives on Psychological Science*, *11*(6), 899–904. https://doi.org/10.1177/1745691616663918

Fowler, G., Cope, C., Michalski, D., Christidis, P., Lin, L., & Confroy, J. (2018). Women outnumber men in psychology graduate programs. *Monitor on Psychology*, *49*(11).

Fox, J., & Weisberg, S. (2019). *An R companion to applied regression* (3rd ed.). Thousand Oaks, CA: Sage.

Geraci, L., Balsis, S., & Busch, A. J. B. (2015). Gender and the h index in psychology. *Scientometrics*, *105*(3), 2023–2034. https://doi.org/10.1007/s11192-015-1757-5

Ginther, D. K., & Kahn, S. (2012). Education and academic career outcomes for women of color in science and engineering. *In Conference for the Committee on Women in Science, Engineering, and Medicine, Washington, DC*.

Hirsch, J. E. (2005). An index to quantify an individual's scientific research output. *PNAS*, *102*(46), 16569–16572. https://doi.org/10.1073/pnas.0507655102

Homan, P. (2019). Structural sexism and health in the United States: A new perspective on health inequality and the gender system. *American Sociological Review*, *84*(3), 486–516. https://doi.org/10.1177/0003122419848723

Huang, J., Gates, A. J., Sinatra, R., & Barabási, A. L. (2020). Historical comparison of gender inequality in scientific careers across countries and disciplines. *Proceedings of the National Academy of Sciences of the United States of America*, *117*(9), 4609–4616. https://doi.org/10.1073/pnas.1914221117

König, C. J., Fell, C. B., Kellnhofer, L., & Schui, G. (2015). Are there gender differences among researchers from industrial/organizational psychology? *Scientometrics*, *105*(3), 1931–1952. https://doi.org/10.1007/s11192-015-1646-y

Leahey, E. (2006). Gender differences in productivity: Research specialization as a missing link. *Gender and Society*, *20*(6), 754–780. https://doi.org/10.1177/0891243206293030

Lindfelt, T., Ip, E. J., Gomez, A., & Barnett, M. J. (2018). The impact of work-life balance on intention to stay in academia: Results from a national survey of pharmacy faculty. *Research in Social and Administrative Pharmacy*, *14*(4), 387–390. https://doi.org/10.1016/j.sapharm.2017.04.008

Mishra, S., Fegley, B. D., Diesner, J., & Torvik, V. I. (2018). Self-citation is the hallmark of productive authors, of any gender. *PLOS One*, *13*(9), 1–21. https://doi.org/10.1371/journal.pone.0195773

Nosek, B. A., Graham, J., Lindner, N. M., Kesebir, S., Hawkins, C. B., Hahn, C., … Tenney, E. R. (2010). Cumulative and career-stage citation impact of social-personality psychology programs and their members. *Personality and Social Psychology Bulletin*, *36*(10), 1283–1300. https://doi.org/10.1177/0146167210378111

Odic, D., & Wojcik, E. H. (2019). The publication gender gap in psychology. *American Psychologist*, *75*(1), 92–103. https://doi.org/10.1037/amp0000480

Pell, A. N. (1996). Fixing the leaky pipeline: Women scientists in academia. *Journal of Animal Science*, *74*(11), 2843–2848. https://doi.org/10.2527/1996.74112843x

Pinheiro, J., Bates, D., DebRoy, S., Sarkar, D., Heisterkamp, S., Van Willigen, B. (2020). Linear and nonlinear mixed effects models. https://doi.org/10.1080/10618600.1995.10474663

Rizopoulos, D. (2020). GLMMadaptive: Generalized linear mixed models using adaptive gaussian quadrature. R package version 0.6-8. https://CRAN.R-project.org/package=GLMMadaptive

Schwarz, G. (1978). Estimating the dimension of a model. *Annals of Statistics*, *6*(2), 461–464.

Stewart, P. K., Wu, Y. P., & Roberts, M. C. (2007). Top producers of scholarly publications in clinical psychology Ph.D. programs. *Journal of Clinical Psychology*, *63*(12), 1209–1215. https://doi.org/10.1002/jclp.20422

Watkins, M. W., & Chan-Park, C. Y. (2015). The research impact of school psychology faculty. *Journal of School Psychology*, *53*(3), 231–241. https://doi.org/10.1016/j.jsp.2015.03.003

Williams, M. T. (2019). Adverse racial climates in academia: Conceptualization, interventions, and call to action. *New Ideas in Psychology*, *55*, 58–67. https://doi.org/10.1016/j.newideapsych.2019.05.002

Wilson, R. (2012). Why are associate professors some of the unhappiest people in Academe?—Faculty—*The Chronicle of Higher Education* (p. 1). Retrieved from https://www.chronicle.com/article/Why-Are-Associate-Professors/132071

Xu, Y. J. (2008). Gender disparity in STEM disciplines: A study of faculty attrition and turnover intentions. *Research in Higher Education*, *49*(7), 607–624. https://doi.org/10.1007/s11162-008-9097-4

How to cite this article: White SW, Xia M, Edwards G. Race, gender, and scholarly impact: Disparities for women and faculty of color in clinical psychology. *J Clin Psychol*. 2020;1–12. https://doi.org/10.1002/jclp.23029