American Knowledge Workers Experience Less Racial Discrimination and Greater Well-being When Working Remotely Than In Person

Vivian L. Xiao[1,2], Dylan Wiwad[3], Sanaz Talaifar[4], Charles Chu[5], Lucas Puente[3], Ashley Lagaron[3], and Brian S. Lowery[6]

[1]Owen Graduate School of Management, Vanderbilt University, 401 21st Ave S, Nashville, TN, 37203, USA
[2]School of Business, University of Washington Bothell, 18807 Beardslee Blvd, Suite 210, Bothell, WA 98011
[3]Slack Technologies LLC, 415 Mission St, San Francisco, CA, 94105 USA
[4]Department of Management and Entrepreneurship, Imperial College London, South Kensington Campus, London, SW7 2AZ, UK
[5]Questrom School of Business, Boston University, 595 Commonwealth Avenue, Boston, MA, 02215, USA
[6]Stanford Graduate School of Business, Stanford University, 655 Knight Way, Stanford, CA, 94305, USA

Corresponding Author:
Vivian L. Xiao
Management and Organization Area
School of Business
University of Washington Bothell
18807 Beardslee Blvd, Suite 210
Bothell, WA 98011
Email: vlxiao@uw.edu

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Abstract

As the U.S. workforce grows increasingly racially diverse and remote work grows increasingly common, understanding how these two factors will converge to shape the future of work has never been more timely or important. It remains unclear if remote work helps or harms workers of color, leaving organizations with little empirical evidence to guide their remote work policies in ways that advance diversity, equity, and inclusion (DEI) to best serve today's racially diverse workforce and maximize worker well-being. The present research addresses this issue by investigating whether workers of color (i.e., workers from non-White racial backgrounds) experience less racial discrimination when working remotely versus in-person and examining the relationship between remote work and well-being among workers of all races in two large-scale surveys of American knowledge workers (*N*'s = 32,245 and 5,216). We find that workers of color report fewer experiences of racial discrimination when working remotely than in person, a reduction that we show cannot be attributed simply to reduced interactions between coworkers. We further find that reduced racial discrimination is in turn related to greater well-being (e.g., job satisfaction, affective commitment, psychological safety) among workers of color and that remote work is associated with greater work-related well-being across workers of all races. We discuss potential explanations for this phenomenon and consider remote work's potential as an important tool for advancing DEI within organizations.

Significance

Workers of color often have more negative experiences of their workplaces than White workers. As remote work becomes increasingly common, it remains unclear how remote work might equalize or further exacerbate the negative experiences of workers of color. Two large-scale surveys of American knowledge workers find that when working remotely (vs. in person), workers of color report experiencing less racial discrimination, and this reduced racial discrimination is related to greater well-being. Further, workers of all races report better outcomes when working remotely. These findings suggest that remote work is equitable work, and workplace policies that allow for remote work may play a crucial role in enabling organizations to best serve the needs of an increasingly racially diverse workforce.

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When it comes to the future of work, the past few years have made two things clear: 1) the future of work is increasingly diverse, and 2) the future of work is increasingly virtual. The working population of the United States has begun to undergo a significant change—people of color now make up the majority of new entrants into the workforce[1]. This change will likely continue as the U.S. population diversifies[1–3], making the question of how to create more racially equitable and inclusive workplaces evermore important. At the same time, the prevalence of remote work has exploded in recent years, accelerated by the COVID-19 pandemic. Job postings offering hybrid or remote work arrangements have increased three to five-fold[4], and the vast majority of workers now prefer this manner of working and are eager to take jobs that include opportunities for remote work[5–8]. As such, there is much reason to believe that remote work is here to stay.

Despite these dramatic changes in the nature of work and organizations, it remains unclear how increased racial diversity in the workforce and remote work will intersect to affect workers' outcomes. We thus examine whether experiences of remote work (relative to in-person work) support more equitable and inclusive workplaces for workers of color and better workplace outcomes for all workers. More specifically, we provide a systematic, descriptive investigation of workers' experiences of racial discrimination and well-being when working remotely versus in person. We pay particular attention to the experiences of workers of color, who traditionally have worse experiences of their workplaces than their White peers[9–11] and whose perspectives are underrepresented in workplace research[12].

Made nearly ubiquitous during the COVID-19 pandemic, remote work is a flexible work arrangement that allows workers to perform their work away from their organization's main site and at a location of their choosing on a regular basis[13]. At the onset of the COVID-19 pandemic, many worried that the broad adoption of remote work would lead to loneliness and social isolation, harming workers' mental health and well-being[14]. As the workforce has begun to transition into the post-COVID era, many leaders similarly expressed concern that managers would unwittingly favor workers who work in person, who managers would see and interact with more than those who work remotely (i.e., proximity bias)[15,16]. However, in the past few years, workers have largely received remote work positively. Workers now report a strong preference for jobs that allow for remote work[5], leading some to speculate that flexible workplace practices that allow for remote work may afford workers more say in when, where, and how they work, enabling workers to thrive in ways they previously could not[6,17,18]. Some initial work has corroborated this assertion[19–21]—for example, suggesting that allowing workers this degree of flexibility in their work arrangements can be beneficial to their psychological outcomes such as their sense of authenticity[22].

Despite emerging evidence pointing to many benefits of remote work, the implications of remote work for racial equity are still not well understood, suggesting the need for a rigorous investigation that centers the experiences of workers of color. On the one hand, anecdotal evidence suggests that remote work may be particularly beneficial for workers of color[23–25], who are often disadvantaged relative to their White peers. Workers of color—and in particular women of color, who are often doubly disadvantaged in the workforce as a result of their race *and* gender[26,27]—cite avoiding racial discrimination and bias as one of the main drivers behind their preference for remote work[23–25]. Consistent with the notion that remote work may be conducive

to greater workplace equity, a recent study of a Chinese firm demonstrated that hybrid work arrangements may foster *gender* equity[19], improving job satisfaction and reducing turnover among women, who typically are disadvantaged relative to men in organizations. However, in contrast to the benefits of remote work shown for gender equity, speculations about the relationship between remote work and *racial* equity remain unverified by systematic research. It is unclear if the previously identified benefits of remote work for women extend to workers of color. Further, the prior work that has identified the benefits of remote work for women's well-being (e.g., job satisfaction) has not unpacked why this may occur and whether discrimination contributes to this relationship. Notably, some early research suggested that remote communication can in fact *increase* cross-race anxiety and bias[28], raising questions about how remote work is related to experiences of discrimination. No research, to our knowledge, has directly examined how workers of color experience remote work in the modern era, an issue that is of paramount importance given an increasingly virtual and racially diverse workforce. Additionally, given the dearth of research on the experiences of workers of color generally, it is perhaps unsurprising that virtually no research has taken an intersectional perspective to understand how race *and* gender intersect to shape experiences of remote work for workers of color. Thus, our first objective in this paper is to center the perspectives of workers of color and investigate their experiences of racial discrimination in remote and in-person work contexts and whether these experiences vary across men and women of color.

We additionally explore the implications of remote work for a set of key, organizationally-relevant outcomes among workers of color: work-related well-being outcomes. Workers of color have long reported that experiences of racial discrimination at work often lead to poor well-being outcomes[9–11,29]. Because managing and navigating experiences of racial

discrimination is cognitively taxing, racial discrimination is thought to contribute to feelings of isolation and anxiety at work[9–11,29–33], which can ultimately result in lower worker productivity and increased voluntary turnover, which is detrimental to both workers and the organizations[34]. In fact, this drop in productivity and rise in turnover in response to experiences of racial inequity is estimated to cost organizations tens of billions of dollars annually[34]. The issue of racial discrimination is thus central to both the experiences and well-being of workers of color and to organizations' financial outcomes. However, work connecting racial discrimination to organizational and other outcomes has historically been conducted against the backdrop of traditional, in-person work contexts. It is therefore unclear whether these dynamics extend to remote work contexts. Thus, the second objective of this paper is to explore how racial discrimination in remote versus in-person settings relates to well-being among workers of color.

If remote work is associated with fewer experiences of racial discrimination and reduced racial discrimination is in turn associated with greater well-being, these results would point to the possibility that offering remote work arrangements could be one simple but meaningful practice that bolsters organization's diversity, equity, and inclusion (DEI) efforts. Although the majority American workers agree that enhancing DEI in organizations is a worthy pursuit[35], there are also those who have expressed concerns that such policies would be detrimental to organizations by unfairly advantaging one group over another[36,37]. In the context of remote work, it is unclear whether or not this is the case. Industry reports suggest that *all* workers, regardless of race, tend to express a strong preference for remote work[5], suggesting that the benefits associated with remote work may extend across workers of all races. Remote work could thus simultaneously advance organizations' DEI efforts, while having the additional benefit of being associated with better workplace experiences for all workers. Amid growing backlash against DEI[38–40], it is

crucial to identify policies that give organizations and their workers the tools for greater racial equity without alienating key stakeholders. However, the experiences of White workers and workers of color in remote versus in-person working contexts has not been compared directly. As such, our third objective in this paper is to investigate the implications of remote work for the well-being of workers broadly across organizations and across different racial groups.

Current Research

We investigated three primary research questions in two large-scale, descriptive studies of American knowledge workers[i]. First, do workers of color experience less racial discrimination when working remotely than when working in person (Research Question [RQ] 1)? Second, do workers of color who experience reduced racial discrimination both in-person and remotely experience better well-being (RQ2)? And third, if workers of color experience less racial discrimination when working remotely, does this come at the expense or benefit of other workers (i.e., White workers) in the organization (RQ3)?

These studies reveal three key findings. First, workers of color do indeed report experiencing less racial discrimination when working remotely than in person, and we observe initial evidence that this effect may be more pronounced among women of color than men of color. We further find that these results cannot be explained by fewer interactions with coworkers when working remotely. Second, these reduced experiences of racial discrimination are linked to well-being among workers of color. And third, remote work is related to better workplace experiences among *all* workers and does not unfairly advantage one racial group over

[i] "Knowledge worker" is defined as a worker whose primary job involves "thinking for a living"[63]. Rather than traditional, more manual forms of labor that center around producing physical products, knowledge workers specialize in the production of knowledge and engaging with "non-routine problems that require non-linear and creative thinking"[64]. In this paper, we operationalize "knowledge worker" as those workers whose jobs primarily entail management responsibilities or whose work otherwise primarily involves working with data, analyzing information, or thinking creatively.

another. Overall, we find evidence suggesting that remote work is an important tool for organizations seeking to improve workers' experiences of racial equity and well-being.

Results

We explore our research questions in two studies. In Study 1, we analyzed six cross-sectional waves of an archival survey of American knowledge workers collected every three months over two years that probed workers' experiences of remote work, racial discrimination, and well-being (December 2020 to November 2022). In Study 2, we surveyed a sample of American knowledge workers on these same variables twice over the span of one month (February 2022 to March 2022). Study 2 replicated and improved upon Study 1 by (a) using more robust, validated measures of work-related well-being, allowing us to better assess the relationship between remote work, racial discrimination, and well-being, and (b) deliberately oversampling women and knowledge workers of color (i.e., workers who self-identified as African American, Asian American, Latinx, etc.[ii]), allowing us to more robustly examine intersectional differences in experiences of remote work. Thus we give greater evidentiary weight to results from Study 2 that use validated measures and allow us to more rigorously examine the relationships between remote work, worker race and gender, and worker outcomes (i.e., racial discrimination and well-being).

In both studies, we center the perspectives of workers of color, who are typically disadvantaged in their workplaces and underrepresented in workplace research, before subsequently zooming out to examine the experiences of all workers. We focus on workers of color for analyses investigating RQ1 and RQ2 (N_{Study1} = 1,523; N_{Study2} = 2,399) and workers of

[ii] In all analyses in this paper, we classified people as "White" only if they reported being Non-Hispanic White. Therefore, participants who identified as White and Hispanic were considered workers of color. This is consistent with cognitive racial classification schemas (i.e., hypodescent)[54].

all races for analyses investigating RQ3 (racial discrimination outcomes: N_{Study1} = 5,312; N_{Study2} = 5,216; well-being outcomes: N_{Study1} = 32,245; N_{Study2} = 5,216).

Our analysis plan is as follows. To examine RQ1, we regress experiences of racial discrimination among workers of color on working modality (in person = 0; remote = 1), worker gender (male = 1, female = -1), and their interaction to examine the relationship between working modality and experiences of racial discrimination, as well as to explore intersectional effects. In Study 1, we also examine whether our findings are robust to the alternative explanation that fewer workplace interactions when working remotely may explain the observed differences in experiences of racial discrimination among workers of color as a function of working modality. That is, simply having lower interaction frequency when working remotely may reduce opportunities for racial discrimination to occur. Thus, we include change in interaction frequency as both a control variable and in interaction with work modality to examine this possibility (see Methods for full measure). To examine RQ2, we regress work-related well-being outcomes on experiences of racial discrimination reported by workers of color. To examine RQ3, we use the full sample of participants in both studies and regress work-related well-being on working modality, worker race (White workers = 1; workers of color = -1), and their interaction. We further employ propensity score matching[41] as a robustness check to simulate random assignment between remote and in-person work contexts. Across research questions, we analyze all data in Study 2 across both time points simultaneously, only accounting for within-individual clustering in our models. In these analyses, we did not account for wave-level clustering because in each case, exploration of Intraclass Correlation Coefficients (ICCs) indicated considerable clustering by individual but not by wave (see Table S6).

Across studies, participants were categorized as White workers or workers of color depending on their self-identified race. Participants in both studies reported their experiences of racial discrimination in the workplace using two items (*"When I am working in person, I feel that I have personally been a target of discrimination because of my race or ethnicity"* and *"When I am working remotely, I feel that I have personally been a target of discrimination because of my race or ethnicity"*) with five-point Likert-type scales (1 = *Strongly Disagree* to 5 = *Strongly Agree*). All participants responded to both items, and we subsequently treated working modality as a within-subjects factor in all analyses examining racial discrimination as an outcome variable (i.e., RQ1), comparing participants' self-reported experiences of racial discrimination while working in person versus remotely. In analyses examining work-related well-being as an outcome variable (i.e., RQ3), working modality was a between-subjects factor. We used one item in which respondents indicated their working modality over the previous week (*"Thinking about your current working week, how often do you work at least a full workday from the following types of locations? - Remote location (e.g., your home)"*) on a scale from 1 (*Not at all*) to 5 (*Always / It is the only location I work at*). To measure well-being, we used four measures of psychological well-being (i.e., work-life balance, sense of belonging, job satisfaction, and degree of stress or anxiety at work) and four measures of functional well-being (i.e., access to resources, flexibility, ability to focus, and productivity) in Study 1 (see Methods for full items) and four well-being measures validated by prior research—three measures of psychological well-being (i.e., job satisfaction, psychological safety, and affective organizational commitment), as well as a measure of turnover intentions—in Study 2 (see Methods for full items). Given the large number of well-being variables in both studies, statistical results for well-

being findings (RQ2 and RQ3) are reported in Tables S3a-S3b and S5a-S5b of Supporting Information (SI) instead of the main text.

In what follows, we report results for RQ1 (i.e., relationship between remote vs. in-person work and experiences of racial discrimination among workers of color), RQ2 (i.e., the relationship between racial discrimination experienced remotely vs. in-person and well-being among workers of color), and RQ3 (i.e., the relationship between remote vs. in-person work and work-related outcomes among all workers). We group and present Study 1 and Study 2 results by research question. All results presented control for respondents' age, gender, organizational tenure, company size, and seniority and, unless otherwise noted, remain unchanged when these controls are removed (see Tables S1a-S5b in SI for more details on results)[iii].

Research Question #1: Do workers of color experience less racial discrimination when working remotely than when working in person?

Given the repeated measures nature of these data, we ran all of our analyses pertaining to this research question as multilevel models to account for within-individual clustering in experiences of racial discrimination at work (null model ICC = .846). We regressed experiences of racial discrimination on working modality, worker gender, and their interaction among workers of color.

When examining the effect of working modality on experiences of racial discrimination among workers of color, we find that workers of color overall report experiencing less racial discrimination when working remotely than in person (Study 1: β = -.098, p < .001, 95% CI [-.133, -.063]; Study 2: β = -.211, p < .001, 95% CI [-.242, -.181]).

[iii] We examined additional potential confounding variables in Study 1 in a series of supplemental analyses, including measures of workers' optimism about their company's future, concerns about remote work affecting their career trajectory, and preferences for remote work, as these individual differences could explain the relationship between remote work, perceived racial discrimination, and well-being. All results hold when controlling for these variables (see Tables S2a, S3a, and S4a in SI).

Delving further into this relationship to examine intersectional effects, we find in Study 1 that there is no significant interaction between working modality and worker gender on experiences of racial discrimination (β = -.011, p = .548, 95% CI [-.046, .024]). In Study 2, where we oversampled women and workers of color and thus had greater statistical power to detect small interaction effects, we do observe a significant two-way interaction between working modality and worker gender on racial discrimination (β = .031, p = .049, 95% CI [.0002, .061]; see Table 1). Probing this relationship further, we find that although both men and women of color report experiencing less racial discrimination when working remotely than in person, the effect of working modality on experiences of racial discrimination was stronger among women of color (β = -.242, p < .001, 95% CI [-.285, -.199]) than men of color (β = -.180, p < .001, 95% CI [-.223, -.137]; see Figure 1).

Overall, these results suggest that all workers of color (both women and men) experience less workplace racial discrimination when working remotely than in person, with suggestive evidence that this is especially true for women of color. Moreover, these results were robust to the alternative explanation that simply having fewer interactions when working remotely explains the differences in experiences of racial discrimination. Specifically, changes in interaction frequency when working remotely did not interact with working modality to predict experiences of racial discrimination among workers of color, and the effect of working modality on experiences of racial discrimination among workers of color held when controlling for change in interaction frequency. These results suggest that fewer experiences of racial discrimination among workers of color when working remotely (versus in person) cannot be wholly attributed to reductions in interaction frequency when working remotely (see Table S2a in SI).

Research Question #2: Do workers of color who experience reduced racial discrimination both in-person and remotely experience better well-being?

Next, we examine whether and how racial discrimination is related to a broader set of outcomes among workers of color—work-related well-being. We regressed each work-related well-being measure in each study on both experiences of in-person racial discrimination and experiences of remote racial discrimination. This allows us to replicate prior work by examining whether racial discrimination experienced in person is associated with poorer well-being outcomes, as well as extend this work by exploring whether racial discrimination experienced *remotely* similarly has implications for a broader set of important well-being outcomes.

In-Person Racial Discrimination and Well-being. In Study 1, we find that experiences of in-person racial discrimination did not reliably predict any of the four psychological well-being measures or any of the four functional well-being measures (see Table S3a in SI)[iv]. However, there are two major reasons why we may have observed these null results. First, the measures of work-related well-being in this archival dataset were not validated scales and may thus lack the validity and reliability necessary to detect the effect of experiences of racial discrimination on work-related well-being. Second, the measures of experiences of racial discrimination and work-related well-being are misaligned on their temporal specificity—the experiences of racial discrimination measures assess participants' *global* experiences in each of these settings and in contrast, the work-related well-being measures refer to participants'

[iv] Without control variables, there were no significant relationships between experiences of racial discrimination (in person or remote) and any of the eight well-being measures. When controlling for age, gender, organizational tenure, company size, and seniority, in-person racial discrimination was significantly related to two functional well-being items (i.e., flexibility and productivity) and remote racial discrimination was significantly related to one functional well-being item (i.e., productivity). However, after controlling for other individual differences that might explain this relationship (i.e., workers' optimism about their company's future, concerns about remote work affecting their career trajectory, and preferences for remote work), these effects were no longer significant. Thus, we conclude that racial discrimination, experienced either in person or remotely, does not reliably predict these particular measures of work-related well-being in Study 1 (see Table S3a in SI for more details).

316 experiences specifically *within the past week*. This mismatch in the temporal specificity of the
317 measures (see specificity matching principle[42,43]) may obscure the relationship between
318 experiences of racial discrimination and work-related well-being.

319 In Study 2, using more robust, validated measures of work-related well-being that were
320 appropriately matched on specificity to the racial discrimination measures, we observed that
321 there did appear to be meaningful relationships between experiences of in-person racial
322 discrimination and work-related well-being (see Table S3b in SI). In particular, we observe
323 significant main effects of experiences of in-person racial discrimination on all three
324 psychological well-being outcomes (i.e., job satisfaction, affective commitment, psychological
325 safety). Greater experiences of in-person racial discrimination were related to poorer
326 psychological well-being outcomes. Additionally, we also observe a significant main effect of
327 experiences of in-person racial discrimination on turnover intentions. Greater experiences of in-
328 person racial discrimination were related to higher turnover intentions. Overall, these results
329 replicate prior findings that the racial discrimination that workers of color experience while
330 working in person is indeed meaningfully linked to a broader set of well-being outcomes.

331 **Remote Discrimination and Wellbeing.** Next, we examine the relationship between
332 experiences of *remote* racial discrimination and work-related well-being and find that results are
333 more mixed. In Study 1, we observe that experiences of remote racial discrimination did not
334 reliably predict any of the four psychological well-being measures or any of the four functional
335 well-being measures (see Table S3a in SI). In Study 2, although we observe a significant main
336 effect of experiences of remote racial discrimination on one of the psychological well-being
337 outcomes (i.e., job satisfaction), such that greater reported remote racial discrimination is
338 associated with greater job satisfaction, the main effects of remote racial discrimination on the

other two psychological well-being outcomes were not significant (i.e., affective commitment, psychological safety; see Table S3b in SI)[v]. That is, the effect of remote racial discrimination on psychological well-being is unclear. However, when examining turnover intentions, we find a significant main effect of experiences of remote racial discrimination on turnover intentions (see Table S3b in SI). Greater experiences of remote racial discrimination are associated with greater turnover intentions.

Using robust, validated measures of well-being that match the experiences of racial discrimination measures on temporal specificity, we observe that racial discrimination is indeed linked to work-related well-being outcomes. Our results replicate prior work linking in-person racial discrimination to poor well-being outcomes. However, we find that this effect may not extend to remote racial discrimination, as we observe positive, negative, and null relationships between remote racial discrimination and work-related well-being, and it is thus unclear how remote racial discrimination is associated with well-being broadly. This suggests that more investigation into the relationship between experiences of racial discrimination experienced remotely versus in person on work-related well-being is warranted.

Research Question #3: If workers of color experience less racial discrimination when working remotely, does this come at the expense or benefit of other workers (i.e., White workers) in the organization?

Finally, we investigate how remote work relates to worker outcomes (i.e., racial discrimination and well-being) among both White workers and workers of color to ensure that the benefits associated with remote work are equitably distributed.

[v] Without control variables, there is a significant, positive relationship between remote racial discrimination and psychological safety. However, this effect is no longer significant after age, gender, organizational tenure, company size, and seniority are accounted for. We report the more robust analyses with controls in the main manuscript, but more information is available in Table S3b in SI.

Remote Work and Racial Discrimination. First, we reexamine the relationship between remote work and experiences of racial discrimination to determine if this relationship varies across White workers and workers of color. We regress experiences of racial discrimination on working modality (within-subjects factor), worker race (between-subjects factor), and their interaction in multilevel models. In this broader sample, we observe a significant main effect of working modality (Study 1: β = -.066, p < .001, 95% CI [-.085, -.048]; Study 2: β = -.124, p < .001, 95% CI [-.143, -.106]), such that all workers, regardless of race, report experiencing less racial discrimination when working remotely than in person. Notably, we observe that the main effect of working modality is qualified by a significant two-way interaction between working modality and worker race (Study 1: β = .032, p < .001, 95% CI [.014, .050]; Study 2: β = .086, p < .001, 95% CI [.068, .105]), suggesting that the relationship between remote work and racial discrimination does indeed differ between workers of different races. Simple slopes analysis revealed that although the relationship between working modality and experiences of racial discrimination was stronger among workers of color, the simple effect of working modality on experiences of racial discrimination remained significant for both White workers (Study 1: β = -.034, p = .001, 95% CI [-.053, -.013]; Study 2: β = -.038, p = .002, 95% CI [-.063, -.013]) and workers of color (Study 1: β = -.098, p < .001, 95% CI [-.128, -.067]; Study 2: β = -.211, p < .001, 95% CI [-.238, -.184]). Across both studies, this suggests that all workers experience less racial discrimination when working remotely (as opposed to in person), although this is especially the case for workers of color (see Tables S4a and S4b in SI).

Remote Work and Work-Related Well-being. Next, we reexamine the relationship between working modality and work-related well-being and test whether significant differences exist between White workers and workers of color. We regressed each work-related well-being

outcome separately on working modality, worker race, and their interaction in a series of linear regressions.

In Study 1, when investigating both psychological (i.e., work-life balance, sense of belonging, job satisfaction, degree of stress or anxiety) and functional (i.e., access to resources, flexibility, focus, productivity) well-being, we observe significant main effects across all outcomes of working modality such that spending a greater proportion of time working remotely was associated with better psychological and functional well-being (see Table S5a in SI). For the majority of well-being outcomes (psychological: belonging, overall job satisfaction, stress or anxiety; functional: access to resources, productivity), this effect was equivalent across workers of different races. For the remaining three outcomes (psychological: work-life balance; functional: flexibility, focus), there was a significant interaction between working modality and worker race such that the effect of working modality was slightly stronger among White workers (see Table S5a in SI).

In Study 2, we observe significant main effects of working modality across all measures of psychological well-being (i.e., job satisfaction, affective commitment, psychological safety) such that spending a greater proportion of time working remotely was associated with better well-being (see Table S5b in SI). Again, two of these three outcomes (i.e., affective commitment, psychological safety) this effect was equivalent across workers of different races. For job satisfaction, there was a significant interaction between working modality and worker race such that the effect of working modality was slightly stronger among White workers than workers of color. We do not observe a significant main effect of working location on turnover intentions, nor do we observe a significant interaction with worker race (see Table S5b in SI).

To further isolate the effect of remote work on work-related well-being in both studies, we utilized propensity score matching to create a sample of fully in-person and fully remote knowledge workers matched on a series of covariates (i.e., age, gender, seniority, industry, tenure, and company size; See Methods for a full description of our matching procedure). Propensity score matching allows for a more precise comparison of workers in remote and in-person work environments by ensuring the two groups are as similar as possible, effectively simulating a randomized experimental design[41]. After generating this sample, we reran the same analyses as before and found that the above effects of remote work on work-related well-being held (see Tables S5a-S5b in SI). Overall, across both studies, these results suggest that remote work is related to greater work-related well-being for all workers, but more investigation into whether and why the benefits of remote work for well-being varies between workers of different races is warranted.

Discussion

Across two large-scale samples of American knowledge workers (total *N*s = 32,245 and 5,216), we find that remote work is associated with a number of benefits among workers of color, who are traditionally disadvantaged in their workplaces. When working remotely as opposed to in person, workers of color report fewer experiences of racial discrimination, an effect that may be especially pronounced among women of color. Furthermore, we observe evidence that racial discrimination is linked to a broader set of well-being outcomes among workers of color. When workers of color experience less in-person racial discrimination, they also tend to experience greater job satisfaction, affective commitment, and psychological safety, as well as lower turnover intentions. Finally, zooming out, we find that remote work is associated with fewer reported experiences of racial discrimination and a number of positive well-being

outcomes (e.g., job satisfaction, affective commitment, psychological safety) among all workers. These findings thus point to the potential for remote work to be one simple but important workplace practice that organizations can implement to bolster racial equity and inclusion within the organization, without unfairly advantaging or disadvantaging any particular racial group.

Furthermore, we investigated, and ruled out, one potential mechanism that could explain why workers of color experience less racial discrimination when working remotely—fewer workplace interactions in remote work contexts. Although the quantity of interactions does decrease somewhat when working remotely, our findings suggest that this reduction in interaction frequency does not fully explain the benefits that remote work has among workers of color for racial discrimination. This finding thus points to an interesting possibility—that remote work has the potential to improve the *quality* of workplace interactions in a way that is beneficial for workers (e.g., by contributing to reduced experiences of racial discrimination).

Although we can only speculate about the causal mechanisms behind the relationship between remote work and racial discrimination in the present paper, research from communications suggests that one particularly interesting possibility is that the medium of remote work itself enables this change. This may be in part because communication while working remotely is inherently less detail-rich—that is, the number of sensory cues that provide contextual information about the social interaction will be attenuated[44–46]. Since the advent of digital communication, many scholars have been hopeful that because of this feature, new technology and modes of communication via digital channels would enable more equitable communication and collaborations[44,45]. Scholars theorized that the reduction in sensory richness in digital media would reduce the salience of status-based cues, such as indicators of one's race or gender (e.g., email eliminates visual information about one's communication partner), making

one's social identities and group memberships (e.g., race and gender identity) less salient and more difficult to infer, which would in turn reduce identity-based discrimination[44,45].

In the modern era, newer technologies such as video conferencing have made the total avoidance of status-based cues nearly impossible (e.g., workers' races and genders often may be readily inferred from their video feed during a Zoom meeting)[47–49], but it is nevertheless possible that remote work may provide an opportunity for minimizing racial discrimination. In particular, this may be enabled by a confluence of the features of remote work and the nature of discrimination in the modern organization. Work has shown that although video conferencing may be more detail-rich than email (e.g., some visual information is present over video that is not present over email), it is still often experienced as less detail-rich than face-to-face communication, in part by reducing the amount of nonverbal information available (e.g., body language, eye contact)[46]. At the same time, the majority of discrimination that exists in the modern organization is often subtle in nature (e.g., microaggressions) rather than overt (e.g., blatant antipathy)[10,31]. Much of this subtle discrimination frequently occurs via nonverbal behaviors, communicated in the form of body language or eye contact[10,31], which is more difficult to both enact and discern when working remotely, even when using video conferencing[46].

Our findings are consistent with the idea that one unintended benefit of the lack of sensory richness in the virtual context may be a reduction in modern forms of racial discrimination that are often subtle and more difficult to communicate and perceive virtually. Furthermore, although our work replicates prior research showing that racial discrimination experienced in person is detrimental to workers' well-being outcomes[9,11,29], this link between racial discrimination and worker well-being does not seem to generalize to racial discrimination

experienced while working remotely. Thus, allowing workers more opportunities to work remotely may alleviate one significant source of negative workplace experiences (i.e., racial discrimination) and foster greater well-being (i.e., greater job satisfaction, affective commitment, and psychological safety). This is particularly important for workers of color, who are a rapidly growing share of the U.S. workforce[1–3] and typically have poorer experiences of their organizations overall[9–11,29]. However, we note that this is but one potential casual mechanism underlying our observed effect and more work will be needed to unpack the precise processes that explain how remote work is related to these benefits for racial discrimination and work-related well-being.

Limitations and Future Directions

Although the present paper provides a demonstration of the relationship between remote work and experiences of racial discrimination, it leaves open a number of questions that warrant further study. First, the present paper analyzes two large datasets of American knowledge workers, but the current studies are limited by their survey-based design and cannot establish causality. However, we do find that our results hold over and above a number of control variables, including age, gender, organizational tenure, company size, seniority, and frequency of workplace interactions. Further, when using propensity score matching to simulate random assignment to remote or in-person working contexts, we similarly find that our results hold. These sets of analyses demonstrate the robustness of our effects and suggest that the medium of virtual communication while working remotely may indeed contribute to reduced racial discrimination. Nevertheless, future work should replicate these findings using experimental designs, both in the lab and using field interventions, to establish a causal link between remote

work and improved worker outcomes. Such experimental designs would also allow researchers to more directly explore mechanisms underlying this effect.

Second, since the present studies were primarily focused on American knowledge workers, it would be interesting to examine the generalizability of these effects to other occupations, segments of the labor force, organizational contexts, and countries. It is also important to examine whether the benefits of remote work generalize to other work-related outcomes. The present research has identified a number of significant and important benefits associated with remote work, such as fewer experiences of racial discrimination among workers of color and greater well-being among all workers, but other research has noted the potential for remote work to have a negative impact on other outcomes. For example, recent work points to potential for remote work to produce Zoom fatigue and more siloed collaborations in certain contexts, such as when remote work practices are not implemented well[50,51]. Other recent work has suggested that there may be important individual differences in when remote work predicts positive or negative outcomes[22]. Future research ought to examine what contextual factors and individual differences, such as a match between workers' preferences and their working arrangements, influences the degree to which remote work benefits workers and organizations.

Finally, we believe the present studies provide compelling evidence supporting the notion that workers of color experience less racial discrimination when working remotely (as opposed to in person), but a fruitful avenue of future research may be to examine the relationship between remote work and other forms of identity-based discrimination, such as gender discrimination, which may be distinct from racial discrimination in meaningful ways[52]. For example, some recent work suggests that remote work may improve job satisfaction and reduce turnover rates

among women[19], but it remains to be seen whether this effect is driven by differences in discrimination experienced while working remotely versus in person.

Conclusion

As the workforce transitions into the post-COVID era, organizations are debating the extent to which they should retain practices that were widely adopted during the pandemic, such as increased opportunities for remote work[4]. Many organizations and leaders have expressed the desire to bring workers back into the office full-time, citing concerns that remote work will be harmful to workers[15,16]. However, our results suggest the opposite. Remote work is in fact associated with *improvements* in outcomes for *all* workers, and most notably, among those traditionally disadvantaged in the workplace, workers of color. Retaining remote work practices has the potential to not only improve all workers' general experiences of their workplaces but also significantly reduce the amount of racial discrimination that workers of color experience in the workplace, which, in the long run, can reduce costs to organizations by reducing voluntary worker turnover.

Our results thus suggest that remote work may constitute a simple but crucial step that organizations can take to foster more racially equitable and inclusive workplaces for *all* workers, regardless of race. Rather than attempting to steer workers back to more traditional, in-person-only work arrangements, organizations ought to embrace flexible workplace practices that include the option for remote work. In a workforce that is continuing to grow more racially diverse[1–3] and where worker enthusiasm for remote and hybrid work options remains high[5], organizations that retain such practices will be best positioned to meet the needs of the future of work.

Materials and Methods

Study 1

Participants

In this archival dataset, participants were recruited using Qualtrics panel services to participate in this study by meeting the following criteria: (a) they reported that they were employed working 30 or more hours a week, (b) they had been identified as a knowledge worker, defined by either having responsibilities including "work with data, analyze information, or think creatively" or a job role as a skilled office worker or above, (c) they passed an attention check (*"Please select option B"*), and (d) they took longer than 420 seconds to complete the survey (see Study 1 Relevant Materials in SI for full questions and response options).

Additionally, although the sampling design in this study was meant to be broadly representative of the population of American knowledge workers, this dataset also employed several sampling quotas. First, across organizations with (a) less than or equal to and (b) more than 1000 workers, 2,400 participants were recruited in each wave. Second, among C-Level executives, 200 participants were recruited in each wave. Finally, 150 African American women with children and 250 parents of color were recruited in each wave. As this dataset was archival in nature, the determination of these quotas stemmed from research objectives separate from ours that pertained to the effects of remote work on working parents' well-being specifically, as children are a complicating factor in working from home, and whether remote work affected executives in unique ways. Specific analyses for these subgroups in the present paper were not intended.

Wave 5. For analyses of racial discrimination, we focused on Wave 5 of a larger international data collection effort, as this wave included measures of racial discrimination that other waves did not. The sample in Wave 5 was comprised of 5,312 American respondents (M_{age}

564 = 43.32, SD_{age} = 11.72; 45.33% Male, 54.46% Female, .21% Other). Of these participants,
565 71.33% self-identified as White, 9.09% self-identified as Black or African American, 6.44%
566 self-identified as Asian or Asian American, 11.00% self-identified as Hispanic or Latino, and
567 2.11% identified as some other race.

568 **Waves 3-8.** For analyses focused solely on well-being, we examined data from Waves 3-
569 8 of a larger international data collection effort that surveyed eight cross-sectional samples of
570 workers over a two-year time span from December 2020 until November 2022. This sample was
571 comprised of a total of 32,245 American knowledge workers (M_{age} = 41.92, SD_{age} = 12.40;
572 47.05% Male, 52.66% Female, .29% Other). In this sample, 69.82% self-identified as White,
573 9.64% self-identified as Black or African American, 4.41% self-identified as Asian or Asian
574 American, 12.16% self-identified as Hispanic or Latino, and 3.97% self-identified as some other
575 race (see Table S7 for more detailed information about worker race by wave).

576 ***Sensitivity Power Analyses***

577 As this data collection was part of a larger data collection effort, we did not conduct *a*
578 *priori* power analyses. We tested all of our core hypotheses in Study 1 with linear regressions,
579 one-sample t-tests, and multilevel models. With the smaller of our two subsamples (N = 5,312)
580 we are adequately powered (a = .05, β = .80) to detect effects as small as f^2 = .003 in linear
581 regressions with eight predictors (the most complex model presented) and cohen's d = .038 for
582 the one sample t-tests.

583 For the multilevel models, we simulated power for a main effect, two-way, and three-way
584 interaction using the "simr" package in R[53] for effects between β = .001 and β = .05 in .0005
585 increments (99 effect sizes total). Specifically, we stored the most complex multilevel model in
586 this study (the effect of working modality, worker race, and change in workplace interactions on

experiences of racial discrimination) and ran 500 simulations at each of the 99 effect sizes whereby we sequentially fixed a main effect, two-way interaction, and three-way interaction to the effect size and simply recorded the proportion of statistically significant effects at the fixed effect size. These simulations showed that we are adequately powered to detect β as small as .047 for main effects, .028 for two-way interactions, and .039 for three-way interactions in the most complex multilevel models we ran for this study (see Figures S1-S3 in SI for depictions of these power simulations).

Measures

Because the data presented in this paper are drawn from a larger survey, there were many survey items that were not relevant to the present research question. Here, we will focus only on the core measures included in the focal analyses. Unless otherwise noted, we report descriptive statistics across all waves (N = 32,245).

Worker Race. Participants reported their self-identified race (i.e., *"How would you identify your race/ethnicity?"*) and selected from the following options: American Indian or Alaska Native, Asian or Asian American, Black or African American, Native Hawaiian or Other Pacific Islander, White, Two or more races, Race or ethnicity not listed. Participants also reported their self-identified ethnicity (i.e., *"Do you identify as Hispanic or Latinx, or Spanish origin?"*; 1 = *Yes*, 2 = *No*, 3 = *Prefer not to answer*). Prior to analyses, we collapsed across all workers of color to produce two categories for analysis: White (non-Hispanic) workers and workers of color. Participants who selected multiple or other races, as well as those who identified as Hispanic/Latinx, were categorized as workers of color, consistent with cognitive racial classification schemas (i.e., hypodescent)[54].

Working Modality. Participants responded to a single item assessing their frequency of remote work over the previous week (i.e., *"Thinking about your current working week, how often do you work at least a full work day from the following types of locations - Remote location (e.g., your home)"*; *M* = 3.98, *SD* = 1.57) on a five-point Likert-type scales (1 = *Not at all*, 2 = *Rarely (e.g., a couple of times per month)*, 3 = *Sometimes (e.g., 1-2 days per week)*, 4 = *Most of the time (e.g., 3-4 days per week)*, and 5 = *Always / it is the only location I work at*).

Experiences of Racial Discrimination. Participants in Wave 5 (*N* = 5, 312) responded to two items assessing their experiences of racial discrimination in their workplace on a five-point Likert-type scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*). Participants responded to two items assessing their experiences of racial discrimination when working in remote versus in-person work environments (i.e., *"When I am working [remotely / in person], I feel that I have personally been a target of discrimination because of my race or ethnicity"*; M_{rem} = 1.88, *SD* = 1.32; M_{ip} = 1.94, *SD* = 1.36).

Work-Related Well-being. Participants responded to eight items assessing their degree of psychological and functional well-being on a five-point Likert-type scale (1 = *Very Poor* to 5 = *Very Good*).

Psychological Well-being. Participants answered four items assessing their psychological well-being: *"Over the past week, how have you felt about the following aspects of your work life:"* (a) *"my work life balance"* (*M* = 3.88, *SD* = 1.01), (b) *"my sense of belonging at work"* (*M* = 4.02, *SD* = 0.96), (c)*"my stress or anxiety about work"* (*M* = 3.50, *SD* = 1.11), and (d) *"my overall satisfaction with my working environment"* (*M* = 4.03, *SD* = 0.95).

Functional Well-being. Participants answered four items assessing their functional well-being:*"Over the past week, how have you felt about the following aspects of your work life:"* (a)

"my productivity at work" (*M* = 4.23, *SD* = 0.81), (b) *"my level of access to relevant people, files, and resources at work"* (*M* = 4.14, *SD* = 0.85), (c) *"the flexibility I have at work"* (*M* = 4.05, *SD* = 0.98), and (d) *"my ability to focus on my work"* (*M* = 4.13, *SD* = 0.86).

Frequency of Workplace Interaction. Participants in Wave 5 (*N* = 5,312) responded to two items assessing changes in frequency of workplace interactions since the COVID-19 pandemic began and remote work became widely adopted (i.e., *"Since the onset of the COVID-19 pandemic, how has the frequency of interactions with your coworkers changed, if at all"*) on a three-point Likert-type scale (-1 = *Less frequent, post-COVID*; 0 = *About as frequent as pre-COVID*; 1 = *More frequent, post-COVID*). Participants were asked to report changes in interaction frequency both with their own team (i.e., *"interactions (including informal chats and meetings) with my core team"*; *M* = -.16, *SD* = .65) and within their organization as a whole (i.e., *"interactions with others at my company (outside of my core team)"*; *M* = -.28, *SD* = .64).

Study 2

Participants

In Study 2, we modeled some of our sampling criteria after the archival dataset in Study 1 with a few notable improvements. As in Study 1, in order to qualify for our study, respondents must have been (a) employed working 30 or more hours a week and (b) a knowledge worker as defined by either reporting that they "work with data, analyze information, or think creatively" from a list of workplace responsibilities or by being a skilled office worker or above when reporting their job role (see Study 2 Relevant Materials in SI for questions and response options).

In Study 2, we additionally constructed our sample to better allow us to examine workers' experiences of racial discrimination. Specifically, although we designed our sample to be broadly representative of the population of American knowledge workers, we oversampled

workers of color, because these workers are often underrepresented in organizational samples and we wanted to ensure that workers of color were well-represented enough in our sample to robustly examine one of the main areas of interest in this study—racial discrimination. In service of this effort, we aimed to recruit a sample composition of 25% African American, 15% Asian, 10% Hispanic, and the remaining 50% Non-Hispanic White. We additionally targeted an even 50%/50% split of men and women, as women of color especially tend to be rendered invisible, both in the workplace and in research[12,55,56], and we wanted to ensure adequate representation to fully capture their experiences while working remotely versus in person.

We conducted a two-wave survey of American knowledge workers in February and March 2022 using Qualtrics panel services. This research was approved by the Stanford University IRB (Protocol #: IRB-39851) and informed consent was obtained from participants at both time points. At Time 1, we recruited 5,216 American knowledge workers (M_{age} = 44.40; SD_{age} = 11.11; 49.71% Male, 49.81% Female, 2.68% Non-Binary, 2.11% Prefer not to say). Of these participants 54.03% self-identified as White, 24.33% self-identified as Black or African American, 16.20% self-identified as Asian or Asian American, 2.09% self-identified as American Indian or Alaska Native, .46% self-identified as Middle Eastern or North African, .50% self-identified as Native Hawaiian or Pacific Islander, and 2.40% indicated that they identified as some other race or ethnicity that was not listed.

Of the respondents to the first wave, 2,525 participants (M_{age} = 46.26; 49.58% Male, 49.98% Female, 2.38% Non-Binary, 1.98% Prefer not to say) returned in the second wave (48.41% retention rate). Of these participants 56.83% self-identified as White, 21.58% self-identified as Black or African American, 17.07% self-identified as Asian or Asian American, 2.06% self-identified as American Indian or Alaska Native, .32% self-identified as Middle

Eastern or North African, .40% self-identified as Native Hawaiian or Pacific Islander, and 1.74% indicated that they identified as some other race or ethnicity that was not listed.

Sensitivity Power Analyses

Identical to our approach in Study 1 we simulated power for a main effect, two-way, and three-way interaction using the "simr" package in R[53] for effects between $\beta = .001$ and $\beta = .15$ in .0005 increments (299 effect sizes total). Specifically, we stored the most complex multilevel model in this study (the effect of experiences of in-person discrimination and experiences of remote discrimination on well-being) and ran 500 simulations at each of the 299 effect sizes whereby we sequentially fixed a main effect, two-way interaction, and three-way interaction to the effect size and simply recorded the proportion of statistically significant effects at the fixed effect size. We conducted simulations for a wider range than Study 1 due to the smaller sample size. These simulations showed that we are adequately powered to detect β as small as .087 for main effects, .110 for two-way interactions, and .053 for three-way interactions in the most complex multilevel models we ran for this study (see Figures S4-S6 for depictions of these power simulations).

Measures

Again, because the data presented in this paper are drawn from a larger survey, there were many survey items that were not relevant to the present research question. Here, we will focus only on the core measures included in the focal analyses.

Worker Race. Participants reported their self-identified race (i.e., *"How would you identify your race/ethnicity?"*) and selected from the following options: American Indian or Alaska Native, Asian or Asian American, Black or African American, Middle Eastern or North African, Native Hawaiian or Other Pacific Islander, White, Race or ethnicity not listed.

Participants also reported their self-identified ethnicity (i.e., *"Do you identify as Hispanic or Latinx, or Spanish origin?"*; 1 = *Yes*, 2 = *No*, 3 = *Prefer not to answer*). Prior to analyses, we collapsed across non-White participants to produce two categories for analysis: White (non-Hispanic) workers and workers of color. As in Study 1 and consistent with cognitive racial classification schemas (i.e., hypodescent), participants who selected multiple or other races, as well as those who identified as Hispanic/Latinx, were categorized as workers of color[44].

Working Modality. Participants responded to a single item assessing their frequency of remote work over the previous week (i.e., *"Thinking about your current working week, how often do you work at least a full work day from the following types of locations - Remote location (e.g., your home)"*; M_{t1} = 3.01, SD_{t1} = 1.62; M_{t2} = 2.84, SD_{t2} = 1.61) on a five-point Likert-type scales (1 = *Not at all*, 2 = *Rarely (e.g., a couple of times per month)*, 3 = *Sometimes (e.g., 1-2 days per week)*, 4 = *Most of the time (e.g., 3-4 days per week)*, and 5 = *Always / it is the only location I work at*).

Experiences of Racial Discrimination. Participants responded to the same two items as in Study 1 assessing their experiences of racial discrimination in their workplace when working remotely and in person on a five-point Likert-type scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*; remote: M_{t1} = 1.47, SD_{t1} = 1.03; M_{t2} = 1.34, SD_{t2} = .88; in person: M_{t1} = 1.60, SD_{t1} = 1.09; M_{t2} = 1.49, SD_{t2} = .99).

Work-Related Well-being.

Participants responded to three measures of psychological well-being (job satisfaction, affective organizational commitment, and psychological safety), as well as a measure of turnover intentions. These measures are all validated by prior research and thus represent an improvement over the measures used in Study 1.

Job Satisfaction. Participants responded to one item assessing their overall job satisfaction (i.e., *"In general, how satisfied are you with your current job?"*; M_{t1} = 3.40, SD_{t1} = 1.04; M_{t2} = 3.34, SD_{t2} = 1.05) on a five-point Likert-type scale (1 = *Not at all Satisfied* to 5 = *Extremely Satisfied*)[58].

Affective Organizational Commitment. Participants responded to six items assessing their affective organizational commitment (e.g., *"I feel personally attached to my work organization"*; M_{t1} = 5.04, SD_{t1} = 1.31, α_{t1} = .92; M_{t2} = 4.98, SD_{t2} = 1.35, α_{t2} = .93) on a seven-point Likert-type scale (1 = *Strongly Disagree* to 7 = *Strongly Agree*)[59].

Psychological Safety. Participants responded to one item assessing their degree of psychological safety at work (i.e., *"If I make a mistake it is not held against me"*; M_{t1} = 4.53, SD_{t1} = 1.59; M_{t2} = 4.59, SD_{t2} = 1.56) on a seven-point Likert-type scale (1 = *Strongly Disagree* to 7 = *Strongly Agree*)[60].

Turnover Intentions. Participants responded to two items assessing their turnover intentions (i.e., *"I frequently think of quitting my job"* and *"I am planning to search for a new job during the next 12 months"*) on seven-point Likert-type scales (1 = *Strongly Disagree* to 7 = *Strongly Agree*; M_{t1} = 3.27, SD_{t1} = 1.90; M_{t2} = 3.18, SD_{t2} = 1.90)[61]. Items were highly correlated ($r_{t1}(5,314) = .78$, $p_{t1} < .001$; $r_{t2}(2,523) = .77$, $p_{t2} < .001$) and were thus collapsed into one composite measure for analyses.

Propensity Score Matching Approach

To ensure comparability between the remote and in-person workers in our between-subjects analyses examining the relationship between remote work and work-related well-being, we employed a propensity score matching approach[41]. This approach attempts to simulate a randomized experiment by creating a matched sample where the distribution of covariates is

similar between fully remote and fully in-person knowledge workers. This helps ensure that any differences in outcomes between these two groups are due to their remote work status rather than other factors such as differences in their demographic characteristics. Missing data was handled using multiple imputation with which we generated 20 imputed data sets using predictive mean matching to impute any missingness on age, gender, seniority, industry, tenure, company size, experiences of remote and in-person discrimination, and worker ethnicity. We then conducted all analyses on each of the 20 datasets sequentially and pooled the results. We used the MatchIt package in R[62] to create propensity scores on each of the 20 datasets using nearest neighbor matching. Overall, the propensity score matching was effective at creating matched datasets. For example, in one of the imputed datasets the standard mean differences on covariates ranged from -.142 to .451 before matching; after matching the standard mean differences ranged from -.077 to .136. The overall standardized difference between groups dropped from .451 in the unmatched sample to .136 in the matched sample. This suggests that the two samples were comparable on all covariates and allow for more robust claims about the connection between working modality and any outcome variables.

Data, Materials, and Software Availability

The use of all data for both studies required obtaining a data-use agreement between Slack Technologies and Stanford University, as well as IRB approval. As such, we are unable to release full survey instruments and datasets, including upon request, as Slack Technologies' legal guidelines prohibit the sharing of survey instruments and raw data. However, the relevant materials, data, and analysis code concerning the present paper (i.e., the materials, data, and code necessary to replicate the present research) are available on the Open Science Framework (OSF): https://osf.io/n8v73/?view_only=2d27a7ab254b40bab319caf76d31f349.

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References

1. Long, H. & Van Dam, A. Women of color are surging into the U.S. workforce, causing a historic first in who's getting hired. *The Washington Post* (2019).
2. Fry, R. & Parker, K. Early Benchmarks Show 'Post-Millennial' Generation On Track To Be Most Diverse, Best-Educated Generation Yet. *Pew Research Center* https://www.pewresearch.org/social-trends/2018/11/15/early-benchmarks-show-post-millennials-on-track-to-be-most-diverse-best-educated-generation-yet/ (2018).
3. Olin, A. America is more diverse than ever, but diversity doesn't equal equality. *The Kinder Institute for Urban Research* https://kinder.rice.edu/urbanedge/2020/11/23/america-racial-inequality-diversity-does-not-equal-equality (2020).
4. Hansen, S. *et al. Remote Work across Jobs, Companies, and Space.* https://www.nber.org/papers/w31007 (2023) doi:10.3386/W31007.
5. Dua, A. *et al. Americans Are Embracing Flexible Work—and They Want More of It*. *McKinsey & Company* https://www.mckinsey.com/industries/real-estate/our-insights/americans-are-embracing-flexible-work-and-they-want-more-of-it (2022).
6. Future Forum Pulse. *Leveling the Playing Field in the Hybrid Workplace*. https://futureforum.com/research/leveling-the-playing-field-in-the-hybrid-workplace/ (2022).
7. Ladders. *25% of All Professional Jobs in North America Will Be Remote by End of next Year*. https://www.theladders.com/press/25-of-all-professional-jobs-in-north-america-will-be-remote-by-end-of-next-year (2021).

8. Lund, S. *et al. The Future of Work after COVID-19 . McKinsey Global Institute* https://www.mckinsey.com/featured-insights/future-of-work/the-future-of-work-after-covid-19#/ (2021).
9. Banerjee, D. & Perrucci, C. C. Job satisfaction: Impact of gender, race, worker qualifications, and work context. in *Research in the Sociology of Work* (eds. Williams, C. & Dellinger, K.) vol. 20 39–58 (Emerald Group Publishing, 2010).
10. Hebl, M., Cheng, S. K. & Ng, L. C. Modern Discrimination in Organizations. *Annual Review of Organizational Psychology and Organizational Behavior* **7**, 257–282 (2020).
11. Tuch, S. A. & Martin, J. K. Race in the Workplace: Black/White Differences in the Sources of Job Satisfaction. *Sociol Q* **32**, 103–116 (1991).
12. Xiao, V. L. Deliberate Inclusion: Considering Underrepresented Perspectives in Psychology. in *The Future of Scholarship on Diversity and Inclusion in Organizations* (eds. King, E. B., Roberson, Q. M. & Hebl, M. R.) 351–373 (2022).
13. U.S. Office of Personnel Management. Remote Work. https://www.opm.gov/frequently-asked-questions/telework-faq/remote-work/what-is-the-definition-of-remote-work/ (2024).
14. Staglin, G. When Home Becomes The Workplace: Mental Health And Remote Work. *Forbes* (2020).
15. Hirsch, A. S. Preventing Proximity Bias in a Hybrid Workplace. *Society for Human Resource Management* https://www.shrm.org/topics-tools/news/employee-relations/preventing-proximity-bias-hybrid-workplace (2022).
16. Tsipursky, G. What Is Proximity Bias and How Can Managers Prevent It? *Harvard Business Review* (2022).

17. Neeley, T. The Importance of Autonomy In Remote or Hybrid Work. *Think Work by Tsedal Neeley* https://www.linkedin.com/pulse/importance-autonomy-remote-hybrid-work-tsedal-neeley/ (2022).

18. Reisinger, H. & Fetterer, D. Forget Flexibility. Your Employees Want Autonomy. . *Harvard Business Review* (2021).

19. Bloom, N., Han, R. & Liang, J. Hybrid working from home improves retention without damaging performance. *Nature* **630**, (2024).

20. Bloom, N., Liang, J., Roberts, J. & Ying, Z. J. Does Working from Home Work? Evidence from a Chinese Experiment. *Quarterly Journal of Economics* 165–218 (2015) doi:10.1093/qje/qju032.

21. Gajendran, R. S. & Harrison, D. A. The Good, the Bad, and the Unknown About Telecommuting: Meta-Analysis of Psychological Mediators and Individual Consequences. *Journal of Applied Psychology* **92**, 1524–1541 (2007).

22. Schertler, M., Glumann, N. V. & Boehm, S. A. How Two Megatrends Affect Each Other: Studying the Interplay of Remote Work and Workplace Inclusion with a Random Intercept Cross-Lagged Panel Model. *Academy of Management Discoveries* (2023) doi:10.5465/AMD.2022.0133.

23. Ceron, E. Escaping discrimination by working from home. *Los Angeles Times* (2022).

24. Williams, J. C., Andrews, O. & Boginsky, M. Why Many Women of Color Don't Want to Return to the Office. *Harvard Business Review* (2022).

25. Dupree, C. H. Black employees will thrive with remote work — it's anti-racist. *The Hill* (2022).

26. Rosette, A. S., Koval, C. Z., Ma, A. & Livingston, R. W. Race matters for women leaders: Intersectional effects on agentic deficiencies and penalties. *Leadership Quarterly* **27**, 429–445 (2016).

27. Thomas, R. *et al. Women in the Workplace 2022*. https://womenintheworkplace.com/Women_in_the_Workplace_2022.pdf (2022).

28. Pearson, A. R. *et al.* The fragility of intergroup relations: Divergent effects of delayed audiovisual feedback in intergroup and intragroup interaction. *Psychol Sci* **19**, 1272–1279 (2008).

29. Weaver, C. N. Black-White Differences in Job Satisfaction: Evidence from 21 Nationwide Surveys. *Psychol Rep* **83**, 1083–1088 (1998).

30. Jones, K. P., Peddie, C. I., Gilrane, V. L., King, E. B. & Gray, A. L. Not So Subtle: A Meta-Analytic Investigation of the Correlates of Subtle and Overt Discrimination. *J Manage* **42**, 1588–1613 (2016).

31. Marchiondo, L. A., Ran, S. & Cortina, L. M. Modern Discrimination. in *The Oxford Handbook of Workplace Discrimination* (eds. Colella, A. J. & King, E. B.) 217–236 (Oxford University Press, 2018).

32. Murphy, M. C., Richeson, J. A., Shelton, J. N., Rheinschmidt, M. L. & Bergsieker, H. B. Cognitive costs of contemporary prejudice. *Group Processes and Intergroup Relations* **16**, 560–571 (2013).

33. Walker, S. S., Corrington, A., Hebl, M. & King, E. B. Subtle Discrimination Overtakes Cognitive Resources and Undermines Performance. *J Bus Psychol* **71**, 311–324 (2018).

34. Society for Human Resource Management. *Racial Inequity Persists, Costs American Workplaces Billions Annually*. https://www.shrm.org/about/press-room/shrm-report-racial-inequity-persists-costs-american-workplaces-billions-annually (2021).

35. Minkin, R. *Diversity, Equity and Inclusion in the Workplace*. https://www.pewresearch.org/social-trends/2023/05/17/diversity-equity-and-inclusion-in-the-workplace/ (2023).

36. Totenberg, N. Supreme Court guts affirmative action, effectively ending race-conscious admissions. *NPR* (2023).

37. Waldman, D. A. & Sparr, J. L. Rethinking Diversity Strategies: An Application of Paradox and Positive Organization Behavior Theories. *Academy of Management Perspectives* **37**, 174–192 (2023).

38. The Chronicle of Higher Education. DEI Legislation Tracker. *The Chronicle of Higher Education* https://www.chronicle.com/article/here-are-the-states-where-lawmakers-are-seeking-to-ban-colleges-dei-efforts (2024).

39. Adams, C. & Chiwaya, N. Map: See which states have introduced or passed anti-DEI bills. *NBC News* (2024).

40. Catalyst. *What's Really Causing the DEI Backlash — And How to Fix It*. https://www.catalyst.org/2024/05/21/dei-backlash-causes/ (2024).

41. Rosenbaum, P. R. & Rubin, D. B. *The Central Role of the Propensity Score in Observational Studies for Causal Effects*. vol. 70 https://academic.oup.com/biomet/article/70/1/41/240879 (1983).

42. Ajzen, I., Fishbein, M., Lohmann, S. & Albarracín, D. The Influence of Attitudes on Behavior. in *The Handbook of Attitudes* (eds. Albarracin, D. & Johnson, B. T.) vol. 1 (Routledge, 2018).

43. Swann, W. B., Chang-Schneider, C. & McClarty, K. L. Do people's self-views matter? Self-concept and self-esteem in everyday life. *American Psychologist* **62**, 84–94 (2007).

44. Dubrovsky, V. J., Kiesler, S. & Sethna, B. N. The Equalization Phenomenon: Status Effects in Computer-Mediated and Face-to-Face Decision-Making Groups. *Hum Comput Interact* **6**, 119–146 (1991).

45. Siegel, J., Dubrovsky, V., Kiesler, S. & Mcguire, T. W. Group Processes in Computer-Mediated Communication. *Organ Behav Hum Decis Process* **37**, 157–187 (1986).

46. Passarelli, A. M., Trinh, M. P., Van Oosten, E. B. & Varley, A. Communication quality and relational self-expansion: The path to leadership coaching effectiveness. *Hum Resour Manage* (2022) doi:10.1002/hrm.22156.

47. Boucher, E. M., Hancock, J. T. & Dunham, P. J. Interpersonal sensitivity in computer-mediated and face-to-face conversations. *Media Psychol* **11**, 235–258 (2008).

48. Marwick, A. E. Online Identity. in *A Companion to New Media Dynamics* (eds. Hartley, J., Burgess, J. & Bruns, A.) 355–364 (Blackwell Publishing Ltd., 2013). doi:10.1002/9781118321607.ch23.

49. Talaifar, S. & Lowery, B. S. Freedom and Constraint in Digital Environments: Implications for the Self. *Perspectives on Psychological Science* (2022) doi:10.1177/17456916221098036.

50. Queiroz, A. C. M. *et al.* Too tired to connect: Understanding the associations between video-conferencing, social connection and well-being through the lens of Zoom fatigue. *Comput Human Behav* **149**, (2023).

51. Yang, L. *et al.* The effects of remote work on collaboration among information workers. *Nat Hum Behav* **6**, 43–54 (2022).

52. Sidanius, J. & Pratto, F. *Social Dominance: An Intergroup Theory of Social Hierarchy and Oppression*. (Cambridge University Press, New York, NY, 1999).

53. Green, P. & Macleod, C. J. SIMR: An R package for power analysis of generalized linear mixed models by simulation. *Methods Ecol Evol* **7**, 493–498 (2016).

54. Ho, A. K., Sidanius, J., Levin, D. T. & Banaji, M. R. Evidence for Hypodescent and Racial Hierarchy in the Categorization and Perception of Biracial Individuals. *J Pers Soc Psychol* **100**, 492–506 (2011).

55. Purdie-Vaughns, V. & Eibach, R. P. Intersectional invisibility: The distinctive advantages and disadvantages of multiple subordinate-group identities. *Sex Roles* **59**, 377–391 (2008).

56. Sesko, A. K. & Biernat, M. Prototypes of race and gender: The invisibility of Black women. *J Exp Soc Psychol* **46**, 356–360 (2010).

57. *Exempt Research.* 45 CFR § 46.104 (2024).

58. Scarpello, V. & Campbell, J. P. Job Satisfaction: Are All the Parts There? *Pers Psychol* **36**, 577–600 (1983).

59. Allen, N. J. & Meyer, J. P. The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of Occupational Psychology* **63**, 1–18 (1990).

60. Edmondson, A. Psychological Safety and Learning Behavior in Work Teams. *Adm Sci Q* **44**, 350–383 (1999).

61. Chen, G., Ployhart, R. E., Thomas, H. C., Anderson, N. & Bliese, P. D. The Power of Momentum: A New Model of Dynamic Relationships between Job Satisfaction Change and Turnover Intentions. *Academy of Management Journal* **54**, 159–181 (2011).

62. Ho, D. E., Imai, K., King, G. & Stuart, E. A. MatchIt: Nonparametric Preprocessing for Parametric Causal Inference. *J Stat Softw* **42**, (2011).

63. Davenport, T. H. *Thinking for a Living : How to Get Better Performance and Results from Knowledge Workers*. (Harvard Business School Press, 2005).

64. Reinhardt, W., Schmidt, B., Sloep, P. & Drachsler, H. Knowledge worker roles and actions-results of two empirical studies. *Knowledge and Process Management* **18**, 150–174 (2011).

Figure 1. Experiences of racial discrimination as a function of working modality and worker gender among workers of color in Study 2, controlling for age, organizational tenure, company size, and seniority.

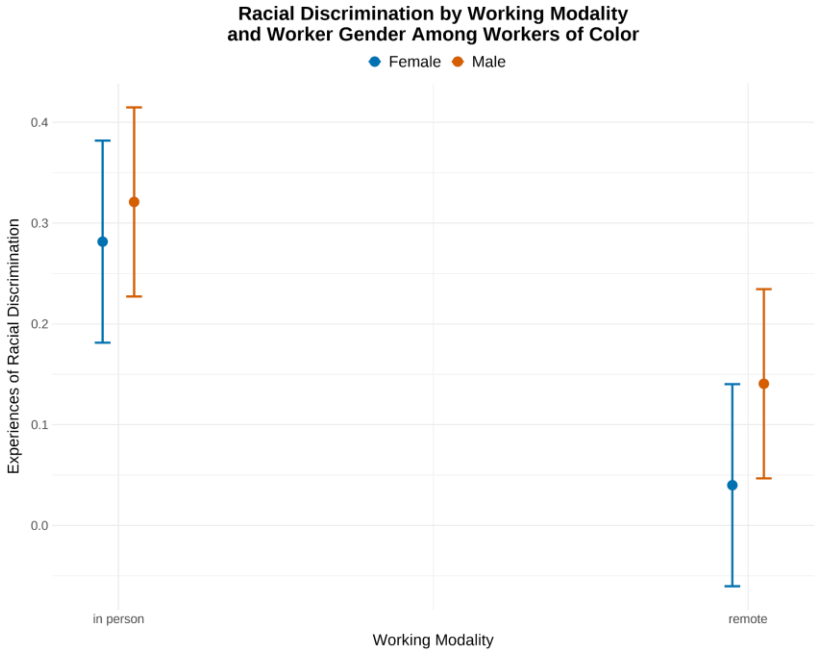

Table 1. The effect of working modality, gender, and their interaction on experiences of racial discrimination in Study 1 and Study 2, controlling for age, organizational tenure, company size, and seniority.

	Study 1		
	ß	*p*	*95% CI*
Working modality[a]	-.098	< .001	[-.133, -.063]
Gender[b]	.050	.084	[-.007, .106]
Working modality x gender	-.011	.548	[-.046, .024]
	Study 2		
	ß	*p*	*95% CI*
Working modality	-.212	< .001	[-.242, -.181]
Gender	.020	.375	[-.024, .063]
Working modality x gender	.031	.049	[.0002, .061]

[a] in person = 1; remote = -1

[b] Male = 1; female = -1