

Disparate Impact? Career Disruptions and COVID-19 Impact Statements in Tenure Evaluations

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Abstract: Extensive research reveals employer biases against workers with career disruptions, particularly those related to caregiving. However, the effectiveness of organizational practices intended to mitigate such biases is less well understood. This study examines the use of COVID-19 impact statements in tenure decisions at research universities, an organizational intervention that was designed to reduce biases but raised concerns that it might inadvertently amplify them. Contrary to concerns about unintended consequences, a pre-registered survey experiment with 602 full professors in STEM fields reveals that the inclusion of impact statements leads to more favorable tenure evaluations, regardless of faculty gender and disruption type. Qualitative evidence suggests that perceptions of pandemic-related disruptions as legitimate, externally imposed, time-limited events in the past help circumvent previously documented biases. This study enhances our understanding of organizational practices that effectively mitigate biases and points to the potential role of narrative framing in workplace evaluations and organizational inequalities.

Keywords: organizations; inequalities; caregiving; gender; higher education

Replication Package: Deidentified survey data and the code needed to replicate the findings are available at <https://doi.org/10.5683/SP3/UAM9PJ>.

Citation: Rivera, Lauren A., Katherine Weisshaar, and András Tilcsik. 2024. "Disparate Impact? Career Disruptions and COVID-19 Impact Statements in Tenure Evaluations." *Sociological Science* 11: 626-648.


Received: May 13, 2024

Accepted: June 17, 2024

Published: August 13, 2024

Editor(s): Arnout van de Rijt, Kristen Schilt

DOI: 10.15195/v1.a23

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CAREER disruptions associated with caregiving can be potent sources of gender inequalities in professional careers. Even temporary employment interruptions related to caring for children or family members can have lasting consequences on subsequent career outcomes (Padavic, Ely, and Reid 2020; Pedulla 2016; Weisshaar 2018). And although many workers remain employed while handling caregiving responsibilities, work disruptions—for example, due to taking parental leave or navigating childcare coverage and school closures—still have implications for workplace evaluations and career advancement (Maxwell, Connolly, and Ní Laoire 2019; Munsch 2016; Offer and Schneider 2011; Thébaud and Taylor 2021; Yu and Kuo 2017). Among parents, mothers are more likely than fathers to take on the majority of childcare labor and as a result, are more likely to experience work disruptions. In dual-career couples, for example, on average, mothers take on 60 percent of total childcare time and over 70 percent of childcare work during normal work hours (Schoonbroodt 2016).

However, the adverse effect of work disruptions on careers is not just about the time or energy available to devote to a job; it is also about employer bias. In professional occupations, “ideal worker” norms portray desirable employees as completely devoted to work (Acker 1990; Blair-Loy 2004; Britton 2017; Davies and Frink 2014). Employees with substantial nonwork obligations, such as caregiving commitments, violate this norm and can experience backlash. For example,

employers rate workers whom they believe are caregivers more negatively in workplace evaluations, net of actual skills, qualifications, hours worked, or productivity (Benard and Correll 2010; Correll, Benard, and Paik 2007; Munsch 2016; Weisshaar 2021). Interestingly, both women and men can experience caregiving bias. For example, fathers who take time out of work to prioritize family or who use flexible work arrangements for childcare face penalties comparable to, or sometimes even exceeding, those experienced by mothers (Munsch 2016; Weisshaar 2018, 2021). Thus, although career disruptions due to caregiving are more prevalent among women and, therefore, constitute a major source of gender inequality in the labor market, penalties arising from *employer bias* can negatively impact caregivers' workplace evaluations regardless of gender (Albiston and Correll 2023; Evertsson 2016; Gough and Noonan 2013; Ishizuka and Musick 2021; Lyttelton, Zang, and Musick 2022; Philipp et al. 2023; Stone and Hernandez 2013; Weisshaar 2018, 2021). Employers' biases against caregivers can cause particularly stark inequalities between those with and without caregiving responsibilities in occupations that have time-delineated, up-or-out promotion systems—such as academia, law, or finance (Blair-Loy 2004; Hatchett 2020; Mickey, Misra, and Clark 2022; Morgan et al. 2021; Noonan and Corcoran 2004; Reskin 1977).

Although extensive research demonstrates the existence of inequalities and bias related to employees' caregiving statuses, less is known about what—if anything—can be done to alleviate these patterns. Recently, social scientists have turned their attention to organizational interventions that might improve gender equity in the workplace, such as policies or practices to decrease the expression of bias in workplace evaluations (Albiston and Correll 2023; Bohnet, van Geen, and Bazerman 2016; Castilla 2015; Correll 2017; Kalev, Dobbin, and Kelly 2006; Moss-Racusin et al. 2014; Rivera and Tilcsik 2019; Sherman 2020; Williams 2021). In this article, we evaluate the effectiveness of an organizational intervention common in academia intended to mitigate caregiving and gender inequalities in promotion decisions, particularly those related to career disruptions during the COVID-19 pandemic.

Careers, Caregiving, and COVID-19

The COVID-19 pandemic represents an extreme case of a career disruption that disproportionately affected caregivers, especially mothers with young children (Collins et al. 2020; Fan and Moen 2021; Forsythe et al. 2020; Landivar et al. 2020; Shuai, Chmura, and Stinchcomb 2020). Overnight, schools and daycares shuttered, and working parents shifted to managing their children's remote schooling while navigating their work challenges (Carlson, Petts, and Pepin 2020; Collins, Landivar, et al. 2021; Yavorsky, Qian, and Sargent 2021). Although both mothers and fathers experienced a sharp increase in time spent on household and childcare responsibilities, mothers in the U.S. took on a greater share of this labor than fathers, on average (Alon et al. 2020; Collins et al. 2020; Collins, Ruppanner, et al. 2021; Lyttelton et al. 2022; Ruppanner et al. 2021; Yavorsky et al. 2021). As a result, the early COVID-19 pandemic may have deepened many of the pre-existing gender inequalities in the home (Alon et al. 2020; Collins, Landivar, et al. 2021; Collins, Ruppanner, et al. 2021; Fisher and Ryan 2021; Landivar et al. 2020, 2023; Yavorsky et al. 2021).

The career disruptions related to caregiving during the pandemic have particularly serious consequences in “up-or-out” professions—such as academia, law, and finance—where workers either obtain a promotion (e.g., tenure) or lose their job entirely. In these careers, because workers have a limited timeframe to demonstrate their performance to their employers, productivity disruptions (real or perceived) can derail upward career trajectories (Hatchett 2020; Mickey et al. 2022; Morgan et al. 2021; Reskin 1977). In academic science, for example, the sudden closure of laboratories and research sites drastically hindered the research progress of many professors, and mothers of young children experienced particularly severe research disruptions (Cui, Ding, and Zhu 2022; Gao et al. 2021; King and Frederickson 2021; Krukowski, Jagsi, and Cardel 2021; Myers et al. 2020; Staniscuaski et al. 2021). In the initial pandemic period, U.S. women scientists with dependents under the age of five reported declines in research time of 30–40 percent (Myers et al. 2020). Given that even a one-year delay in publication progress can adversely affect perceptions of an early-career faculty member’s productivity and scholarly impact and thus their prospects for promotion to tenure, these disruptions may have long-term effects on the gender composition of the professoriate (see Ioannidis, Boyack, and Klavans 2014).

Presently, universities worldwide are grappling with how to handle such pandemic-related research disruptions in faculty tenure decisions. One intervention that many institutions have introduced is allowing faculty to include a “COVID-19 Impact Statement” in their tenure dossiers, enabling them to document pandemic-related research interruptions (NYU 2021; Settles, Linderman, and Saville 2021; UC Berkeley 2021; University of Maryland 2022; University of Texas at Austin 2020). Although the intention of impact statements is to *improve* equity in tenure reviews, there has been substantial controversy over them, with faculty voicing concerns that these statements may instead *negatively* affect tenure evaluations and increase inequality (Langin 2022; Malisch et al. 2020; Mickey et al. 2022). Despite the widespread implementation of this intervention and the debates surrounding it, no empirical research has directly examined how COVID-19 impact statements affect tenure evaluations.

On the one hand, advocates of impact statements assert that drawing awareness to structural factors affecting a faculty member’s productivity during the tenure-track period could help evaluators contextualize productivity and make more appropriate judgments of a candidate’s record. For example, one University of California campus describes how impact statements provide “context that will help reviewing agencies understand the impact that COVID-19 may have had on their academic record for the review period” (UC Santa Barbara 2021). Proponents argue that this added context could potentially result in more equitable tenure evaluations, especially for women with young children who were disproportionately affected by pandemic-related disruptions (Cui et al. 2022; Gao et al. 2021; King and Frederickson 2021; Krukowski et al. 2021; Malisch et al. 2020; Myers et al. 2020; Staniscuaski et al. 2021). Universities often emphasize this intended equalizing effect when describing the rationale for allowing COVID-19 impact statements. For example, the University of Massachusetts at Amherst states: “With the pandemic impact statement, faculty members are helping ensure that the university recognizes

both the additional contributions that they made due to the pandemic, and the limitations that the pandemic imposed upon them, so that their work is valued and *any impacts do not derail their career*" [emphasis added] (University of Massachusetts Amherst ADVANCE Program 2021).

On the other hand, because COVID-19 impact statements contain personal information about hardships experienced during the pandemic, they have the potential to make devalued or marginalized identities salient and *induce* biased evaluations of faculty members' past or future productivity. Biases related to caregiving and gender are especially relevant. Research in sociology shows that employers view caregivers of any gender as less competent and committed employees and rate them more negatively than non-caregivers with identical qualifications (Correll et al. 2007; England, Levine, and Mishel 2020; Thébaud and Taylor 2021; Weisshaar 2018). Such patterns are common in academic science, where ideal worker norms of total work devotion are strong, and work is often seen as a calling (Blair-Loy and Cech 2022; Morgan et al. 2021; Thébaud and Taylor 2021). Moreover, prior work shows an additional *flexibility stigma* (Stone and Hernandez 2013; Williams, Blair-Loy, and Berdahl 2013) in academic science, whereby faculty who require work-family accommodations are penalized compared to those who do not use or require flexible work arrangements (Blair-Loy and Cech 2022; Cech and Blair-Loy 2014; Thébaud and Taylor 2021).

Although faculty tenure committees are typically aware of the gender of the faculty member under review regardless of whether a COVID-19 impact statement is included, these statements could reveal previously unknown information about parental status or caregiving obligations. As a result, there is a concern among some faculty that COVID-19 impact statements could backfire: rather than providing information that contextualizes performance and improves evaluations, statements could elicit backlash and penalize faculty with caregiving obligations, net of actual productivity (Langin 2022; Mickey et al. 2022). Indeed, such concerns are explicitly acknowledged in certain universities' descriptions of their COVID-19 Impact Statement policy or their instructions for tenure candidates (Settles et al. 2021). For example, the University of Texas at Austin explicitly cautions candidates not to mention childcare responsibilities in their statements due to concerns that this information could induce motherhood or caregiving biases (University of Texas at Austin 2020).

Thus, although COVID-19 impact statements are typically discussed as a potential means to increase equity in tenure decisions, especially for parents, there are also substantial concerns that they may backfire and result in more negative tenure assessments. Therefore, empirically investigating how the presence and content of impact statements affect tenure evaluations is important for understanding both the short-term impact of these policies on faculty outcomes and longer-term patterns of demographic diversity in the professoriate.

Here, we provide the first empirical study of the effect of COVID-19 impact statements on tenure evaluations of faculty. Using a pre-registered survey experiment conducted with tenured full professors in the biological and physical sciences at U.S. research universities ($n = 602$) in 2023, we examine how the inclusion of a COVID-19 impact statement affects a faculty member's tenure evaluations and

whether this effect varies by the nature of the disruption disclosed (childcare closure versus laboratory closure) and the candidate's gender.

Methods

Participants

We study these questions in the context of biological and physical science fields, where prior work suggests gender and caregiving biases are salient (Blair-Loy and Cech 2022; Cech and Blair-Loy 2014; Moss-Racusin et al. 2012; Sheltzer and Smith 2014; Thébaud and Taylor 2021). Moreover, work in these fields is often laboratory-based, enabling us to compare the effects of COVID-19 statements that detail caregiving-related disruptions (childcare closure) versus those that detail disruptions unrelated to caregiving (laboratory closure). These fields are, therefore, well-suited to testing whether COVID-19 impact statements elicit gender and caregiving biases in evaluations.

We sampled faculty in the biological and physical sciences from the 100 highest-ranked research-intensive (R1) universities in the United States (US News & World Report 2022). We focused on these types of universities because tenure is competitive and typically awarded based on perceptions of a faculty member's research productivity, research contributions, and scholarly reputation in their field (Hatchett 2020; Matias, Lewis, and Hope 2022; National Center for Science and Engineering Statistics 2023). Therefore, pandemic-related research disruptions are likely to be meaningful in tenure decisions (Alperin et al. 2019; Smith, Vidler, and Moses 2022). We randomly selected 35 of the top 100 universities for inclusion in the sample.

Within these universities, we invited full professors from the biological sciences (biology, biochemistry, botany, genetics, immunology, microbiology, physiology, zoology) and physical sciences (chemistry, physics, astronomy, earth, atmospheric, and oceanographic or geological sciences) to participate (Abraham et al. 1999). All active research faculty at the full professor rank listed on department websites from these fields were invited to participate in the survey; emeriti faculty, clinical professors, and those with secondary appointments in the focal departments were ineligible. We invited only full professors to participate in the survey, rather than all faculty, because full professors tend to have the most experience evaluating tenure candidates. This sampling strategy yielded a total of 2,980 faculty.

602 faculty respondents completed the study. Table S1 in the online supplement presents the descriptive statistics of participants. To ensure respondent confidentiality, we cannot link the invited respondents to their participation (or lack thereof) in the survey, and respondents were not required to answer the social, demographic, and institutional questions on the survey (e.g., gender, field, university), so the sample size for these measures varied somewhat across each question.

Based on the self-reported characteristics of respondents in our survey, our sample comprised a relevant and diverse sample of full professors, and we found no evidence of systematic differences between the participants and the broader sample of invited faculty. First, participants represented a highly relevant sample, possessing substantial experience as full professors who had previously conducted

tenure evaluations. Respondents averaged between 10-14 and 15-19 years as a full professor and reported having reviewed a median of 30 tenure cases. Second, survey respondents were highly similar to the full sample of faculty invited to take the survey in terms of known characteristics (see Table S2 in the online supplement). The distribution across geographic regions, public/private universities, university rankings, and faculty members' gender were similar, indicating no obvious sign of non-response bias. Our sample was also similar to published estimates of 4-year university full faculty composition in biological and physical sciences, of whom about 27 percent are female, and 79 percent are White (National Center for Science and Engineering Statistics (NCSES) 2023). In our survey, 20 percent of respondents are female, and 93 percent are White. The average U.S. News ranking of our respondents' universities was 48—close to the median in the top 100—and 39 percent of respondents indicated they are in biological sciences, and 61 percent indicated they are in the physical sciences. Respondents' ages ranged from 41 to 74, with an average of 54. The majority (57 percent) of respondents reported having one or more children, with the youngest averaging an age of about 20. Taken together, our survey respondents constitute a sample that is observably similar to the wider population of senior faculty at research universities, has substantial relevant experience in conducting tenure evaluations, and shows no obvious signs of differential selection into survey participation.

Experimental Design

The survey experiment is a between-subjects 3×2 factorial design that fully randomized respondents into one of three COVID-19 impact statement conditions (No Statement; Lab Closure; Childcare Closure) and one of two candidate genders (Woman; Man). Given our interest in the effects of COVID-19 impact statements on tenure evaluations, and specifically in whether revealing information about candidates' caregiving statuses differentially affects male and female candidates, we designed the experimental conditions to test the effect of a childcare closure statement relative to both a different type of closure—a lab closure—and to a control condition with no statement. A lab closure reflects a disruption to research productivity that can be explained in a COVID-19 impact statement without revealing a candidate's caregiving or parental status. Moreover, a lab closure works well with our interest in biological and physical science fields, where norms around motherhood and caregiving conflict with beliefs that scientists should exhibit high devotion to work and prioritize research over other areas of life (Blair-Loy and Cech 2022). We randomly assigned whether the tenure materials included an optional COVID-19 impact statement and whether the statement detailed research disruptions due to childcare or laboratory closure.

Taking an experimental approach to this research is advantageous because it allows us to examine the effect of COVID-19 impact statements on tenure evaluations when candidates were otherwise equivalent. In reality, given the gendered nature of care work, women, mothers, and caregivers experiencing care closures faced larger productivity losses during the early pandemic period than those without caregiving responsibilities (Cui et al. 2022; Gao et al. 2021; King and Frederickson 2021;

Krukowski et al. 2021; Myers et al. 2020; Staniscuaski et al. 2021). In our experiment, we kept the profiles of faculty candidates consistent, ensuring that evaluators received the same information about each candidate's productivity and scholarly impact. This approach allowed us to causally test the effect of COVID-19 impact statements on evaluations, eliminate concerns about productivity as a confounding factor, and isolate the effect of potential gender or caregiving bias.

One concern about survey experiments is the possibility of experimenter demand effects, whereby participants report not their genuine beliefs but the responses they think the researchers expect to observe (Orne 1962). However, given the lack of direct interactions between the experimenter and the participants, online survey experiments tend to be significantly less susceptible to demand effects than in-person laboratory studies (Mummolo and Peterson 2019), especially if they adopt a between-subjects (rather than within-subject) design, as we did in our study. By exposing each participant to only one experimental treatment and keeping them unaware of other conditions, a between-subjects design makes it challenging for participants to deduce the study's intent, thus reducing the potential influence of demand effects (Charness, Gneezy, and Kuhn 2012).

Stimulus Materials

Faculty respondents were asked to evaluate a tenure case as if they were members of a university personnel committee that reviews promotion and tenure cases. They were told that the candidate is an Assistant Professor in a laboratory sciences field being considered for tenure and that candidates were allowed to submit a COVID-19 impact statement. Respondents viewed the "Summary of Evaluation of Tenure Case" document (see the online supplement), which was identical across experimental conditions aside from the candidate's signaled gender. We developed the tenure case materials with input from university informants. The Summary indicated that the candidate for tenure had strengths and weaknesses and that the case was "close to the threshold." Quotes from external letter-writers also indicated some ambiguity, with some praising the candidate's record and others questioning the level of productivity. The Summary additionally contained short reviews indicating that the candidate had fulfilled teaching and service expectations. We intentionally crafted an ambiguous case, given research suggesting that biases, including those related to gender and caregiving, are most likely to occur in such situations (Dovidio and Gaertner 2000; Foschi 2000; Heilman and Haynes 2005). Moreover, tenure evaluations at research institutions often involve a degree of ambiguity, as relatively few cases are entirely clear-cut and unequivocal (Hatchett 2020).

The COVID-19 Impact Statement treatment followed the Summary of Evaluation of Tenure Case document. In the "No Statement" condition, respondents answered questions immediately after reviewing the Summary document. For the "Lab Closure" and "Childcare Closure" experimental conditions, respondents read a paragraph labeled "Optional COVID-19 Impact Statement from the Candidate" (see the online supplement). The Lab Closure statement indicated that the candidate conducted the bulk of their research in a laboratory on campus, which was

closed from March 2020 to March 2021. The Childcare Closure statement indicated that the candidate had two young children who require constant supervision; the children's daycare closed from March 2020 to March 2021. In both statements, the candidate estimated that the closure decreased the time they were able to devote to research by approximately 65 percent during the first year of the pandemic. The statements indicated that the lab/daycare reopened during the following year, but from March 2021 to March 2022, additional lab/daycare closures and disruptions led to a decrease in time dedicated to research by approximately 35 percent.

We developed the lab closure and childcare closure statements after reviewing numerous examples of COVID-19 impact statements provided by our contacts at multiple R1 universities. In addition, we conducted a pilot survey of full professors ($n = 18$)—sampled using the same criteria that we used for our main experiment—which showed that participants tended to view the tenure evaluation task in our experiment as “completely realistic” or “realistic.”

Both the lab closure and the child closure statements used similar wording and language to describe the closure and gave identical estimates of how negatively the closure impacted the candidate's research time. Aside from the reason for the disruption (laboratory versus childcare closure), the language and impacts documented within these statements were identical.

The second experimental manipulation was the random assignment of the candidate's gender (male or female), signaled by name (Comenetz 2016; Newman et al. 2018; Social Security Administration 2022). We selected candidates' names (Jennifer and Michael Nelson) to signal gender and to imply that the candidate was likely White and in an age range typical for a tenure candidate (mid-30s). To do so, we conducted a pretest of possible first and last names in terms of perceived gender, race/ethnicity, social class, education, age, and immigration status—see Table S10 in the online supplement.

Scholarship on the intersections of gender and race in workplace evaluations suggests that women of color may face unique stereotypes and workplace outcomes compared to White women (Eaton et al. 2020; Mickey and Smith-Doerr 2022; Rosette et al. 2018). Because the stark reality is that only about 1.3 percent of employed doctoral degree holders in biological and physical sciences are Black women and 1.9 percent are Latina women (National Center for Science and Engineering Statistics 2023), we used names typically perceived as White, while acknowledging that minoritized racial groups—both women and men—may have unique experiences not captured in our design.

Measures and Analysis

We asked respondents to evaluate the candidate on several dimensions. The primary dependent variable—respondents' recommendation of whether or not to grant the promotion to tenure—was a 1-6 scale ranging from 1 (“Definitely do not promote”) to 6 (“Definitely promote”). We also asked respondents to assess the candidate's current and future productivity, commitment relative to similar faculty members, and—to tap the social dimensions of tenure evaluations—the extent to which they would advocate to tenure the candidate if the committee disagreed

over the recommendation. We also asked them to explain their recommendation qualitatively in an open-ended text box.

The ordinal scale variables were treated as continuous in OLS regression models, as described below. We also created standardized dependent variables, with a mean of 0 and standard deviation of 1, to compare the experimental treatment in standardized units.

Following our pre-registration plan,¹ we analyzed the quantitative survey measures using OLS regressions, first examining the main effects of the COVID-19 impact statements and then including an interaction term of the impact statement condition with candidate gender. As an exploratory analysis, we used other OLS regression models to examine variation in the effect of the COVID-19 impact statements by interacting the experimental condition with evaluator characteristics, such as university prestige, as well as evaluators' gender and parental status (see Figures S2-S4 in the online supplement). Statistical significance is derived from regression coefficients, using a 95 percent significance threshold, and, when applicable, using predicted values from regressions and 95 percent confidence intervals of marginal effect estimates (two-tailed t-tests).

Finally, as an exploratory qualitative analysis, we hand-coded respondents' open-ended text responses describing their rationale for their tenure decision in detail without knowledge of the experimental condition to which they were assigned. From this process, we noted common themes that emerged across many responses in each condition (Miles, Huberman, and Saldaña 2014). To understand whether there were also more subtle differences in language and tone between conditions, we used analysis of these open-ended text responses using the Linguistic Inquiry Word Count (LIWC) 2022 software (Boyd et al. 2022). The LIWC-22 program analyzes text-for-word frequencies within dictionaries that are psychometrically validated (Boyd et al. 2022). We used the basic dictionary package in LIWC, which measures words related to several dimensions, including tone, emotion, and a variety of topics (Boyd et al. 2022). The LIWC measures reflect the percentage of words in a respondent's open-ended text response that belonged to a LIWC dictionary of a particular dimension. We conducted OLS regressions applied to LIWC measures to explore variations in the language participants used to justify their decisions.

In addition to the stimulus material used in the experiment, the online supplement (Part 1) contains additional details regarding the survey design and analysis.

Results

We found that the inclusion of *any* COVID-19 impact statement resulted in significantly more positive tenure recommendations compared to no statement, regardless of whether the statement detailed childcare ($\beta = 0.333$; $p = 0.00016$) or laboratory disruptions ($\beta = 0.189$; $p = 0.031$). Figure 1 displays estimates of the recommendation for tenure outcome across the COVID-19 impact statement experimental conditions, derived from Model 1 in Table S3. On the recommendation for promotion scale from 1-6, respondents, on average, evaluated candidates with no COVID-19 impact statement at a value of 4.54, or in between "maybe promote" and "probably promote." Candidates with lab closure statements received an average score of

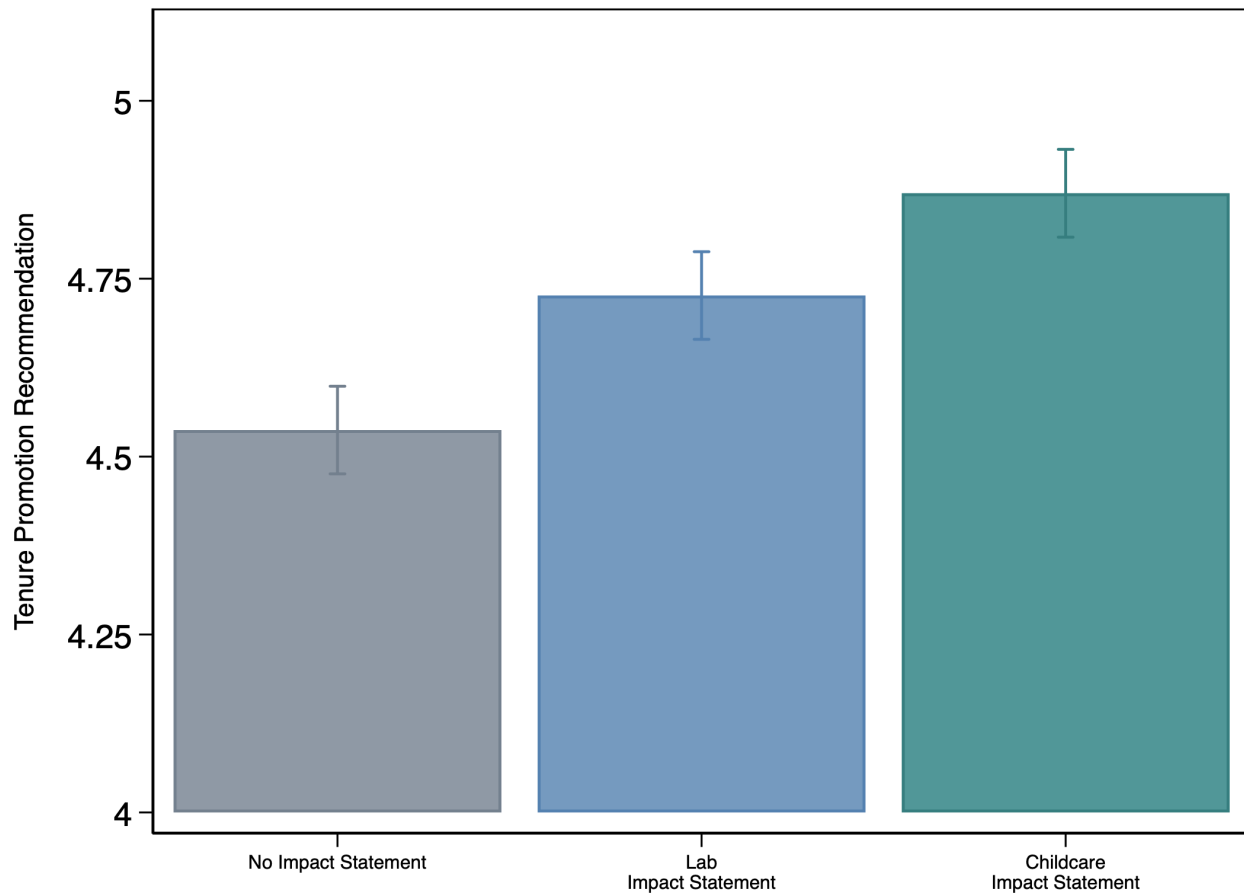


Figure 1: Recommendation of promotion with tenure across COVID-19 impact statement experimental conditions. Estimates from OLS regression models pooling men and women candidates. Error bars display standard errors of the mean. Lab Impact Statement and Childcare Impact Statement means are statistically significantly higher than No Impact Statement ($p < 0.05$ and $p < 0.001$, respectively, from two-tailed t-tests). Lab and Childcare Impact Statement means are not significantly different from one another. The tenure recommendation measure is a 1-6 scale with 6 indicating a stronger recommendation for tenure. Regression models are provided in Table S3 in the online supplement.

about 4.73, an increase of 0.189, or about 0.2 standard deviations, relative to no statement ($p < 0.05$), and candidates with childcare statements received an average score of about 4.87, an increase of 0.333, or about 0.38 standard deviations, compared to no statement ($p < 0.001$). The promotion recommendation levels between the two statement types (lab and childcare statement) were not significantly different from one another ($p = 0.102$).

The effects of COVID-19 impact statements did not significantly vary by the candidate's gender. Thus, we find no evidence that the childcare impact statement leads to bias against mothers (or fathers). Figure 2 displays estimates of recommendation for tenure across the impact statement and candidate gender, derived from the regression in Model 2 of Table S3 in the online supplement. We find no statistically significant interaction between candidate gender and COVID-19 impact statement:

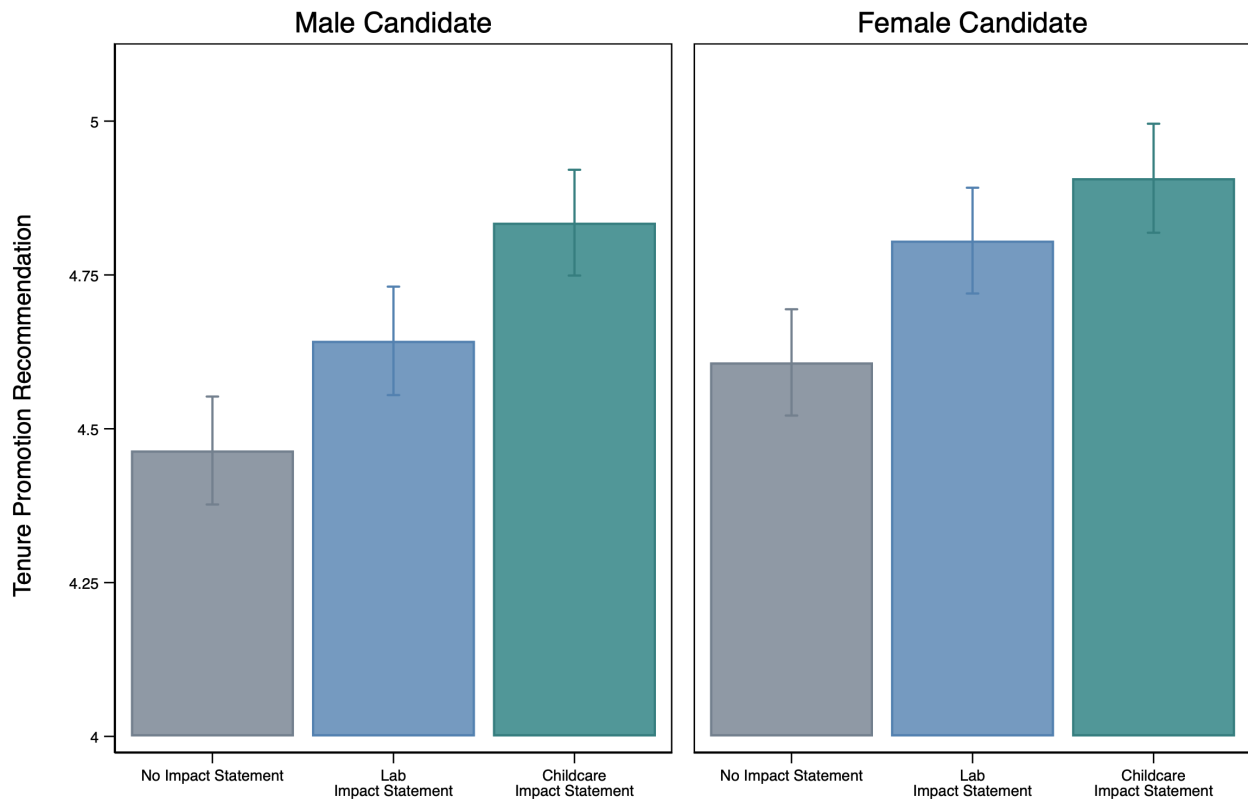


Figure 2: Recommendation of promotion with tenure across COVID-19 impact statement experimental conditions and candidate gender. Estimates from OLS regression models with impact statement \times candidate gender interaction term. Error bars display standard errors. Within candidate gender, Lab Impact Statement mean is not statistically different from No Impact Statement ($p = 0.154$ for male candidates and $p = 0.106$ for female candidates). Childcare Impact Statement means are statistically significantly higher than No Impact Statement ($p < 0.01$ for male candidates and $p < 0.05$, respectively). Lab and Childcare Impact Statement means are not significantly different from one another. Regression models are provided in Table S3 in the online supplement.

statements have a positive effect for both men and women ($p = 0.910$ for the lab \times gender interaction and $p = 0.686$ for the childcare \times gender interaction). In the candidate gender interaction model, the lab statement effect is not statistically significant within gender, for men or women separately ($p = 0.154$ and $p = 0.106$, respectively), but the effect of the childcare statement is statistically significant compared to no statement for both men and women ($p < 0.01$ and $p < 0.05$, respectively). Based on these results, we can reject a negative effect of childcare statements on women's tenure recommendations at the 5 percent level, and on men's at the 1 percent significance level.

We also examined whether the inclusion of a COVID-19 impact statement affected respondents' perceptions of the faculty member beyond the recommendation of whether or not to grant tenure. For example, it is possible that a COVID-19 statement detailing extensive childcare obligations could yield a more favorable tenure recommendation but generate a more negative perception of a faculty mem-

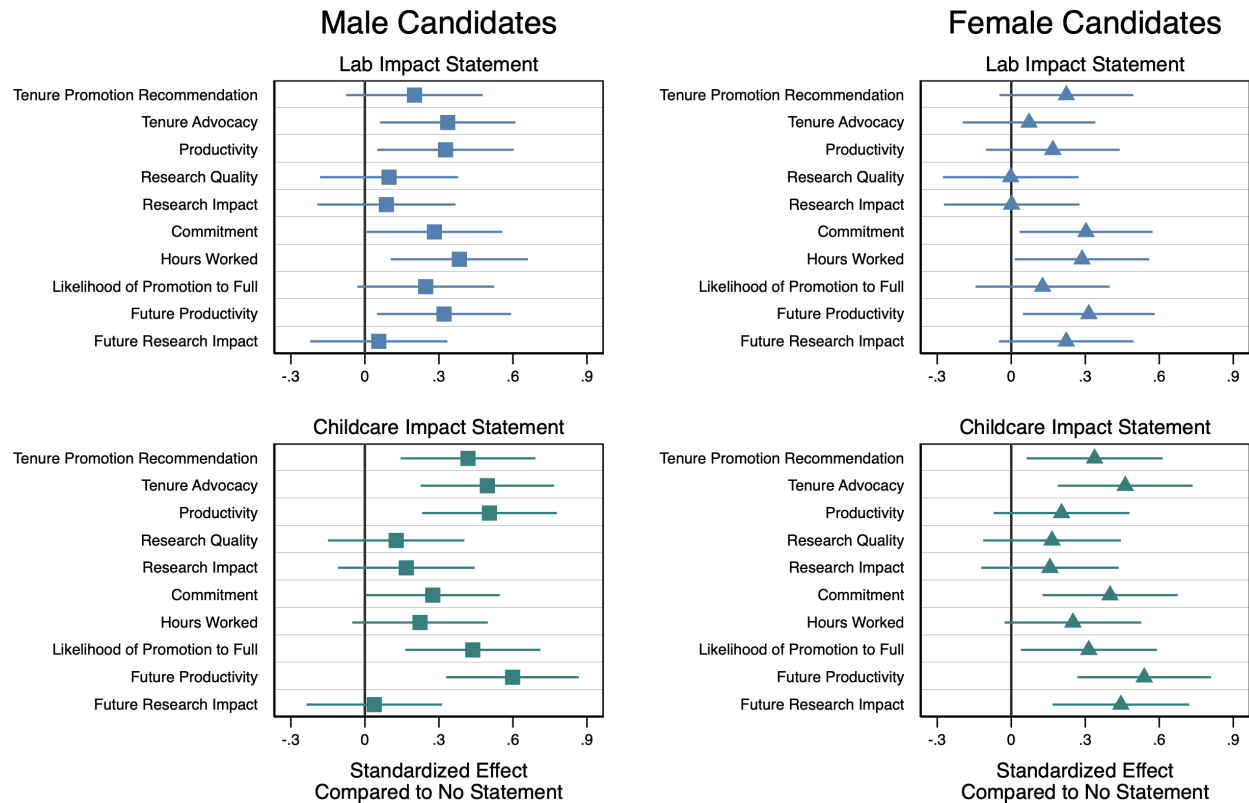


Figure 3: Standardized effects of COVID-19 impact statement on all evaluation measures by candidate gender. Effects are estimated from OLS regressions of standardized measures, with impact statement \times candidate gender interaction term. Bars display 95 percent confidence intervals. The x-axis is the estimated effect in standard deviation units, compared to the within-gender no-statement candidate (indicated with the reference line at $x = 0$). Error bars for statistically significant effects at $p < 0.05$ do not cross the x-axis. Positive values indicate more favorable evaluations. Full regression models are given in Table S5 and marginal effects in Table S6 in the online supplement.

ber’s long-term research trajectory or commitment to science. Figure 3 illustrates the marginal effects of the COVID-19 impact statement, compared to no statement, within candidate gender, across standardized measures (mean of 0 and standard deviation of 1) of all evaluation items. The marginal effect estimates present 95 percent confidence intervals; when these confidence intervals cross 0 on the x-axis, the effect is not statistically significant at the $p < 0.05$ level. The full regression models appear in Table S5 and average marginal effects in Table S6 (non-standardized regression measures are displayed in Table S4).

As indicated in Figure 3, we did not find evidence of negative effects on a range of measures, including those capturing a faculty member’s expected future career trajectory. If anything, in some cases, these statements resulted in significantly more positive perceptions of a researcher’s long-term career prospects. For example, including a lab statement (compared to no statement) led to about a 0.3 standard deviation increase on measures of commitment to science and expected future productivity for both men and women candidates (see Table S6). Childcare

statements, relative to no statement, similarly have significant positive effects on these measures for both men and women candidates—with a more than 0.5 standard deviation increase on expected future productivity—and also show significant positive effects on advocacy and promotion to full professor.

Collectively, from these results, we can reject a penalty of childcare statements for women candidates on tenure recommendations (at the 5 percent level), advocacy (at the 0.1 percent level), commitment (1 percent level), future productivity (0.1 percent level), future impact (1 percent level), and promotion to full professor (5 percent level). For men candidates, we can likewise reject a penalty of childcare statements on tenure recommendations (at the 1 percent level), advocacy (at the 0.1 percent level), productivity (0.1 percent), commitment (5 percent), future productivity (0.1 percent) and promotion to full professor (1 percent).

These results are surprising given prior research showing gender and caregiving biases in evaluations, especially in academic science (Blair-Loy and Cech 2022). To explore possible mechanisms, we hand-coded respondents' qualitative explanations for their recommendations. A clear pattern emerged that participants in the COVID-19 statement conditions, compared to the no statement condition, discussed research disruptions as being explicitly tied to COVID-19, legitimate, and as being in the past (see Fig. 4). In the impact statement conditions, respondents perceived pandemic-related disruptions to research productivity as the result of external disruptions beyond the candidate's control rather than as indicators of a candidate's quality as a scholar or underlying productivity. In the presence of these statements, language attributing disruptions to structural obstacles rather than the candidate's choice or "fault" was common. For example, one participant remarked of the candidate, "His productivity is low due to factors out of his control." Moreover, respondents viewed the pandemic as a legitimate basis for productivity disruptions. One participant illustrated, "High-quality publications and low number of papers seems to have a valid reason (COVID disruption)." Finally, faculty viewed these disruptions as temporary and *in the past*, thus not a risk to the candidate's future productivity. One evaluator stated, "In this case the number of outputs has been affected by childcare during COVID. There is every indication that this number will increase as things settle down."

Based on themes identified during our manual coding, we analyzed these responses with the text analysis program LIWC (Boyd et al. 2022), focusing on LIWC dictionaries of words associated with temporality: time ("when," "now," "then") and focus on the past ("was," "did," "ago"). Both types of COVID-19 impact statements were associated with greater percentages of temporality words compared to no statement ($p < .05$; see Fig. S1 and Table S9). These findings suggest that perceptions of the pandemic as an externally imposed, legitimate, and temporally bound event may, therefore, serve to buffer candidates from the negative effects of caregiving disclosures found in prior research.²

Discussion

Overall, our study suggests that COVID-19 impact statements can be a useful intervention to help university tenure committees account for inequalities generated

“The Covid situation obviously had a **temporary negative influence.**”

“She seems like a strong candidate, with the main weakness being **temporary productivity issues**, which can be accounted for by Covid.”

“High-quality publications and low number of papers seems to have a **valid reason** (COVID disruption).”

“His productivity is low due to **factors out of his control.**”

“**It isn’t his fault** if he couldn’t put out as much work due to Covid 19 and childcare. **I’d expect productivity would improve now.**”

Figure 4: Examples of quotes from open-ended qualitative responses describing the reasoning behind tenure recommendation in COVID-19 Impact Statement conditions.

by the pandemic in a way that does not seem to result in significant gender or caregiving bias. This result is encouraging for universities and tenure candidates seeking to account for pandemic-related career disruptions in tenure decisions. Yet it is somewhat surprising given prior research on motherhood and caregiving biases and flexibility stigma in academic science. Our exploratory analysis of participants’ open-ended responses raises the possibility that perceptions of the pandemic itself—as an externally imposed, legitimate, time-delineated event that participants viewed as being in the past—may counteract biases related to career disruptions and caregiving in evaluation. Therefore, it is possible that employer biases related to gender and caregiving may be less salient when evaluators perceive career-related disruptions as discrete, legitimate incidents that are out of a worker’s control and are in the past (see also Bedi, Majilla, and Rieger 2022; Kricheli-Katz 2012, 2013).

Indeed, prior research has shown that workers who exit the labor market are perceived less favorably when their departure is seen as freely chosen (e.g., “opting out” to care for family members) versus externally imposed (e.g., involuntary termination) (Weisshaar 2018, 2021). Moreover, individuals are more motivated to neutralize bias or promote equity when they personally believe in a cause, such as when a source of injustice is personally relevant to them (Birnbaum et al. 2023; Dahl, Dezső, and Ross 2012; Dasgupta et al. 2018; Wang, Gao, and Feng 2021). Therefore, future research should probe the degree to which perceptions of the controllability, legitimacy, and temporality of career disruptions affect the activation or salience of gender and caregiving biases in workplace evaluations within and beyond the academy. Doing so could help employers design personnel practices

and interventions to mitigate biases and help employees in professional occupations frame common career-related disruptions, such as gaps in work histories and part-time or nonstandard employment, in a way that minimizes backlash.

On a broader level, our study suggests that it is not only the existence of career disruptions that is relevant for understanding patterns of workplace inequality; the specific type of disruption *and how it is framed* also matters for the expression of caregiving and gender biases in workplace evaluations. Historical, political, and cultural sociologists have highlighted the power of narrative to shape social perception and behavior. Put simply, it is not just events themselves but *the stories we tell about events* that shape reality and action (e.g., Polletta et al. 2011; Rivera 2008; Schudson 1989; Zerubavel 2004). Prior work examines how personal narratives contextualizing performance can shape educational sorting, such as in college admissions applications (see Bastedo and Bowman 2017; Gebre-Medhin et al. 2022; Karabel 2005; Stevens 2007). Our results raise the possibility that personal narratives can also shape evaluation and stratification within careers and may represent a fruitful interventional strategy to reduce the expression of certain biases. It remains a task of future research to examine this possibility more directly.

Overall, we find that the inclusion of COVID-19 impact statements resulted in more positive tenure evaluations for both women and men faculty, regardless of whether career disruptions stemmed from laboratory or childcare closures. Nevertheless, our study is not without limitations, which point to additional future research directions. First, although the profiles in our experiment reflect the reality that biological and physical sciences remain predominantly White (National Center for Science and Engineering Statistics 2023), it will be important for future research to assess whether perceptions of parents vary by both gender and race/ethnicity. Second, our study focuses exclusively on perceptions of faculty who discuss career disruptions related to laboratory closures and childcare, which participants saw as externally imposed, time-delineated, and legitimate. It is possible that other types of disruptions, for example those that continue into the present (e.g., “long COVID”), could be evaluated differently. Finally, our experimental design holds productivity constant. Although this design is beneficial in that it allows us to isolate the effect of COVID-19 impact statements on tenure evaluations and directly measure the presence or absence of bias related to gender or caregiving, it does not allow us to examine whether women faculty faced more extensive research disruptions or whether women and men have different propensities to submit—or mention childcare—in impact statements for their tenure dossiers (Pachucki et al. 2023). Future research could explore this possibility, as “gaming the system” through inaccurate reporting might be possible. Yet, when focused on evaluations of otherwise equivalent candidates, we did not find evidence that caregiving and gender penalties are activated for faculty who write about childcare in their COVID-19 statements.

Conclusion

Sociological research on organizational inequalities across gender and caregiving statuses tends to yield troubling results. Yet it is equally important for scholars to recognize and highlight positive outcomes—such as effective interventions—if they

do occur. Doing so enables organizations to implement approaches that increase equity and curtail the pervasive inequalities that typically unfold in the absence of deliberate action (e.g., Correll 2017). Our study evaluates one such approach and reveals that—in response to certain disruptions like those caused by the COVID-19 pandemic—organizations can design interventions that mitigate caregiving and gender biases.

Notes

1 <https://aspredicted.org/qd3vz.pdf>

2 We tested whether these effects differed across evaluators' characteristics, including based on the prestige of respondents' universities, as well as respondents' gender and parental status. These results are presented in the online supplement in Figures S2-S4 and Tables S7-S8.

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Acknowledgements: We are deeply grateful to Jeannette Colyvas for formative discussions about COVID-19 impact statements. We also thank Anne Bowers, Clayton Childress, Stefan Dimitriadis, Laura Doering, Alicia Eads, Angelina Grigoryeva, Ryann Manning, Santiago Campero Molina, Sida Liu, Katherine Spoon, the Toronto Group of Seven, participants at the International Conference on Science of Science and Innovation, and seminar participants at the Amsterdam Centre for Inequality Studies, Stanford University, and Columbia University for useful feedback on early drafts.

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