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The Isolated Choice Effect and Its Implications for Gender Diversity in Organizations

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Abstract. We highlight a feature of personnel selection decisions that can influence the gender diversity of groups and teams. Specifically, we show that people are less likely to choose candidates whose gender would increase group diversity when making personnel selections in isolation (i.e., when they are responsible for selecting a single group member) than when making collections of choices (i.e., when they are responsible for selecting multiple group members). We call this the *isolated choice effect*. Across six preregistered experiments ($n = 3,509$), we demonstrate that the isolated choice effect has important consequences for group diversity. When making sets of hiring and selection decisions (as opposed to making a single hire), people construct more gender-diverse groups. Mediation and moderation studies suggest that people do not attend as much to diversity when making isolated selection choices, which drives this effect.

History: Accepted by Yuval Rottenstreich, decision analysis.



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Introduction

Many organizations publicly espouse commitments to increase their diversity and inclusiveness. For example, the majority of Fortune 500 companies boast executives responsible for workplace diversity initiatives (Kwong 2012) and include diversity statements on their websites (Jones and Donnelly 2017). Despite this, many well-intentioned organizations remain remarkably homogeneous, which has prompted a large body of research exploring why homogeneity persists and tactics for increasing workplace diversity (Bohnet et al. 2015, Schroeder and Risen 2016, Babcock et al. 2017).

Notably, diversity objectives are typically set by organizational leaders who have a bird's-eye view of how hiring decisions shape the overall diversity of their organizations. However, the implementation of these objectives is often left to individual managers and teams who frequently make hiring decisions one at a time, making it challenging to have a global perspective on the impact each hire will have on organizational diversity. We propose that this common

feature of hiring decisions—that they are often made in isolation—may have important and previously unappreciated implications.

In this paper, we show that people are less likely to choose candidates whose gender would increase group diversity when making personnel selections in isolation (i.e., when they are responsible for selecting only a single group member) than when making collections of choices (i.e., when they are responsible for selecting multiple group members). We call this phenomenon the *isolated choice effect*, and it means that groups constructed via an aggregation of isolated selection decisions are less diverse than groups whose members are selected in collections.

When people make hiring or selection decisions in isolation, we theorize that they attend less to how their selected candidate will affect the diversity of the group than when making collections of such decisions. Past research has shown that people are able to rapidly and accurately form impressions of the diversity of a group of people (Phillips et al. 2018).

The diversity of a collection of people selected together is therefore likely to be easy to assess and salient. However, because diversity is inherently a group-level property (Harrison and Klein 2007) and any one individual cannot be “diverse,” diversity is less tangible and therefore likely to be less salient when making selection decisions in isolation. Past research has shown that salient attributes are overweighted when we make choices (Bordalo et al. 2012, 2013). We therefore hypothesize that the decreased salience of diversity when selection decisions are made in isolation (instead of in collections) will produce the isolated choice effect.

Past research on choice bracketing in consumer settings provides suggestive evidence that making isolated selection decisions may lessen the gender diversity of constructed groups (Read et al. 1999). Specifically, people have been shown to select less variety in products when making consumption decisions one at a time (e.g., on a series of separate occasions) rather than simultaneously (Simonson 1990, Simonson and Winer 1992, Read and Loewenstein 1995, Read et al. 2001). In one canonical study, Simonson (1990) offered students snack choices at three meetings spread across three weeks. Students who were randomized to choose one snack each week were significantly more likely to choose the same snack each time (and thus a less diverse set of snacks) than students randomized to simultaneously choose snacks for all three meetings at the first weekly gathering.¹

Notably, there are important differences between consumer choice and hiring decisions that make it unclear whether we should observe the same patterns in both settings. First, past research on choice bracketing in the consumer space typically focuses on consumers’ preferences for “variety,” wherein consumers choose different items (rather than the exact same item) in consumption bundles. For example, choosing a Snickers and a Twix would be considered variety-seeking, even though both are chocolate candy bars, because this represents more variety than choosing two Snickers bars (or two Twix bars). Here, the exact same consumer product can be consumed more than once. For hiring or selection decisions, because the same person cannot be hired repeatedly, all sets of decisions tautologically have identical variety because each hiring decision requires selecting a different person. However, some sets of decisions differ in their demographic “diversity,” which is the focus of this paper.

A second key distinction between past research on choice bracketing in consumer contexts and our work on personnel selection pertains to what drives the underlying decisions. Many of the mechanisms shown to operate in the realm of consumer choice cannot apply

in the realm of personnel selection. For instance, past research has posited that one reason choosing products all at once rather than over time leads to product diversification is because people have uncertain forecasts of their future preferences (Simonson 1990; Read and Loewenstein 1995). Further, because some choices made in sets are made for future consumption periods (whereas isolated choices are made at the moment of consumption), people may overestimate how much their tastes will change or how satiated they will be by repeatedly consuming the same product, or they may choose variety to reduce the risk of consuming something undesirable repeatedly. In personnel selection decisions, however, these factors are unlikely to play a role because the same person cannot be hired for multiple positions, and people are not “consumed” like products. While expecting to get bored with Twix bars quickly or worrying that you will not like Twix bars as much as anticipated may prompt the inclusion of a Snickers bar in your consumption bundle, a hiring manager is unlikely to think about choosing male and female job candidates in this way. Every job candidate is unique (i.e., not all men will act alike, nor will all women), but all Twix bars taste the same. Thus, leading explanations for these past findings about consumer choice cannot easily explain our findings in the realm of hiring decisions.

In this paper, we propose and explore another mechanism to account for our findings, which may also influence consumer choices. Specifically, we examine the salience of group-level diversity. Because groups can have emergent properties (e.g., diversity) that are not apparent when considering individuals, people choosing groups may weight these emergent group properties in their decisions. Past research has proposed this mechanism as a contributor to variety-seeking in consumer choice domains (Kahneman and Lovallo 1993, Read et al. 2001), but it has received scant empirical attention.

Across six preregistered experiments ($n = 3,509$), we provide evidence for the isolated choice effect. Consistent with our theorizing, we find that the salience of group diversity mediates the effect and drawing attention to diversity attenuates the effect.

Study 1

In Study 1, we examined how the isolated choice effect influences the gender diversity of job candidates chosen in a hypothetical hiring scenario. We predicted that participants tasked with hiring for a single position (i.e., those randomized to an isolated choice condition) would choose a lower proportion of women than participants tasked with hiring for multiple positions (i.e., those randomized to a collective choice condition).

Methods

Participants. We decided in advance to recruit 525 participants through Amazon’s Mechanical Turk. After excluding participants who did not follow directions (following our preregistration plan), we were left with 500 participants (48.8% of whom identified as men). Participants were paid \$0.70 to fill out a survey that took about five minutes to complete. This study was preregistered on AsPredicted.org (<http://aspredicted.org/blind.php?x=4kg79v>).

Procedure. Participants were asked to imagine they were hiring for a technology company that was looking to fill five different roles: software engineer, product manager, user-experience designer, marketing analyst, and sales representative.

Participants were randomly assigned to either the *isolated choice* condition or the *collective choice* condition. In the *isolated choice* condition, participants were told that they would be hiring one person to fill one of these five roles. In the *collective choice* condition, participants were told they would be hiring five people—one person to fill each role. As a result, participants in the *isolated choice* condition made one hiring decision, whereas participants in the *collective choice* condition made five hiring decisions simultaneously (i.e., all five decisions were shown on the same screen). To balance the number of hiring decisions made across conditions, we assigned five times as many participants to the *isolated choice* condition as the *collective choice* condition.

Before making hiring decisions, participants were shown descriptions of each of the five roles the organization was seeking to fill (e.g., “A software engineer writes computer code to design, develop, maintain, test, and evaluate computer software”). In the *isolated choice* condition, participants were shown the same five job descriptions but were randomly assigned to fill just one of the five roles. After reading these job descriptions, participants were asked to make hiring decisions for the role(s) they were responsible for filling.

For each role, participants were asked to choose among three candidates who had prior work experience in a relevant job. The candidates were held constant across conditions, so the decisions participants had to make were identical across conditions; all that differed was the number of decisions participants were responsible for making. Because participants in both conditions always chose among three candidates for each position, participants in both conditions were engaging in joint evaluation (as opposed to separate evaluation) for each decision (Bohnet et al. 2015), as will be the case across all studies in this paper. The three candidates for each role always included at least two men, and we varied candidate

quality such that the woman always had a moderate amount of experience.² In addition, for one role, we included three men to obscure our study’s focus on gender diversity. Participants were provided with each candidate’s picture (taken from the Chicago Face Database; Ma et al. 2015), most recent job, and number of years of experience. All study materials are available in our online supplement.

Results

Our dependent variable of interest was whether a woman was selected in each hiring decision.³ In the *isolated choice* condition, women were chosen in 7.4% of all hiring decisions; in the *collective choice* condition, women were chosen in 18.0% of all hiring decisions. Following our preregistered analysis plan, we ran an ordinary least squares regression with robust standard errors (SEs) clustered by participant to predict whether a female candidate was chosen in each hiring decision. Because the unit of analysis was a single hiring decision, each participant in the *isolated choice* condition was included once, whereas each participant in the *collective choice* condition was included in the regression five times. Our only predictor variable was an indicator variable for being in the *isolated choice* condition. We found that the effect of being in the *isolated choice* condition on the likelihood of selecting a female candidate was significant ($b_{isolated_choice} = -0.105$, $SE = 0.026$, $p < 0.001$; 95% confidence interval (CI): $-0.157, -0.054$).⁴ In other words, making isolated choices produced less gender-diverse groups of hires than making sets of choices.⁵

Discussion

In this study, we found that people hired a lower proportion of women when making personnel decisions in isolation rather than in collections. In a supplemental study, we replicated this effect using a different organizational context and different stimuli (see Study S1 in the online supplement).

One potential concern about the design of this study, however, is that participants in the *collective choice* condition had to make five times as many decisions as those in the *isolated choice* condition, so fatigue or depletion could be responsible for our findings. To address this concern, we also ran a preregistered replication of this study where participants in the *isolated choice* condition made four additional, unrelated decisions (e.g., choosing between couches) in order to hold the number of decisions constant between conditions. Participants were assigned to one of the five hiring decisions at random, and the hiring decision was presented in the same order across conditions (first, second, third, fourth, or fifth) to balance the timing of decisions across conditions. We again replicated our results (see Study S2 in the online

supplement), suggesting that our findings cannot be explained by fatigue.

Study 2

In Study 2, we ran a conceptual replication of Study 1 using a different study paradigm. Our new paradigm involved a more natural and familiar task with authentic stimuli: participants were asked to select famous authors for inclusion in a high school English class.

Methods

Participants. We decided in advance to recruit 600 participants through Amazon’s Mechanical Turk. After excluding participants who did not follow directions (following our preregistration plan), we were left with 598 participants (53.0% of whom identified as men). This study was preregistered on AsPredicted.org (<http://aspredicted.org/blind.php?x=6sw3eg>).

Procedure. Participants were truthfully told that we were interested in understanding which authors Americans think students should be exposed to in high school. They were told that they would see a list of 25 authors whose books are commonly read in American high schools and that they would be asked to recommend some number of those authors for inclusion in a high school English course (and we did, in fact, share their recommendations with a high school English teacher who had influence in determining curriculum at their school). Eight of the 25 authors were women. The authors were chosen by combining recommendations from GoodReads and BuzzFeed (Althouse 2013).

Participants were randomly assigned to either an *isolated choice* condition or a *collective choice* condition and saw a list of the names and photos of the same 25 authors in each condition. In the *isolated choice* condition, participants were asked to recommend one author. They were asked to select this sole author by ranking all the authors in their mind and selecting their #1, #2, #3, #4, or #5 ranked author for inclusion in a high school English course. We randomly assigned participants in the *isolated choice* condition to tell us either their #1, #2, #3, #4, or #5 ranked author. In the *collective choice* condition, participants were asked to recommend five authors. They were asked to select this set of authors by ranking all the authors in their mind and selecting their top five authors for inclusion in a high school English course. Thus, in both conditions, participants were asked to rank all 25 authors, but they reported either their top five or one member of their top five at random. Because participants saw all 25 authors in both conditions, all decisions were made under joint evaluation.

This procedure ensured that the aggregation of *isolated* decisions across participants was equivalent in overall quality to the aggregation of *collective*

decisions across participants, because both sets of decisions should contain equal numbers of #1, #2, #3, #4, and #5 ranked authors. However, in the *collective choice* condition, diversity should be more salient because participants are asked to report a group of five authors as opposed to only one individual author. All study materials are available in our online supplement.

Results

Our outcome of interest was whether participants recommended female authors for inclusion in an American high school English course. In the *isolated choice* condition, 24.0% of the recommended authors were women; in the *collective choice* condition, 29.5% of the recommended authors were women. Following our preregistered analysis plan, we ran an ordinary least squares regression with robust SEs clustered by participant to predict the selection of a female author. As in past studies, the unit of analysis was a single author recommendation, so participants in the *collective choice* condition contributed five times as many observations to our regression as participants in the *isolated choice* condition. Our only predictor variable was an indicator variable for being in the *isolated choice* condition. We found that being in the *isolated choice* condition significantly decreased participants’ likelihood of selecting a female author ($b_{isolated_choice} = -0.0545$, $p = 0.047$; 95% CI: -0.108 , -0.0008). This study offers further evidence that isolated choices lead to the selection of less gender-diverse groups than collective choices.

Study 3

In Study 3, we tested our proposed mechanism. We explored whether the isolated choice effect arises because diversity is less salient when choices are made in isolation than collectively. Study 3A is a mediation study, whereas Study 3B is a moderation study.

Study 3A

In Study 3A, we tested whether diversity (a property of groups but not individuals) is more salient when making collective choices than when making isolated choices and whether the salience of diversity mediates people’s personnel selection decisions.

Methods

Participants. We decided in advance to recruit 520 participants through Amazon’s Mechanical Turk. After excluding participants who did not follow directions (following our preregistration plan), we were left with 502 participants (43.8% of whom identified as men). Participants were paid \$0.60 to take a survey that could be completed in about five minutes. This study was preregistered on AsPredicted.org (<http://aspredicted.org/blind.php?x=q76fa4>).

Procedure. We used the same stimuli and a study design similar to Study 1. As in Study 1, participants were asked to imagine they were hiring for a technology company that was looking to fill five different roles. Participants were randomly assigned to either the *isolated choice* condition or the *collective choice* condition. Those in the *isolated choice* condition were told they would be tasked with hiring one person to fill one of these five roles. Those in the *collective choice* condition were told they would be tasked with hiring five people, one for each role.

For each role, participants were asked to choose among three candidates who had prior work experience in a relevant job. The candidates were held constant across conditions. The three candidates for each job always included at least two men (and we included three men as candidates for one job to obscure the fact that our study was focused on gender diversity). Given our focus on gender diversity, in order to avoid wasting participants in this study, we did not assign any participants in the *isolated choice* condition to hire for the role where it was impossible to select a woman, and to maintain parallelism in our design, we discarded hiring decisions made by participants in the *collective choice* condition for this role in our analyses (per our preregistration). Participants were provided with each candidate's picture (taken from the Chicago Face Database; Ma et al. 2015), most recent job, and number of years of experience.

After participants had made their hiring selection(s), to test for our mechanism, we asked participants to what extent they agreed with the following statement: "I considered how my choice(s) would influence the diversity of the tech team hired when making my decision(s)" on a scale from 1 (Not at all) to 7 (Extremely). All study materials are available in our online supplement.

Results

Our dependent variable of interest was whether a woman was selected in each hiring decision. Consistent with our previous results, in the *isolated choice* condition, women were chosen in 15.3% of the hiring decisions; in the *collective choice* condition, women were chosen in 21.1% of the hiring decisions ($b_{isolated_choice} = -0.058$, $SE = 0.030$, $p = 0.054$; 95% CI: -0.117 , 0). Participants also reported that diversity was considered less in their decision-making process in the *isolated choice* condition ($M_{isolated_choice} = 3.32$, standard deviation (SD) = 2.09) than in the *collective choice* condition ($M_{collective_choice} = 4.03$, SD = 2.02; $t(500) = 3.02$, $p = 0.0027$).

We next tested whether considering diversity mediated the relationship between making isolated choices and selecting female candidates. First, there was a significant main effect of assignment to the *isolated choice*

condition on how much participants considered diversity ($b_{isolated_choice} = -0.704$, $SE = 0.232$, $p = 0.0023$). Second, the relationship between considering diversity and selecting a female candidate was also significant ($b_{considering_diversity} = 0.059$, $SE = 0.0070$, $p < 0.001$). Consistent with mediation, the effect of assignment to the *isolated choice* condition on selecting a female candidate ($b_{isolated_choice} = -0.061$, $SE = 0.030$, $p = 0.040$)⁶ was eliminated when controlling for diversity considerations ($b_{isolated_choice} = -0.020$, $SE = 0.028$, $p = 0.49$). A Sobel test confirmed that this reduction in effect size was significant ($b_{reduction} = -0.042$, $SE = 0.015$, $p = 0.0046$), and a 5,000-sample bootstrap analysis (Shrout and Bolger 2002, MacKinnon et al. 2007) also produced a bias-corrected 95% CI for the size of the indirect effect that excluded zero (95% CI: -0.073 , -0.015).

Study 3B

Given the inherent limitations of mediation analyses, we also tested our mechanism via a moderation study in which we manipulated rather than measured whether diversity was salient. Specifically, in Study 3B, we tested whether the isolated choice effect is eliminated when attention is drawn to diversity in both the isolated and collective choice conditions.

Methods

Participants. We decided in advance to recruit 1,050 participants through Amazon's Mechanical Turk. After excluding participants who did not follow directions (following our preregistration plan), we were left with 1,038 participants (44.1% of whom identified as men). Participants were paid \$0.45 to take a survey that could be completed in about four minutes. This study was preregistered on AsPredicted.org (<http://aspredicted.org/blind.php?x=5sx59i>).

Procedure. Similar to Studies 1 and 3A, participants in this study were asked to imagine they were hiring for a technology company that was looking to fill five different roles. This study used a 2×2 (*isolated choice* versus *collective choice* \times *diversity valued* versus *control*) factorial design. Participants were randomly assigned to either the *isolated choice* condition or the *collective choice* condition. To balance the number of hiring decisions made across conditions, we assigned four times as many participants to the *isolated choice* condition as the *collective choice* condition. Those in the *isolated choice* condition were told that they would be tasked with hiring one person to fill one of these five roles. Those in the *collective choice* condition were told that they would be tasked with hiring five people, one for each role.

Participants were also randomly assigned to either a condition where attention was drawn to diversity

by stating that it was valued or a control condition where no such statement was made. In the *diversity valued* condition, participants were told, “The company strongly values diversity,” immediately prior to making their hiring selection(s); in the *control* condition, we omitted this statement, so diversity was not made explicitly salient.

Participants had to choose among three candidates for each role they were asked to fill. These candidates were held constant across conditions and always included at least two men (one of the decisions included three men as candidates to conceal that our study focused on gender diversity). Participants were provided with each candidate’s picture (taken from the Chicago Face Database; Ma et al. 2015), most recent job, and number of years of experience. Finally, as a manipulation check, we asked participants to rate their agreement with the statement, “The company strongly values diversity,” on a scale from “1: Strongly disagree” to “5: Strongly agree.” All study materials are available in our online supplement.

Results

Our manipulation check confirmed that participants in the *diversity valued* condition believed that the organization valued diversity more than those in the *control* condition ($M_{diversity_valued} = 4.42$, $SD_{diversity_valued} = 0.90$; $M_{control} = 3.24$, $SD_{control} = 0.67$; $t(1,036) = 23.85$, $p < 0.001$), suggesting that our manipulation was successful.

Our dependent variable of interest was whether a woman was selected in each hiring decision. When attention was not drawn explicitly to diversity, we found evidence of the isolated choice effect: participants in the *isolated choice* condition hired women 15.0% of the time, and participants in the *collective choice* condition hired women 25.3% of the time ($b_{isolated_choice} = -0.103$, $SE = 0.030$, $p < 0.001$; 95% CI: -0.163 , -0.044 ; see Figure 1). However, when attention was drawn to diversity by telling participants that the organization valued diversity, the isolated choice effect disappeared: participants in the *isolated choice* condition hired women 36.5% of the time, and participants in the *collective choice* condition hired women 37.1% of the time ($b_{isolated_choice} = -0.006$, $SE = 0.034$, $p = 0.867$; 95% CI: -0.072 , 0.060 ; see Figure 1). There was also a significant interaction between the *diversity valued* and *isolated choice* conditions ($b_{isolated_choice*diversity_valued} = 0.10$, $SE = 0.045$, $p = 0.03$; 95% CI: 0.009 , 0.187), suggesting that drawing attention to diversity moderated the effect of being in the *isolated choice* condition on the likelihood of selecting a female candidate.

Discussion

Taken together, Studies 3A and 3B provide evidence that isolated choices lead to less diverse hires because

diversity is less salient when choices are made in isolation than when they are made in collections. Study 3A shows that participants attend less to diversity when making isolated choices than collective choices, and this mediates the effect of isolated choices on the gender diversity of hired candidates. Study 3B shows that the isolated choice effect is eliminated when attention is drawn to diversity considerations by explicitly noting that a company values diversity.

In a supplemental study, we ran a 2×2 experiment where we varied whether choices were made in isolation or collectively as well as whether we told participants the organization they were helping had low levels of gender diversity (19% of its employees were women) or high levels of gender diversity (48% of its employees were women). When gender diversity was high (and therefore there would be no specific reason to attend to diversity), we replicated the isolated choice effect, but when gender diversity was low (and diversity was thus a salient problem), we no longer observed a significant isolated choice effect (see Study S3 in the online supplement). This supplementary study provides further evidence consistent with our proposed mechanism: diversity is more salient in collective choices than in isolated choices, which leads to more diverse hires when choices are made collectively.

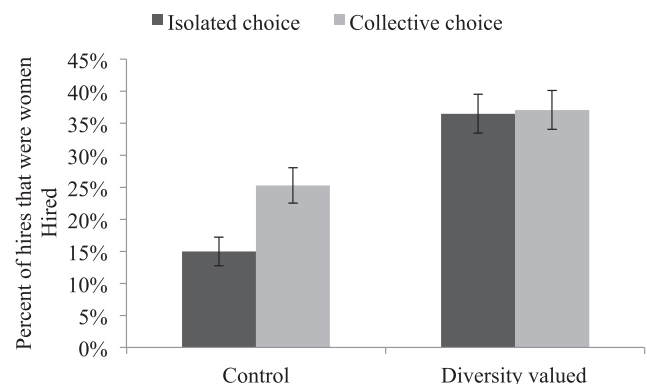
Study 4

In Study 4, we examined whether the isolated choice effect extends to real—rather than hypothetical—decisions.

Study 4A

In Study 4A, participants were tasked with hiring graduate students to participate in a business pitch competition. Their bonuses were contingent on the success of the candidate(s) they hired.

Figure 1. Explicitly Stating that Diversity Is Valued Moderates the Isolated Choice Effect



Note. Error bars represent ± 1 standard error.

Methods

Participants. We decided in advance to recruit 310 participants through Amazon’s Mechanical Turk. After excluding participants who did not follow directions (following our preregistration plan), we were left with 271 participants (49.1% of whom identified as men). Participants were paid \$0.40 plus a potential bonus of up to \$1.00 to take a survey that took about five minutes to complete. This study was preregistered on AsPredicted.org (<http://aspredicted.org/blind.php?x=pq3wz5>).

Procedure. Participants were truthfully told that an East Coast university would be hosting a business pitch competition. People would compete in teams, and each team would include three members: a team leader, a financial analyst, and a brand manager. Each team would come up with a business idea, and judges would evaluate these business ideas to choose a winning team.

Participants were randomly assigned to either an *isolated choice* or *collective choice* condition. Participants in the *isolated choice* condition were told that they would hire one person to join a pitch competition team, and if the team that person joined won the pitch competition, the participant would earn a \$1.00 bonus. Participants in the *collective choice* condition were told that they would hire all three members of a pitch competition team, and if their team won the pitch competition, the participant would earn a \$1.00 bonus. After the conclusion of the experiment, we organized and ran the pitch competition as described, and participants were paid bonuses accordingly.

All candidates for the pitch competition team were actual graduate students at the East Coast university where the pitch competition took place. Participants were provided with fully truthful information about the candidates, including photos, names, the number of years they had completed in their graduate programs, and their areas of research. Candidates for the team leader role included two white men and one white woman with comparable backgrounds. Candidates for the financial analyst and brand manager roles were three white men. Participants in the *collective choice* condition hired one person for each of the three roles, but we did not assign any participants in the *isolated choice* condition to make hiring decisions for the financial analyst or brand manager roles because we were interested in whether a woman was hired for each position, and all three candidates for those roles were men. All study materials are available in our online supplement.

Results

Our dependent variable of interest was whether the woman was hired for the team leader role.

As preregistered, we conducted a two-sample test of proportions to compare the rate of choosing the female candidate across conditions. Consistent with our previous studies, we found that the woman was hired significantly less often in the *isolated choice* condition (20.6%) than in the *collective choice* condition (45.7%, $z = 4.26, p < 0.001$).

Study 4B

In Study 4B, participants were tasked with recommending speakers for an academic conference, and their choices helped determine who was invited to the conference.

Methods

Participants. We decided in advance to recruit 600 participants through Amazon’s Mechanical Turk (53.5% of whom identified as men). Participants were paid \$0.45 to take a survey that took about four minutes to complete. This study was preregistered on AsPredicted.org (<http://aspredicted.org/blind.php?x=t4qh4s>).

Procedure. Participants were told that the researchers conducting this study were organizing an upcoming academic conference. They were told that they would recommend speakers for the conference, and the conference would include at least one speaker from each of five focus areas: health, education, conflict management, financial literacy, and energy. We further informed participants that their decisions were consequential, because we would invite the most frequently recommended speakers from each focus area to the conference.

Participants were randomly assigned to either the *isolated choice* condition or the *collective choice* condition. In the *isolated choice* condition, participants were tasked with choosing one speaker from one of the focus areas chosen at random (either health, education, conflict management, financial literacy, or energy). In the *collective choice* condition, participants were tasked with selecting five speakers, one from each focus area.

For each focus area, participants were asked to choose among three candidates. These candidates were held constant across conditions. For four of the five focus areas, the three candidates included two white men and one white woman. To obfuscate the study’s focus on gender diversity, we included three white men as candidates for one focus area. Because we were interested in whether a woman was selected for each decision, participants in the *isolated choice* condition were never assigned to choose a speaker in the focus area with three men as candidates, and we did not include decisions made by participants in the *collective choice* condition in this focus area in our

analyses (to ensure the conditions were evenly balanced). To balance the number of hiring decisions made across conditions, we assigned four times as many participants to the *isolated choice* condition as the *collective choice* condition.

Participants were provided with truthful information about all candidates, including pictures, names, academic institutions, years of academic experience, and impact factors (their *h*-index on Google scholar, as of August 2019). All study materials are available in our online supplement.

Results

Our dependent variable of interest was whether a woman was chosen for each decision. In the *isolated choice* condition, women were chosen in 32.2% of all selection decisions; in the *collective choice* condition, women were chosen in 45.8% of all selection decisions. Following our preregistered analysis plan, we ran an ordinary least squares regression with robust SEs clustered by participant, where the dependent variable was whether a woman was chosen in each decision. The only predictor variable was an indicator variable for being in the *isolated choice* condition. We found that the effect of being in the *isolated choice* condition on the likelihood of selecting a female candidate was significant and negative ($b_{isolated_choice} = -0.163$, $SE = 0.034$, $p < 0.001$; 95% CI: -0.230 , -0.096). In other words, consistent with our other studies, making isolated choices produced less gender-diverse groups of speakers for the conference than making sets of choices.

General Discussion

Across six preregistered experiments, we find that the isolated choice effect influences the gender composition of groups. We present evidence that people select less gender-diverse teams when making isolated hiring or selection decisions (i.e., when making a single hire) than when making collections of selection decisions (i.e., when making multiple hires). We also find that diversity is less salient when people make isolated choices than collections of choices, and salience of diversity mediates the effect of isolated choices on personnel selection decisions. Together, our results highlight a potentially important contributing factor to the underrepresentation of women in many groups and organizations, given that hires are often made in isolation rather than in collections.

All of the studies presented explore settings where women are underrepresented, and women are hired infrequently in the isolated choices we study. In settings where men are underrepresented, our theory predicts that hiring in collections (rather than

in isolation) should still increase the gender diversity of hired candidates, but increasing gender diversity in these settings would mean increasing the rate of selecting *male* candidates. To test this prediction, we conducted a supplemental study using the same stimuli as Study 1 but switching the genders of all job candidates. In other words, there were more qualified women than men available to hire for each position. We still found that people opted for less gender diversity when making isolated choices than when making sets of choices (see Study S4 in the online supplement); however, because these revised stimuli included an overrepresentation of qualified women, participants hired fewer *men* when making isolated choices as opposed to fewer women. These results provide support for the idea that the isolated choice effect is about diversity and not just about women.

We chose to study the isolated choice effect in the context of gender diversity because of its important policy implications. However, the isolated choice effect should generalize to other contexts where group diversity is considered desirable. It would be valuable for future research to examine how our findings extend to other social categories (e.g., race). It would also be useful to test the effects of isolated choices on personnel selection decisions in the field to establish the external validity of these findings. In particular, future field work comparing hiring decisions made on separate occasions (that are truly separated in time) with decisions made collectively would be of great value.

Examining the multiple potential motives that underlie people's greater desire for diversity when it is made salient would also be useful. The salience of diversity may affect hiring decisions in multiple ways: people may believe that diversity is better for group performance, they may believe that it is their moral obligation to pursue diversity, or they may want to avoid appearing discriminatory. Disentangling whether all or some of these factors drive the patterns we detect would be beneficial. Study 3B establishes that organizational context, including explicit demands for diversity, can influence the strength of the isolated choice effect. Future research exploring this further would be valuable.

Past research has found that people often react negatively to explicit attempts to increase diversity (Plant and Devine 2001, Legault et al. 2011, Dobbin et al. 2015) and that it is challenging to change people's biases and stereotypes (Kalev et al. 2006, Lai et al. 2016, Chang et al. 2019, Forscher et al. 2019). Prompting people to make collective rather than isolated decisions is a novel approach to increasing diversity in that it does not involve reprimands or explicit directives (which can be viewed as overly paternalistic),

nor does it rely on changing people's biases and stereotypes. For these reasons, it may be a particularly promising approach to increasing diversity in organizations.

Practically, our results suggest that organizations interested in increasing diversity might consider having decision makers hire in collective rather than isolated ways. For example, rather than hiring one person every month, a company could hire three people every quarter. In the long run, the company will hire the same number of people, but choices will be made collectively (every quarter) rather than in isolation (every month). Alternatively, companies could give certain people oversight over many hiring decisions so that at least some employees are making collective decisions rather than allowing hiring managers or teams to make decisions in isolation.

Although our work prescribes structural changes to hiring practices that are likely to increase organizational diversity, we recognize that these prescriptions may be difficult to implement in some contexts. It would therefore be valuable for future work to explore ways of making isolated choices *feel* collective. For example, future research could examine the effects on hiring of showing people their past hiring decisions or the employees most recently hired by their coworkers. Such interventions could also draw attention to diversity, which is a group-level property, and may lead to decisions that look more like collective, rather than isolated, choices.

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Endnotes

¹ More broadly, the isolated choice effect is related to extensive prior work on the behavioral consequences of narrow versus broad decision frames in a wide range of settings ranging from labor supply decisions to budgeting (Camerer et al. 1997, Thaler 1999).

² The woman always had fewer years of experience than one of the men and more years of experience than the other (e.g., 4 years versus 5 or 2 years). We made the woman marginally less qualified than one of the men in order to avoid ceiling effects that might arise from social desirability concerns in experiments. In Studies 2 and 4A, we replicate our effects when there are no differences in quality across candidates by gender.

³ For decisions where all three candidates were men, the dependent variable was coded as zero in both conditions. Our results are identical regardless of whether we include these decisions in our analyses.

⁴ As a robustness check, we reran all analyses in all studies using logistic regressions rather than ordinary least squares regressions. None of the results change in significance based on the model used (see section titled *Robustness Checks* in the online supplement). Complete regression tables are presented in Tables S1–S5 in our online supplement for all regressions in this paper.

⁵ In this study, the decision in which all three candidates were men included one black man. As an exploratory analysis, we tested whether the rate of choosing the black man varied across conditions. Consistent with the isolated choice effect, we found that the black man was chosen marginally more often in the *collective choice* condition (39.1%) than in the *isolated choice* condition (24.7%, $z = 1.75$, $p = 0.08$).

⁶ Because of bootstrapping SEs in the mediation analysis, estimates from the mediation analysis vary slightly relative to estimates from the main regression.

References

- Althouse S (2013) 23 books you didn't read in high school but actually should. *Buzzfeed* (July 5), <https://www.buzzfeed.com/spenceralthouse/23-books-you-didnt-read-in-high-school-but-actually-should>.
- Babcock L, Recalde MP, Vesterlund L, Weingart L (2017) Gender differences in accepting and receiving requests for tasks with low promotability. *Amer. Econom. Rev.* 107(3):714–747.
- Bohnet I, Van Geen A, Bazerman M (2015) When performance trumps gender bias: Joint vs. separate evaluation. *Management Sci.* 62(5):1225–1234.
- Bordalo P, Gennaioli N, Shleifer A (2012) Salience theory of choice under risk. *Quart. J. Econom.* 127(3):1243–1285.
- Bordalo P, Gennaioli N, Shleifer A (2013) Salience and consumer choice. *J. Political Econom.* 121(5):803–843.
- Camerer C, Babcock L, Loewenstein G, Thaler R (1997) Labor supply of New York City cabdrivers: One day at a time. *Quart. J. Econom.* 112(2):407–441.
- Chang EH, Milkman KL, Gromet DM, Rebele RW, Massey C, Duckworth AL, Grant AM (2019) The mixed effects of online diversity training. *Proc. Natl. Acad. Sci. USA* 116(16):7778–7783.
- Dobbin F, Schrage D, Kalev A (2015) Rage against the iron cage: The varied effects of bureaucratic personnel reforms on diversity. *Amer. Sociol. Rev.* 80(5):1014–1044.
- Forscher PS, Lai CK, Axt JR, Ebersole CR, Herman M, Devine PG, Nosek BA (2019) A meta-analysis of procedures to change implicit measures. *J. Personality Soc. Psych.* 117(3): 522–559.
- Harrison DA, Klein KJ (2007) What's the difference? Diversity constructs as separation, variety, or disparity in organizations. *Acad. Management Rev.* 32(4):1199–1228.
- Jones S, Donnelly G (2017). Why we logged every fortune 500 company's diversity data, or lack thereof. *Fortune* (June 16), <http://fortune.com/2017/06/16/why-we-logged-every-fortune-500-companys-diversity-data-or-lack-thereof/>
- Kahneman D, Lovallo D (1993) Timid choices and bold forecasts: A cognitive perspective on risk taking. *Management Sci.* 39(1):17–31.
- Kalev A, Dobbin F, Kelly E (2006) Best practices or best guesses? Assessing the efficacy of corporate affirmative action and diversity policies. *Amer. Sociol. Rev.* 71(4):589–617.
- Kwoh L (2012) Firms hail new chiefs (of diversity). *Wall Street Journal* (January 5), <https://www.wsj.com/articles/SB10001424052970203899504577129261732884578>.
- Lai CK, Skinner AL, Cooley E, Murrar S, Brauer M, Devos T, Calanchini J, Xiao YJ, Pedram C, Marshburn CK, et al. (2016)

- Reducing implicit racial preferences: II. Intervention effectiveness across time. *J. Experiment. Psych. General* 145(8):1001–1016.
- Legault L, Gutsell JN, Inzlicht M (2011) Ironic effects of anti-prejudice messages: How motivational interventions can reduce (but also increase) prejudice. *Psych. Sci.* 22(12):1472–1477.
- Ma DS, Correll J, Wittenbrink B (2015) The Chicago face database: A free stimulus set of faces and norming data. *Behav. Res. Methods* 47(4):1122–1135.
- MacKinnon DP, Fairchild AJ, Fritz MS (2007) Mediation analysis. *Annu. Rev. Psych.* 58(1):593–614.
- Phillips, LT, Slepian, ML, Hughes, BL (2018) Perceiving groups: The people perception of diversity and hierarchy. *J. Personality Soc. Psych.* 114(5):766–785.
- Plant EA, Devine PG (2001) Responses to other-imposed pro-Black pressure: Acceptance or backlash? *J. Experiment. Soc. Psych.* 37(6):486–501.
- Read D, Antonides G, Van den Ouden L, Trienekens H (2001) Which is better: Simultaneous or sequential choice? *Organ. Behav. Human Decision Processes* 84(1):54–70.
- Read D, Loewenstein G (1995) Diversification bias: Explaining the discrepancy in variety seeking between combined and separated choices. *J. Experiment. Psych. Appl.* 1(1):34–49.
- Read D, Loewenstein G, Rabin M (1999) Choice bracketing. *J. Risk Uncertainty* 19(1-3):171–197.
- Schroeder J, Risen JL (2016) Befriending the enemy: Outgroup friendship longitudinally predicts intergroup attitudes in a co-existence program for Israelis and Palestinians. *Group Processes Intergroup Relations* 19(1):72–93.
- Shrout PE, Bolger N (2002) Mediation in experimental and non-experimental studies: New procedures and recommendations. *Psych. Methods* 7(4):422–445.
- Simonson I (1990) The effect of purchase quantity and timing on variety-seeking behavior. *J. Marketing Res.* 27(2):150–162.
- Simonson I, Winer RS (1992) The influence of purchase quantity and display format on consumer preference for variety. *J. Consumer Res.* 19(1):133–138.
- Thaler RH (1999) Mental accounting matters. *J. Behav. Decision Making* 12(3):183–206.