http://pubsonline.informs.org/journal/mnsc/

MANAGEMENT SCIENCE
Vol. 64, No. 7, July 2018, pp. 3269–3287
ISSN 0025-1909 (print), ISSN 1526-5501 (online)

The Colorblind Crowd? Founder Race and Performance in Crowdfunding

Peter Younkin,[a] Venkat Kuppuswamy[b]

[a] McGill University, Montreal, Quebec H3A 1G5, Canada; [b] University of North Carolina at Chapel Hill, Chapel Hill, North Carolina 27599

Contact: peter.younkin@mcgill.ca, http://orcid.org/0000-0002-9988-8534 (PY); venkat_kuppuswamy@kenan-flagler.unc.edu, http://orcid.org/0000-0001-9881-8502 (VK)

Received: January 19, 2016
Revised: October 19, 2016
Accepted: January 10, 2017
Published Online in Articles in Advance: May 31, 2017

https://doi.org/10.1287/mnsc.2017.2774

Abstract. The dearth of minority entrepreneurs has received increasing media attention but few academic analyses. In particular, the funding process creates challenges for either audit or correspondence methods, making it difficult to assess the role, or type, of discrimination influencing resource providers. We use a novel approach that combines analyses of 7,617 crowdfunding projects with an experimental design to identify whether African American men are discriminated against and whether this reflects statistical, taste-based, or unconscious bias on the part of prospective supporters. We find that African American men are significantly less likely than similar white founders to receive funding and that prospective supporters rate identical projects as lower in quality when they believe the founder is an African American male. We conclude that the reduction in perceived quality does not reflect conscious assumptions of differences in founder ability or disamenity but rather an unconscious assumption that black founders are lower quality. In two additional experiments, we identify three means of reducing this bias: through additional evidence of quality via third-party endorsements (i.e., awards, evidence of prior support), through evidence that African American founders have succeeded previously, and by removing indicators of the founder's race.

History: Accepted by Toby Stuart, entrepreneurship and innovation.

Funding: This research was supported by the Social Science and Humanities Research Council of Canada [No. 430-2016-00720]. All experiments were conducted by the first author as approved by the host university [No. REB 86-0716].

Supplemental Material: The online appendix is available at https://doi.org/10.1287/mnsc.2017.2774.

Keywords: entrepreneurship • crowdfunding • economic discrimination • inequality

1. Introduction

The role of ethnicity in entrepreneurship (Aldrich and Waldinger 1990) and, in particular the underrepresentation of minorities among the population of funded ventures (Blanchflower et al. 2003, Sohl 2015), is the subject of increasing popular and political attention. A common explanation for this underrepresentation is that resource providers are biased against minority founders. However, despite significant concern over the possibility of discrimination in entrepreneurial settings, there have been few studies that show evidence of discrimination by resource providers and, more importantly, that identify the specific type of discrimination affecting minority performance.

Prior research on discrimination in labor markets (Bertrand and Mullainathan 2004), auctions (Doleac and Stein 2013, Nunley et al. 2011), and consumer behavior (Ayres and Siegelman 1995, List 2004) establish two primary but contradictory explanations for why resource providers may be biased against minority founders. The theory of statistical discrimination (Arrow 1998, Phelps 1972) suggests that prospective supporters use race as a proxy for unobserved traits that indicate the investment is more likely to fail (e.g., lower quality, less committed founder). Alternately, taste-based discrimination (Becker 1957) implies that prospective supporters reject minority founders, irrespective of their qualifications, out of their own distaste for minorities more broadly.

The difference in motivation between these forms of discrimination suggests equally distinctive solutions. Notably, if discrimination reflects economically efficient action, then it is not clear that there is a problem to solve. Instead, if discrimination reflects individual taste, there may be no clear way to solve it. Nevertheless, if policymakers seek to change the rate of minority entrepreneurship, we must first determine whether there is evidence of discrimination by resource providers, and second, we must determine the basis upon which this discrimination is founded.

Traditionally, it has proven challenging to identify when and for what reason discrimination occurs (Heckman 1998), leading to the use of either audit or correspondence studies to assess discrimination (Pager

2007). However, entrepreneurial settings involve specific and intractable obstacles that limit the utility of either approach. In particular, investment decisions are multistage, private, and heavily influenced by the actions of other actors within the network. As such, it is unrealistic to submit identical proposals from identical candidates who differ only in their race and not risk the investors recognizing the artificiality of the exercise. Audit studies are similarly limited because word of identical pitches by seemingly identical actors would spread and contaminate the results. To address these limitations, we test the role of bias on the performance of minority founders in crowdfunding, a new means of raising capital via small contributions from a broader pool of supporters.

Crowdfunding represents an important new source of early-stage capital for entrepreneurs (Agrawal et al. 2015, Mollick and Kuppuswamy 2014). In 2015, crowdfunding projects raised an estimated $17.2 billion within North America (Massolution 2015), more than double the $6.89 billion in early-stage contributions by angel investors in the United States (Sohl 2015). Particularly important for minority founders, crowdfunding offers a potential remedy to bias exhibited by banks (Blanchflower et al. 2003) and professional investors. Specifically, crowdfunding moves the locus of funding decisions away from a small pool of experts and spreads them out across a much broader population of potential contributors. This "democratization" of funding decisions has been found to help female founders (Greenberg and Mollick 2017) and to facilitate the success of socially valued projects overlooked by traditional experts (Mollick and Nanda 2016). The evidence that crowdfunding mitigates some biases and the resultant hope that it will enable minority founders is at the heart of current policy debates centered on changing investment criteria to expand the purview of crowdfunding. The object of this paper is to identify the specific conditions under which this new form of fundraising achieves that promise and offers African American[1] founders an equitable alternative path to capital.

Using a combination of observational and experimental data, we find that despite the promise of crowdfunding, prospective funders remain biased against African American founders. This bias generates a reduction in the perceived quality of African American projects and helps explain significant performance discrepancies in the observed sample of projects. Furthermore, this bias is not a conscious effort to mitigate any presumed deficiencies among African American founders or the result of overt enmity, but reflects an unconscious prejudice. We test a variety of platform-level and founder-level remedies and find that crowdfunding platforms can reduce bias by overtly favoring (e.g., awarding "staff pick" badges) African American founders or, more discreetly, by displaying the diversity of successful founders that use the platform. Individual founders can also ensure more equitable treatment by reducing the visibility of their race from the project webpage. In sum, our findings highlight the current limits of crowdfunding as a vehicle for minority entrepreneurs while offering solutions for how platforms and founders may mitigate bias.

These findings link a significant literature on discrimination in economic settings to a body of research in entrepreneurship that investigates the underperformance of minority founders. Specifically, we extend prior tests of discrimination to a new economic context and introduce a novel empirical design that allows for the joint occurrence of statistical and taste-based discrimination. Our work also contributes to a growing literature in entrepreneurship that examines the conditions under which broadening the pool of resource providers can alter the types of projects or people that find support (Burtch et al. 2015, Greenberg and Mollick 2017, Mollick and Nanda 2016). In what follows, we examine the empirical evidence of discrimination, discuss three possible explanations, and describe a series of experiments designed to distinguish between these hypotheses.

2. Discrimination in Entrepreneurship

One of the persistent questions in entrepreneurship is why minority founders are underrepresented among the population of funded ventures. The prevailing answer focuses upon the challenges minorities face in acquiring the capital needed to found a venture (Fairlie 1999). For example, Freeland and Keister (2016) find that black founders are less likely than white founders to receive credit from suppliers, and Fairlie and Robb (2007) show that the availability of startup capital is conditioned by race. Research on the broader question of minority underperformance suggests three possible explanations for this phenomenon—statistical bias, taste-based bias, and implicit bias—each of which proposes an alternate means of improving rates of success for minority entrepreneurs. However, to our knowledge, there have been no prior attempts to test which of these forms of discrimination help explain the underrepresentation of minorities in entrepreneurship, leading to different assumptions about the efficacy of potential remedies.

First, there is the possibility that prospective supporters exhibit statistical discrimination, by which they devalue black founders based on an expectation that minorities are less likely to complete the project or to deliver at the promised quality. In this situation, prospective supporters use founder ethnicity as a proxy for unobserved traits that are relevant to their investment or purchasing decision. There is a robust literature on statistical discrimination (Arrow 1998), but a few examples are particularly pertinent here.

For instance, studies of peer-to-peer loan sites find that minorities pay higher interest rates and also that this reflects their higher likelihood of default (Pope and Sydnor 2011). Often, the salience of race increases when uncertainty increases, suggesting that people use race as a proxy for seller intent or quality but only when those are ambiguous. For example, on eBay, seller race matters when the seller's rating is low (Nunley et al. 2011). Similarly, Doleac and Stein (2013) find that Craigslist buyers are less likely to buy iPods from black sellers when the seller is from a high-crime neighborhood. These findings suggest that moving a transaction online does not eliminate discrepant outcomes and also show that these discrepancies may reflect differences in perceived risk, not enmity.

In an entrepreneurial setting, a claim of statistical bias could mean expert investors assume that black founders are disproportionately likely to fail, to grow slowly, or to be undervalued by potential acquirers. If true, investor discrimination would reflect an effort to achieve greater efficiency and might be mitigated through the provision of effective contradictory evidence of founder or ethnic group quality. Alternatively, allowing contributions from a broader pool might also reduce statistical bias by incorporating people whose different experiences lead to either no assumptions around minority performance or even positive expectations.

A second explanation presumes that because the majority of individuals contributing early-stage resources are white men (Sohl 2015), there may be collective preference or in-group bias. Becker (1957) defines this "taste-based" discrimination as reflecting a preference to support people of a particular ethnicity even if it is not economically efficient to do so. Supporting this view, there is a robust literature documenting the prevalence of taste-based discrimination in evaluations of individual ability (Pager et al. 2009) and across a range of economic transactions (Ayres and Siegelman 1995).

Entrepreneurial environments are particularly problematic because they entail both a subjective assessment of founder ability and an investment made under uncertainty. Decision making in this context presents multiple opportunities for the introduction of bias, which may explain why minorities are less likely to receive small business loans (Blanchflower et al. 2003) and tend to experience lower levels of support from other investors. Further, the existence of taste-based bias would negate the value of additional information because the discrimination is not driven by efficiency concerns. Instead, minority founders would benefit most from a change in the population of funders—a result that may be attainable through technological innovations such as crowdfunding.

Research in psychology and sociology offers a third possibility: that unequal outcomes reflect unconscious rather than conscious processes (Greenwald et al. 1998). The theory of implicit bias treats discrimination as a subconscious act that reflects ingrained cultural beliefs. As a result, prospective supporters may not dislike black founders or consciously use their race to proxy for unobserved characteristics, but they reflexively discount black founders based on unconscious assumptions (Bertrand et al. 2005). Critically, the solution to unconscious bias cannot rely upon asking prospective supporters what concerns they have about the founder. However, offering additional evidence of quality—although not requested—may help offset the unconscious bias and offer a method for improved minority performance.

While prior studies of bias in entrepreneurship focused on explaining the behavior of banks and professional investors, one potential solution is to develop alternatives that diversify the population of funders beyond these traditional experts through a vehicle such as crowdfunding. A broader pool of funders can reduce the effect of in-group bias by increasing the volume of people from underrepresented groups. In addition, amateurs differ from experts in the projects they favor (Mollick and Nanda 2016), suggesting variation in their evaluative processes that may benefit minorities in the same way as it has women (Greenberg and Mollick 2017). Therefore, we test whether reward-based crowdfunding improves the performance of black founders. Moreover, we use an experimental design to identify which forms of discrimination are active in this context and how crowdfunding platforms may counter them.

3. Empirical Context: Crowdfunding

A significant impediment to commercializing new ideas is the availability of seed capital or early-stage funding. New ventures often find it difficult to raise funding from traditional sources of entrepreneurial capital, such as angel investors, banks, and venture capital funds. As a result, entrepreneurs are increasingly turning to large, online communities for early-stage capital (Agrawal et al. 2014). The focus of our study is reward-based crowdfunding, popularized by the platforms Indiegogo and Kickstarter, in which founders offer presales or other rewards in exchange for money they use to further their venture. Founder surveys demonstrate the entrepreneurial orientation of these projects, finding that 90% of large crowdfunding projects in technology, videogames, and product design turned into ongoing businesses (Mollick and Kuppuswamy 2016).

In 2015, crowdfunding platforms raised $34 billion collectively (Massolution 2015), and the number and variety of sites continues to expand (Younkin

and Kashkooli 2016). Kickstarter alone has raised over $2.6 billion in pledges from 11.7 million backers to fund almost 113,000 creative ideas (Kickstarter 2016), and a list of its recent successes includes a virtual reality headset that later sold for $1 billion to Facebook, a smart watch that raised an additional $20 million, and a new video game system.

Concerning the issue of minority entrepreneurship, these platforms allow anyone to view projects posted online, opening the door to a more heterogeneous population of potential supporters. This results in a promising alternative path to funding for entrepreneurs or ventures that typically fare poorly with banks or venture capitalists. Specifically, there is optimism that by replacing a small set of geographically isolated and ethnically homogeneous experts with a diverse and dispersed crowd, the significance of a founder's race will decline.

4. Data

Our sample of 7,617 projects represents every Kickstarter project launched between January 2012 and March 2014 with a goal of at least $5,000, a video, a photograph of the founder, and Facebook data available for the project founder.[2]

4.1. Dependent Variables

We use several project performance outcomes as dependent variables in our analysis. Our primary dependent variable, *Project Funded*, is a binary indicator that takes the value 1 if the project succeeded in reaching its fundraising goal and 0 otherwise. Another project outcome, *Raised*, measures the total dollar amount raised by the project. We split *Raised* into two additional dependent variables—*Backers* and *Avg. Amount*. While *Backers* measures the number of separate contributions received by the crowdfunding project, *Avg. Amount* measures the average size of a project's contributions, rounded to the nearest dollar (= *Raised/Backers)*. Summary statistics of our main variables are displayed in Table 1.

4.2. Independent Variables

The main independent variable in our analysis is *Black Founder*, a binary indicator for the race of the founder. To obtain information on the race associated with each project founder, we had at least two separate raters visit the project webpage and examine the photo associated with the listed project founder. *Black Founder* takes the value 1 only if all raters agreed that the founder's race was black (a full description of the process used to code race is available in Online Appendix A). This approach captures the perceived identity of the founder irrespective of self-identification and allows us to estimate the influence of being seen as black by prospective supporters. We prefer a conservative measure, which requires full agreement, to better isolate the minimum influence of founder race. Of the 7,617 projects in our sample, 556 projects (7.30%) were from black founders (*Black Founder* = 1). There are 201 additional projects (2.64%) for which there was disagreement on the race of the founder. The results are unchanged if we exclude these projects from the analysis (see Online Table A3) rather than classify them as *Black Founder* = 0.

Table 1. Summary Statistics ($N = 7{,}617$)

Variable	Mean	Std. dev.	Min	Max
Project Funded	0.36	0.48	0.00	1.00
Raised ($)	8,432.09	21,858.73	0.00	684,755.00
Backers	110.39	347.08	0.00	11,749.00
Avg. Amount ($)	84.69	97.12	1.00	2,227.00
Black Founder	0.07	0.26	0.00	1.00
Female Founder	0.23	0.42	0.00	1.00
Video Pitch Quality	3.05	0.98	1.00	5.00
Project Goal	27,822.00	131,397.60	5,000.00	5,250,000.00
Total Words	637.97	559.69	0.00	5,301.00
Median Reward	140.76	271.30	1.00	10,000.00
Facebook Friends	815.13	959.06	0.00	5,677.00
Female Words	0.34	0.76	0.00	9.39
Male Words	0.54	0.88	0.00	9.75
Positive Words	4.25	1.59	0.00	20.00
Negative Words	0.95	0.85	0.00	20.00
Authenticity Words	25.29	18.38	0.00	99.00

To control for potential variation in the quality of the projects, we leverage the central role played by videos in project performance (Mollick 2014) and created a novel measure of *Video Pitch Quality*. Specifically, we extracted the main video for each of the projects in our sample and showed it to subjects recruited through Amazon's Mechanical Turk service using the protocol used to code founder race (see Online Appendix A) and a script offering $0.20 to "watch and rate a crowdfunding video." The videos were shown in isolation without additional details visible from the project's webpage, including any indication of the project's ultimate performance. Respondents were asked to rate (five-point scale) the persuasiveness, professionalism, speaker's enthusiasm, and overall quality of the video (Chen et al. 2009) and one attention check. To ensure the reliability of these ratings, we separately had two trained research assistants rate a random sample of 100 projects each, and their ratings were consistent with those given by the respondents (Cronbach's alpha > 0.8). Given the high correlation between the four attributes (Cronbach's alpha > 0.9), we combined them into a single scale measure of *Video Pitch Quality*.

In addition, we control for a full range of influential variables identified in prior studies of crowdfunding. These include *Female Founder*, whether the founder of the project is female (Greenberg and Mollick 2017, Marom et al. 2016); the number of Facebook friends

of the project founder (*Facebook Friends*); the fundraising goal of the project in dollars (*Project Goal*); the total number of words used to describe the project (*Total Words*); and the median reward level for the project (*Median Reward*) as well as fixed effects for the category associated with the project and the month in which it launched. As is clear in Table 1, many of our continuous variables are highly skewed to the right. As we expect diminishing returns to the effect of these variables over their range of values, we follow recent advice on modeling curvilinear relationships and log transform these variables when we include them in our empirical models (Haans et al. 2016).

Finally, consistent with recent work that has explored how project descriptions influence project outcomes (Gorbatai and Nelson 2015), we use text-analysis software (Linguistic Inquiry and Word Count (LIWC)) to measure key attributes related to the written pitch (Pennebaker et al. 2001). Specifically, we include measures for the use of words associated with positive emotions (*Positive Words*), negative emotions (*Negative Words*), authenticity (*Authenticity Words*), and gender indicators (*Female Words, Male Words*).

4.3. Estimation Method

Tto estimate the causal effect of founder race on crowdfunding performance, we must first address the possibility that projects from black and nonblack founders differ in systematic ways. Underlying differences in project characteristics can lead to significant selection biases when examining the effect of race on performance (Heckman 1979). To reduce selection bias, we employ a nonparametric matching approach called coarsened exact matching (CEM) (Blackwell et al. 2009, Iacus et al. 2012). CEM involves "'coarsening' a set of observed covariates, performing exact matching on the coarsened data, 'pruning' observations so that strata have at least one treatment and one control unit, then running estimations using the original (but pruned) uncoarsened data" (Aggarwal and Hsu 2014, p. 875).

To determine which covariates to match on, we identified variables that differed significantly between projects by black and nonblack founders. Model (1) of Table 2 displays the result of a logit model with *Black Founder* as the dependent variable. We then constructed a CEM matched sample of black and nonblack founder projects by requiring exact matches for project category and *Female Founder*. Furthermore, we matched black and nonblack founder projects on *Female Words, Facebook Friends, Project Goal, Total Words*, and *Median Reward*, using coarse buckets defined by the 5th, 25th, 50th, 75th, and 95th percentiles of each log-transformed variable (Singh and Agrawal 2011). Our matched sample consisted of 663 projects—213 projects from black founders and 450 projects from nonblack founders. To check whether the matched sample consisted of a more comparable set of projects from black and nonblack founders, we re-estimated the logit model with *Black Founder* as the outcome using the matched sample (model (2) in Table 2). As expected, none of the covariates (including the category fixed effects) remain significantly correlated with *Black Founder* in the matched sample.

4.4. Results

In model (4) of Table 2, we use the matched sample to estimate a logit model of *Project Funded* as a function of *Black Founder* and our control variables (for reference purposes, model (3) of Table 2 displays the logit results estimated using the full sample). We note that several control variables that are significant predictors of *Project Funded* in the full sample lose their significance in the model limited to the matched sample (e.g., *Video Pitch Quality*)—a result due in part to the much smaller size of the matched sample. However, *Black Founder* has a negative coefficient that remains significant at the 1% level. To evaluate the size of the negative effect, we compute the marginal effect of *Black Founder* (using the results of model (4)). We find that the probability of success falls from 0.40 for nonblack founders to 0.18 for black founders—a decrease of 55%. The negative effect of *Black Founder* is observed again when we model *Raised* using a log-linear specification in model (5). Interpreting the coefficient of *Black Founder*, we find that projects from black founders raise 86.1% less than comparable projects by nonblack founders.

The simplest explanation for these findings is that the networks of black founders are not as wealthy as those of nonblack founders. If this assumption were true, given that Kickstarter permits contributions as small as $1, we would expect black founders to receive the same number of contributions as nonblack founders (with comparable network size) but that these contributions would be smaller in size. We therefore test whether the performance of black founders reflects a decrease in the number of contributions, the average size of contributions, or both. To this end, we use a log-linear specification to model *Backers* and *Avg. Amount* as a function of *Black Founder* in models (6) and (7), respectively, and find that black founders receive both fewer contributions and smaller contributions, the former of which is hard to attribute to differences in network resources.

4.5. Additional Robustness Tests

These results are robust to alternative specifications in which *Raised, Backers*, and *Avg. Amount* are estimated using count models for both the entire sample of projects (see Online Table A1) and the CEM sample (see Online Table A2). The results are also robust to alternate treatment effect estimators, including propensity

Table 2. Main Analysis of Project Success as a Function of *Black Founder* Using CEM

	Black Founder	*Black Founder*	*Project Funded*	*Project Funded*	log(*Raised*)	log(*Backers*)	log(*Avg. Amount*)
	Full sample	CEM sample	Full sample	CEM sample	CEM sample	CEM sample	CEM sample
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Black Founder			−1.541***	−1.469***	−1.976***	−1.086***	−0.556***
			(0.136)	(0.275)	(0.249)	(0.148)	(0.0813)
Video Pitch Quality	0.0112	−0.0541	0.225***	0.0813	0.0548	0.0190	0.0201
	(0.0470)	(0.0936)	(0.0292)	(0.117)	(0.131)	(0.0837)	(0.0366)
Female Founder	0.201	0.0291	0.373***	0.477	1.097**	0.573**	0.0620
	(0.107)	(0.295)	(0.0664)	(0.365)	(0.345)	(0.217)	(0.103)
log(*Positive Words*)	0.127	0.479	0.223*	0.577	0.910*	0.638**	0.183
	(0.149)	(0.331)	(0.0926)	(0.382)	(0.377)	(0.230)	(0.113)
log(*Negative Words*)	0.127	−0.0304	−0.384***	−0.825*	−0.311	−0.282	−0.0319
	(0.133)	(0.289)	(0.0879)	(0.372)	(0.354)	(0.218)	(0.106)
log(*Female Words*)	0.317**	0.174	0.0553	0.000183	0.0114	−0.0592	0.206
	(0.116)	(0.323)	(0.0821)	(0.384)	(0.362)	(0.213)	(0.125)
log(*Male Words*)	−0.0918	0.306	0.00870	0.0881	−0.0348	−0.0247	0.0828
	(0.120)	(0.243)	(0.0732)	(0.313)	(0.309)	(0.190)	(0.104)
log(*Authenticity Words*)	−0.00900	0.170	−0.0665	0.0361	−0.0647	0.0398	−0.123**
	(0.0613)	(0.130)	(0.0369)	(0.155)	(0.153)	(0.0925)	(0.0438)
log(*Facebook Friends*)	0.165***	0.0397	0.607***	0.844***	0.670***	0.563***	0.0601
	(0.0500)	(0.0957)	(0.0327)	(0.160)	(0.141)	(0.0884)	(0.0444)
log(*Project Goal*)	0.227***	0.0600	−0.747***	−0.867***	0.111	0.0689	0.117*
	(0.0478)	(0.145)	(0.0398)	(0.209)	(0.194)	(0.117)	(0.0596)
log(*Total Words*)	−0.192***	0.0152	0.302***	0.578*	0.633***	0.412***	0.0296
	(0.0281)	(0.1000)	(0.0329)	(0.236)	(0.152)	(0.0944)	(0.0328)
log(*Median Reward*)	−0.348***	−0.111	0.276***	0.313	0.898***	0.426***	0.322***
	(0.0644)	(0.135)	(0.0339)	(0.166)	(0.226)	(0.122)	(0.0526)
Category fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	−3.663***	−3.006	−1.238**	−2.884	−6.599**	−5.650***	0.888
	(0.710)	(1.712)	(0.481)	(2.312)	(2.426)	(1.485)	(0.714)
N	7,617	663	7,617	641[a]	663	663	602
R-squared					0.355	0.374	0.274
Pseudo *R*-squared	0.064	0.039	0.186	0.278			

Note. Robust standard errors in parentheses.
[a]Twenty-two projects dropped from logit sample because two category indicators perfectly predict outcome.
***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

score matching (see Online Table A4) (Rosenbaum and Rubin 1983) and inverse probability weighting (see Online Table A5) (Wooldridge 2007). We also tested whether performance varied with project category but found no evidence (see Online Table A6) to support this claim. To account for possible bias arising from inconsistent coder assessments of founder and gender, we restricted the sample to projects without coding conflicts and found consistent results (see Online Table A3). Finally, we expanded the sample to include projects without a founder's photo and reran our CEM matched sample analysis with three treatment categories (see Table 3). We found that projects from black founders continue to underperform projects from nonblack founders and those without a founder picture. These results are also robust to alternative performance measures (see Online Table A7). This indicates that black founders may improve their chances of success by choosing a profile picture with race obscured or with a company logo. These tests are explained in detail in Online Appendix A.

4.6. Conclusion

This observational study provides real-world evidence that black entrepreneurs experience less success on crowdfunding platforms. Further, ex post analysis of the performance of successful projects indicates that black founders are no more likely to delay rewards or fail to deliver than nonblack founders (see Table 4), suggesting that the funding disparity does not reflect variations

Table 3. Analysis of Project Success Using CEM Including Projects Without a Founder Picture

	Multinomial logit w/ Full sample (ref: *Nonblack Founders*)		Multinomial logit w/ CEM Sample (ref: *Nonblack Founders*)		*Project Funded*	*Project Funded*
	Black Founder	*No Picture*	*Black Founder*	*No Picture*	Full sample	CEM sample
Variables	(1)		(2)		(3)	(4)
Black Founder					−1.431***	−1.842***
					(0.130)	(0.400)
No Picture					0.849***	0.191
					(0.0537)	(0.343)
Video Pitch Quality	−0.00506	−0.772***	0.0625	−0.167	0.0599*	0.000203
	(0.0468)	(0.0262)	(0.182)	(0.180)	(0.0236)	(0.180)
log(*Positive Words*)	0.134	−0.112	0.939	0.782	0.191*	0.193
	(0.150)	(0.0797)	(0.558)	(0.481)	(0.0758)	(0.516)
log(*Negative Words*)	0.135	0.000941	−0.292	−0.211	−0.509***	−1.011*
	(0.131)	(0.0729)	(0.502)	(0.483)	(0.0710)	(0.492)
log(*Female Words*)	0.361**	−0.210**	−1.081	0.536	0.176**	0.0713
	(0.113)	(0.0739)	(0.919)	(0.827)	(0.0670)	(0.953)
log(*Male Words*)	−0.132	−0.110	−0.406	−0.0502	−0.0196	−0.0251
	(0.121)	(0.0634)	(0.439)	(0.418)	(0.0598)	(0.417)
log(*Authenticity Words*)	−0.0185	−0.277***	−0.388	−0.370	−0.0628*	0.276
	(0.0635)	(0.0324)	(0.219)	(0.205)	(0.0308)	(0.219)
log(*Facebook Friends*)	0.165***	0.00618	0.0667	−0.212	0.536***	0.380
	(0.0478)	(0.0199)	(0.159)	(0.125)	(0.0261)	(0.209)
log(*Project Goal*)	0.245***	−0.0298	−0.0372	−0.377	−0.684***	−0.850***
	(0.0490)	(0.0275)	(0.200)	(0.202)	(0.0312)	(0.226)
log(*Total Words*)	−0.183***	0.0398	0.0779	0.179	0.236***	−0.0349
	(0.0264)	(0.0203)	(0.118)	(0.120)	(0.0226)	(0.120)
log(*Median Reward*)	−0.368***	−0.103***	0.0331	0.286	0.304***	0.347*
	(0.0668)	(0.0294)	(0.222)	(0.236)	(0.0288)	(0.174)
Category fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	−3.674***	2.948***	−2.137	1.544	−0.326	1.307
	(0.720)	(0.372)	(2.776)	(2.616)	(0.385)	(3.062)
N	10,647		389		10,647	361[a]
Pseudo *R*-squared	0.106		0.079		0.162	0.196

Note. Robust standard errors in parentheses.
[a]Twenty-eight projects dropped from logit sample because two category indicators perfectly predict outcome.
***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

in founder ability. However, it remains unclear whether discrimination, net of founder and project quality, is conscious or unconscious, and whether it reflects statistical assumptions or dislike. Because of the known challenges in distinguishing between taste-based and statistical discrimination (Heckman 1998), we follow the recommendation of List (2004) and use a multistage experimental design to determine: (1) Is there evidence of racial bias when founder and project quality is constant? (2) Is the bias reflective of statistical assumptions, dislike, or unconscious associations? (3) How might founders or platforms mitigate it?

Table 4. Summary of Delivery Performance for a Subset of Black and Nonblack Founder Projects

	Mean values		
Delivery outcome	*Black Founder* = 0 (N = 729)	*Black Founder* = 1 (N = 29)	p-value of T-test
Delivery pending (1/0)	0.071	0.069	0.961
Delivery delay in days[a]	220.867	218.222	0.953

[a]Where available—684 nonblack founder projects and 27 black founder projects.

5. Experimental Measurement Validation

To use facial processing to test the influence of perceived differences in ethnicity, we needed to ensure that there was no additional information beyond the ethnicity of the subject being conveyed. Given the wealth of research on the effects of subtle difference in facial composition, affect, and expression, we began by selecting a sample of 16 facial photographs (eight

Table 5. The Perceived Traits for Selected Photographs

	Age	Attractive	Trustworthy	Confident	Likeable
White Founder					
Mean	25.7	3.10	3.70	3.76	3.89
SD	3.48	0.46	0.77	0.87	0.77
Black Founder					
Mean	25.8	3.00	3.68	3.81	3.95
SD	3.38	0.70	0.68	0.75	0.63
Participants	159	159	159	159	159

black, eight white) of similarly aged men (20–25) from a database of facial photographs taken under identical conditions (e.g., lighting, background, image size) and validated as signaling identical emotions in multiple prior psychological and neuroscience experiments (Minear and Park 2004).

As assessments of quality can also be influenced by attractiveness (Hamermesh and Biddle 1994) and trustworthiness (Ohanian 1990), we solicited 400 respondents using Amazon's Mechanical Turk service to identify a pair of photographs of equal attractiveness and perceived credibility. Respondents were recruited via a script asking them to "evaluate four pictures" and paid $0.75 for the activity. We only accepted respondents with a 95% approval rate located within the United States and did not allow repeat participants. In addition, respondents who completed the task in less than 45 seconds or more than 10 minutes or who failed the attention check ("Was the last picture of a man or a woman?") were excluded from our analyses. As a result, a total of 352 respondents (with a minimum of 50 respondents for each photo) were used in our analyses. A majority of respondents self-reported as male (60%), white (76%), under 45 (85%), and college-educated (61%).

Each respondent was randomly shown 4 of the 16 photos and asked to estimate age, attractiveness (five-point scale), and trustworthiness (five-point scale). In addition, we asked respondents to assess the confidence and likeability of the person photographed (five-point scale) as alternate measures of credibility. Of the 64 possible pairs, we identified one pair with no statistically significant differences in age, attractiveness, emotion, trustworthiness, or perceived credibility (see Table 5).

6. Experimental Test of Conscious Bias

6.1. Description

Using the validated photographs, we tested whether founder race influenced a prospective supporter's perception of the project. Our design differs from prior research on discrimination in one significant fashion. Although taste-based and statistical discrimination are often hypothesized as oppositional, these explanations are rarely tested as independent alternatives. Instead, most studies directly test for statistical discrimination and use an absence of evidence as proof of taste-based discrimination (Bertrand et al. 2005, Pope and Sydnor 2011). This approach defines distaste as the absence of a rational reason to expect racial differences. However, amenity and expectation are not mutually exclusive conceits: a person may dislike a group that is also more likely to fail, or one's expectations for group performance may be influenced by disamenity. As such, dislike of a group may affect the likelihood that a person would interpret ambiguous information as evidence of group incompetence. Therefore, as explained in the following, we design our experiment to directly test both forms of discrimination. Our experiment allows us to distinguish between subjects who assume the quality of a black founder is lower and therefore perceive the project as lower in quality and subjects who do not assume differences in founder quality but still identify the project as lower in quality.

6.2. Subject Recruitment

In July 2015, we recruited 1,300 participants on Amazon's Mechanical Turk service via a script asking them to "evaluate a hypothetical crowdfunding project" and paid $0.50 for the activity. We only accepted respondents with a 95% approval rate located within the United States and did not allow anyone who had participated in the prior test. In addition, respondents who completed the task in under 2 minutes or required 20+ minutes, those who failed the attention check ("What product was for sale?"), those who indicated any problem with the survey, and those who shared an IP address were excluded from our analyses. As a result, a total of 1,186 respondents were used in our analyses. Respondents self-reported as majority male (56%), white (70%), under 35 (62%), and having visited a crowdfunding platform in the past month (68%) (see Table 6). Likely because of the fact that the script specified crowdfunding, this population is comparable to what the major crowdfunding sites report for their users.

6.3. Experimental Design

After indicating consent, subjects were randomly placed into one of four possible conditions. In the *control* condition, respondents were shown a sample project for a wooden tray that holds a smartphone and keys, along with the picture of a white founder named "Joe." In the *strong bias* condition, respondents were shown the same project with a black male founder. Given the subtlety of the change and prior evidence of social desirability bias leading to an exaggeration of positive sentiment for minorities, we anticipated that this condition would only yield a significant effect if the respondents were strongly biased against black founders.

Table 6. Subject Characteristics by Condition

	Control	Strong bias	Moderate bias	Weak bias
Ethnicity				
White	0.72	0.66	0.73	0.77
African American	0.07	0.08	0.09	0.05
Other	0.26	0.24	0.28	0.24
Male	0.59	0.49	0.56	0.59
Age				
18–34	0.62	0.64	0.63	0.61
35–54	0.30	0.30	0.34	0.31
55+	0.08	0.07	0.04	0.08
Experience				
Visited CF sites	0.71	0.63	0.67	0.68
Backed project	0.26	0.25	0.21	0.22
Founded project	0.02	0.04	0.02	0.01
N	254	192	278	278

In the *moderate bias* condition, respondents were shown the same project with the black founder and the name was changed to "Jordan." This name was selected, consistent with prior research (Bertrand and Mullainathan 2004, Fryer and Levitt 2004), by first identifying a name among the 10 most popular names for black male children that was not among the 10 most popular for white, Hispanic, or Asian males born in either NYC or Texas at the time of the birth of the photographed individuals (1995).[3] Separate tests done using the white photograph and name "Jordan" did not differ from the control condition, indicating that there is no independent name effect.

Finally, in the *weak bias* condition, respondents were shown the black founder named "Jordan" with two changes inserted into the text to emphasize his ethnicity (see Figure 1). Each condition increased the salience of founder ethnicity to determine whether bias was reflexive—and therefore consistent across all conditions—or related to the degree of emphasis. All other aspects of the project remained constant across the four conditions with the project conditions set to those at the "start" of a project (i.e., zero dollars raised, zero backers).

The project was for a wooden tray with two separate bins, one for a smartphone and the other for change/keys (see Figure 2). This project was selected because it represented a typical crowdfunding project (i.e., median goal, product price, length of description, number of reward levels), and neither the video nor the photos included any evidence (photographic or narration) of the founder's ethnicity. In addition, we selected a project that solicited funding for a "product" to properly test the experience of minorities using crowdfunding to start a small business as opposed to a charitable request or one for music or film. After viewing the project for a minimum of 30 seconds, participants were allowed to progress and answer a few questions on the quality of the project and then the founder.

6.4. Tests of Conscious Discrimination

The known empirical challenge of identifying the form of discrimination (Heckman 1998) leads researchers to test for statistical assumptions and then infer disamenity from the absence of statistical evidence. Rather than testing whether respondents exhibit dislike, this focuses on whether discrimination reflects rational behavior. In our setting, this would suggest that the relevant question is the following: Do prospective backers use founder race as a proxy for unobservable attributes?

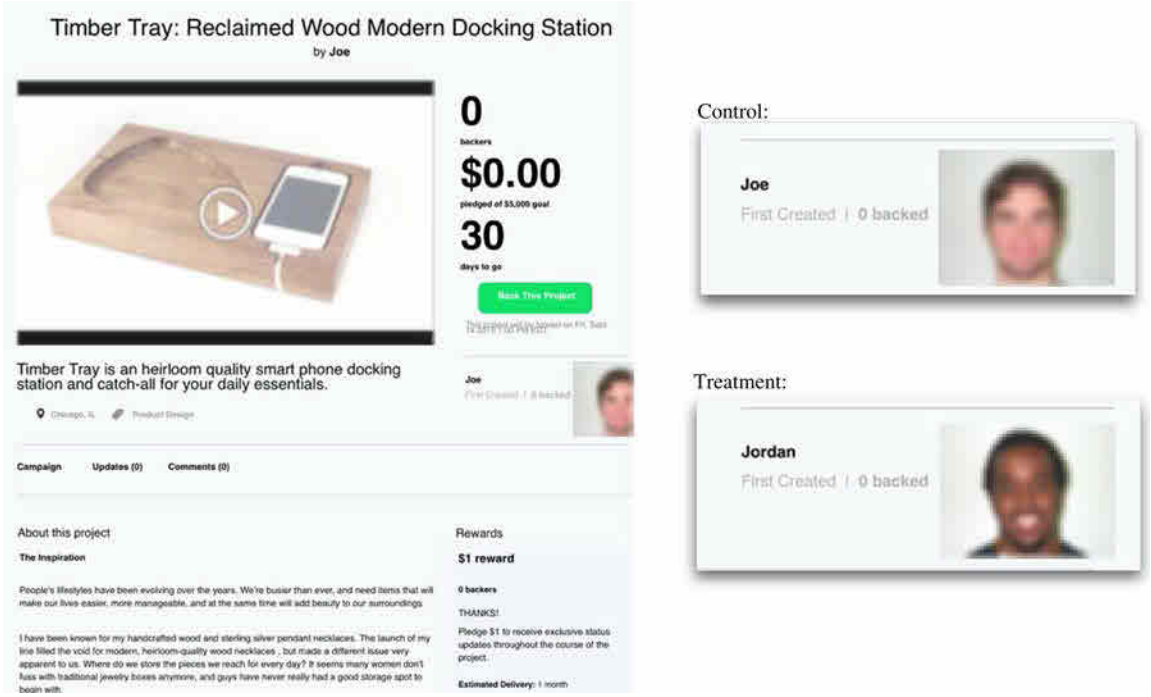
We extend this line of research by testing perceived project and founder quality separately. This approach directly tests whether respondents who do not use race as a proxy for ability still perceive a project by a black founder to be of lower quality. In short, it allows us to determine when prospective backers perceive a project as low quality because they assume the founder is incapable, when they perceive it as low quality despite the founder's ability, and when they separately identify the project as high quality but indicate concern over the founder.

This question is critical for both founders and platforms because it helps us understand which attributes of a project are influenced by the race of the founder and therefore which remedies might prove effective.

Figure 1. Description of Treatment Conditions

	Control	**Strong**	**Moderate**	**Weak**
Name	Joe	Joe	Jordan	Jordan
Photo	White	African American	African American	African American
Text changes	"I wanted to provide finely crafted products that are not only functional, but also beautiful." "As an Industrial Designer and former high-end furniture designer…"	None	None	"I wanted to provide finely crafted, *African American made* products that are not only functional, but also beautiful." "As a *Black* Industrial Designer and former high-end furniture designer…"

Figure 2. (Color online) Site Example



For example, if a founder's race influences the perceived risk of default but not the perceived quality, then awarding a "staff favorite" badge may not reduce the role of bias. However, if race influences the perceived quality but not the perceived risks, then favoring black founders in the awarding of these types of endorsements may be an effective way for a site to moderate bias. To assess these different claims, we asked respondents to first assess the project quality and then founder ability (see Table 7). To reduce the influence of social desirability bias, we also used an indirect question (Fisher 1993) in which respondents were told they had earned a "bonus" question that would award them an extra $0.50 if they answered correctly. The question was the following: "Do you think the majority of other mTurk participants thought this project would succeed or fail?"

Table 7. Tests of Discrimination

Measures of quality
1. How would you rate the overall quality of the site?
2. Projects generally require 200+ supporters to succeed, what is the likelihood this project will get contributions from 200 strangers?
Measures of founder ability
1. How likely is the founder to fail to deliver any products?
2. How likely is the founder to deliver on time?
3. How likely is the founder to deliver the quality they promise?
4. How likely is the founder to receive complaints from their backers?

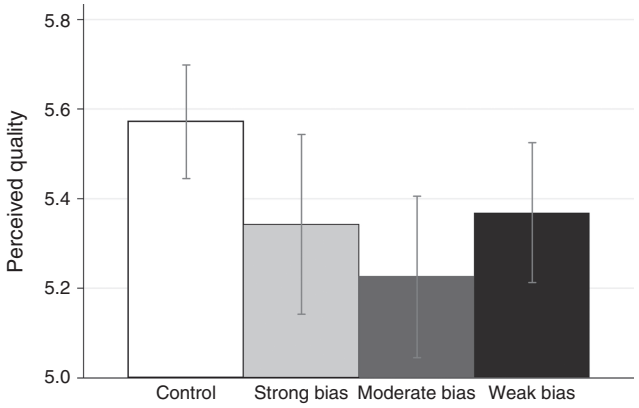
Note. All answers were restricted to a seven-point scale.

In addition, to control for potential individual variance in the perception of founder credibility, we asked the respondents to rate (seven-point scale) their perception of the founder's honesty, confidence, and likeability. To test for the effectiveness of each manipulation and attention to the task as a whole, we then asked respondents four closed-ended questions (e.g., "The product for sale was a . . .") with four possible answers each. Because we are testing the role of conscious bias, respondents who failed attention checks or did not identify founder race were excluded from our analyses. The survey closed by asking respondents to self-report demographic data and to detail their prior experience with crowdfunding.

6.5. Taste-Based Discrimination: Perceived Quality

First, we sought to test whether the race of the founder influenced the respondent's perception of the quality of the project. A taste-based argument would hold that respondents might perceive the project as lower in quality even if they did not identify the founder as less capable. The results of the experiment indicate that, given identical projects, there is a statistically significant reduction in perceived quality for black founders (see Figure 3). Notably, across all subjects in the moderate condition, respondents rated the project quality lower (mean = 5.32, SD = 1.13) than those in the control condition (mean = 5.53, SD = 0.880, $t(467) = 2.25$, $p = 0.025$) using Welch's t-test. This effect becomes more pronounced if we restrict the sample to respondents with experience in crowdfunding or those under 35 who comprise the majority of crowdfunding

Figure 3. Effect of Treatment on Quality



Note. Bars indicate 95% confidence intervals.

supporters (see Table 8). We consider these latter populations significant points of comparison because their greater familiarity with the site increases the accuracy of their measurements and reflects the perspective of active funders on these platforms.

Evidence of bias also emerges in the strong and weak conditions when we restrict the study to those with experience in crowdfunding. For example, experienced respondents in the weak condition rated the quality (mean = 5.37, SD = 0.830) significantly lower than those in the control condition (mean = 5.57, SD = 0.1.05, $t(336) = 1.99$, $p = 0.047$) as did experienced respondents in the strong condition (mean = 5.34, SD = 1.05) relative to the control condition (mean = 5.57, SD = 0.1.05, $t(192) = 1.91$, $p = 0.058$). Again, evidence of bias is strongest across all conditions when we restrict the study to those both experienced in crowdfunding and young (under 35).

We consider these to be extremely conservative tests of bias because the respondents were not asked to contribute to the projects and could easily exhibit preferences they may not otherwise act upon. This, combined with the subtlety of the signal, may help explain why bias primarily emerges when we strengthen the signal of African American identity and when we look at experienced respondents. However, the results do suggest that the performance disparity found in the observational data may derive from bias in the pool of prospective backers.

Table 8. Mean Perceived Project Quality for All Conditions in Experiment 1

	All respondents		Experienced respondents		Experienced and young	
	Mean	SD	Mean	SD	Mean	SD
Control	5.53 ($n = 226$)	0.880	5.57 ($n = 168$)	0.830	5.64 ($n = 107$)	0.840
Strong bias	5.51 ($n = 173$)	1.04	5.34† ($n = 108$)	1.05	5.24** ($n = 74$)	1.04
Moderate bias	5.32* ($n = 251$)	1.13	5.22** ($n = 173$)	1.20	5.11** ($n = 122$)	1.23
Weak bias	5.44 ($n = 257$)	1.04	5.36* ($n = 179$)	1.06	5.30** ($n = 116$)	1.01

$^{\dagger}p < 0.10$, $^{*}p < 0.05$, and $^{**}p < 0.01$ indicate difference from control scenario.

6.6. Statistical Discrimination: Founder Quality

The theory of statistical discrimination suggests that this apparent bias may reflect the use of race as a way to infer unobserved differences in founder quality. In contrast to this claim, tests of all respondents did not rate black founders as less likely to deliver, to deliver high quality, or to deliver on time or more likely to receive complaints. These results did not change when we restricted the analysis to experienced participants or to respondents of a particular age or ethnicity. In addition, we model two naive ordinary least squares regressions that estimate perceived project quality controlling for a respondent's perception of the founder's ability (see Table 9). In model (1) we estimate the effect of each founder quality measure individually, while in model (2) we combine these four measures into a single *Founder Quality* factor variable using a principal component factor analysis (all four eigenvalues > 1). Estimating the results for the entire population (models (1) and (2)) or limiting the analysis to respondents with crowdfunding experience (models (3) and (4)), we find that significant evidence for a racial penalty independent of founder quality assessments. Furthermore, interactions between measures of founder quality and race are not statistically significant.

The results indicate that the reduction in perceived project quality cannot be attributed to a conscious assumption that black founders are less capable. As such, it would appear that the bias found here is not motivated by an attempt to mitigate anticipated risk, but rather by distaste for minority founders. In addition, the absence of difference reinforces our finding in the measurement validation that the selected photographs do not subtly convey a difference in aptitude or trustworthiness.

6.7. Statistical Discrimination: Likelihood of Support

Statistical discrimination may also emerge if supporters believe *others* will be biased against minority founders. The resulting expectation that a project will fail could produce a negative feedback loop in which audiences assume that minority founders are less likely to succeed and therefore opt not to fund them, making them, in turn, less likely to succeed. The respondents themselves may not believe the founder incapable, but if they believe others are biased, then not promising support may be an efficient decision.

Table 9. Influence of Founder Attributes on Perceived Project Quality

	Perceived project quality			
	All respondents		Experienced respondents	
	(1)	(2)	(3)	(4)
Condition (relative to control)				
Strong bias	−0.140	−0.151	−0.239*	−0.263*
	(0.10)	(0.10)	(0.12)	(0.12)
Moderate bias	−0.194*	−0.236*	−0.271*	−0.318**
	(0.10)	(0.10)	(0.12)	(0.12)
Weak bias	−0.228*	−0.237*	−0.306**	−0.333**
	(0.10)	(0.10)	(0.12)	(0.12)
Likelihood founder is				
On time	0.131**		0.099	
	(0.04)		(0.05)	
Matches quality	0.325***		0.334***	
	(0.05)		(0.06)	
Fails to deliver	0.041		0.031	
	(0.03)		(0.04)	
Receives complaints	−0.092**		−0.117**	
	(0.03)		(0.04)	
Founder quality factor		0.521***		0.540***
		(0.04)		(0.05)
Respondent characteristics				
White	−0.101	−0.135	−0.050	−0.055
	(0.08)	(0.08)	(0.10)	(0.10)
Male	−0.167*	−0.184**	−0.174*	−0.209*
	(0.07)	(0.07)	(0.09)	(0.09)
Age	0.137*	0.124*	0.129	0.136
	(0.06)	(0.06)	(0.08)	(0.08)
Experienced	−0.133	−0.165*		
	(0.08)	(0.08)		
Constant	3.341***	5.758***	3.469***	5.603***
	(0.35)	(0.14)	(0.42)	(0.16)
N	673	673	461	461
Adjusted *R*-squared	0.27	0.24	0.27	0.25

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

To test this, we asked respondents how likely they thought the project was to succeed. While we find that respondents adjusted their estimate of success according to their perception of founder quality, we did not find any evidence that these estimates varied by condition. In other words, respondents used founder quality to predict the likelihood of success but did not further adjust this expectation based on the race of the founder. Interactions between perceived founder quality and condition were also not significant.

Tests of the indirect measure of project success also returned no significant differences in conditions across all respondents, but a significant difference was observed between the expectations of experienced and inexperienced respondents. Notably, inexperienced respondents believed that the other participants would overwhelmingly support a black founder (65.2%) while experienced respondents assumed the likelihood was lower (53.4%, $\chi^2(1, N = 424) = 5.10$, $p = 0.015$). This was not a matter of inexperience inflating expectations because the two groups did not differ in their predictions for support of a white founder. While this suggests that the failure of black founders is not based in differing assumptions about the likelihood they will succeed, it also indicates that experienced participants learn to reduce expectations for minority founders or that they are less optimistic about peer support for minorities than inexperienced actors.

6.8. Alternate Explanations

An alternate interpretation of the evidence might be that discrimination results not from dislike, but from homophily among a predominantly white pool of respondents. This preference for "people like us" would explain both the evidence of discrimination and the lack of evidence that race is used to infer founder quality. While the homophily argument would not challenge the existence of bias, it would suggest that the cause was not distaste, but affinity, and that the solution might therefore involve the recruitment of

more black supporters rather than trying to persuade white ones.

To test this, we examined whether the above results varied by respondent race and found no significant differences in the behavior of white and nonwhite respondents in any of the conditions. The paucity of black respondents made it impossible to compare the responses of white and black respondents alone, and therefore, we cannot rule out the possibility of significant white/black differences. However, our results indicate that nonwhite respondents exhibit a pattern identical to white respondents in favoring the white founder over the black one.

7. Experimental Test of Unconscious and Conscious Bias

7.1. Description

One limitation shared by both taste-based and statistical explanations of discrimination is their assumption that individuals act consciously to discriminate. As Bertrand et al. (2005) explain, research in psychology (Dovidio et al. 2002) and sociology (Castilla 2008) finds that individuals also have unconscious associations for ethnic groups that can bias their evaluations (Greenwald et al. 1998), leading to differences in promotions, hiring, and interpersonal behavior. While, to our knowledge, there has not yet been an attempt to examine unconscious bias in entrepreneurship, the similar need to evaluate quality under uncertainty creates the proper conditions for unconscious bias to emerge.

The results of our initial experiment found that respondents prefer projects from nonblack founders even if they do not believe white founders to be any more capable. We interpret this as evidence of a conscious taste-based bias, but the results do not allow us to distinguish between a preference that emerges from conscious *dislike* of black founders and one that emerges from an unconscious *prejudgment* of quality.

While this may sound like mere semantics, it represents the difference between a problem that platforms cannot address themselves and one that they can. The notion of an unconscious bias suggests that respondents may enter the experiment with an unrecognized belief that a black founder will be lower in quality. As a result, and critical to the design of our study, prospective backers may not recognize their bias and therefore not indicate any belief that black founders are less capable or trustworthy. However, evidence that contradicts these biases will still have an outsized effect.

Therefore, to distinguish between conscious and unconscious biases, we designed a second experiment that tested the effect of project quality signals on the discrepancy in perceived project quality between white and black founders. If the bias is driven by conscious discrimination, then additional indicators of project quality should not reduce the gap in perceived quality because they offer information immaterial to the existing bias. However, if respondents discount the quality of black founders because of unconscious assumptions, then additional signals of quality should disproportionately benefit black founders.

Our design uses two different signals of quality. First, in keeping with theories of social proof, we tested whether evidence that others supported the project altered the perception of the project's value. Second, we estimated the value of an external indicator that suggested people beyond the founder's community approved of the project. Using two signals allows us to separate the influence of in-group and out-group support for the project and to more precisely identify the cause of a racial discount in crowdfunding.

7.2. Experimental Design

One week after the prior experiment, we recruited a new set of 1,200 subjects through Amazon's mTurk service. As before, we eliminated any participants who failed any attention checks, participated in earlier rounds, completed the task too slowly (>20 min) or quickly (<2 min), or indicated any problems with the survey. In total, we include responses from 871 participants who self-reported as majority male (53%), white (79%), under 35 (63%), and having visited a crowdfunding platform in the past month (88%).

Each respondent randomly was assigned to see the project from the control or moderate condition and then randomly assigned to one of three conditions that assessed different project quality signals. In the *10% condition*, we altered the project to indicate that, with approximately 90% of the time remaining (27 days), the project had met ~10% of its goal ($489 of $5,000). In the *75% condition*, we indicated that with approximately one fourth of the time remaining (7 days), the project had met approximately three fourths ($3,830) of its goal. The dollar amounts reflect the percentage contributed if donations occurred linearly with time and were chosen to look authentic (rather than $1,000). Therefore, both signals suggest the same rate of donation, just at different points in time. We selected these two amounts to distinguish between the need for initial and overall popular support. Finally, in the *endorsement* condition, we included a prominent badge at the top of the project declaring it to be a "Staff Pick." This badge is nearly identical to the one used by the platform itself and therefore has high familiarity for experienced participants. The projects were identical to those used in the prior experiment with the exception of the changes listed here.

Respondents were then asked the same questions from the prior experiment regarding the perceived project quality, the likelihood of success, and the likelihood others thought the project would succeed. In

addition, they were asked two questions about the specifics of the project and three manipulation checks: (1) What was the name of the founder? (2) What was the ethnicity of the founder? And either (3a) had the project won any awards or recognition from the site, or (3b) had the project raised any money?

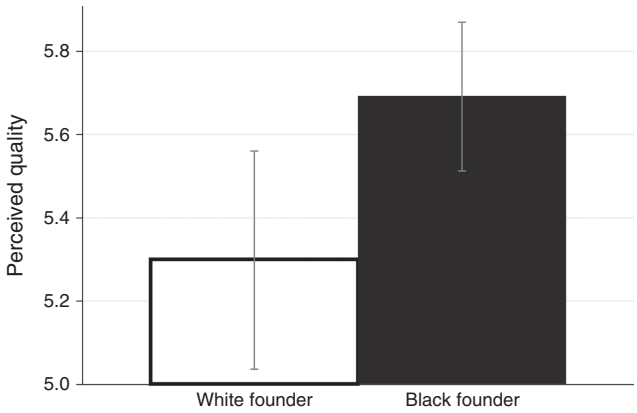
Finally, to estimate the influence of these primes on respondent behavior, we posed an open-ended question asking if they had any suggestions for the founder on how to improve the project. This design allows us to estimate both variations: how founder race affects the value of a given endorsement and also how different endorsements affect the value of founder race.

7.3. Perceived Project Quality

We presume that a signal of quality will generally enhance the perception of the project's quality. The question is whether the signal raises estimates for white and black founders equally, leaving the perceptual gap intact and indicating that the racial penalty reflects conscious distaste. Or do the signals disproportionately benefit black founders, erasing the perceptual penalty and confirming the assumption that perceptual penalties reflect unconscious project quality concerns. Our results indicate that reaching 10% of funding effectively reverses the influence of race, raising the perception of project quality for black founders (mean = 5.61, SD = 0.798) above that for white founders (mean = 5.37, SD = 1.04, $t(182) = -1.72$, $p = 0.087$), and again, the result that is more pronounced among experienced respondents (see Figure 4).

The effects were similarly positive for both alternate forms of endorsements (75% support and platform award) with both signals eliminating the evidence of bias. Restricting the analyses by experience, age, or respondent ethnicity does not alter these effects. In each case, the formerly robust penalty for black founders disappears, and estimates of quality are statistically indistinguishable irrespective of the founder.

Figure 4. Effect 10% Support on Quality for Experienced Supporters



Note. Bars indicate 95% confidence intervals.

In addition, as in the prior studies, we find that there is no difference in the estimates of the likelihood of success between founders. These results indicate that respondents are more attentive to social proof than site activity and also suggest a potential mechanism for achieving greater equality. Namely, given the outsized significance of endorsements for black founders, sites might include the founder's race among their criteria for awarding recognition. In addition, our results indicate that the benefit of social proof for minorities is greatest early on; therefore, sites may consider granting preferential treatment (i.e., visibility on the landing page or in promotional emails) to new projects by black founders as a means of reducing imbalance in success rates.

7.4. Behavioral Test

Given that this experiment relied upon implicit tests of opinion, we sought to also test if founder race influenced respondent behavior in a fashion consistent with our findings. Therefore, as a final question, we asked a subset of respondents, "Do you have any advice you would offer us on how to improve the project?" 87% of respondents offered responses, which were then coded using the LIWC dictionary to assess the length and ratio of positive to negative comments (Chung and Pennebaker 2008, Pennebaker et al. 2001). The results confirm our findings that respondents exhibit a desire to help black founders and yet scrutinize their projects more closely. For example, for projects with only 10% support, respondents offered black founders more suggestions (mean = 16.3, SD = 16.8) than they did for white founders (mean = 12.81, SD = 11.4, $t(176) = -1.66$, $p = 0.098$). However, the comments contained more positive words for white founders (mean = 5.76, SD = 10.9) than for black founders (mean = 3.24, SD = 6.14, $t(170) = 1.85$, $p = 0.066$). These differences disappear as support reaches 75%, if the site endorses the project, or if we limit analysis to the experienced backers. For these latter conditions, respondents offered identical types of comments to both founders, just as they now evaluated the projects identically.

8. Experimental Tests of Site and Founder Interventions

8.1. Description

The above tests identify unconscious bias among potential backers as the source of a discrepancy in the performance of white and black crowdfunding projects. However, this information does little to assist sites in achieving equality and even less to help black founders improve their performance. To identify the manner in which unconscious bias affects evaluations and to contribute a potential remedy, we designed a final experiment to test the efficacy of three interventions in reducing bias.

8.2. Debiasing Intervention

Research in psychology has established evidence that "debiasing" techniques can moderate the influence of stereotypical associations in interpersonal judgments (Heilman et al. 1988). This research treats stereotypes as operating primarily as a proxy for unobserved relevant characteristics rather than as a reflection of dislike (Heilman 1984). For instance, to hire a daycare worker, an employer may care whether that person is nurturing and, if the candidate does not provide direct evidence regarding nurturing, the employer may infer this ability (or inability) by relying upon a stereotypical association that women are more nurturing than men.

Critically, a debiasing approach assumes that stereotypes only attain relevance in the absence of contrary evidence. Candidates can therefore mitigate potential penalties by providing affirmative evidence of the relevant ability and contradicting the stereotypical associations. In our case, this would suggest that black founders who directly and clearly contradict common stereotypes that they are lazy, uneducated, or unmotivated (Gaertner and McLaughlin 1983) will not be subject to the same degree of bias as those who make no such claim. To test the efficacy of this action, we conducted an experiment using the same design as the initial experiment but with one notable change in the project's text to indicate that a founder was hard-working, educated, and capable.

8.3. Group Success Intervention

A second possibility is that bias arises not from an assumption about how one group acts, but from a lack of information about how a member of that group will perform. For example, this theory would claim that people do not reject female leaders because leadership is "male" but because they have seen men lead successfully and lack experience with a female leader (Aigner and Cain 1977). Beaman et al. (2009) test this proposition explicitly in a field experiment in India and find that when people are exposed to a female leader for the first time, it weakens stereotypes about gender roles and eliminates bias in how female leaders' effectiveness is perceived. Consistent with the debiasing literature, this treats bias as emerging from scarce information—what varies is whether individuals benefit from group-level or individual-level corrections. The implication of the Beaman et al. (2009) findings is that mitigating bias does not require the negation of specific racial stereotypes but can also occur through exposure to broader evidence that African Americans can succeed as founders. We test this proposition by altering the design of the initial experiment so that some respondents were first shown an array of photos of "recent successful founders" with a varying number of African Americans included in the array.

8.4. "Whitewashing" Intervention

The first two interventions tested different means of reducing bias by providing additional information. A logical alternative is to reduce bias through the elimination of the initial indicators of race. Recent studies on supply-side responses to evidence of bias lend credence to the assumption that employees act proactively to avoid bias (Pager and Pedulla 2015). In particular, work by Kang et al. (2016) finds that minority job applicants were likely to reduce the evidence of their ethnicity by adopting "white" names or removing association with ethnic groups from their resumes. Further, and significant to our interest in testing plausible interventions, Kang et al. conduct an audit study that demonstrates "whitewashed" resumes were more likely to receive positive responses than identical resumes containing evidence of ethnicity. To test the effect of whitewashing in crowdfunding, we created a final condition in which respondents were shown the initial project with the photograph replaced by a blue square (per site policy) and the initials "JM" in place of a name.

8.5. Experimental Design for Tests of Interventions

In August 2016, we recruited a new set of 1,375 subjects through Amazon's mTurk service using a script and payment identical to what was offered in the initial experiment. As before, we eliminated any participants who failed any attention checks, participated in earlier rounds, completed the task too slowly (>20 min) or quickly (<2 min), or indicated any problems with the survey. As a result, we included responses from 1,048 participants who self-reported as majority male (50.1%), white (79%), under 35 (56%), and having visited a crowdfunding platform in the past month (68%).

Given the amount of time separating our initial experiments from these intervention tests and the possibility of change in respondent racial attitudes, we elected to run the initial experimental design a second time. This allowed us to test the replicability of our initial results and also provided a more accurate baseline score to test the effect of a given intervention on perceived quality. This meant that the respondents could be assigned to one of nine possible conditions, as before, a control condition in which they were shown the white founder named "Joe" and a bias condition in which they were shown the black founder named "Jordan." To test the effect of debiasing, we introduced two new *debiased* conditions (*debiased black founder* and *debiased white founder*) in which the text of the two projects was changed to emphasize the founder's commitment, education, and ability.

To test the effect of group-level evidence of success, we introduced four new treatments. In the *photo prime* condition, people received a photo of nine randomly selected recent founders of a crowdfunding project (five white, two Asian-American, one Hispanic) and

one white photo validated in the earlier pretests. In the *black prime* condition, the one artificial white founder was replaced with a photograph of a black man of similar age, attractiveness, and likeability. To further identify the influence of the racial composition of the array, we also tested an array with only randomly selected white founders (*white prime*) and an array in which we replaced two of the white founders in the initial random sample with two more randomly selected black founders (*multiple black prime*). These latter conditions allowed us to distinguish between the effect of seeing any photo, a diverse group, and different percentages of African Americans on the perception of black founders. Respondents in all photo conditions received the bias project because the intent was to test degrees of representativeness on the assessment of black founders.

Finally, we created a *whitewashed* condition, described above, in which respondents received a project where the photograph of the founder had been removed and the name replaced by the initials "JM." The projects were identical to those used in the prior experiment with the exception of the changes listed here.

Prior to the experiment, we conducted a separate test of each potential mechanism by recruiting 800 respondents through Amazon's Mechanical Turk service to assist in "a short survey on crowdfunding founders." We used the above exclusion criteria and paid \$0.15 for participation, limiting each respondent to one response. The respondents were instructed, "We're trying to help people with their crowdfunding campaigns. Crowdfunding is a way for people to raise money by asking a lot of people (the crowd) to contribute small amounts. People use this money for all kinds of things from starting a business to selling video games to paying off medical bills."

For the debiased mechanism, we added, "Below is the pitch for one project; please read it closely and answer the questions that follow," and we showed respondents different versions of the project text. We then asked two attention checks (e.g., what was the project for, and what was the material?). Finally, respondents were asked whether they agree or disagree that the speaker was (seven-point scale) lazy, educated, committed, passionate, persuasive, professional, enthusiastic. Respondents shown the debiased script rated the founder as more educated, hard-working, and committed, but no more or less passionate, professional, enthusiastic, or persuasive than those shown the original.

To test the effectiveness of the group-level intervention, in place of the text we showed a subset of respondents the photo arrays of recent founders and unrelated questions about their experience with crowdfunding. We then asked the respondents to estimate the percentage of crowdfunding founders who are black. The black founder (42%) and multiple black (45%) primes significantly raised the estimates relative to the control and unprimed conditions (36%) while the photo prime (40%) was not significantly different.

In a pretest of the whitewashed condition, respondents were shown the modified project and then asked to recall the name and identify the race of the founder with choices "black, white, Asian, Latino, other, and not certain." Of the 91 participants in this pretest, 90 selected "not certain," and 1 selected "other."

8.6. Replication of Bias

Despite occurring one year after our initial experiment, the assessments of the control and treatment conditions indicate the persistence of bias in this setting. Specifically, all respondents rated the quality of the project significantly higher when shown a white founder (mean = 5.72, SD = 0.090), than when shown a black founder (mean = 5.28, SD = 0.104, $t(202) = 3.22$, $p = 0.002$). As before, evidence of bias was persistent across multiple subsamples, including respondents with more crowdfunding experience, white, and nonwhite respondents. These current all-respondent scores represent the baseline against which we compare the efficacy of the potential interventions. (Full details of the conditions, with examples, are available in Online Appendix B.)

8.7. Debiasing and Perceived Quality

Our results indicate that debiasing through the contradiction of relevant stereotypes did not significantly improve the performance of black founders, nor did it eliminate the gap in perceived quality between projects from white and black founders. The only notable effect of the prime was in reducing the amount of help provided by respondents to a debiased black founder (mean = 13.2, SD = 1.11) relative to the amount provided to the control black founder (mean = 16.7, SD = 1.80, $t(175) = 1.66$, $p = 0.10$). This difference suggests that respondents did recognize the founder with contrasting information as more capable/less in need, but this did not translate into higher estimates of quality.

It should be noted that under neither condition (nor in any subsequent intervention) do we find any difference in the expectations of project success or founder quality. As such, we reaffirm our conviction that any evidence of bias is not statistical in nature, which may explain the ineffectiveness of the debiasing intervention.

8.8. Group Success and Perceived Quality

The results indicate that efforts to develop new group-level associations or to suggest that African Americans are typical crowdfunding founders improve the perception of black founders. Specifically, respondents shown the black prime rated black founders' projects

as higher quality (mean = 5.57, SD = 0.103) than respondents shown an unprimed black founder (mean = 5.28, SD = 0.103, $t(208) = 2.04$, $p = 0.045$) and no different than the white founder (mean = 5.72, SD = 0.090, $t(195) = 1.08$, $p = 0.28$). In addition, respondents shown the multiple black prime also rated black founders' projects as higher quality (mean = 5.61, SD = 0.091) than the control black founder (mean = 5.28, SD = 0.103, $t(216) = 2.35$, $p = 0.020$). This effect appears to be driven by specific evidence of African American success on the platform as opposed to a general positive response to the photo array because respondents shown a diverse array that lacked African Americans in the photo prime condition (mean = 5.39, SD = 0.100) and those shown an all-Caucasian array in the white prime condition (mean = 5.19, SD = 0.134) did not raise their estimates. Significantly, this indicates that the site can achieve greater equality by offering potential backers evidence that African Americans have succeeded and also that this evidence cannot merely show the success of minority founders more generally but requires evidence of African American success.

8.9. "Whitewashing" and Perceived Quality

Finally, the results reinforce the value of disguising founder traits. Obscuring the picture and providing only initials, rather than a name, raised the perceived quality of the project (mean = 5.61, SD = 0.101) relative to the control black founder (mean = 5.28, SD = 0.104, $t(205) = 2.29$, $p = 0.023$) using a Welch's t-test. Importantly, and in contrast to recent work (Burtch et al. 2015) that finds potential costs to anonymity, the difference in perceived project quality scores between the initial white founder and the group receiving the whitewashed intervention is not statistically significant ($p > 10$). This suggests that a site-wide policy of removing founder photos could reduce bias without adversely affecting general perceptions of quality.

9. Limitations

It is important to recognize that while crowdfunding offers a means for prospective entrepreneurs to acquire resources it is not identical to traditional venture capital decisions or to the decisions made by bank loan officers. The results therefore speak specifically to how we might improve outcomes on this new form of financing but may not be generalizable to other methods of capital acquisition.

Second, while we use photographs selected from a database of emotionally equivalent images and tested for equivalence of age, attractiveness, and trustworthiness, the photos are of different people, and it is possible that our results reflect some unrecognized variations in the images.

Third, we use a successful project in the experimental design. While the project was largely representative of other successful projects, it also reflected a higher-quality offering, and the results may not be applicable when the project is of lower quality. In addition, we chose a project that required limited technical ability (i.e., basic woodworking skills), and the results may differ in contexts in which the projects require more advanced or specialized knowledge.

Fourth, we restricted our tests to the differences between male black and white founders, leaving for future research the potential confounding influence of gender or alternate ethnicities.

Fifth, the experimental results rely on respondents drawn from an online pool of workers. While prior research has found that these populations are no less representative than those recruited to a physical lab, the results may be specific to either the online interaction or to respondents found online.

Finally, although we describe the results in terms of differences in the mean, it is important to establish that the effect is not to generally reduce the impression of quality for all participants. Instead, the results reveal that, while many respondents rated the project as high quality irrespective of founder race, the percentage of respondents giving a high or low rating varied. For example, 17% of respondents rated the project quality "below average" for any black founder, but less than 10% did so for the white founder. Our findings, therefore, do not indicate that people will not support a black founder but that black founders confront an extra hurdle when a minority of potential supporters downgrade their evaluation based on the founder's race.

10. Discussion

In this paper, we return to a long-standing question in entrepreneurship: what explains the underperformance of minority founders? Specifically, given prior evidence of bias among traditional resource providers, we consider whether broadening the pool of potential funders through crowdfunding offers a new path to equal opportunity for African Americans. Our results indicate that performance discrepancies persist despite crowdfunding's promise and that the lower likelihood of success for black male founders does not appear to be a product of the most likely explanations: smaller networks, less wealthy networks, or lower-quality entrants. Instead, we find that prospective backers exhibit a consistent preference for white founders over black founders. In a subsequent experiment that controlled for project and founder variation, we find that backers perceive the quality of black founders' projects as lower but do not presume black founders are less capable. A second experiment tested whether backer bias was conscious or unconscious and found, similar to Pope and Sydnor (2011), evidence that backers exhibit a pro–African American sentiment constrained by unconscious bias. As a result, even though

respondents do not consciously assume that African Americans are less capable, the benefits to additional signals of quality are greater for African Americans than they are for white founders. A final experiment identified two additional interventions through which sites or founders might reduce bias and improve minority performance. First, we find that evidence of prior success by African American founders significantly improves the response to projects by subsequent black founders, effectively eliminating any bias. Second, we find that hiding evidence of the founder's ethnicity, or "whitewashing," by electing not to show a picture or name, raises the estimation of the quality of the project to be on par with that of a white founder.

These results have three primary contributions to prior work on entrepreneurship and racial discrimination. First, our findings address the question of whether diversifying the pool of resource providers generates more equal outcomes. We find that it can, but it does not do so automatically. Efforts to shift the demographics of the people allocating resources are liable only to be partially effective. Our results demonstrate that one reason a diversified pool does not automatically improve upon banks or professional investors is because of widespread, and unconscious, discounting of black founders. Relatedly, these findings extend the nascent research on crowdfunding as an alternative to traditional methods of financing new ventures, providing the first test of whether novel funding methods that rely on crowds rather than experts achieve more equal results, and show the limitations inherent in them at present.

Second, we extend research on economic discrimination by offering a direct test of perceived quality independent of our test of assumptions of founder capability. Previous research measured statistical discrimination and often used the absence of a finding as evidence for taste-based claims. However, this treats two potentially complementary causes as mutually exclusive while our approach allows us to show that there is a negative association with black founders independent of declines in perceived likelihood of success or assumptions about founder competence. In addition, we provide one of the first efforts to use these theories to understand entrepreneurial performance. Specifically, our results provide one of the first tests of the role of unconscious bias in explaining the performance of minority entrepreneurs. This suggests that minority founders may benefit disproportionately from external signals of quality even when their referees do not have specific concerns over their qualifications.

Finally, our findings also offer platform managers and prospective founders three distinct means of reducing bias: (1) by considering founder race in the designation of site-based awards, (2) by providing prospective backers with evidence of prior African American success, and (3) by reducing evidence of founder race by eliminating founder pictures.

Acknowledgments

Both authors contributed equally to the paper. The authors thank department editor Toby Stuart, the associate editor, three anonymous reviewers, Andras Tilcsik, Sameer Srivastava, Dev Jennings, Henrich Greve, Elena Obukhova, Lisa Cohen, Matissa Holister, Chris Rider, and Barry Bayus, as well as audiences at the 2016 Academy of Management Conference and the 2016 West Coast Research Symposium.

Endnotes

[1] We use the terms "African American" and "black" interchangeably.

[2] We restrict our analysis to those projects with Facebook data available for the project's founder because of the importance of controlling for social network size as highlighted in prior work on crowdfunding (Mollick 2014). However, our results are similar if we exclude social network size from the analysis and use the entire sample of projects.

[3] Texas and New York City were the only two places within the United States to record newborn names by race in 1995.

References

Aggarwal VA, Hsu DH (2014) Entrepreneurial exits and innovation. *Management Sci.* 60(4):867–887.

Agrawal A, Catalini C, Goldfarb A (2014) Some simple economics of crowdfunding.*Inform. Policy Econom.* 14(1):63–97.

Agrawal A, Catalini C, Goldfarb A (2015) Are syndicates the killer app of equity crowdfunding? MIT Sloan Research Paper 5126-15, Massachusetts Institute of Technology, Cambridge.

Aigner DJ, Cain GG (1977) Statistical theories of discrimination in labor markets. *Indust. Labor Relations Rev.* 30(2):175–187.

Aldrich H, Waldinger R (1990) Ethnicity and entrepreneurship. *Annual Rev. Sociology* 16(1):111–135.

Arrow KJ (1998) What has economics to say about racial discrimination? *J. Econom. Perspect.* 12(2):91–100.

Ayres I, Siegelman P (1995) Race and gender discrimination in bargaining for a new car. *Amer. Econom. Rev.* 85(3):304–321.

Beaman L, Chattopadhyay R, Duflo E, Pande R, Topalova P (2009) Powerful women: Does exposure reduce bias? *Quart. J. Econom.* 12(4):1497–1540.

Becker G (1957) *The Economics of Discrimination* (University of Chicago Press, Chicago).

Bertrand M, Mullainathan S (2004) Are Emily and Greg more employable than Lakisha and Jamal? A field experiment on labor market discrimination. *Amer. Econom. Rev.* 94(4):991–1013.

Bertrand M, Chugh D, Mullainathan S (2005) Implicit discrimination. *Amer. Econom. Rev.* 95(2):94–98.

Blackwell M, Iacus S, King G, Porro G (2009) CEM: Coarsened exact matching in Stata. *Stata J.* 9(4):524–546.

Blanchflower D, Levine P, Zimmerman D (2003) Discrimination in the small-business credit market. *Rev. Econom. Statist.* 85(4): 930–945.

Burtch G, Ghose A, Wattal S (2015) The hidden cost of accomodating crowdfunder privacy preferences: A randomized field experiment. *Management Sci.* 61(5):949–962.

Castilla E (2008) Gender, race, and meritocracy in organizational careers. *Amer. J. Sociology* 113(6):1479–1526.

Chen XP, Yao X, Kotha S (2009) Entrepreneur passion and preparedness in business plan presentations: A persuasion analysis of venture capitalists' funding decisions. *Acad. Management J.* 52(1):199–214.

Chung CK, Pennebaker JW (2008) Revealing dimensions of thinking in open-ended self-descriptions: An automated meaning extraction method for natural language. *J. Res. Personality* 42(1):96–132.

Doleac JL, Stein LCD (2013) The visible hand: Race and online market outcomes. *Econom. J.* 123(572):F469–F492.
Dovidio JF, Kawakami K, Gaertner SL (2002) Implicit and explicit prejudice and interracial interaction. *J. Personality Soc. Psych.* 82(1):62–68.
Fairlie RW (1999) The absence of the African-American owned business: An analysis of the dynamics of self-employment. *J. Labor Econom.* 17(1):80–108.
Fairlie RW, Robb A (2007) Why are black-owned businesses less successful than white-owned businesses? The role of families, inheritances, and business human capital. *J. Labor Econom.* 25(2):289–323.
Fisher RJ (1993) Social desirability bias and the validity of indirect questioning. *J. Consumer Res.* 20(2):303–315.
Freeland RE, Keister LA (2016) How does race and ethnicity affect persistence in immature ventures? *J. Small Bus. Management* 54(1):210–228.
Fryer RG, Levitt SD (2004) The causes and consequences of distinctively black names. *Quart. J. Econom.* 119(3):767–805.
Gaertner SL, McLaughlin JP (1983) Racial stereotypes: Associations and ascriptions of positive and negative characteristics. *Soc. Psych. Quart.* 46(1):23–30.
Gorbatai AD, Nelson L (2015) Gender and the language of crowdfunding. *Acad. Management Proc.* 2015(1):15785.
Greenberg J, Mollick E (2017) Activist choice homophily and the crowdfunding of female founders. *Admin. Sci. Quart.* 62(2): 341–374.
Greenwald A, McGhee D, Schwarz J (1998) Measuring individual differences in implicit cognition: The implicit association test. *J. Personality Soc. Psych.* 74(6):1464–1480.
Haans RF, Pieters C, He Z-L (2016) Thinking about U: Theorizing and testing U- and inverted U-shaped relationships in strategy research. *Strategic Management J.* 37(7):1177–1195.
Hamermesh D, Biddle J (1994) Beauty and the labor market. *Amer. Econom. Rev.* 84(5):1174–1194.
Heckman JJ (1979) Sample selection bias as a specification error. *Econometrica: J. Econometric Soc.* 153–161.
Heckman JJ (1998) Detecting discrimination. *J. Econom. Perspect.* 12(2):101–116.
Heilman ME (1984) Information as a deterrent against sex discrimination: The effects of applicant sex and information type on preliminary employment decisions. *Organ. Behav. Human Performance* 33(2):174–186.
Heilman ME, Martell RF, Simon MC (1988) The vagaries of sex bias: Conditions regulating the undervaluation, equivaluation, and overvaluation of female job applicants. *Organ. Behav. Human Decision Processes* 41(1):98–110.
Iacus SM, King G, Porro G (2012) Causal inference without balance checking: Coarsened exact matching. *Political Anal.* 20(1):1–24.
Kang SK, DeCelles KA, Tilcsik A, Jun S (2016) Whitened résumés: Race and self-presentation in the labor market. *Admin. Sci. Quart.* 61(3):469–502.
Kickstarter (2016) Stats. Accessed September 1, 2016, https://www.kickstarter.com/help/stats.
List JA (2004) The nature and extent of discrimination in the marketplace: Evidence from the field. *Quart. J. Econom.* 119(1):49–89.
Marom D, Robb A, Sade O (2016) Gender dynamics in crowdfunding (Kickstarter): Evidence on entrepreneurs, investors, deals and taste-based discrimination. Available at http://ssrn.com/abstract=2442954.
Massolution (2015) *2015CF The Crowdfunding Industry Report* (Massolution, Los Angeles).
Minear M, Park DC (2004) A lifespan database of adult facial stimuli. *Behav. Res. Methods, Instruments, Comput.* 36(4):630–633.
Mollick E (2014) The dynamics of crowdfunding: An exploratory study. *Bus. Venturing* 29(1):1–16.
Mollick E, Kuppuswamy V (2014) After the campaign: Outcomes of crowdfunding. UNC Kenan-Flagler Research Paper 2376997, University of North Carolina at Chapel Hill, Chapel Hill.
Mollick E, Kuppuswamy V (2016) Crowdfunding: Evidence on the democratization of startup funding. Harhoff D, Lakhani K, eds. *Revolutionizing Innovation: Users, Communities, and Open Innovation*. (MIT Press, Cambridge, MA).
Mollick E, Nanda R (2016) Wisdom or madness? Comparing crowds with expert evaluation in funding the arts. *Management Sci.* 62(6):1533–1553.
Nunley JM, Owens MF, Howard RS (2011) The effects of information and competition on racial discrimination: Evidence from a field experiment. *J. Econom. Behav. Organ.* 80(3):670–679.
Ohanian R (1990) Construction and validation of a scale to measure celebrity endorsers' perceived expertise, trustworthiness, and attractiveness. *J. Advertising* 19(3):39–52.
Pager D (2007) The use of field experiments for studies of employment discrimination: Contributions, critiques, and directions for the future. *Ann. Amer. Acad. Political Soc. Sci.* 609(1):104–133.
Pager D, Pedulla DS (2015) Race, self-selection, and the job search process. *Amer. J. Sociology* 120(4):1005–1054.
Pager D, Western B, Bonikowski B (2009) Discrimination in a low-wage labor market: A field experiment. *Amer. Sociol. Rev.* 74(5): 777–799.
Pennebaker J, Francis M, Booth R (2001) *Linguistic Inquiry and Word Count* [*Computer Software*] (Erlbaum Publishers, Mahwah, NJ).
Phelps ES (1972) The statistical theory of racism and sexism. *Amer. Econom. Rev.* 62(4):659–661.
Pope DG, Sydnor JR (2011) What's in a picture?: Evidence of discrimination from prosper.com. *J. Human Resources* 46(1):53–92.
Rosenbaum PR, Rubin DB (1983) The central role of the propensity score in observational studies for causal effects. *Biometrika* 70(1):41–55.
Singh J, Agrawal A (2011) Recruiting for ideas: How firms exploit the prior inventions of new hires. *Management Sci.* 57(1):129–150.
Sohl JE (2015) *The Angel Investor Market in* 2014*: A Market Correction in Deal Size* (Center for Venture Research, Durham, NH).
Wooldridge JM (2007) Inverse probability weighted estimation for general missing data problems. *J. Econom.* 141(2):1281–1301.
Younkin P, Kashkooli K (2016) What problems does crowfunding solve? *Calif. Management Rev.* 58(2):20–43.