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Supplementary Materials for

Evidence that investors penalize female founders for lack of industry fit

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Supplementary Text

Below we provide additional sample coding and methodological detail.

Study 1

We captured data for every venture that launched at US-based TechCrunch Disrupt "TCD" competitions, which have taken place across launch locations of San Francisco (launch location = 1) and New York (launch location = 0), from inception in 2010 through the latest launch batch in 2018 at the time of our data retrieval (launch year mean = 2013, SD = 2.35). As each TCD participant and respective venture has a corresponding Crunchbase entry, we were able to obtain individual data points of information from venture and founding CEO Crunchbase profiles. If a venture has raised funding, each round will be listed on the Crunchbase profile, as well as the aggregate funds raised amount or, in certain instances, the label "undisclosed" will appear for the raised amount; 392 ventures had either zero for their funding rounds ($0 raised) or fully-disclosed funding amounts for all rounds.

We were able to verify founder and venture values against LinkedIn profiles, venture websites, company press releases, and TCD videos. For instance, we could confirm founding CEO gender (F = 1) by cross-referencing Crunchbase photo and name data against videos of their TCD launch pitches. We converted founding CEO age information to ordinal values (0, 1, 2) to indicate whether the founding CEO was younger than, roughly equivalent to, or older than the 43.2 average of tech entrepreneurs with high growth new ventures (57). We were also able to capture operating status (binary 0, 1 value of closed *vs.* not closed) of each venture from Crunchbase. We separately obtained serial entrepreneurship and years of experience values but found they were not additive to our interaction models, likely because the models already accounted for other proxies of quality (TCD performance) and experience (age); this is also consistent with past Lack of Fit model research regarding the perpetuation and confirmation of gendered expectations (22-26).

We arrived at our continuous measure of BLS Percentage (mean = 44.32, SD = 17.85) using the "women as percentage of total employed by detailed industry category" obtained from the "2019 annual averages of employed persons by detailed industry, sex, race, and Hispanic or Latino ethnicity" available via the BLS (2). Table 2 shows a significant positive correlation of ln funding with venture quality (binary 0, 1 value indicating whether the venture was a contestant

or a finalist at TCD, consistent with (*16*) findings on influence of status) and with operating status (binary 0, 1 value of closed *vs.* not closed) but a significant negative correlation of ln funding with founding CEO gender (F = 1), as predicted. Notably, founding CEO gender does not have a significant correlation with key covariates such as venture quality, helping to rule out the alternative explanation that female-led ventures receive less funding because they are objectively inferior to male-led ventures.

For additional comparisons, we also converted our continuous BLS Percentage measure of industry gender dominance into female-dominated (56% of higher women employed) versus gender-neutral (45% through 55% women employed) versus male-dominated (44% or lower women employed) industry categories, corresponding to thresholds utilized for robustness tests conducted in recent work on gender-dominated sectors (*48*). Note that a preliminary (pilot) study conducted in advance of Study 1 involving blind coding of the industries as either female- or male-oriented arrived at similar results in terms of both direction of effects and their significance levels. Prior to finalizing our full model with control measures, we performed our main analyses testing for the interaction effect of founding CEO gender and industry gender dominance on logged funding by using alternatives, such as a binary industry gender dominance classification (female-dominated if greater than 50% women employed, male-dominated if less than 50% women employed) and tightened thresholds for gender neutrality (e.g. approximately 48 through 52% women employed), achieving consistent statistically significant regression results.

Although ancillary to the paper's premise, we also performed separate analyses on gender neutral industries (those with 45% through 55% women's employment) to find that differences in logged funding raised by male- and female-led ventures was non-significant ($ln_{funding}$ *diff* = 3.30; *P* = .385). Post-hoc comparisons of male- and female-led ventures indicate the strength of our evidence increases with decreasing degrees of women's industry representation, with disparities widening from female-dominated to gender neutral to male-dominated industries. However, we caution drawing conclusions about neutral industries as the raw funding coefficient between amount raised by male- and female-led ventures indicates a sizable differential, and the sample size (of female-led ventures serving neutral industries) for neutral industry comparisons is not well-powered. See Fig. S1 for relevant comparisons across gender dominant industries.

<u>Study 2</u>

Sample Detail. We relied on simulations instead of benchmarked effect sizes to determine an appropriate sample size for our within-subjects experiment (*65*), counterbalanced to eliminate potential for primacy effects identified in prior work (*21*). First, we constructed a null model with four observations per participant where the dependent variable did not differ among the conditions presented in random order. Next, we adjusted this model so that 80% of participants allocated more funding to both male founding CEOs and to the female founding CEO in the female-dominated industry over the female founding CEO in the male-dominated industry. In other words, the female founding CEO trespassing into the male-dominated industry was allocated the least amount of funding by 4 out of 5 participants in this hypothesized model. Next, we inputted an effect size parameter of 15% less funding for the female founding CEO in the male-dominated industry compared to her female founding CEO counterpart in the female-dominated industry. We then ran the hypothesized model with these simulated parameters 1,000 times with increasing (by 5 participants) sample sizes, allowing the order and exact funding amounts to randomly vary around the constraint described above.

These simulations crossed our threshold for a 90% probability of correctly identifying the parameter effect of founding CEO gender in an industry marked by lack of fit at 125 participants. Available funding allowed us to be more conservative and recruit a panel of 130 participants. The sample mean age was 51.63 years, SD = 16.21; 67.7% male, 86.2% identifying as White, 100% had a bachelors or graduate degree, 50% had 10 or more years of investing experience, 95% invested in seed, Series A and B (*vs.* pre-seed) stages, and 79% participated in angel, crowdfunding, and venture funding (*vs.* pure friends-and-family) rounds. Participants reported investing in a wide range of industries. Table 4 indicates that ln funding and ln valuation are significantly correlated with each other and with perceived fit, as hypothesized. We performed a series of supplemental analyses that ruled out the effect of investor gender on our funding and valuation outcome measures, confirming female investors behave similarly to male ones, and that also dismissed the influence of industry homophily based on investor industry experience.

Method Detail. Participating investors received the following introductory remarks and specific instructions before being presented each venture. They were then asked to provide 7-point rating scale measures and funding allocations for each venture out of a constant sum of

$400,00; see recent research for procedural precedent (*31*). We also captured uncapped responses to the question, "At what valuation would you invest in each of these ventures? Please place a USD ($) valuation on each venture by using the open field below." Throughout the survey, we reinforced the connection to female *vs.* male founding CEO and to female- *vs.* male-dominated industry by repeating the name and industry served (e.g. "How much funding would you allocate to [Kristen's human resources] technology venture?"). Note that we deployed survey best practices to ensure response quality, including speeding, amount verification, open-ended and other quality checks. See introductory remarks and procedural details below:

    Introduction. "In this study, you will have the chance to review Crunchbase profiles containing limited information about 4 ventures, including a brief description of the company and its founder, as well as key performance indicators. After doing so, you will be asked to allocate a fictional quantity of funds to each venture (out of a total $400,000) as you see fit, then provide a bit of background information about yourself. As an attention check, you will have to make sure that your responses add up to $400,000 across the 4 ventures. We will also conduct a speed check to ensure you are not just quickly allocating the exact same amount of $100,000 to every venture without considering each one."

    Instructions. Read the following situation and answer the questions based on the Crunchbase venture profiles to follow! Note that there is no "Back" button, so you can't go back, but you will have the chance to double-check your funding allocations for each venture at the end. You may want to jot down notes for each venture so you have them handy as a reference point at the end. Make your decisions based on the instructions below, not your personal preferences.

> *The venture fund you work for has pre-vetted 4 ventures and determined each one meets the fund's investing criteria in terms of industry, geography and stage of development (this means you do not need to apply outside knowledge or personal preferences to the exercise). You now have the opportunity to review each venture's description and key performance indicators, as well as information about the venture's founding CEO. After reviewing each venture, you will provide your thoughts on each investment opportunity. You will also be given the opportunity to allocate a fictitious sum of $400,000 (IN TOTAL, across ALL 4 of these investment opportunities) as you see fit.*

Rating Scale Measures. Please indicate the extent to which [Founding CEO Name]'s [name of industry] tech venture conveys the following to you (7-point rating scale from 1 = Extremely Low to 7 = Extremely High). A sense of:

1. Venture quality
2. Trust in the CEO's ability to execute
3. Fit between the CEO & the venture

Manipulations. See Fig. S2 for details on the Crunchbase profile manipulations that generated the experimental conditions: male founding CEO-male-dominated industry; male founding CEO-female-dominated industry; female founding CEO-male-dominated industry; female founding CEO-female-dominated industry. We patterned each fictitious venture profile after actual ventures in Study 1's sample. These were ventures that a) were all designated as finalists in the TCD competition and b) all raised hundreds of millions of dollars in funding, representing the top 3% of the sample. The male- *vs.* female-dominated industries they targeted were comparable in terms of having 30-40 *vs.* 70-80 percent employment of women. For the venture monikers, we created 1-word names reflective of each venture that were standardized in terms of letter length; for the founding CEO names, we created 2-syllable first names using the most identifiable tier of male *vs.* female names in comparable socioeconomic and racial categories (*58*). Each profile included varied yet comparable depictions of founding year, headquarters location, number of employees, funding stage, year-over-year growth, as well as quality and status via indications of performance at various TCD competitions.

The Crunchbase profiles included 3-line descriptions of financial advisory, family healthcare, automotive sharing, and employee benefits platforms, complete with comparable references to technology, to enabling everyday usage, and to successfully meeting user needs. The 3 lines of Founder information included reinforcements of founding CEO role and name, references to successful serial entrepreneurship, years of industry experience, passion and personal pain point for the offering, and relevant industry certifications. As a testament to their comparability, we observed non-significant rating scale response comparison results for standalone venture quality and for standalone trust in each CEO type. See Fig. S3 for both ln funding and ln valuation as outcomes.

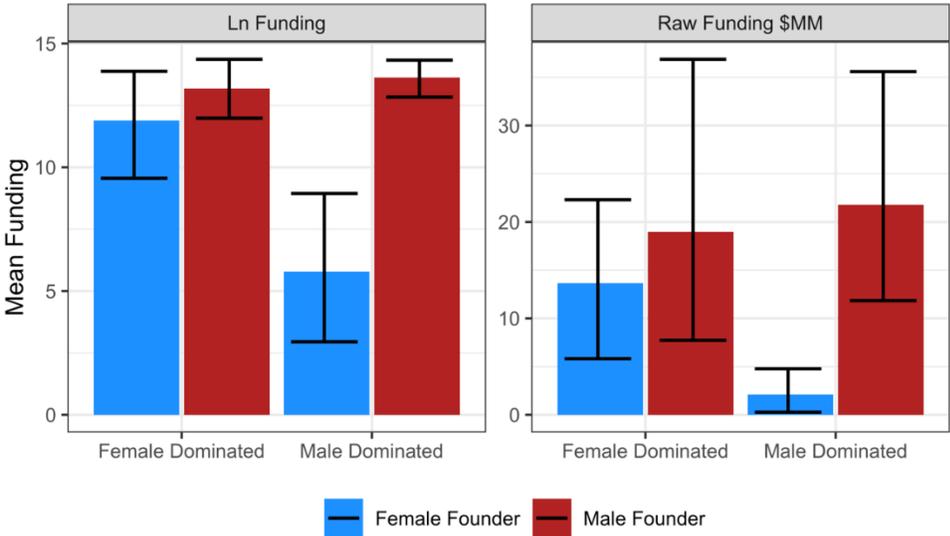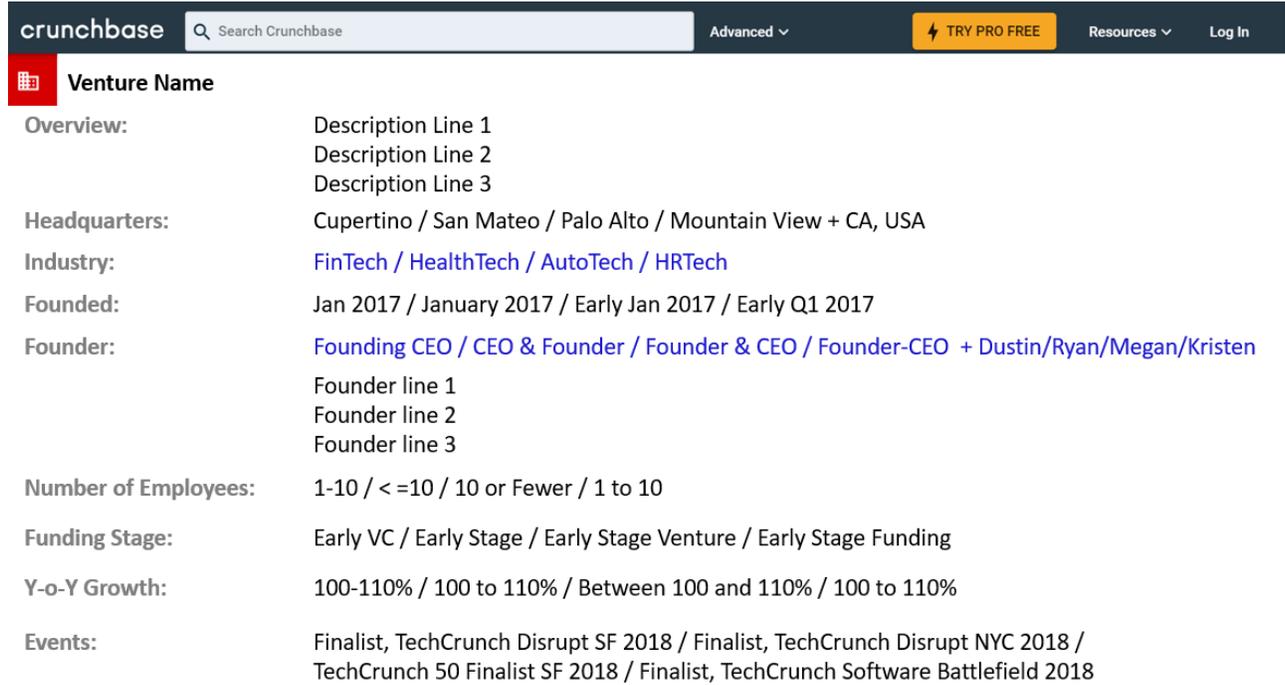**Fig. S1.** Study 1 Female Founder Disadvantage Due to Lack of Fit

Fig. S2. Study 2 Crunchbase Profile Manipulations for 4 Conditions

crunchbase	Q Search Crunchbase		Advanced ⌄	⚡ TRY PRO FREE	Resources ⌄	Log In

▦ Venture Name

Overview:	Description Line 1 Description Line 2 Description Line 3
Headquarters:	Cupertino / San Mateo / Palo Alto / Mountain View + CA, USA
Industry:	FinTech / HealthTech / AutoTech / HRTech
Founded:	Jan 2017 / January 2017 / Early Jan 2017 / Early Q1 2017
Founder:	Founding CEO / CEO & Founder / Founder & CEO / Founder-CEO + Dustin/Ryan/Megan/Kristen
	Founder line 1 Founder line 2 Founder line 3
Number of Employees:	1-10 / < =10 / 10 or Fewer / 1 to 10
Funding Stage:	Early VC / Early Stage / Early Stage Venture / Early Stage Funding
Y-o-Y Growth:	100-110% / 100 to 110% / Between 100 and 110% / 100 to 110%
Events:	Finalist, TechCrunch Disrupt SF 2018 / Finalist, TechCrunch Disrupt NYC 2018 / TechCrunch 50 Finalist SF 2018 / Finalist, TechCrunch Software Battlefield 2018

Fig. S3. Study 2 Female Founder Disadvantage Due to Lack of Fit
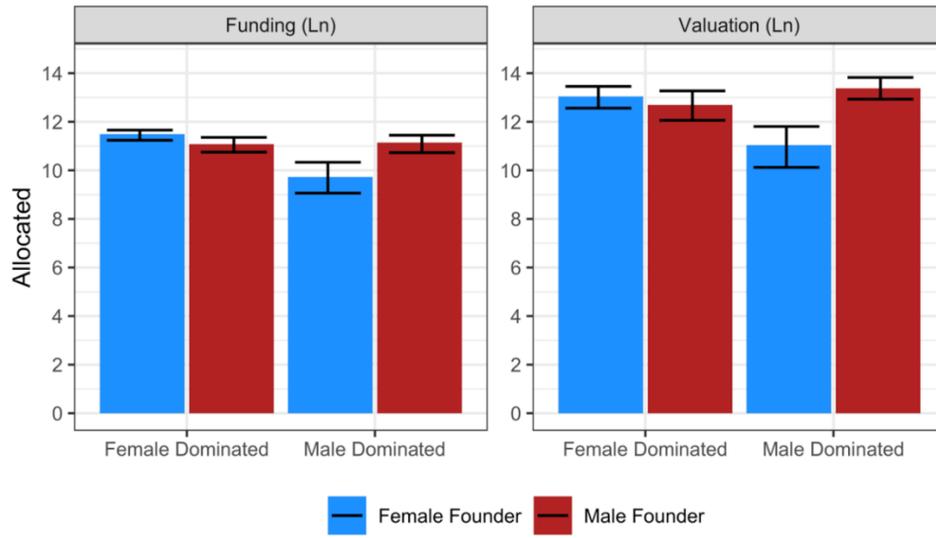
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