Confidence Spillovers in Competitive Environments: Evidence from Entrepreneurship

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Abstract

Interactions with confident individuals encourage entry into competitive environments. In our experimental setting, randomized connections with managers with high entrepreneurial confidence, but no prior experience, increase the likelihood young managers also become entrepreneurs. We find the effect is driven by less confident individuals, including women, starting businesses. Through multiple surveys, we confirm treated managers become more confident in their entrepreneurial abilities. We also reject alternative explanations including increased entrepreneurial knowledge and decreased risk aversion. Consistent with the hypothesis that less confident but capable individuals become entrepreneurs, we find no evidence firms started by treated managers perform worse than other firms. Through our analysis of confidence spillovers, we offer the first experimental evidence that peers increase entrepreneurship and provide a novel channel linking these effects through gains to confidence.

JEL Classification: L26, D81, D84, D91, C92

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1 Introduction

Entrepreneurship is characterized by highly-skewed and low average returns (Hamilton, 2000; Moskowitz and Vissing-Jørgensen, 2002; Shane, 2008).[1] These features have become only more relevant in recent years as product market competition increased, prompting the emergence of superstar firms and winner-take-all (David et al., 2017). In this competitive landscape, individuals who are less confident are likely to shy away from entrepreneurship despite their high ability (Camerer and Lovallo, 1999; Holm et al., 2013; Koellinger et al., 2007), potentially resulting in an unrepresentative selection of entrepreneurs and loss of innovation. This hypothesis prevails in a range of other economic settings: for example, women are significantly less likely to enter competitive environments and careers despite equal ability (Gneezy et al., 2003; Niederle and Vesterlund, 2007), and these differences explain the underrepresentation of women across fields and leadership positions (Buser et al., 2014; Flory et al., 2014; Kanthak and Woon, 2015). It is therefore critical to understand how agents form their self-confidence, and whether updates to these beliefs can impact real economic consequences.

This paper examines whether interacting with a confident agent promotes entry into entrepreneurship. While prior work has suggested that preferences for competition are heavily influenced by societal factors (Andersen et al., 2013; Gneezy et al., 2009), we instead test whether simple policies can be implemented to override these factors and encourage less confident agents towards competitive environments. In our particular setting, policies that promote interaction within narrow contexts may lead to a spillover of confidence, leading to higher rates of quality entrepreneurship without a corresponding reallocation of training or resources. To date, the limited direct evidence suggests interaction with more confident individuals may actually be harmful (Brown, 2011) as it negatively impacts self-perception and exacerbates aversion to competition (Fischer, 2017).[2] Whether confidence has spillover effects and encourages entry into competitive environments is then an empirical question.

Under an experimental setting that randomizes the social networks of young managers, we demonstrate interaction with a confident peer influences (i) how managers view their own entrepreneurial po-

[1] For instance, Shane (2008) estimates over fifty percent of new firms fail within five years, while 0.03 percent achieved more than $100 million in sales.

[2] Brown (2011) provides empirical evidence for this theoretical prediction by showing that the presence of a superstar in a PGA golf tournament is associated with lower performance by the other competitors.

tential and (ii) increases the rate of entrepreneurship. Our key insight is to identify peers confident in their entrepreneurial abilities despite no prior experience: through this distinction we are able to disentangle a confidence spillover from a more traditional spillover of knowledge or resources. Our analysis requires causal identification of confidence spillover effects, detailed employment data including firm starts, and measures of an individual's experiences or views on entrepreneurship both before and after the forced interaction. To meet the first criteria we study students enrolled in the Master of Business Administration (MBA) program at Indiana University (IU).[3] At IU, every entering MBA student is randomly assigned to a cohort and a team in their first year in the program.[4] Students in the same cohort take the core MBA classes together, while students in the same team are assigned to work together on course projects and a large case study at the end of the first semester. Given that students do not choose these groups, some students will be more exposed to a particular set of students for reasons exogenous to their ability, effort, or interests.

To analyze each individual's career path before and after peer involvement with their peers, we obtain detailed individual-level employment records from a large online business networking service. From this online platform, we observe employment history (job title, location, start and end dates, firm name) and education (undergraduate institution, MBA major, graduation year). We also collect information on the employment and survival of each new firm. We then merge this data with the information about cohort and team assignments, and admissions information obtained from the MBA office at Indiana University. Finally, we use the online networking service to collect detailed employment information for each firm created by an individual in the sample.

To identify students confident in their entrepreneurial abilities, we incorporate admissions data detailing the intended major of the student prior to entering the MBA program. According to the sample, 35 percent intend to complete a major (either first or second) in entrepreneurship. We verify these students are significantly more likely to start a new firm following graduation. In addition, we survey incoming current students and confirm that students intending to major in entrepreneurship express high confidence about their entrepreneurial abilities (according to three separate measures) even after controlling

[3] Ahern et al. (2014); Lerner and Malmendier (2013); Shue (2013) also explore a related setting. We differ from this past literature by precisely identifying peer interaction within groups of four individuals.

[4] A cohort has an average of approximately sixty students, while a team has four students on average. Depending on the year, an MBA class at IU has approximately 180 students.

for other observable characteristics. In comparison, we find no evidence that individuals who want to major in entrepreneurship are less risk/ambiguity averse than the rest of the population, limiting the role of risk preferences in our setting.[5] We then aggregate the number of confident peers within teams and cohorts.

We estimate having one cohort member with high entrepreneurial confidence (but without prior entrepreneurial experiences) increases the rate of entry into entrepreneurship by 0.4 percentage points within three years after graduation. Given the rate of firm creation during the three years following MBA graduation (3.4 percentage points), peers increase firm creation by roughly 12 percent relative to the mean. In contrast, we estimate that interaction with a cohort member experienced in entrepreneurship actually decreases the rate of entrepreneurship by 0.6 percentage points, confirming the findings of Lerner and Malmendier (2013).[6] By controlling for the intended major of each student, we can confirm students are modifying their future career plans in response to peer interaction. Given that each cohort has approximately sixty students, we hypothesize the effects will be larger if students were to interact in smaller groups. Since IU also forces students to interact in small teams of approximately four students, we can test this prediction. We show that a confident team member increases the overall rate of entering entrepreneurship by 1.2 percentage points; that is, when interactions are tighter, treatment increases firm creation by roughly 35 percent relative to the mean.

We next assess the economic implications of peer influence on entrepreneurship. First, we evaluate the long-term effects by extending the time period for each student to start a new firm. We find the differences between the treated and untreated students remain five years following graduation, suggesting that peers cause the creation of firms that would otherwise not exist in the economy. Second, we measure entrepreneurial success by firm survival (lasting at least five years) and size (hiring at least ten employees), and confirm that student interactions impact the rate of successful firm creation. Third, entrepreneurs in our sample are more successful than the average entrepreneur in the economy. For example, by matching up the new firms in the sample to online information on funding sources, we estimate two percent of the

[5] In this way, our results find further support for Holm et al. (2013); Koudstaal et al. (2015) who find no evidence that entrepreneurs are more risk averse than the rest of the population.

[6] To classify students that previously started a new business we incorporate resumé and firm information from the online networking service. We estimate that 3.4 percent of the students in our sample had an unsuccessful entrepreneurial experience before the MBA.

firms created by IU-MBA graduates experience a successful exit by either being acquired or successfully completing an IPO. In addition, four percent of the firms receive venture capital funding, a rate six times higher than the average new firm in the economy (Robb and Robinson, 2012). Our results highlight the economic significance on entrepreneurship after interaction with a confident peer.

To confirm the spillover effect corresponds to increased entrepreneurial confidence, we directly survey individuals in the population under three methods. Out of these three methodologies, two establish a causal relationship between interacting with a confident peer and increased entrepreneurial confidence. First, we survey all graduates in the sample, asking how they rate their entrepreneurial abilities relative to other Kelley MBA alumni. We examine whether alumni interacting with peers intending to major in entrepreneurship (defined at both the cohort and team-level) report higher rates of relative confidence. In addition to our standard controls, we also condition on (i) whether the student ultimately graduated with an entrepreneurship major and (ii) whether the student founded a firm following graduation. Across all specifications we confirm an increase in relative confidence among the treated population years after the original treatment.

Second, we survey current MBA at IU students before and after treatment. Focusing on current students offers fourth benefits. First, we are able to test for a change in confidence. Second, we can reject the argument that work experience or coursework is impacting our results as these students are still in the first year and have all taken the same classes. Third, we can minimize the time between treatment and survey. Fourth, based on the survey responses prior to treatment, we are able to develop multiple measures of ex-ante confidence. Our findings confirm that treatment leads to an increase in relative entrepreneural confidence. In addition, we also verify that exposure to a student reporting high initial confidence in entrepreneurship (rather than intending to major) leads to increased confidence.

Third, we contact the treated individuals in our sample (those with a team member intending to major in entrepreneurship) and establish three key findings. According to the responses, 22 percent of individuals report the team member increased their likelihood of start a firm, while no individuals reported a decrease in likelihood. In addition, among impacted individuals, 46 percent report a change in views towards entrepreneurship, compared to 8 percent reporting an increase in knowledge (and 46 percent report both channels). Most significant for our study, the majority of individuals report their changing

views are related to increased entrepreneurial confidence rather than (i) increased willingness to accept risk, (ii) increased expectations of the financial benefits, (iii) altered preferences regarding non-financial benefits, or (v) other changes. The results help establish a direct connection between peer influence and increased entrepreneurial confidence.

We offer two tests to confirm the results are driven by less confident individuals gaining confidence. First, under our direct test, we find treated students already intending to major in entrepreneurship are no more likely to start a firm than the corresponding control group. In contrast, low confident students interacting with confident peers at either the cohort or team level are substantially more likely to enter entrepreneurship. Second, we evaluate whether peer influence affects disproportionally females rather than males.[7] We first confirm that women are (i) less likely to major in entrepreneurship and (ii) less likely to enter entrepreneurship even after controlling for intended major, which is consistent with past literature (Gneezy et al., 2003; Niederle and Vesterlund, 2007). In addition, we analyze our earlier surveys and confirm female MBA students and alumni are significantly less confident in their entrepreneurial abilities compared to males. Finally, we estimate larger peer effects for women, suggesting that forced interaction high confidence individuals is especially valuable for those who have low confidence.

Lastly, we assess whether increased confidence affects the quality of entrepreneurship. On the one hand, The interaction with highly confident peers may lead treated individuals to become overconfident and create lower-quality firms. On the other hand, if confident peers help low confident peers become more calibrated, individuals who report low confidence will create high-quality firms. Our results show that firms founded by treated individuals are no worse than those created by control individuals (as measured by survival rates and employment size), suggesting highly confident peers help low confident individuals become less biased. Our results offer novel evidence that altering entrepreneurial confidence early in the career will indirectly impact the proportion of successful entrepreneurs.

[7] Assuming students endogenously sort into groups based on similar characteristics (i.e., male students interacting with other male students), the gender gap may be driven by peer effects as female workers will have less interaction with past or future entrepreneurs.

2 Literature Review

Our paper contributes to two separate literatures: (i) the behavioral traits of entrepreneurs and (ii) the role of social influence on entry to entrepreneurship. To begin, past research has analyzed whether entrepreneurs have unique behavioral traits from the rest of the population including optimism about the future (Puri and Robinson, 2007), risk aversion (Parker, 2009), ambiguity aversion (Knight, 1921), preferences for independence (Cooper and Saral, 2013), or preferences for variety (Åstebro and Thompson, 2011). Closest to our own research are papers analyzing whether entrepreneurs are overconfident in their abilities (Åstebro et al., 2007; Holm et al., 2013). We make two contributions to this literature. First, we offer novel evidence that entrepreneurial confidence is not a fixed trait, but instead impacted by peer networks.[8] Second, any behavioral differences between entrepreneurs and non-entrepreneurs may be driven by the fact that entrepreneurs have unique career experiences from the rest of the population. By observing the future entrepreneurial plans of skilled workers (rather than past experiences), we can measure differences in these individuals prior to starting a firm. According to our findings, workers intending to start a firm are more confident in their entrepreneurial abilities; however, we find limited evidence of greater optimism, lower risk or ambiguity aversion, or stronger preferences for variety or independence. Therefore our results highlight the primary role of confidence in explaining entry to entrepreneurship.

Next, we add to the literature documenting peer influence on entrepreneurship rates (Giannetti and Simonov, 2009; Kacperczyk, 2013; Lerner and Malmendier, 2013; Markussen and Røed, 2017; Nanda and Sorensen, 2010). Especially close to our experimental setting is Lerner and Malmendier (2013), who find that peers with prior entrepreneurial experience decrease the rate of firm creation by offering advice on entrepreneurial ideas; to our knowledge, this result is unique as other past research documents peer influence increases entrepreneurship. Our key insight is that while the prior literature has exclusively focused on peers with prior experience in entrepreneurship, we can separately identify peers confident in their abilities despite holding no prior experience. As a result, we make three primary contributions to this literature. We are the first to confirm peers can causally increase the rate of entrepreneurship in an experimental setting. In addition, we isolate a unique channel relating peers to firm creation, increased

[8] In this way, we build on a recent literature demonstrating risk preferences vary across time (Cohn et al., 2015; Guiso et al., 2018).

confidence in entrepreneurial abilities. And lastly, we reconcile the past literature by demonstrating the dual existence of negative and positive peer effects.

3 Data

This paper relies on the random assignment of MBA students, data on new firm creation and success, and information on each student's intended major. We first introduce our experimental setting by closely following Hacamo and Kleiner (2017), then summarize the datasets, and finally confirm students intending to major in entrepreneurship are more confident than the rest of the population.

3.1 Data Sources

Kelley School of Business MBA Program. Upon entry to the Full-Time MBA program, students are assigned to a cohort of roughly sixty students and take first semester courses together; each graduating class is composed of three or four cohorts in total. Students are also assigned to a team of four students and members must complete multiple case competitions and group homework assignments together. Assignment to a cohort and team is based on maximizing diversity within groups and is similar to methods in other MBA programs (Ahern et al., 2014; Shue, 2013). For students graduating in 2003-2010, assignment was based across five characteristics: gender, race (for domestic students), citizenship (classified as US or International), GMAT scores (grouped in quartiles), and undergraduate major (business, STEM disciplines, and all other majors). Starting with the class of 2011, the MBA office added Keirsey Personality Type as a sixth characteristic. While the system is electronic, staff members are also allowed to make manual corrections to achieve balance. Important to our study, students are not sorted based on their intended MBA major or future employment goals. This is a particular benefit of the data, as randomizing based on majors or employment goals will generate little variation across teams and cohorts (Chetty et al., 2011).

Student Admissions and Transcript Data. We collect additional information about students from applications and Indiana University transcripts. Application information includes personal characteristics (citizenship, gender, ethnicity, etc.), GMAT scores, and intended MBA major. We create seven fixed effects

for nationality: US, India, China, South Korea, Japan, Taiwan, and Other, as all other nations compose less than one percent of the sample. Race is included only for domestic managers and is defined as: Asian, Black, Hispanic, White, and Other. Other includes multi-racial, Native American, and Pacific Islander, which each comprise less than one percent of the sample. We split GMAT scores into quartiles and create a fixed effect for each subset. Finally, we distinguish between three undergraduate majors: STEM, Business/Economics, and Other and create three separate fixed effects.

Online Business Networking Service Data. To observe career outcomes over several years we match each student to his or her corresponding profile from a large online social network. The profiles include self-reported data on both employment and education. All data is publicly available and obtained through web searches and then parsed into a panel dataset.[9] From this data we identify students starting new firms. We define firm creation using the following criteria. First, we include individuals that classify their job title as 'founder' of a firm. Second, we include in our list of entrepreneurs any 'chief executive officer', 'chief financial officer', or 'owner' that joined their firms the same year of founding. Each firm's startup year is either directly observed in the firm's profile on the business networking website, or estimated using the earliest date any employee joined the firm (as observed on the website). Finally, we include individuals with job titles like 'self-employed' and 'entrepreneur' and job titles that contain the phrase 'independent'. We impose additional restrictions on these criteria. In particular, if the firm already has employees prior to a person joining, we require that person be explicitly classified as an owner or founder in order to count him/her as an entrepreneur.

Data Cleaning. To match each student in the sample to his or her online profile, we find all online profiles that state the individual attended the Indiana University MBA program. We then manually match profiles based on first and last name and year of graduation (when available on the profile). We drop any graduates without online profiles as well as cases where the profiles list incorrect graduation years. Finally, we confirm that the undergraduate college/university from the admissions data matches the listed undergraduate college/university according to the online profile. In total, we are able to match nearly 95% of MBA graduates to their online profiles.

[9] For a more detailed description of the data, we refer readers to Hacamo and Kleiner (2016).

3.2 Data Summary

Student Demographics. We first summarize firm creation across the sample in four separate figures. We include only students without prior experience in entrepreneurship in our sample. Figure 1 plots the rate of entrepreneurship by the year of graduation among all students in the MBA program. We require the students to start the firm within the first three years of graduation as the most recent class graduated in 2013. Rates of new firm creation are lowest among the class of 2004 and highest among the class of 2010. From the time-series, we identify a counter-cyclical pattern of firm creation.

We next measure entrepreneurship rates across subsets of the sample. First, Figure 2 distinguishes students with (i) no intention to major in entrepreneurship, and (ii) intending to either first or second major in entrepreneurship. We find students intending to major in entrepreneurship are nearly twice as likely to start a firm within five years of graduation. Second, Figure 3 splits the sample into students that (i) graduated the MBA with a major in entrepreneurship and (ii) those that majored in other fields. We find entrepreneurship majors are four times as likely to start a firm within five years of graduation. Third, Figure 4 distinguishes students (i) entering a start-up firm upon graduation, and (ii) those entering alternative employment. We find students entering a start-up are seventy-five percent more likely to start a firm within five years of graduation relative to the rest of the population.

We summarize the rates of entrepreneurship in Panel A of Table 1. Our sample initially includes all MBA students graduating between 2003 and 2013. The sample initially includes 2,189 students. Excluding students with prior experience as an entrepreneur, we reduce the sample to a final 2,102 students. Among the students in our final sample, 1.2% of students found a new firm directly after graduation and 1.8% within a year of graduation. After three (five) years of graduation, rates of new firm creation increase to 3.4% (4.3%). Last, we define a small firm as any firm employing at most ten employees and define a young firm as any firm that started after the student graduated from the MBA. We define a start-up as any firm classified as either young or small. We find that sixteen percent of the sample joins (rather than starts) a start-up firm within the three years following graduation.

According to the data, fourteen percent of students intended to first major in entrepreneurship, while another eighteen percent intended to second major in entrepreneurship. According to the online networking service only four percent of students actually graduate with a first major in entrepreneurship.

Turning to the team and cohort results, each team has an average of four students, while each cohort has an average of sixty-two students. First, the average team includes 0.1 students with prior experience in entrepreneurship, compared to the 2.1 students in the average cohort. Second, the average team includes 0.5 students intending to first major in entrepreneurship, compared to 10.5 students in the average cohort. Third, the average team includes 0.6 students intending to second major in entrepreneurship, compared to twelve students in the average cohort.

New Firm Demographics. We summarize data on the new firm demographics in Figures 5 and 6. First, we estimate that over 90% of firms survive over one year, 70% survive three years, and over 40% survive for five years following creation. Second, to measure employment, we use the networking website to find all users who report that they are working (or have worked) for the new firms created by our entrepreneurs. Within our sample, over 90% hire an employee (other than the founder), 50% hire five employees, and over 40% hire at least ten employees during the life of the firm.

In addition, we note a small proportion of these firms are particularly successful. We attempt to match each firm in our sample to information on financing sources from an entrepreneurial networking website. According to the data, two percent of the firms created by IU-MBA graduates experience a successful exit by either being acquired or successfully completing an IPO; in addition, four percent of the firms received VC funding.

Finally, in unreported results, we also match each new firm to a two-digit NAICS code. New firms predominantly arise in the industries: Professional, Scientific, and Technical Services (23%), Information (17%), Health Care (14%), Finance and Insurance (12%), Retail Trade (7%), Administrative (7%), and Educational Services (7%).

4 Methodology

4.1 Empirical Specification

We begin this section by developing the concept of confidence spillovers. The concept of an information spillover is already well established in the economics literature: networks facilitate the transfer of information when frictions are present that limit acquisition. We define a confidence spillover as a par-

ticular form of information spillovers where an agent updates their perceived place in the distribution of talent after interacting within a network. Following the entrepreneurship literature (Knight, 1921), we assume individuals know the distribution of entrepreneurial wages for all workers, yet cannot fully observe their relative place in the distribution. In this environment, individuals may then update expectations of their relative ability following social interactions when peers are not representative of the population. For instance, peers demonstrating high rates of confidence (despite limited evidence of ability) will lead individuals to increase their own expectations. In contrast, individuals with less interaction to confident peers may assume potential entrepreneurs hold skillsets and knowledge unique from the rest of the population. In this way, social interactions impact how an individual forms their relative confidence, ultimately affecting the likelihood of entrepreneurial entry.

Analyzing this hypothesis is complicated by two primary obstacles. First, social networks may influence the rate of entrepreneurship through access to information about the entrepreneurial process without altering confidence (Gompers et al., 2005). For instance, individuals with past entrepreneurial experience may discourage others from pursuing poor entrepreneurial endeavors (Lerner and Malmendier, 2013). To separately identify a change in confidence from access to entrepreneurial knowledge, we distinguish between (i) peers interested in starting a firm in the future but without prior entrepreneurial experience and (ii) peers with prior experience in entrepreneurship. We argue that while groups may impact entrepreneurial confidence, only the latter holds detailed knowledge about the entrepreneurial process. We offer a range of subsequent analysis that supports this argument in the section 5.

Second, to identify whether confident peers have a causal effect on the decision to start a firm, we must address the endogeneity concerns associated with peer effects (Hellerstein et al., 2015; Manski, 1993). To test whether confidence is shaped your place within a peer group rather than the full population, we require peers to be randomly assigned; otherwise, individuals may sort into groups based on their abilities and confidence. Therefore, we exploit the forced assignment of incoming students into cohorts and teams at Indiana University. Students in the same cohort take the core MBA classes together, while students in the same team are assigned to work together on course projects and a large case study at the end of the semester. Specifically, we follow the standard approach in the literature and estimate peer effects from these cohorts and teams through a linear-in-means regression framework (Graham, 2008;

Manski, 1993):

$$\begin{aligned} Entrepreneur_i &= \alpha + \beta \times Treatment_i + \gamma \times Experienced\ Peer_i \\ &+ \rho \times Intended\ Entrepreneur_i + Controls_i + YearFE_i + \varepsilon_i \end{aligned} \tag{1}$$

where $Entrepreneur_i$ is a binary variable that takes a value of one when individual i starts a new firm following MBA graduation. While the results primarily focus on firm creation within three years of graduation, we also vary the time frame from one to five years after graduation. Our primary independent variable of interest is $Treatment_i$, a discrete variable denoting the number of cohort (or team) members of student i that intend to major in entrepreneurship and have no prior entrepreneurial experience. We test the hypothesis that $\beta > 0$, which implies that individuals intending to major in entrepreneurship increase their peers' likelihood of firm creation.

To distinguish a behavioral effect from a transfer of entrepreneurial knowledge we follow the past literature and control for $Experienced\ Peer_i$: a discrete variable denoting the number of cohort (team) members of student i that created a failed firm prior to entering the MBA program. Based on Lerner and Malmendier (2013) we expect $\gamma < 0$, which implies that individuals with prior unsuccessful entrepreneurship experience decrease the likelihood of entrepreneurship of her peers. In addition, to explicitly identify a change in career plans, we control for whether the student intends to major in entrepreneurship. Specifically, we include the variable $Intended\ Entrepreneur_i$, which takes a value of one if student i intends to either first of second major in entrepreneurship according to her MBA application.

We also include a year of graduation fixed effect since students are only randomly assigned within the same graduating class. We also include several other controls in the analysis to account for individual characteristics used by the MBA office in the assignment to teams and cohorts, namely: gender, citizenship, race, GMAT, and undergraduate major fixed effects. Finally, all errors are clustered at the cohort (team) level.

4.2 The Traits of Entrepreneur Majors

Entrepreneurial Confidence. We frame our paper on evaluating entrepreneurial confidence; however, focusing on confidence is traditionally challenging for two reasons. First, confidence is generally difficult

to directly observe. Second, past students with high entrepreneurial confidence are also more likely to gain entrepreneurial experience following graduation; differences between these groups may therefore be driven by later career experiences rather than initial beliefs. To overcome both concerns, we consider a proxy for entrepreneurial confidence: whether the individual intended to major in entrepreneurship at the time of MBA application.[10] Focusing on intended entrepreneurship majors is valuable as (i) we are able to observe this measure for the entire sample of students and (ii) we observe the measure prior to student interaction and prior to post-MBA employment experiences.

Given our primary interest in examining entrepreneurial confidence, it is necessary to confirm that students intending to major in entrepreneurship are significantly more confident compared to their classmates. Unfortunately, we cannot observe the entrepreneurial confidence of students prior to interaction as our data follows students in the MBA classes of 2003-2013. Instead, we survey incoming Indiana University MBA students from the classe of 2021 in the summer of 2019.[11] We summarize the class of 2021 in Panel B of 1. We estimate 24% of the students intend to first or second major in entrepreneurship; as a result, students have 15 peers in their cohort planning to major in entrepreneurship and 1.3 peers in their team. After reaching out to all 137 MBA students in the class of 2021, we received a total of 125 responses, a response rate of 91%. Within each survey we ask three questions to measure entrepreneurial confidence:

Q1: Do you believe you would be worse, equal, or better at starting a company relative to the other MBA students at Kelley?

Q2: How confident are you in your ability to start a company?

Q3: Among past IU graduates that started a firm, only 5-10% employ ten or more workers within the first year. What is the likelihood you personally start a firm that employs ten or more workers within the first year?

[10] For a more detailed discussion of the relationship, we refer the readers to the appendix.

[11] The downside of analyzing survey responses from the classes of 2021 is that these students may differ from students in the classes of 2003-2013 that are the focus of our primary analysis. Therefore, we also conduct a similar survey of the classes of 2003-2013 and confirm students that intended to major in entrepreneurship at the time of the MBA application remain more confident in their entrepreneurial abilities compared to other students. We refer interested readers to section 5 for the full details of this analysis.

The first question (Q1) is our primary focus as it measures a individual's *relative confidence* compared to other individuals in the same MBA class. We offer five multiple choice options: (i) Bottom 10% of students, (ii) Better than 10% of students, (iii) Better than 30% of students, (iv) Better than 50% of students, and (v) Better than 70% of students. We expect both confident individuals as well as those aware of their high entrepreneurial ability are likely to score higher in this question.

In addition to the first question, we also provide two alternate measures of confidence. The second question (Q2) develops a measure of *absolute confidence* on entrepreneurial ability as we do not incite a comparison with others nor provide a benchmark. As in (Q1), we expect students who are either overconfident or aware of their high entrepreneurial ability to rank higher on this measure. We offer five potential answers, (i) Not Confident, (ii) Not Very Confident, (iii) Somewhat Confident, (iv) Confident, and (v) Very Confident. The third question (Q3) measures whether students are confident in their abilities to start highly successful firms, and aims to separate *overconfident* individuals. We offer eight potential answers: (i) 0-1%, (ii) 1-2%, (iii) 2-5%, (iv) 5-10%, (v) 10-15%, (vi) 15-20%, (vii) 20-30%, (viii) 30-50%, and (ix) above 50%. We conjecture that students who respond above 10-15% are overconfident on their entrepreneurial ability. Our underlying assumption is that those who believe that their likelihood of starting a highly successful firm is well above the best entrepreneurs who attend the IU MBA are overconfident.

We present the first question (Q1) responses for both intended entrepreneurs and other students in Figure 7. As mentioned above, students are offered five multiple choice options: (i) Bottom 10% of students, (ii) Better than 10% of students, (iii) Better than 30% of students, (iv) Better than 50% of students, and (v) Better than 70% of students. Assuming students are fully aware of their own entrepreneurial abilities, we should observe that roughly half the sample replies above the median. However, in contrast, we observe that 70% of respondents place themselves above the median. We find this result is greater among students intending to major in entrepreneurship (87% respond at or above the median); however, 64% of students not intending to major in entrepreneurship still respond above the median. In addition, we find students intending to major in entrepreneurship are twice as likely to place themselves in the top 30% of the distribution as the rest of the student population. Overall, students who intend to major in entrepreneurship self report higher rate of relative entrepreneurial confidence, and the differences are especially great within the right-hand side of the distribution.

As discussed above, we are primarily interested in whether students intending to major in entrepreneurship are more confident than other students. Therefore, for each question we rank each potential multiple choice answer and create a categorical variable that varies between 1 and n, where n is the highest ranked answer.[12] We then estimate the relationship between intending to major in entrepreneurship and each measure of confidence under a linear regression model. We present the results in Panel A of Table 2. Each regression model controls for a wide range of controls including graduation year, gender, nationality, and race. We offer more details concerning each measure in the discussion in the next section and the appendix. Finally, we include an indicator whether the individual started a firm prior to entering the MBA program.

The results in the first and second column in Panel A of Table 2 report the estimations for Q1, and show that students intending to major in entrepreneurship demonstrate higher relative entrepreneurial confidence. The first column excludes controls variables, while the second column includes the controls discussed above. The third and fourth column shows these same students also demonstrate higher absolute confidence (Q2). The fifth and sixth column reports our measure of overconfidence(Q3) and again find similar results. In addition, all three results are statistically significant.

For comparison, we also present the relationship between entrepreneurial confidence and prior entrepreneurial experience. Across two of the three measures, we find no statistically significant evidence that students that previously started a firm are more confident in their entrepreneurial abilities. The results again help confirm that the intention to major in entrepreneurship is a valid and unique proxy for entrepreneurial confidence.

Measures of Alternate Behavioral Traits. Of course, any estimated relationship between entrepreneurial confidence and the intention to enter entrepreneurship has the potential for measurement error due to variables unobservable to the econometrician. Of particular concern is that behavioral traits or preferences, which are often observable in our primary dataset, may influence entrepreneurial outcomes. This presents a concern in our identification strategy; to demonstrate these concerns are relatively minor in our setting, we examine whether students intending to major in entrepreneurship differ from other students in their (i) optimism about the future, (i) risk and ambiguity aversion, and (ii) preferences for workplace

[12]The answers listed in the previous paragraph are already sorted from lowest to highest rank.

independence and variety. Inclusion of these particular measures is motivated by the prior literature as discussed below. We therefore include the following questions in the survey:

Q4: Over the past 90 years, the US stock market has observed an average return of 9% a year. What will be the average annual US stock market return over the next ten years?

Q5: Among people born in the US in 1919, 1.4% are still alive in 2019. What is the likelihood you live to age 100?

Q6: How much would you pay for a lottery ticket that gives you a 50% probability of winning $500 and 50% of winning nothing?

Q7: How much would you pay for a lottery ticket that gives you a x% probability of winning $500? (x is between 25% and 75%)

Q8: How important is it for you to be in control of your daily schedule?

Q9: How important is it for you to have a job providing a variety of different tasks?

Each question is related to a potential behavioral characteristic or preference that predicts entrepreneurship according to the literature. Q4 offers a measure of optimism about the economy (Bengtsson and Ekeblom, 2014). Q5 measures non-economic optimism (Puri and Robinson, 2007). Q6 measures risk aversion (Parker, 2009), while Q7 is about ambiguity aversion (Knight, 1921). Q8 details preferences for independence (Cooper and Saral, 2013) and Q9 concerns preferences for workplace variety (Åstebro and Thompson, 2011).

As before, we offer several multiple choice answers for each question, and describe all possible answers in the online appendix. We then rank each answer and convert to a positive integer. We estimate the relationship between intending to major in entrepreneurship and each characteristic. We then present the results in Panel B of Table 2. As before, we control for a wide range of controls including graduation year, gender, race, and nationality. Across all six measures, we only find two statistically significant links: students intending to major in entrepreneurship are less optimistic about future stock market returns, while they are more optimistic about their health. Given these measures suggest opposing relationships, we argue optimism is unlikely to be driving our results. Otherwise, we find no evidence that students

intending to major in entrepreneurship hold different behavioral traits from the rest of the population. The results help confirm the unique role of overconfidence in predicting entrepreneurial career plans.

5 Results

To test our hypotheses, we introduce four sets of results. First, we evaluate the influence of peers on new firm creation under a range of empirical specifications. Second, we test whether the results are driven by a change in entrepreneurial confidence. Third, we examine whether a shock to confidence leads to an increased rate of successful firms and a higher proportion of female entrepreneurs. Fourth, we evaluate alternative explanations of the results.

5.1 Do Confident Peers Impact Entry to Entrepreneurship?

Spillover Effects at the Cohort Level. In Table 3, we evaluate how confident peers influence entry into entrepreneurship. In Panel A, we define peers at the cohort-level, which include on average sixty-one students. The first and second column detail the results under a linear probability model, while the third and fourth columns offer the results under a probit regression model. The dependent variable of interest is a binary variable denoting the student founded a firm within three years of graduation. We use three years as the most recent MBA class graduated in 2013 and we collected employment data in 2016, allowing all individuals the same number of years to start a new firm. In Columns (1) and (3) of both panels, we include year fixed effects as students are only randomly assigned within the same graduating class. We also control for whether the student intended to major in entrepreneurship according to her application. In Columns (2) and (4), we add controls for experienced peers as well as demographics used in the sorting process: gender, nationality, race, GMAT score, and undergrad major.

According to Column (2) of panel A, we estimate that individuals with a cohort member intending to major in entrepreneurship (and without prior entrepreneurial experience) are 0.4 percentage points more likely to enter entrepreneurship. As the likelihood of starting a firm within three years of graduation is 3.4%, each cohort member increases the rate of peer new firm creation by 12% relative to the mean. Since these peers have no prior entrepreneurial experiences, the results lend support to our argument that peers influence entrepreneurial confidence. To the best of our knowledge, this is the first evidence that

peers increase firm creation in an experimental setting.[13]

In comparison, individuals with a cohort member with prior experience in entrepreneurship are 0.6 percentage points less likely to enter entrepreneurship, a decrease of over 20% relative to the mean. Recall from our earlier discussion that past research including Nanda and Sorensen (2010) report a positive correlation between an individual's past entrepreneurial experience and the incidence of firm creation of his workplace peers. However, in subsequent work, Lerner and Malmendier (2013) demonstrate in a randomized setting that an individual with entrepreneurial experience causally reduces the entry to entrepreneurship of her peers. Our results replicate the findings of Lerner and Malmendier (2013), while providing support for the existence of positive and negative peer effects. As a result, we are able to reconcile the opposing findings documented in the literature.

Spillover Effects at the Team Level. In addition to cohorts, students are also assigned to a team of roughly four students, and students in the team complete group assignments and case studies together during the entire first year of the MBA. Given this close relationship, we expect peers to have a larger impact, relative to cohort members, on the career outcomes of fellow team members. We evaluate the influence of confident team peers on rates of new firm creation in Panel B of Table 3.

According to Column (2), we estimate that adding a peer intending to major in entrepreneurship increases the rate of firm creation among other team members by 1.2 percentage points, a 35% increase relative to the mean. We also estimate that adding a peer with entrepreneurial experience to a team decreases the rate of firm creation among other team members by 2 full percentage points, a decrease of over 50% relative to the mean. We note the coefficients are significantly larger in size than the results from Panel A of Table 3. As team are composed only four students (rather than sixty in the cohort), the results confirm our hypothesis that peer influence increases as connections are more tightly defined.

Nonlinear Specification. Given the likelihood of firm creation is only 3.4% according to Table 3, the binary dependent variable takes a value of one for only a small set of students, potentially raising concerns that the linear probability model is a misfit for this application. To mitigate these concerns, we also introduce a probit regression model in the third and fourth column of Panel A and B to ensure the results

[13] While other researchers identify a similar positive relationship from peers within the same school (Kacperczyk, 2013), neighborhood (Markussen and Røed, 2017), or family (Lindquist et al., 2015), peers are not randomly assigned.

are robust to the modeling choice in the baseline estimation. We confirm that a student with a cohort (and team) member intending to major in entrepreneurship is more likely to start a new firm; meanwhile, a cohort (and team) member with prior experience in entrepreneurship decreases the likelihood other students start a new firm.

According to the probit results, we estimate that exposure to one additional cohort member intending to major in entrepreneurship increases the likelihood of firm creation by 0.004%; this is compared to an estimate of 0.004% from the linear results. We also estimate that exposure to one additional team member intending to major in entrepreneurship increases the likelihood of firm creation by 0.016%; this is compared to an estimate of 0.012% from the linear results. The results suggest our prior estimates under the linear probability model do not depend on the particular empirical specification.

Temporary or Permanent Effects? The results highlight the influence of confident peers on firm creation. One explanation for our findings is that confident peers may simply impact the timing of firm creation; alternatively, confident peers may impact the ultimate decision to enter entrepreneurship, leading to the creation of firms that otherwise would not exist in the economy. If peer influence leads to a permanent increase in firm creation, then the estimated peer effects will remain persistent in the long-run. If confident peers only accelerate the timing of firm creation (as opposed to the overall likelihood), then we should observe peer effects dissipate as the horizon increases.

In Panel A of Table 4 we estimate the impact of peer influence on new firm creation at one to five years following MBA graduation. First, we estimate that treatment increases the rate of new firm creation among fellow cohort members by 0.2 percentage points after one year, compared to 0.4 percentage points after three years, and 0.4 percentage points after five years.[14] Given the results persist after five years, we conclude that confident peers have a permanent impact on entrepreneurship rates, leading to the creation of firms that would otherwise not exist in the economy.

Do Confident Peers Affect the Creation of Successful Firms? Thus far, we define entrepreneurs in the sample by requiring (i) the individual is identified as the founder of the firm and (ii) no other employees joined the firm prior to the individual. One potential concern is that confident peers only influence the

[14] In addition, we estimate that experienced peers decrease the rate of new firm creation among fellow cohort members by 0.4 percentage points after one year, compared to 0.6 percentage points after three years and 0.6 percentage points after five years.

creation of small and unsuccessful firms. However, if the economic value of firm creation is contingent on the survival rate and employment growth, we can evaluate whether confident peers impact the rate of successful firm creation in our setting. To this end, we tighten the restriction of entrepreneur in Panel B of Table 4 by also requiring the firm (i) survives for at least x years, or (ii) employs at least x workers.

In Columns (1)-(3) , we estimate the impact of confident peers on the likelihood that low confidence individuals establish employer firms. Cohort members intending to major in entrepreneurship increase the rate of employer firms with at least six employees by 0.4 percentage points and employer firms with at least ten employees by 0.3 percentage points.[15] In Columns (4)-(6), we estimate the impact of peers on establishing resilient firms—those that survive for at least five years. We estimate the likelihood of starting a firm lasting at least five years increases by 0.3 percentage points when a cohort member intends to major in entrepreneurship (compared to a similar rate of 0.4 percentage points for firms lasting at least one year).[16] In sum, peers influence the likelihood of employer and resilient firms, highlighting the potential for real effects on the economy.

5.2 Do Confident Peers Affect Entrepreneurial Confidence?

Survey of the Class of 2003-2013. In Table 2 we illustrate that intended majors entrepreneurship majors are more confident in their entrepreneurial abilities than the rest of the student population after controlling for observable characteristics. In addition, the results discussed above provide compelling evidence individuals who interact with confident peers are more likely to create a firm. However, the combination of these two results does not confirm that confidant peers impact the rate of firm creation through a change in entrepreneurial confidence. Therefore, in this section, we attempt to better isolate a change in entrepreneurial confidence based on three additional surveys.

In the first survey, we attempt to contact all 2,189 students within the 2003-2013 sample by email and ask each student to complete a single question.

Q1: Do you believe you would be worse, equal, or better at starting a company relative to the other MBA graduates from your class at Kelley?

[15] Cohort members with prior experience in entrepreneurship decrease the rate of employer firms with six or more employees by 0.4 percentage points and the rate of 10+ employee firms by 0.3 percentage points.

[16] The likelihood of starting a firm lasting at least five years decreases by 0.6 percentage points when a cohort member has prior experience in entrepreneurship (compared to a rate of 0.8 percentage points for firms lasting at least one year).

Of the 2,189 students contacted, we receive a total of 373 replies, a response rate rate of 17%. In the first and third column, we control only for year fixed effects and whether the student initially intended to major in entrepreneurship for consistency with the prior findings. In the second and fourth column, we include the standard fixed effects for (i) nationality, (ii) race, (iii) GMAT, and (iv) undergraduate major. We include two additional controls that likely influence entrepreneurial confidence. First, as these individuals have graduated, we control whether the individual actually completed an entrepreneurship major as coursework may improve confidence. Second, as these individuals have worked following graduation, we also control for whether the individual founded a firm during the five years following the MBA.

We estimate each additional cohort level peer intending to major in entrepreneurship increases relative confidence by roughly 0.03 points. Given a mean confidence of 3.1, we estimate a 1 percentage point increase relative to the mean. In addition, we estimate each additional team-level peer intending to major in entrepreneurship increases relative confidence by roughly 0.2 points, an increase of 6 percentage points relative to the mean. The results confirm our interpretation that individuals perceive their abilities relative to their peer group rather than the population.

Survey of the Class of 2021. There are four disadvantages to the results above. First, we are not able to survey students prior to treatment, eliminating our ability to measure a change in confidence at the individual-level. Second, work experience, especially in entrepreneurship, will likely influence self-reported entrepreneurial confidence. Third, students are surveyed years after interaction, limiting our ability to identify an effect when the change in not permanent. Fourth, we have only one measure of ex-ante confidence. To overcome all four concerns, we resurvey the class of 2021.

As previously discussed, we surveyed the class of 2021 in the summer prior to treatment; among the 137 students, we received 125 responses. We next resurvey these same students in November of 2019 after their first semester of interaction; out of the 125 that originally submitted the survey, 105 also completed the November survey. As these students are surveyed before and after treatment, we are able to document a change in confidence. Second, as these students are still in their first semester of the MBA, differences in confidence cannot be attributed to work experience (as these students are full-time) or course instruction (as all first semester students take the same courses with the same instructors). Third, as these students are surveyed in November of their first semester, we can limit the time between treatment and the survey.

Fourth, we are able to exploit the initial survey responses to develop multiple measures of ex-ante confidence. Therefore, by surveying these students, we can test whether interacting with a confident peer (based on multiple definitions) leads to a causal change in entrepreneurial confidence.

We present our results in Panel B of Table 5. The first column defines a confident peer as a team-member intending to major in entrepreneurship. The second column defines a confident peer based on relative confidence: specifically, as a team-member that originally placed themselves in the top 30% of the class in terms of entrepreneurial ability. The third column defines a confident peer as a team member that originally reported they are "confident" or "very confident" in their entrepreneurial abilities. The fourth column defines a confident peer as a team member initially reporting that there is a 30% chance (or greater) they start a firm that employs at least ten workers within the first year. Therefore the third column focuses on peers with high absolute confidence, while the fourth column focuses on peers with high overconfidence based on our prior definitions. We only focus on team effects as we only have three separate cohorts in the class of 2021, compared to 28 different teams. As before, we also control for worker characteristics including (i) nationality, (ii) race, and (iii) gender. In addition, we control for the initial confidence of the students across all four measures.

Across three of the four specifications, we confirm that students intending to major in entrepreneurship report higher rates of relative confidence in their entrepreneurial abilities. Specifically, we estimate knowing a team-member intending to major in entrepreneurship increases confidence by 0.33 (compared to a mean of 3.7). Similarly, a team member with high relative confidence increase relative confidence by 0.33 and a team member with high overconfidence increases relative confidence by 0.32. We estimate a similar effect for peers with high absolute confidence, though the effect is not quite statistically signidicant at the ten percent level. This evidence helps verify that our results do not depend on the exact definition of confident peers.

Self Reported Effects of Treatment. Third, we directly ask treatment students in the classes of 2003-2013 to describe the effects of treatment. Specifically, we contact each individual with a team member intending to major in entrepreneurship; among the 495 students contacted, we received 185 replies, for a response rate of 37%. We then ask three questions:

Q1: In your first-year at IU-Kelley, one of your teammates was interested in becoming an entrepreneur and wanted to choose entrepreneurship as his/her MBA major. Did the team member impact the likelihood that you would started (or already started) a company?

Q2: If so, how did he/she affect your likelihood?

Q3: If he/she changed your views of entrepreneurship, in what what way?

We report the multiple choice answers to the questions in the online appendix. We believe the survey results have three primary benefits. The first question confirms that peers intending to major in entrepreneurship increase interest in firm creation among the rest of the population. As individuals that have not started a new firm may still hold an interest in entrepreneurship, we can potentially identify a significantly larger peer effect than is directly observable from the employment histories. The second question helps distinguish between a change in behavioral traits and learning. The third question helps isolate which behavioral traits change. Specifically, we test whether peers influence (i) entrepreneurial confidence, (ii) risk aversion, (iii) optimism about the returns to entrepreneurship, or (iv) preferences toward non-monetary awards (such as valuing independence and variety).

We summarize the survey data in Figures 8, 9, and 10. First, we estimate that 22.4 percent of respondents reply that the peer team member increased their interest in starting a firm; in comparison, 77.6 percent of individuals report no impact and no individual report a decrease. We note we are able to compare these findings directly to our regression analysis. According to Table 3, we estimated a team member increases the likelihood of firm creation by only 1.2 percentage points; therefore the majority of individuals that choose to not enter entrepreneurship are still influenced by treatment.

Second, among the individuals reporting the team member had an effect, 46 percent of individuals responded that the team member changed his/her views of entrepreneurship, 8 percent report he/she learned about entrepreneurship from the team member, and 46 percent responded that both channels are present. Therefore, while it is difficult to fully distinguish between these channels, we find peers disproportionately impact behavioral characteristics.

Third, we distinguish how peers influence an individual's views towards entrepreneurship. Among the individuals reporting a change in views, we offered five possible responses: (i) made me confident

about my abilities (shock to entrepreneurial confidence), (ii) decreased my concerns about the risk of owning business (shock to risk aversion), (iii) helped me realize I would enjoy entrepreneurship (shock to preferences), (iv) increased my expectations of monetary incentives (shock to optimism), or (v) other. According to the results 56.5% of the population reported a change in entrepreneurial confidence. In comparison, we find smaller effects on risk aversion (26.1%), entrepreneurial preferences (4.4%), optimism (0%), and other (4.4%). Overall, the survey results further support our argument that the increase in firm starts is primarily driven by a change in entrepreneurial confidence.

5.3 Do Peers Influence High or Low Confidence Individuals to Enter Entrepreneurship?

Heterogeneous Spillover Effects by Initial Confidence. Under our hypothesis, individuals know the distribution of entrepreneurial wages for all workers, yet cannot fully observe their relative place in the distribution. Individuals may then update expectations of their relative ability following social interactions when peers are not representative of the population. Assuming this is true, we should find treatment (interaction with a confident peer) increases the rate of firm creation for less confident individuals, yet has limited effects among individuals already confident of their entrepreneurial abilities. We test this result in Table 6.

In Panel A, we identify peers at the cohort-level, while we define peers as team members in Panel B. We then split the sample population into (i) individuals with low entrepreneurial confidence (identified as students not intending to major in entrepreneurship) and (ii) individuals with high entrepreneurial confidence (identified as students intending to major in entrepreneurship). In Panel A, we estimate interacting with a confident cohort member increases the rate of firm creation by 0.4% among low-confident individuals, yet we estimate no impact on high-confident individuals. In Panel B, we estimate that interacting a confident team member increases the rate of firm creation by 1.6% among high-confident individuals, and again no effect on high-confident individuals. The results suggest less confident individuals are updating their relative place in the distribution following treatment, further supporting our hypothesis outlined above.

Entrepreneurial Confidence across Gender. We next analyze the impacts of confident peers on the rate of female entrepreneurship as past researchers have found significantly lower rates of entrepreneurship

among women compared to men (Fairlie and Robb, 2009) and lower rates of confidence (Barber and Odean, 2001; Huang and Kisgen, 2013). Based on this literature, we hypothesize spillover effects may be larger among women in the sample: assuming individuals endogenously choose to sort into groups based on similar characteristics (i.e. males interacting with other males), female workers will then have less interaction with past or future entrepreneurs (Markussen and Røed, 2017). For the women in our setting, the forced assignment of students into teams and cohorts may then be a unique chance to interact with students confident in their entrepreneurial abilities.

Before analyzing peer influence by gender, we offer three initial findings. First, according to Panel A of Table 7 females are 5.4 percentage points less likely to intend to major in entrepreneurship. Second, we confirm that men are roughly twice as likely to start a new firm relative to females in the sample. In Panel A of Table 8 we estimate that women are 1.2 percentage points less likely to start a firm in the first year after graduation and 3.2 percentage points less likely five years after graduation even after controlling for the intention to major in entrepreneurship. Therefore, we find evidence that the entrepreneurial gender gap widens over the individual's career.

Third, we return to our survey results in Panel B and C of Table 7. In Panel B, we document that the women in the class of 2021 are less confident in their entrepreneurial abilities compared to the male students.These results hold after controlling for the intended major of the student, the prior entrepreneurial experience of the student. Specifically, women are 0.5-0.6 less confident in their relative abilities compared to a mean confidence rating of 3.7 and a standard deviation of 0.96. In Panel C, we document lower rates of confidence among women in the classes of 2003-2013, though the effects are no longer statistically significant at the ten percent level. The results suggest that a shock to entrepreneurial confidence may have a disproportionate impact on female workers and confirm the prior literature highlighting lower rates of confidence among women.[17]

Spillover Effects on Firm Creation across Gender. We measure peer effects separately among males and females. According to the the first and second column of Panel B of Table 8, peer influence disproportionately affects females. We estimate peers at the cohort-level majoring in entrepreneurship increase

[17] In addition, in unreported results, we find evidence that women are more risk averse and more ambiguity averse than their male counterparts.

firm creation by 0.8 percentage points among females compared to 0.3 percentage points among the males in the sample.[18]

The results above highlight the significance for females to have interactions with confident peers. We next test whether the gender of peers is also significant in the third and fourth column of Panel B. Specifically, we distinguish between male peers and female peers within the cohort. Focusing on female entrepreneurship, we find that a female peer intending to major in entrepreneurship increases firm creation by 1 percentage point (compared to 0.7 percentage points for the male peer). Overall, we offer suggestive evidence that the gender of the peer impacts the rate of firm creation.

5.4 Does Increased Confidence Decrease Average Entrepreneurial Quality?

Spillover Effects on the Proportion of Successful Firm Creation. We next evaluate whether low confidence individuals who interact with high-confidence peers leads to the creation of high-quality firms. The interaction with highly confident peers may lead treated individuals to become overconfident and create lower-quality firms. However, if confident peers help low confident peers become more calibrated, individuals who report low confidence will create high-quality firms.

We exclusively analyze individuals that founded a firm within three years of graduation. According to Column (2) of Table 9 we find individuals who are exposed to highly confident peers are 5.1 more likely to create firms that survive at least five years, though this estimate is not statistically significant at the 10% level. According to our estimates in Column (4), individuals who interact with highly confident peers are 8 percentage points more likely to create firms that employ 5 or more workers. We find no evidence that a shock to entrepreneurial confidence decreases the proportion of successful new firms, suggesting that low-confidence individuals are less biased after interacting with high-confidence peers.

5.5 Additional Tests

Do Confidence Spillovers depend on the Abilities of the Intended Entrepreneur? When judging their personal entrepreneurial abilities compared to fellow MBA students, we theorize students that regularly

[18] In unreported results, we establish similar results among racial minority students. First, we estimate white students are slightly more likely to start a new firm than international and U.S. minority students. Second, while we find limited evidence of peer affects on white students, peers with an intended major in entrepreneurship increase firm creation among minority students by 0.4 percentage points.

interact with intended entrepreneurs are better able to directly observe their entrepreneurial abilities and compare these students' abilities to their own. Based on (Carrell et al., 2013), we hypothesize students choose to form sub-groups within classroom settings based on ability; if this is true, we should find high-performing peers influence high-performing students, while low-performing peers influence low-performing students. To offer evidence of this argument, we distinguish between intended entrepreneurs entering the MBA program with a high GMAT score (defined as a score of 650 or above, which is roughly the median score) and those with a low GMAT score (defined as below 650). In line with our argument, we observe that peers influence only students with similar GMAT scores, and have no effect on all other students in the cohort. The results help confirm our effects are driven by peer interactions.

Do Peers offer Advice on Entrepreneurial Ideas? The related work of Lerner and Malmendier (2013) suggests entrepreneurial peers causally decrease the rate of entrepreneurship. They argue their findings suggest peers with prior experience advise other students on their entrepreneurial ideas. In contrast, we argue peers can causally increase the rate of entrepreneurship through increased confidence. To provide evidence that our results are unlikely driven by students advising each other on entrepreneurial ideas, we examine two subsamples of confident peers who are likely to have little information regarding whether a given entrepreneurial endeavor is a good investment. In Columns (1) and (2) of Table 11, we define treatment as the number of cohort members that (i) intend to major in entrepreneurship and (ii) do not start a firm within five years following graduation. We estimate that treatment still increases the rate of firm creation by 0.6 percentage points. In Columns (3) and (4), we instead define treatment as the number of cohort members (i) intending to major in entrepreneurship and (ii) graduate from the MBA with a different major. According to this definition, peers increase firm creation rates by 0.4 percentage points. The results continue to hold even after excluding peers holding relevant information.

Do Peers Influence Classroom Performance? We illustrate peers influence the rate of firm creation, and argue for a behavioral channel as opposed to a rational framework. For evidence against a learning mechanism, we next illustrate that (i) intended entrepreneurs do not outperform other students in the classroom, and (ii) peers intending to major in entrepreneurship do not impact the classroom performance of peers. We focus on classroom performance based on prior research documenting the high

success rate of skilled and educated entrepreneurs (Gupta and Hacamo, 2018; Walsh and Nagaoka, 2009). We measure classroom performance from grades in the first semester of the MBA as all students are enrolled in the same Core Curriculum. Though the exact nature of the Core Curriculum has changed over the years, the courses cover eight topics taught by eight different faculty members: Critical Thinking, Economics, Finance, Accounting, Marketing, Operations, Quantitative Analysis, and Strategic Management. A recent literature has confirmed the value of these general managerial skills over more firm- or industry-specific knowledge (Custódio et al., 2013; Frydman, 2005; Murphy and Zabojnik, 2007).

We present the results in Table 12. In the first and second column we define peers at the cohort-level, while in the third and fourth column we define peers at the level of the team. Across all four columns, we find no evidence that peers intending to major in entrepreneurship impact classroom performance. Overall, we find no evidence that our peers effects are likely driven by a learning mechanism. In addition, the results demonstrate that students intending to major in entrepreneurship are not statistically different in their classroom performance. If anything, these students perform slightly below the mean student, though these differences are not statistically different. These results offer one possible explanation for why interacting with intended entrepreneurs may increase entrepreneurial confidence: students realize intended entrepreneurs perform no better in the classroom than other peers, suggesting they do not hold unique abilities.

Do Peers Influence Risk Aversion and Optimism? We argue the results suggest individuals evaluate their own relative ability based on the self-confidence of others, driving the decision to enter competitive settings. However, social interactions may instead influence the rate of entrepreneurship through a variety of channels; for instance, even if intended entrepreneurs are not less risk-averse, they may still lead others to lower risk aversion. We investigate this possibility below.

We present our findings in Table 13. We return to our study of the class of 2021. The treatment effect is defined as interaction with a team member intending to major in entrepreneurship. The first column measures a change in economic optimism, the second column measures the change in non-economic optimism, the third column measure changes in risk aversion, the fourth column measures changes in ambiguity aversion, the fifth column measures changes in the preference for independence, and the sixth column measures changes in the preference for workplace variety. We measure changes by collecting

survey response of the class of 2021 prior to treatment in the summer of 2019 and post-treatment in November of 2019. According to the results, we find that interacting with a peer intending to major in entrepreneurship increases, rather than decreases the risk-aversion of other workers. This is at odds with prior evidence that entrepreneurs are less risk-averse than the general population (Parker, 2009). Otherwise, we find no evidence of any changes among the workers. The results help further confirm that it is a change in entrepreneurial confidence that increases the rate of entrepreneurial entry following treatment.

Do Peers Affect other Real Outcomes? Majoring in Entrepreneurship. Interaction with confident peers may also impact other real outcomes, namely educational choices and employment in start-ups, leading to greater knowledge about entrepreneurship. When acquiring knowledge in this fashion also increases the chance of firm survival and growth (conditional on starting a firm). This argument is based on Panel B of Table 9, which illustrates that majoring in entrepreneurship is correlated with entrepreneurial success, conditional on starting a firm. In Columns (1) and (2), we measure success as employment size; in Columns (3) and (4), we measure success as survival. According to the results, students intending to major in entrepreneurship are 42% more likely to employ five or more workers and 42% more likely to survive at least five years.

To test whether confident peers affect the desire of low confident individuals to major in entrepreneurship, we exploit data on the intended major of each student prior to interaction. In Panel A of Table 10, we first confirm that, relative to other majors, entrepreneurship majors are 6 percentage points more likely to start a firm within a year of graduation and 11 percentage points more likely to start a firm within five years. In Panel B of Table 10, we next evaluate how confident peers influence the decision to major in entrepreneurship. According to the second column, treatment increases the likelihood of switching to an entrepreneurship major by 2.1 percentage points. As students are required to choose a major in the first year of the MBA program, the results confirm that peers immediately influence the decision to learn about entrepreneurship. The timing of the major choice also helps explain why social interactions during the first year of the MBA program can impact the rate of entrepreneurship years later.

Do Peers in other Intended Majors Influence Firm Creation? Our framework exploits our unique data on the intended major of each student in the sample prior to peer interaction. To identify individuals with confidence in starting a new firm, we analyze students intending to major in entrepreneurship. If this interpretation is correct, student peers intending to major in other subjects (finance, marketing, management, operations, and strategy) should not affect the rate of firm creation. In Table 14 we find no statistical evidence that cohort members intending to major in subjects outside entrepreneurship influence the likelihood of firm creation.[19] We consider each subject in a separate regression and combine both first and second intended majors. Across all specifications, no coefficient is statistically significant at the 10% level. The lack of results under all specifications suggest that the intention to major in entrepreneurship is a unique predictor of entrepreneurial confidence.

Do Placebo Peers Influence Firm Creation? A separate concern with our experimental setting is that significance may arise mechanically due to the assignment of students into cohorts and team rather than the peer interaction. To rule out this possibility, we create placebo cohorts (teams), and then estimate the impact of the placebo peers on new firm creation. To create a placebo cohort (team), we randomly assign each student to a placebo cohort (team) and estimate the peer effects based on the placebo peers. We include the standard controls as introduced in Table 3. We repeat this exercise ten-thousand times.

We report the influence of placebo cohort member intending to major in entrepreneurship in Figure 11. In Panel A, we plot the histogram of coefficients and in Panel B we plot the histogram of T-Statistics. In only 2 percent of tests do we estimate a coefficient above 0.001; in addition, in roughly 3 percent of tests we estimate a T-statistic above two. For comparison in Table 3 we estimated a coefficient of 0.004, which is significant at the one percent level. In Figure 12 we report the influence of placebo team members intending to major in entrepreneurship. We estimate a coefficient above 0.01 in roughly 5 percent of cases; we estimate a T-statistic above two for under 2 percent of cases. For comparison, in 3, we estimated a coefficient of 0.012, which is statistically significant at the ten percent level. Overall, we find no evidence that placebo peers influence rates of firm creation, suggesting our actual results are indeed documenting peer influence.

[19] In unreported results, we conduct a similar analysis identifying peers at the team level. Again, no coefficients are statistically significant at the 10% level.

Are Confident Peers Assigned based on Student Characteristics? As mentioned, cohorts and teams are assigned based on a range of student characteristics. Assuming these characteristics also predict the intention to major in entrepreneurship, this is a potential concern in our identification strategy. To overcome this obstacle, our regression controls for the same characteristics used under the assignment process.

For further confirmation, we analyze whether the characteristics used in the assignment process predict cohorts/teams with a relatively high proportion of intended entrepreneurs in Table 15. Failure to find any relationship offers additional evidence our results are driven by exposure to peers intending to major in entrepreneurship. In Panel A we evaluate the demographics within each cohort, while Panel B evaluates demographics within each team. We include a year fixed effect when analyzing cohorts as students are only randomly assigned within the same graduating year. We include a cohort fixed effect when analyzing teams as students are randomly assigned to teams within the same cohort. As we conduct our analysis at the cohort/team level, Panel A has only 36 observations, while Panel B has 566 observations.

For both Panel A and B, the first column evaluates the number of cohort/team members with online business networking service profiles; as we are only able to complete our analysis for students with an online profile, we confirm that the missing profiles are unlikely to be driving our results. The second column evaluates the proportion of female students. The third column evaluates the mean GMAT Score of the students in each cohort/team. The fourth column evaluates the proportion of international students and the fifth column evaluates the proportion of U.S. minority students.

According to Table 15, cohort/teams with a high proportion of intended entrepreneurs (defined as those cohorts/teams with intended entrepreneurs above the median) are not statistically different from cohort/teams with a low proportion of intended entrepreneurs. For instance, cohorts with a high proportion of intended entrepreneurs are slightly *more* likely to include female students (though the relationship is not statistically significant); in comparison, teams with a high proportion of intended entrepreneurs are slightly *less* likely to include female students (though again the result is not statistically significant). Overall, the results continue to suggest that students are influenced by exposure to intended entrepreneurs and not alternative, correlated characteristics.

6 Concluding Remarks

In this paper, we introduce the notion of confidence spillovers: social interactions with confident agents encourages entry into competitive environments. Under an experimental setting that randomizes the social networks of young managers, we observe peers confident in their own abilities increase the rate of entrepreneurship of peers. By directly surveying individuals, we confirm treated managers express higher relative confidence in their abilities and directly state they are more interested to start a business due to greater confidence. We also reject alternative explanations based on a peer's role in providing entrepreneurial knowledge or resources, as well as a change in risk aversion. We demonstrate positive shocks to entrepreneurial confidence can actually offer benefits to the entrepreneurial sector. First, we confirm the women in our sample are less confident and less likely to enter entrepreneurship; however, connections to a confident peer disproportionately impacts female students, increasing the proportion of female entrepreneurship. Second, confident peers help low-confident individuals become less biased, causing relatively successful entrepreneurs among the treatment group. Overall, we offer the first experimental evidence that confident peers increase the rate of entrepreneurship and provide a novel channel linking these effects through gains to confidence.

Although we focus our analysis on individuals who graduated from the MBA at Indiana University, the results have significant implications outside the particular experimental setting. First, as individuals will routinely interact with peers outside their team or cohort, our estimates offer only a lower bound on the influence of peer interaction on firm creation. Policies that promote interaction between skilled workers, even within narrow contexts, will likely impact entrepreneurial confidence (and therefore entrepreneurship rates) across the economy. Second, we find the sign of peer influence is ambiguous and depends on peer attitudes towards entrepreneurship. Policy makers must be aware of the divergent impact of peers when designing policies promoting firm creation. Third, as peer influence predominantly affects female students, our results highlight the potential for policies supporting the diversity of entrepreneurs. Fourth, our findings suggest that promoting entrepreneurial confidence among low confidence individuals will increase the rate of firm creation without decreasing the conditional rate of success.

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Table 1: Data Summary

This table reports the summary statistics of all variables in our sample. Panel A summaries students graduating in 2003-2013; Panel B summarizes students graduating in 2021. *Entrepreneur within X-y of MBA* is a dummy variable equal to one if an individual is an entrepreneur *X* years after graduating from the MBA program. *Joined Start-Up* is a dummy variable equal to one if, at the MBA graduation, an individual joins a firm that is younger than 2 years old or employs less than 10 workers. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship as first or second major. *Graduated Entrepreneur Major* is a dummy variable equal to one if a student effectively graduates with a major in entrepreneurship. *Experienced Peer (Team/Cohort)* measures the number of peers a student has in her first year MBA team/cohort with failed entrepreneurial experience. *Treatment (Team/Cohort)* measures the number of peers a student has in her first year MBA team/cohort who intend to major in entrepreneurship.

Panel A: Summary of 2003-2013 MBA Students

	N	Mean	Std	50th
Entrepreneur within 1y of MBA	2102	0.018	0.13	0
Entrepreneur within 2y of MBA	2102	0.026	0.16	0
Entrepreneur within 3y of MBA	2102	0.034	0.18	0
Entrepreneur within 4y of MBA	2102	0.039	0.19	0
Entrepreneur within 5y of MBA	2102	0.043	0.20	0
Joined Start-Up	2102	0.16	0.36	0
Graduated Entrepreneur Major	2102	0.047	0.21	0
Intended Entrepreneur	2102	0.35	0.48	0
Treatment	2102	22.3	8.04	21
Treatment	2102	0.69	0.46	1
Experienced Peer	2102	2.12	1.82	2
Experienced Peer	2102	0.092	0.29	0
Female Student	2102	0.26	0.44	0
Team Size	2102	4.04	0.79	4
Cohort Size	2102	61.6	8.60	61
MBA Graduation Year	2102	2008.0	3.22	2008

Panel B: Summary of 2021 MBA Students

	N	Mean	Std	50th
Relative Entrepreneurial Confidence	125	3.74	0.97	4
Absolute Entrepreneurial Confidence	125	2.22	0.63	2
Entrepreneurial Overconfidence	125	3.10	1.72	3
Intended Entrepreneur	125	0.24	0.43	0
Prior Entrepreneur	125	0.10	0.31	0
Peer Intending to Major in Entre (Cohort)	119	15.4	3.69	16
Peer Intending to Major in Entre (Team)	119	1.29	0.81	1
Team Size	125	6.66	1.20	7
Cohort Size	125	65.4	14.8	64

Table 2: Are Entrepreneurship Majors More Confident?

This table reports the behavioral traits of students intending to major in entrepreneurship. In Panel A, we estimate whether students intending to major in entrepreneurship are more confident in their entrepreneurial abilities. The first and second column measures relative entrepreneurial confidence, the third and fourth column measures absolute entrepreneurial confidence relative to other MBA students, and the fifth/sixth column measures entrepreneurial overconfidence. Finally, we control for differences in graduation year, gender, nationality, and race. In Panel B, we estimate whether students intending to major in entrepreneurship are associated with other behavioral traits. The first column measures economic optimism, the second column measures non-economic optimism, the third column measure risk aversion, the fourth column measures ambiguity aversion, the fifth column measures a preference for independence, and the sixth column measures a preference for workplace variety. We control for whether the student previously founded a firm prior to the MBA. We also control for differences in graduation year, gender, nationality, and race. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level.

Panel A: Entrepreneurial Confidence and Overconfidence

	Relative Entrepreneurial Confidence		Alternate Measure 1		Alternate Measure 2	
	(i)	(ii)	(i)	(ii)	(i)	(ii)
Intended Entrepreneur	0.512***	0.459***	0.275*	0.226*	0.872**	0.922***
	(3.04)	(2.66)	(1.90)	(1.76)	(2.52)	(2.63)
Prior Entrepreneur		0.149		0.491**		0.092
		(0.49)		(2.22)		(0.19)
Gender FE	No	Yes	No	Yes	No	Yes
Nationality FE	No	Yes	No	Yes	No	Yes
Race FE	No	Yes	No	Yes	No	Yes
N	125	125	125	125	125	125
R-squared	.051	.16	.035	.15	.047	.16

Panel B: Alternative Behavioral Traits

	Optimism		Risk/Ambiguity Aversion		Preferences	
	Economic	Noneconomic	Risk	Ambiguity	Independence	Variety
Intended Entrepreneur	-0.365*	1.035**	0.084	0.166	0.042	0.202
	(-1.67)	(2.12)	(0.23)	(0.51)	(0.26)	(1.31)
Prior Entrepreneur	0.001	-0.555	0.800	0.690	0.196	0.317
	(0.00)	(-0.89)	(1.55)	(1.43)	(0.76)	(1.60)
Gender FE	Yes	Yes	Yes	Yes	Yes	Yes
Nationality FE	Yes	Yes	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes	Yes	Yes
N	125	124	125	125	125	125
R-squared	.034	.043	.081	.077	.08	.065

Table 3: Do Peers Affect Firm Creation?

This table reports how confident peers affect firm creation. In Panel A, we identify peers at the cohort-level; in Panel B, we identify peers at the team-level. In the first and second columns of both panels, we estimate a linear probability model; in the third and fourth columns, we estimate a probit model. *Treatment* measures the number of peers in her first year MBA cohort (in Panel A) or team (in Panel B) who intend to major in entrepreneurship. *Experienced Peer* measures the number of peers in her first year MBA cohort (in Panel A) or team (in Panel B) with a failed entrepreneurial experience. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort-level in Panel A and the team-level in Panel B.

Panel A: *Cohort* Peer Effects

	Linear		Probit	
	(i)	(ii)	(i)	(ii)
Treatment	0.003*	0.004***	0.041**	0.069***
	(1.96)	(3.37)	(2.08)	(3.68)
Experienced Peer		-0.006***		-0.098***
		(-3.20)		(-2.93)
Intended Entrepreneur	0.020**	0.018**	0.270***	0.250**
	(2.67)	(2.42)	(2.87)	(2.46)
Year FE	Yes	Yes	Yes	Yes
Gender FE	No	Yes	No	Yes
Nationality FE	No	Yes	No	Yes
Race FE	No	Yes	No	Yes
GMAT FE	No	Yes	No	Yes
Undergrad Major FE	No	Yes	No	Yes
N	2102	2102	1919	1892
R-squared	.016	.035		

Panel B: *Team* Peer Effects

	Linear		Probit	
	(i)	(ii)	(i)	(ii)
Treatment	0.013*	0.012*	0.239	0.263*
	(1.95)	(1.78)	(1.61)	(1.73)
Experienced Peer		-0.020**		-0.472*
		(-2.20)		(-1.65)
Intended Entrepreneur	0.025***	0.022***		0.379***
	(3.11)	(2.85)		(3.04)
Year FE	Yes	Yes	Yes	Yes
Team Size FE	Yes	Yes	Yes	Yes
Gender FE	No	Yes	No	Yes
Nationality FE	No	Yes	No	Yes
Race FE	No	Yes	No	Yes
GMAT FE	No	Yes	No	Yes
Undergrad Major FE	No	Yes	No	Yes
N	2102	2102	1919	1808
R-squared	.018	.041		

Table 4: Do Peers Affect the Entry of Successful Firms?

This table reports how confident peers affect cumulative firm creation and successful firm creation. In Panel A, we assess whether peers affect firm creation temporarily or permanently by estimating firm creation within X years following MBA graduation. We allow X to be 1,2,3,4,5 years. In Panel B, we measure successful firm creation as employing at least *X* employees, or surviving for a minimum of *X* years. *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship. *Experienced Peer* measures the number of peers in her first year MBA cohort with a failed entrepreneurial experience. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort level.

Panel A: Do peers affect firm creation temporarily or permanently?

	Firm Creation X Years after MBA Graduation				
	1 Year	2 Years	3 Years	4 Years	5 Years
Treatment	0.002**	0.001*	0.004***	0.004***	0.004***
	(2.28)	(2.02)	(3.37)	(3.27)	(3.16)
Experienced Peer	-0.004**	-0.005***	-0.006***	-0.005**	-0.006**
	(-2.59)	(-3.04)	(-3.20)	(-2.42)	(-2.51)
Intended Entrepreneur	0.014**	0.023***	0.018**	0.024**	0.032***
	(2.15)	(3.72)	(2.42)	(2.39)	(3.04)
Year FE	Yes	Yes	Yes	Yes	Yes
Gender FE	Yes	Yes	Yes	Yes	Yes
Nationality FE	Yes	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes	Yes
GMAT FE	Yes	Yes	Yes	Yes	Yes
Undergrad Major FE	Yes	Yes	Yes	Yes	Yes
N	2102	2102	2102	2102	2102
R-squared	.034	.039	.035	.037	.04

Panel B: Do peers affect the entry of successful firms (employment and survival)?

	Employment			Survival		
	2+ Emp	6+ Emp	10+ Emp	1+ Years	3+ Years	5+ Years
Treatment	0.003**	0.004***	0.003***	0.004**	0.003*	0.003*
	(1.98)	(2.61)	(2.76)	(2.16)	(1.70)	(1.91)
Experienced Peer	-0.007**	-0.004*	-0.003	-0.008**	-0.006*	-0.006**
	(-2.39)	(-1.71)	(-1.48)	(-2.35)	(-1.88)	(-2.20)
Intended Entrepreneur	0.015**	0.017***	0.012**	0.016*	0.013*	0.014**
	(2.25)	(3.11)	(2.41)	(1.85)	(1.76)	(2.18)
Constant	-0.132	-0.130	-0.115	-0.180	-0.124	-0.109
	(-0.89)	(-1.08)	(-1.06)	(-0.99)	(-0.78)	(-0.78)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Gender FE	Yes	Yes	Yes	Yes	Yes	Yes
Nationality FE	Yes	Yes	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes	Yes	Yes
GMAT FE	Yes	Yes	Yes	Yes	Yes	Yes
Undergrad Major FE	Yes	Yes	Yes	Yes	Yes	Yes
N	2102	2102	2102	2102	2102	2102
R-squared	.035	.041	.038	.034	.024	.02

Table 5: Do Peers Impact Entrepreneurial Confidence?

This table reports the entrepreneurial confidence of students intending to major in entrepreneurship. In Panel A, we survey students from the classes of 2003-2013 and ask them to report their confidence in their entrepreneurial abilities relative to other Kelley MBA alumni. In the first and second column, *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship. In the third and fourth column, *Treatment* measures the number of peers in her first year MBA team who intend to major in entrepreneurship. In Panel B, we survey students in the class of 2021 and then measure the change in their relative entrepreneurial confidence. In the first column *Peer Intending to Major in Entre* as a team-member intending to major in entrepreneurship. In the second column *Peer with High Relative Confidence* defines treatment as a team-member who originally placed themselves in the top 30% of the class in entrepreneurial ability. In the third column *Peer with High Absolute Confidence* defines treatment as a team member who originally reported they are "confident" or "very confident" in their entrepreneurial abilities. In the fourth column *Peer with High Overconfidence* defines treatment as a team member initially reporting a 30% chance (or greater) they start a firm that employs at least ten workers within the first year. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. *Prior Entrepreneur* is a dummy variable equal to one if a student founded a firm prior to the MBA. *Graduated Entrepreneur Major* is a dummy variable equal to one if a student graduated with an entrepreneurship major. *Entrepreneur within 5y of MBA* is a dummy variable equal to one if a student founded a firm within five years of graduation. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level.

Panel A: Survey of Classes of 2003-2013

	Cohort-Level Peer		Team-Level Peer	
	(i)	(ii)	(i)	(ii)
Treatment (Cohort-Level)	0.044***	0.036**		
	(3.06)	(2.21)		
Treatment (Team-Level)			0.163*	0.193**
			(1.75)	(2.50)
Intended Entrepreneur	0.499***	0.475***	0.471***	0.461***
	(4.19)	(3.37)	(4.07)	(3.30)
Graduated Entrepreneur Major		0.335*		0.311*
		(1.96)		(1.73)
Entrepreneur within 5y of MBA		0.710***		0.723***
		(3.34)		(3.53)
Year FE	Yes	Yes	Yes	Yes
Gender FE	No	Yes	No	Yes
Nationality FE	No	Yes	No	Yes
Race FE	No	Yes	No	Yes
GMAT FE	No	Yes	No	Yes
Undergrad Major FE	No	Yes	No	Yes
N	373	373	373	373
R-squared	.087	.19	.084	.19

Panel B: Survey of Class of 2021

	Team-Level Peer			
	(i)	(ii)	(iii)	(iv)
Treatment (Peer Intending to Major in Entre)	0.334*			
	(1.96)			
Treatment (Peer with High Relative Confidence)		0.323***		
		(2.75)		
Treatment (Peer with High Absolute Confidence)			0.212	
			(1.59)	
Treatment (Peer with High Overconfidence)				0.322***
				(3.33)
Intended Entrepreneur	0.202	0.096	0.103	0.055
	(0.92)	(0.46)	(0.48)	(0.26)
Prior Entrepreneur	0.171	0.165	0.161	0.167
	(0.48)	(0.50)	(0.44)	(0.54)
Gender FE	Yes	Yes	Yes	Yes
Nationality FE	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes
Initial Confidence Measures	Yes	Yes	Yes	Yes
N	105	105	105	105
R-squared	.3	.33	.29	.33

Table 6: Do Peers Affect High or Low Confident Students?

This table reports how confident peers affect firm creation of less confident students and more confident students. In Panel A, we identify peers at the cohort-level; in Panel B, we identify peers at the team-level. In the first and second columns of both panels, we estimate the effect on less confident individuals; in the third and fourth columns, we estimate the effect on more confident individuals. We measure confidence based on whether the students intends to first or second major in entrepreneurship prior to interaction. *Treatment* measures the number of peers in her first year MBA cohort (in Panel A) or team (in Panel B) who intend to major in entrepreneurship. *Experienced Peer* measures the number of peers in her first year MBA cohort (in Panel A) or team (in Panel B) with a failed entrepreneurial experience. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort-level in Panel A and the team-level in Panel B.

Panel A: *Cohort* Peer Effects

	Low Confidence		High Confidence	
	(i)	(ii)	(i)	(ii)
Treatment	0.004**	0.005**	-0.001	0.002
	(2.11)	(2.45)	(-0.33)	(0.83)
Experienced Peer		-0.005		-0.010**
		(-1.53)		(-2.58)
Year FE	Yes	Yes	Yes	Yes
Gender FE	No	Yes	No	Yes
Nationality FE	No	Yes	No	Yes
Race FE	No	Yes	No	Yes
GMAT FE	No	Yes	No	Yes
Undergrad Major FE	No	Yes	No	Yes
N	1367	1367	735	735
R-squared	.019	.033	.013	.076

Panel B: *Team* Peer Effects

	Low Confidence		High Confidence	
	(i)	(ii)	(i)	(ii)
Treatment	0.016***	0.016***	0.006	0.006
	(2.82)	(2.63)	(0.41)	(0.41)
Experienced Peer		-0.008		-0.027*
		(-0.65)		(-1.68)
Year FE	Yes	Yes	Yes	Yes
Team Size FE	Yes	Yes	Yes	Yes
Gender FE	No	Yes	No	Yes
Nationality FE	No	Yes	No	Yes
Race FE	No	Yes	No	Yes
GMAT FE	No	Yes	No	Yes
Undergrad Major FE	No	Yes	No	Yes
N	1367	1367	735	735
R-squared	.017	.026	.019	.085

Table 7: Does Entrepreneurial Confidence Vary Across Gender?

This table reports that women are less confident in their entrepreneurial abilities. In Panel A we analyze the relationship between gender and intending to major in entrepreneurship. In Panel B, we analyze the relationship between gender and relative entrepreneurial confidence among the class of 2021. In Panel C, we analyze the relationship between gender and relative entrepreneurial confidence among the class of 2003-2013. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort level.

Panel A: Intended Major across Gender

	Intended Entrepreneur	
	(i)	(ii)
Female Student	-0.075***	-0.053**
	(-3.18)	(-2.18)
Year FE	Yes	Yes
Nationality FE	No	Yes
Race FE	No	Yes
GMAT FE	No	Yes
Undergrad Major FE	No	Yes
N	2102	2102
R-squared	.041	.058

Panel B: Confidence across Gender (Classes of 2021)

	Relative Entrepreneurial Confidence	
	(i)	(ii)
Female Student	-0.600***	-0.521***
	(-3.52)	(-2.99)
Intended Entrepreneur	0.484***	0.459***
	(2.95)	(2.66)
Prior Entrepreneur		0.149
		(0.49)
Nationality FE	No	Yes
Race FE	No	Yes
N	125	125
R-squared	.14	.16

Panel C: Confidence across Gender (Classes of 2003-2013)

	Relative Entrepreneurial Confidence	
	(i)	(ii)
Female Student	-0.221	-0.185
	(-1.64)	(-1.46)
Intended Entrepreneur	0.468***	0.459***
	(3.70)	(3.17)
Graduated Entrepreneur Major		0.327*
		(1.89)
Entrepreneur within 5y of MBA		0.704***
		(3.29)
Year FE	Yes	Yes
Nationality FE	No	Yes
Race FE	No	Yes
GMAT FE	No	Yes
Undergrad Major FE	No	Yes
N	373	373
R-squared	.086	.18

Table 8: Do Peer Effects Vary Across Gender?

This table reports that women are less likely to enter entrepreneurship and that confident peers disproportionately affect firm creation among women. In Panel A, we estimate the rate of firm creation within X years following graduation by gender. In Panel B, we estimate male and female peer effects on firm creation. In the first and second column, we consider both male and female peers. In the third and fourth column, we distinguish between male and female peers. *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship. *Experienced Peer* measures the number of peers in her first year MBA cohort with a failed entrepreneurial experience. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort level.

Panel A: Firm Creation across Gender

	Firm Creation (X+ Years)				
	1+ Years	2+ Years	3+ Years	4+ Years	5+ Years
Female Student	-0.012*	-0.020**	-0.027***	-0.030***	-0.032***
	(-1.68)	(-2.43)	(-2.80)	(-2.97)	(-3.07)
Intended Entrepreneur	0.013**	0.022***	0.015*	0.021**	0.029***
	(2.11)	(2.96)	(1.79)	(2.30)	(3.04)
Year FE	Yes	Yes	Yes	Yes	Yes
Nationality FE	Yes	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes	Yes
GMAT FE	Yes	Yes	Yes	Yes	Yes
Undergrad Major FE	Yes	Yes	Yes	Yes	Yes
N	2102	2102	2102	2102	2102
R-squared	.034	.038	.033	.035	.038

Panel B: Peer Effect on Firm Creation across Gender

	All Peers		Peers by Gender	
	Female	Male	Female	Male
Treatment	0.008***	0.003*		
	(3.12)	(1.83)		
Treatment (Female Peer)			0.010***	0.003
			(3.47)	(1.56)
Treatment (Male Peer)			0.007**	0.003
			(2.32)	(1.24)
Experienced Peer	-0.017***	-0.003	-0.017***	-0.003
	(-2.98)	(-1.04)	(-2.95)	(-0.98)
Intended Entrepreneur	0.008	0.022**	0.014	0.025**
	(0.73)	(2.31)	(1.20)	(2.64)
Year FE	Yes	Yes	Yes	Yes
Nationality FE	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes
GMAT FE	Yes	Yes	Yes	Yes
Undergrad Major FE	Yes	Yes	Yes	Yes
N	539	1563	539	1563
R-squared	.083	.037	.084	.037

Table 9: Do Peers Affect the Rate of Entrepreneurial Success?

This table reports that confident peers affect the proportion of successful firm creation. We condition the sample on the set of students starting a firm within three years of graduation. In the first, second, and third column, we define success as employing at least X employees. In the fourth, fifth, and six column, we define success as surviving at least X years. *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort level.

	Employment			Survival		
	2+ Emp	6+ Emp	10+ Emp	1+ Years	3+ Years	5+ Years
Treatment	0.001	0.039	0.051	0.012	0.078**	0.072*
	(0.04)	(1.10)	(1.35)	(0.31)	(2.19)	(1.82)
Intended Entrepreneur	-0.006	0.201	0.419***	0.200	0.447**	0.297*
	(-0.09)	(1.40)	(3.21)	(1.21)	(2.46)	(1.73)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Gender FE	Yes	Yes	Yes	Yes	Yes	Yes
Nationality FE	Yes	Yes	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes	Yes	Yes
GMAT FE	Yes	Yes	Yes	Yes	Yes	Yes
Undergrad Major FE	Yes	Yes	Yes	Yes	Yes	Yes
N	72	72	72	72	72	72
R-squared	.37	.49	.5	.41	.44	.37

Table 10: Do Peers Influence a Change in Major Towards Entrepreneurship?

This table reports that individuals who graduate with a major in entrepreneurship are more likely to become entrepreneurs and that confident peers influence a change in major towards entrepreneurship. In Panel A, we estimate the effect of majoring in entrepreneurship on firm creation within *X* years following graduation. In Panel B, we estimate peer effects on graduating with a major in entrepreneurship. *Graduated Entrepreneur Major* is a dummy variable equal to one if a student effectively graduates with a major in entrepreneurship. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort level.

Panel A: Does majoring in entrepreneurship impact firm creation?

	Firm Creation X Years after MBA Graduation				
	1 Year	2 Years	3 Years	4 Years	5 Years
Graduated Entrepreneur Major	0.061**	0.096***	0.092***	0.085***	0.111***
	(2.25)	(3.02)	(2.88)	(2.67)	(3.18)
Intended Entrepreneur	0.008	0.014*	0.008	0.014	0.020*
	(1.21)	(1.77)	(0.89)	(1.42)	(1.94)
Year FE	Yes	Yes	Yes	Yes	Yes
Gender FE	Yes	Yes	Yes	Yes	Yes
Nationality FE	Yes	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes	Yes
GMAT FE	Yes	Yes	Yes	Yes	Yes
Undergrad Major FE	Yes	Yes	Yes	Yes	Yes
N	2102	2102	2102	2102	2102
R-squared	.043	.054	.044	.043	.05

Panel B: Do peers influence others to major in entrepreneurship?

	Graduating with an Entrepreneurship Major	
	(i)	(ii)
Treatment	0.024**	0.023**
	(2.50)	(2.33)
Intended Entrepreneur	0.079***	0.080***
	(6.14)	(6.13)
Year FE	Yes	Yes
Gender FE	No	Yes
Nationality FE	No	Yes
Race FE	No	Yes
GMAT FE	No	Yes
Undergrad Major FE	No	Yes
N	2102	2102
R-squared	.04	.058

Table 11: When do Peers Impact Entrepreneurship?

This table reports how confident peers affect firm creation under alternate treatment measures. In the first and second column of Panel A, *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship and have a GMAT score in the bottom 75th percentile of Kelley MBA students. In the third and fourth column of Panel A, *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship and have a GMAT score in the top 25th percentile of Kelley MBA students. In the first and second column of Panel B, *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship, yet do not start a firm within five years of graduation. In the third and fourth column of Panel B, *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship, yet do not graduate with a major in entrepreneurship. *Experienced Peer* measures the number of peers in her first year MBA cohort with a failed entrepreneurial experience. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort level.

Panel A: Distinguishing Low and High Skill Peers

	Low GMAT Student		High GMAT Student	
	(i)	(ii)	(i)	(ii)
Treatment (Low GMAT Peer)	0.004***		-0.002	
	(3.60)		(-0.91)	
Treatment (High GMAT Peer)		0.000		0.004***
		(0.15)		(2.89)
Experienced Peer	-0.011***	-0.011***	0.000	-0.002
	(-4.55)	(-3.23)	(0.14)	(-0.71)
Intended Entrepreneur	0.024**	0.022*	0.010	0.012
	(2.12)	(1.96)	(0.89)	(1.11)
Year FE	Yes	Yes	Yes	Yes
Gender FE	Yes	Yes	Yes	Yes
Nationality FE	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes
GMAT FE	Yes	Yes	Yes	Yes
Undergrad Major FE	Yes	Yes	Yes	Yes
N	920	920	1182	1182
R-squared	.047	.044	.049	.05

Panel B: Rejecting Learning about Entrepreneurial Projects

	Without Firm Creation		Without Graduating with Major	
	(i)	(ii)	(i)	(ii)
Treatment (Limited Knowledge)	0.004**	0.006***	0.002	0.004**
	(2.54)	(3.17)	(1.59)	(2.65)
Experienced Peer		-0.009***		-0.007***
		(-3.04)		(-3.22)
Intended Entrepreneur	0.021***	0.020**	0.019**	0.018**
	(2.74)	(2.45)	(2.68)	(2.37)
Year FE	Yes	Yes	Yes	Yes
Gender FE	No	Yes	No	Yes
Nationality FE	No	Yes	No	Yes
Race FE	No	Yes	No	Yes
GMAT FE	No	Yes	No	Yes
Undergrad Major FE	No	Yes	No	Yes
N	2102	2102	2102	2102
R-squared	.017	.037	.016	.035

Table 12: Do Peers Affect Classroom Performance?

This table reports whether confident peers affect classroom performance. In the first and second column, we define peers at the cohort-level; in the third and fourth column, we define peers at the team-level. *Treatment* measures the number of peers in her first year MBA cohort or team who intend to major in entrepreneurship. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort-level in the first and second column and the team-level in the third and fourth column.

	Cohort-Level Peers		Team-Level Peers	
	(i)	(ii)	(i)	(ii)
Treatment	-0.005	-0.002		
	(-1.07)	(-0.52)		
Treatment			0.020	0.029
			(0.82)	(1.35)
Intended Entrepreneur	0.011	-0.026	0.015	-0.024
	(0.35)	(-1.05)	(0.49)	(-0.94)
Year FE	Yes	Yes	Yes	Yes
Nationality FE	No	Yes	No	Yes
Race FE	No	Yes	No	Yes
GMAT FE	No	Yes	No	Yes
Undergrad Major FE	No	Yes	No	Yes
N	1933	1933	1933	1933
R-squared	.13	.35	.13	.35

Table 13: Do Peers Affect Risk Aversion and Optimism?

This table reports whether confident peers lead to a chiange in optmism, risk/ambiguity aversion, and workplace preferences. We measure changes by collecting survey response of the class of 2021 prior to treatment in the summer of 2019 and post-treatment in November of 2019. *Treatment* is defined as a team-member intending to major in entrepreneurship. The first column measures a change in economic optimism, the second column measures the change in non-economic optimism, the third column measure changes in risk aversion, the fourth column measures changes in ambiguity aversion, the fifth column measures changes in the preference for independence, and the sixth column measures changes in the preference for workplace variety. We control for whether the student previously founded a firm prior to the MBA and whether the student intended to major in entrepreneurship. We also control for differences in graduation year, gender, nationality, and race. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level.

	Δ Optimism		Δ Risk/Ambiguity Aversion		Δ Preferences	
	Economic	Noneconomic	Risk	Ambiguity	Independence	Variety
Treatment	-0.024	0.378	0.671***	0.164	-0.081	0.141
	(-0.10)	(0.84)	(2.81)	(0.67)	(-0.51)	(1.10)
Intended Entrepreneur	0.070	0.533	0.724**	0.158	-0.258	0.183
	(0.26)	(0.94)	(2.38)	(0.49)	(-1.36)	(1.17)
Prior Entrepreneur	-0.810*	-1.711***	-0.649	0.797	0.023	-0.056
	(-1.86)	(-2.85)	(-1.19)	(1.43)	(0.09)	(-0.23)
Gender FE	Yes	Yes	Yes	Yes	Yes	Yes
Nationality FE	Yes	Yes	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes	Yes	Yes
Initial Confidence Measures	Yes	Yes	Yes	Yes	Yes	Yes
N	104	104	105	105	104	105
R-squared	.53	.31	.48	.47	.25	.41

Table 14: Do Peers in Other Intended Majors Affect Firm Creation?

This table reports how peers in other intended majors influence the rate of firm creation. *Treatment (Finance)* measures the number of peers in her first year MBA cohort who intend to major in finance (and likewise for marketing, management, operations, and strategy). *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort level.

	Firm Creation				
	(i)	(ii)	(iii)	(iv)	(v)
Treatment (Finance)	-0.000				
	(-0.38)				
Treatment (Marketing)		0.001			
		(0.65)			
Treatment (Management)			-0.000		
			(-0.12)		
Treatment (Operations)				-0.001	
				(-0.50)	
Treatment (Strategy)					0.001
					(1.19)
Intended Entrepreneur	0.015*	0.015*	0.015*	0.015*	0.015*
	(1.99)	(1.97)	(1.99)	(1.99)	(1.99)
Year FE	Yes	Yes	Yes	Yes	Yes
Gender FE	Yes	Yes	Yes	Yes	Yes
Nationality FE	Yes	Yes	Yes	Yes	Yes
Race FE	Yes	Yes	Yes	Yes	Yes
GMAT FE	Yes	Yes	Yes	Yes	Yes
Undergrad Major FE	Yes	Yes	Yes	Yes	Yes
N					
R-squared	2102	2102	2102	2102	2102
r2	.033	.033	.033	.033	.033

Table 15: How Different are Cohorts/Teams with a High Proportion of Intended Entrepreneurs ?

This table reports whether cohort/teams with a high proportion of intended entrepreneurs (above the median) also differ across other measures. *Above Median* is a dummy variable equal to one if the proportion of intended entrepreneurs (students intending to first of second major in entrepreneurship) in the cohort/team is above the median. Panel A consider cohorts, while Panel B considers teams. The first column measures the proportion of cohort/team members with an online business networking profile, the second column measures the proportion of female students, the third column measures the mean GMAT score, the fourth column measures the proportion of international students, and the fifth column measures the proportion of U.S. racial minority students. We include year fixed effects in the cohort-level analysis and cohort fixed effects in the team-level analysis. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level.

Panel A: *Cohort* Level

	Cohort Size	Female	GMAT Score	International	U.S. Minority
Above Median	0.120	0.010	-4.181	-0.016	0.025
	(0.07)	(0.62)	(-1.03)	(-0.80)	(1.09)
Constant	60.384***	0.245***	654.727***	0.334***	0.200***
	(63.10)	(26.38)	(289.77)	(29.43)	(15.86)
Year FE	Yes	Yes	Yes	Yes	Yes
N	36	36	36	36	36
R-squared	.95	.84	.8	.89	.7

Panel B: *Team* Level

	Team Size	Female	GMAT Score	International	U.S. Minority
Above Median	-0.083	-0.015	-0.474	-0.017	0.007
	(-1.28)	(-1.15)	(-0.20)	(-1.21)	(0.45)
Constant	3.890***	0.256***	652.939***	0.331***	0.208***
	(83.10)	(28.14)	(384.69)	(32.05)	(18.54)
Cohort FE	Yes	Yes	Yes	Yes	Yes
N	566	566	566	566	566
R-squared	.35	.13	.16	.2	.084

Figure 1: Firm Creation by MBA Graduation Year

This figure illustrates the rate of firm creation by MBA Graduation year. We consider any firm created by an MBA student within 3 years after graduation.

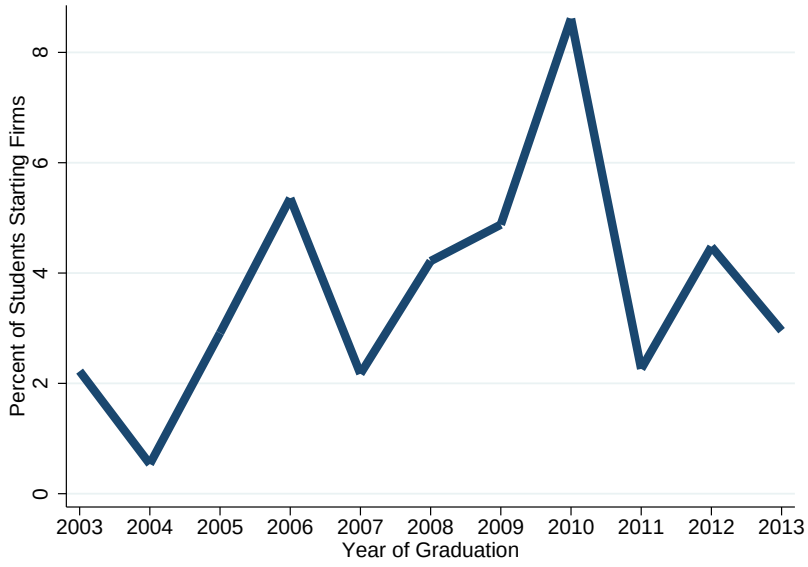


Figure 2: Cumulative Firm Creation By Intention to Major in Entrepreneurship

This figure illustrates the rate of firm creation for students intending and not intending to major in entrepreneurship. The light blue line reports the rate for students intending to major in entrepreneurship, and the dark blue line for students intending to major in any other majors.

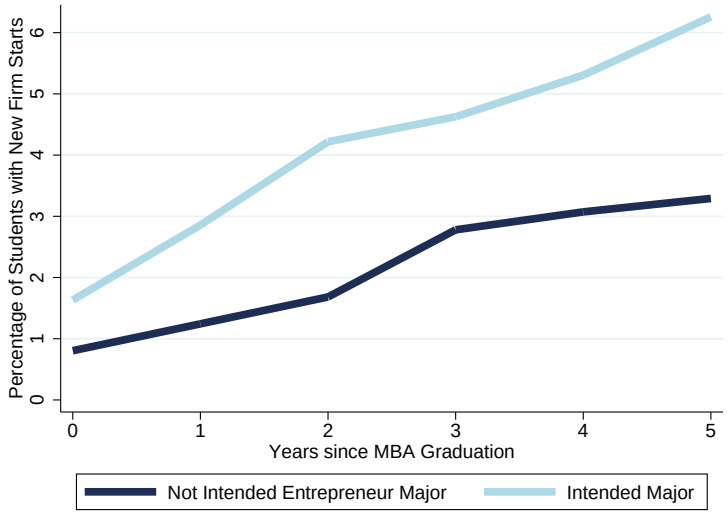


Figure 3: Cumulative Firm Creation By Major in Entrepreneurship at Graduation

This figure illustrates the rate of firm creation for students graduating with a major in entrepreneurship and graduating without a major in entrepreneurship. This figure differs from the prior figure by using actual graduation majors instead of intended majors declared in the application process.

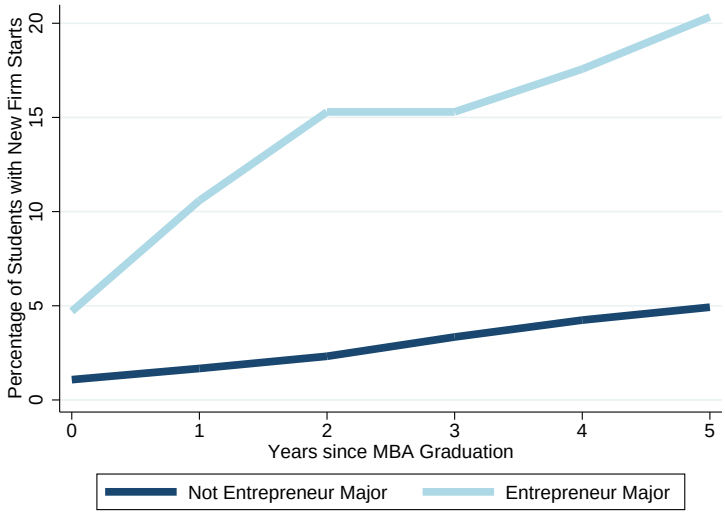


Figure 4: Cumulative Firm Creation By Start-Up Experience at Graduation

This figure illustrates the rate of firm creation for students who choose to work at a start-up at graduation versus students that choose to work at other established companies. A start-up is defined as a firm that is small (10 or fewer employees) or young (founded after the year of MBA graduation).

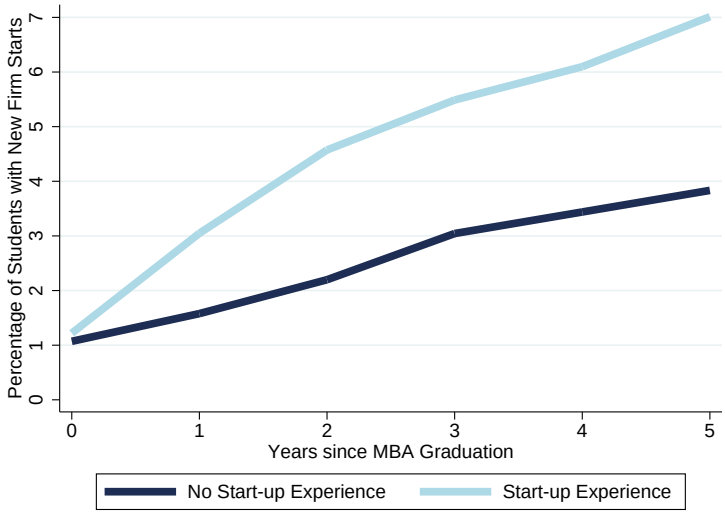


Figure 5: Age of New Firms

This figure illustrates the percent of firms, which were founded by entrepreneurs in the sample, that survive zero to five years after creation.

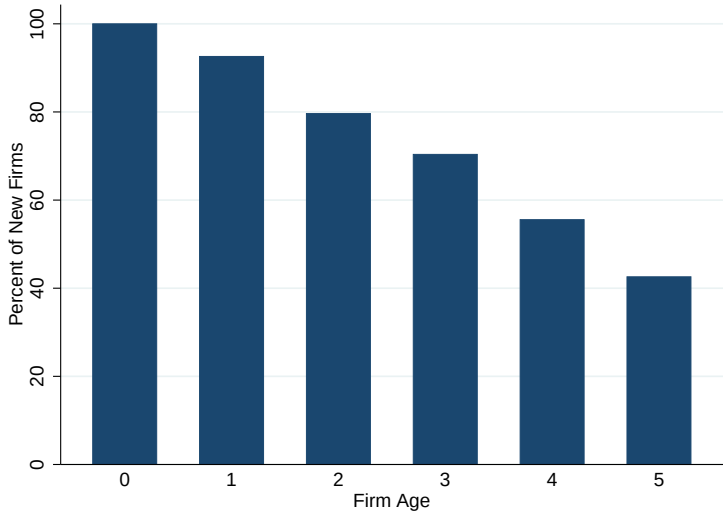


Figure 6: Employment of New Firms

This figure illustrates the percent of firms, which were founded by entrepreneurs in the sample, that employ zero to ten employees (not including founder).

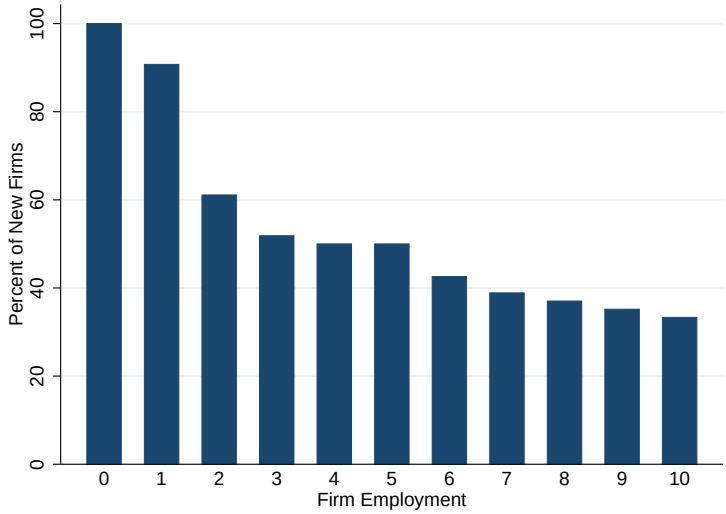


Figure 7: Overconfidence of Intended Entrepreneurs

This figure illustrates the survey responses to question Q1 (described in section 4.2) of current MBA students. Students are asked to report their expected entrepreneurial ability relative to other MBA students. We distinguish between students intending to major in entrepreneurship according to the MBA application and all other students. The first columns measure the percent of students that report being in the bottom 10% of the distribution. The second columns measure the percent of students that report being in the 10-30th percentile of the distribution. The third columns measure the percent of students that report being in the 30-50th percentile, while the fourth columns report the percent of students that report being above the 50-70th percentile. The fifth colums are the percent of students reporting their ability above the 70th percentile.

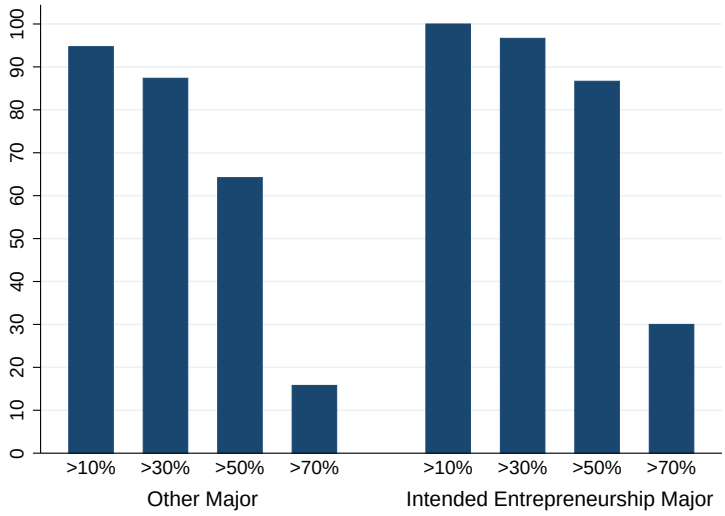


Figure 8: Likelihood of Entrepreneurship from Survey

This figure illustrates the survey responses to question Q1 (described in section 5.2) of treated students. Students with a positive team member are asked whether the team member increased/decreased the likelihood of firm creation.

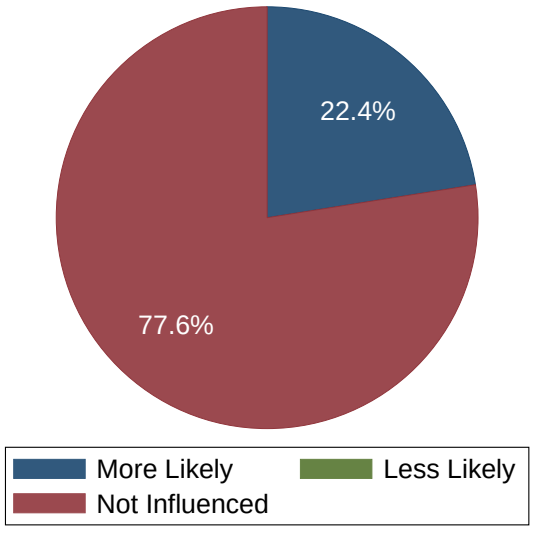


Figure 9: Behavioral Traits vs. Learning from Survey

This figure illustrates the survey responses to question Q2 (described in section 5.2) of treated students. Students reporting a positive effect from a team member are asked whether the effect is driven by a change in views towards entrepreneurship or learning about entrepreneurship.

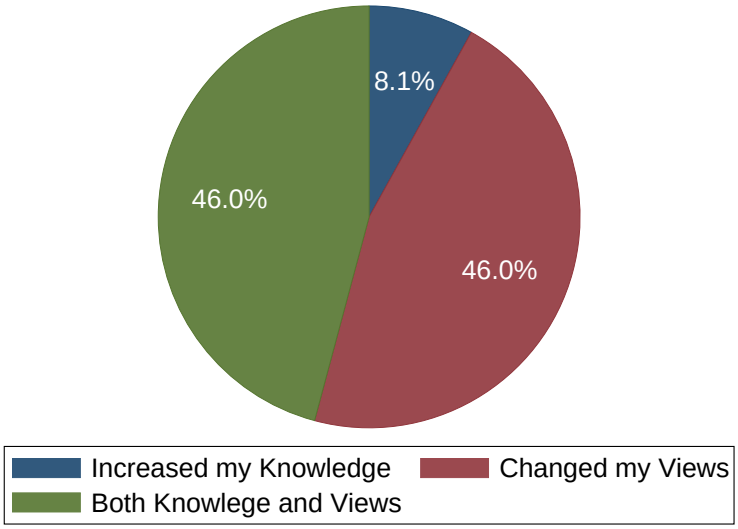


Figure 10: Behavioral Channels from Survey

This figure illustrates the survey responses to question Q3 (described in section 5.2) of treated students. Students reporting a change in views towards entrepreneurship are asked how their views changed and offered five potential responses: (i) confidence in entrepreneurial ability, i(i) willingness to take risk in starting a business, (iii) increased expectations of the rewards of starting a business, (iv) greater appreciation for non-monetary benefits, or (v) other.

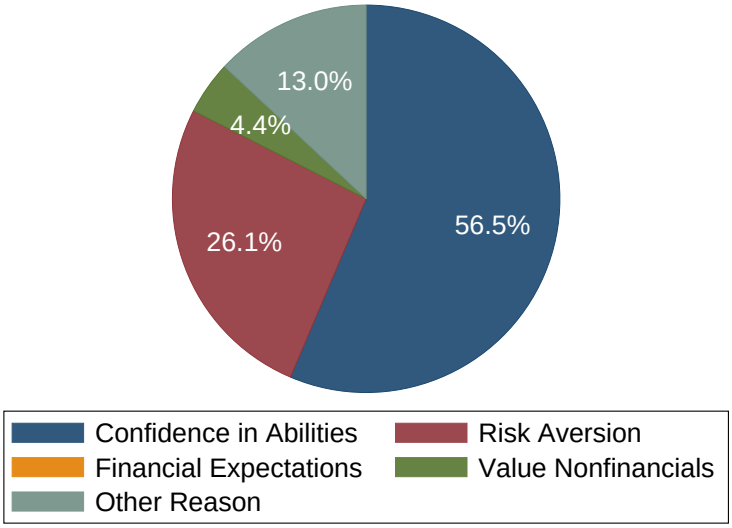
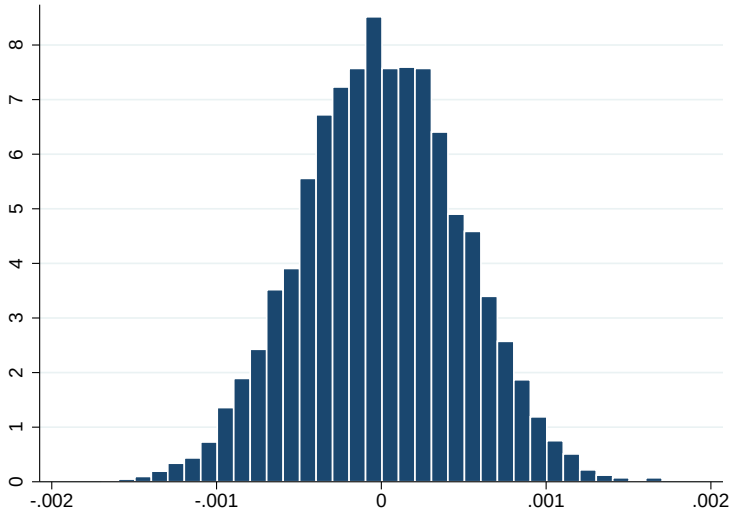


Figure 11: Estimated Effect of Placebo Cohort Members

This figure illustrates the estimated peer effect of placebo cohort members intending to major in entrepreneurship. Students are randomly assigned across all cohorts and then we estimate how placebo peers intending to major in entrepreneurship impact the rate of firm creation. The exercise is then repeated ten-thousand times. In Panel A, we plot the estimated coefficient all the thousand regressions and in Panel B, we plot the T-statstic across all thousand regressions.

Panel A: Coefficients of Placebo *Cohort* Peer Effects on Firm Creation



Panel B: T-Statistics of Placebo *Cohort* Peer Effects on Firm Creation

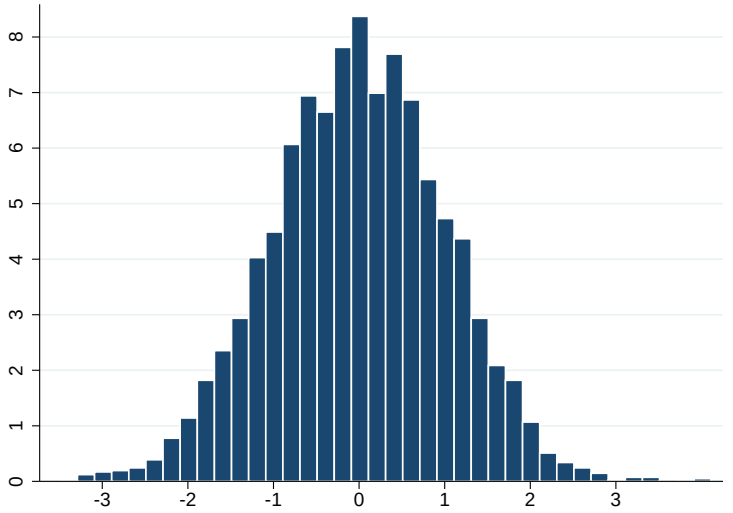
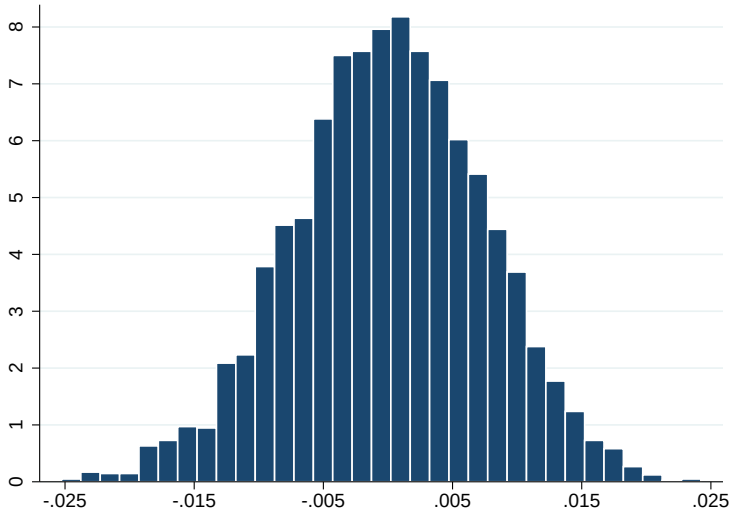


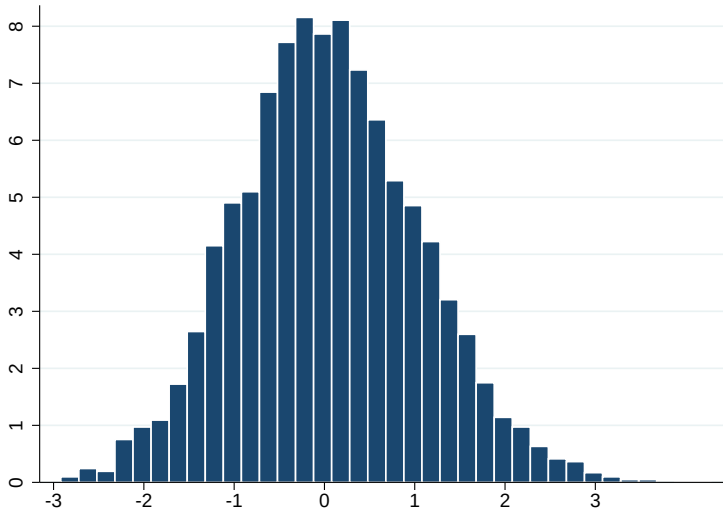
Figure 12: Estimated Effect of Placebo Team Members

This figure illustrates the estimated peer effect of placebo team members intending to major in entrepreneurship. Students are randomly assigned across all teams and then we estimate how placebo peers intending to major in entrepreneurship impact the rate of firm creation. The exercise is then repeated ten-thousand times. In Panel A, we plot the estimated coefficient across all thousand regressions and in Panel B, we plot the T-statstic across all thousand regressions.

Panel A: Coefficients of Placebo *Team* Peer Effects on Firm Creation



Panel B: T-Statistics of Placebo *Team* Peer Effects on Firm Creation



Appendix

Relationship between Intended Major and Entrepreneurial Confidence.

This section describes how we model the relationship between an individual's intention to major in entrepreneurship and entrepreneurial confidence. For the purpose of this discussion, assume confidence is one of many factors that predict an individual's intention to enter entrepreneurship–based on prior literature including Åstebro et al. (2007)— and that the relationship is linear:

$$Intended\ Entrepreneur_i \quad = \quad \beta \times Confidence_i + \gamma \times Controls_i + \varepsilon_i$$

where $Intended\ Entrepreneur$ measures the intention of individual i to start a firm and $Confidence$ measures an individual's confidence in their entrepreneurial abilities. In addition, we consider there are a range of conditioning variables $Controls$ that also influence the decision; for simplicity we assume these variables also relate to the decision in a linear fashion. Last, ε captures any unobserved heterogeneity in the relationship unobservable to the econometrician. Then, assuming our estimation yields estimates $\hat{\gamma}$ and $\hat{\beta}$, we can define imputed $Confidence$ by inverting the relationship assuming β is not equal to 0:

$$\widehat{Confidence}_i \quad = \quad \hat{\beta}^{-1} \times Intended\ Entrepreneur - \hat{\gamma} \times \hat{\beta}^{-1} \times Controls$$

Therefore, we are able to develop an estimate of entrepreneurial confidence as a linear regression model where $\phi = \beta^{-1}$ and $\theta = -\gamma/\beta$. Of course, this estimation is still subject to measurement error, leading to issues in our methodology. Assuming the specification above, measurement error is of the form:

$$\widehat{Confidence}_i \quad = \quad \hat{\beta}^{-1} \times (\gamma - \hat{\gamma}) \times Controls + \hat{\beta}^{-1} \times \beta \times Confidence_i + \nu_i$$

Discussion of Three Different Surveys.

Our analysis includes two separate surveys. First, we survey the Indiana University MBA classes of 2021 during the summer of 2019 prior to interaction. Of the 137 students contacted in total, we received a total of 125 responses, or a response rate of over 90%. We then resurvey these students in November of 2019

and receive a total of 103 replies. Second, we survey past alumni from the classes of 2003-2013. Of the 2,189 students (including students that previously started a firm); we received a total of 373 responses, or a response rate of 17%. Third, we survey a subsample of the alumni of 2003-2013, specifically that were previously connected to a team member intending to major in entrepreneurship. Among the 495 prior students contacted from the classes of 2003-2013, we received 185 responses, or a response rate of 37%. We outline the questions and potential multiple choice options for each survey below.

Survey of Students from the Class of 2021.

Q1: Do you believe you would be worse, equal, or better at starting a company relative to the other MBA students at Kelley?

a) Bottom 10% of students
b) Better than 10% of students
c) Better than 30% of students
d) Better than 50% of students
e) Better than 70% of students
f) Better than 90% of students

Q2: How confident are you in your ability to start a company?

a) Not confident
b) Not very confident
c) Somewhat confident
d) Confident
e) Very confident

Q3: Among past IU graduates that started a firm, only 5 to 10% employ 10 or more workers within the first year. What is the likelihood you personally start a firm that employs 10 or more workers within the first year?

a) 0-1%

b) 1-2%

c) 2-5%

d) 5-10%

e) 10-15%

f) 15-20%

g) 20-30%

h) 30-50%

i) >50%

Q4: Over the past 90 years, the US stock market has observed an average return of 9% a year. What will be the average annual US stock market return over the next ten years?

a) 2-4% each year

b) 4-6% each year

c) 6-8% each year

d) 8-10% each year

e) 10-12% each year

f) 12-14% each year

g) 14-16% each year

h) above 16% each year

Q5: Among people born in the US in 1919, 1.4% are still alive in 2019. What is the likelihood you live to age 100?

a) 0-1%

b) 1-2%

c) 2-5%

d) 5-10%

e) 10-15%

f) 15-20%

g) 20-30%

h) 30-50%

i) >50%

Q6: How much would you pay for a lottery ticket that gives you a 50% probability of winning $500 and 50% of winning nothing?

a) Less than $50

b) 50-$100

c) 100-$150

d) 150-$200

e) 200-$250

f) More than $250

1. [Q7:] How much would you pay for a lottery ticket that gives you a x% probability of winning $500? (x is between 25% and 75%)

a) Less than $50

b) 50-$100

c) 100-$150

d) 150-$200

e) 200-$250

f) More than $250

Q8: How important is it for you to be in control of your daily schedule?

a) Not at all important

b) A little important

c) Somewhat important

d) Important

e) Very Important

Q9: How important is it for you to have a job providing a variety of different tasks?

a) Not at all important

b) A little important

c) Somewhat important

d) Important

e) Very Important

Survey of All Students from the Class of 2003-2013.

Q1: Do you believe you would be worse, equal, or better at starting a company relative to the other MBA graduates from your class at Kelley?

a) Bottom 10% of students

b) Better than 10% of students

c) Better than 30% of students

d) Better than 50% of students

e) Better than 70% of students

f) Better than 90% of students

Q2: How confident are you in your ability to start a company?

a) Not confident

b) Not very confident

c) Somewhat confident

d) Confident

e) Very confident

Q3: Among past IU graduates that started a firm, only 5 to 10% employ 10 or more workers within the first year. What is the likelihood you personally start a firm that employs 10 or more workers within the first year?

a) 0-1%

b) 1-2%

c) 2-5%

d) 5-10%

e) 10-15%

f) 15-20%

g) 20-30%

h) 30-50%

i) >50%

Survey of Treated Students from the Class of 2003-2013.

Q1: In your first-year at IU-Kelley, one of your teammates was interested in becoming an entrepreneur and wanted to choose entrepreneurship as his/her MBA major. Did the team member impact the likelihood that you would started (or already started) a company?

a) Yes

b) No

Q2: If so, how did he/she affect your likelihood?

a) I learned from my team member about entrepreneurship

b) I changed by views towards entrepreneurship

c) Both a change in views and learning

Q3: If he/she changed your views of entrepreneurship, in what what way?

a) He/she influenced my confidence about my abilities

b) He/she changed by views about the risk of business ownership

c) He/she changed my views about the financial benefits

d) He/she changed my views about the non-monetary benefits

e) Other