

The Behavioral Approach to Entrepreneurship

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Abstract: While a subset of entrepreneurs makes large gains by becoming self-employed, many make less than they would in paid employment and failure is frequent. Yet, individuals persist as entrepreneurs, including those who fail and try again. This suggests that some non-pecuniary feature of entrepreneurs' preferences must be quite different from the general population. This chapter explores how risk preferences, preferences for autonomy, time preferences, preferences for competition, and social preferences may differ for entrepreneurs using a behavioral economics perspective.

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I. Introduction

Entrepreneurship is a tough gig. While a subset of entrepreneurs makes large gains by becoming self-employed, the median entrepreneur makes less than they would in paid employment (Hamilton, 2000). Moreover, failure is frequent. Evans and Leighton (1989) estimate that approximately half of new entrepreneurial entrants return to waged work. Even for start-ups backed by venture capital, which are more likely to find success (e.g. Gornall and Strebulaev, 2020), entrepreneurs face high levels of risk relative to the likely returns. Hall and Woodward (2010) find that given reasonable risk aversion parameters and salary levels most entrepreneurs should prefer salaried employment. Nonetheless, individuals persist as entrepreneurs, including many who try multiple times. According to data in the Census Bureau's Annual Survey of Entrepreneurs (2016), 20% of entrepreneurs have previously owned at least 1 business prior to the start of their current business. This suggests that some non-pecuniary feature of entrepreneurs' preferences must be quite different from the general population.

Characterizing the entrepreneur as a unique individual with different preferences from the non-entrepreneur is not novel. The 18th century early economic scholar, Richard Cantillon, in his essay on the nature of business ('Essai sur la Nature du Commerce en General,' 1755) first identified entrepreneurs as those with higher risk tolerance willing to serve in an arbitrage role where they buy and sell under uncertainty for profit. In the 20th century, Frank Knight (1921), extended the work of Cantillon by defining entrepreneurs as individuals who hold a larger set of distinguishing characteristics than just a preference for taking on more risk. He hypothesized that entrepreneurs would have foresight and successful entrepreneurs would also be better at convincing other agents in the society of their vision (see Van Praag, 1999, for an insightful discussion of the historical thought of entrepreneurship).

Behavioral and experimental economics can establish how entrepreneurs actually differ from non-entrepreneurs, but why does it matter? There are two main policy arguments for why the characteristics of an entrepreneur may matter. First, entrepreneurs' characteristics affect selection. There is a growing trend to invest in general entrepreneurship education by both private and public sources. Universities in particular have directed large sums, both private and public, towards entrepreneurship programs. A 2010 OECD report on university entrepreneurship support surveyed 16 universities with major entrepreneurship programs and found that seven used private donations to support their programs, with five covering at least 25% or more of their activities (Organisation for Economic Co-operation and Development, University Entrepreneurship Support: Policy Issues, Good Practices and Recommendations, 2010). In the same report, 11 of the 16 universities cover more than 50% of their activities with public funding. Broader examples beyond the university level also exist. Denmark established the "Partnership for Education in Entrepreneurship" to support the development of entrepreneurship education at all levels, including the primary school level, and this idea is not unique to Denmark (see Huber et al., 2014 for a similar example in the Netherlands). However, the ability of general entrepreneurial education to support entrepreneurship growth does not appear promising. Oosterbeek et al. (2010) found a negative link between entrepreneurship education and intention to become an entrepreneur and Lerner and Malmendier (2013) found that exposure to more entrepreneurial peers in MBA cohorts – an informal form of entrepreneurial education – also decreased entrepreneurship levels. Supporters of entrepreneurship education have limited resources, so instead of applying blanket funds that encourage everyone to be an entrepreneur through general education programs, understanding who is "in the zone" and likely to select into entrepreneurship can redirect resources towards more effective usage. Second, entrepreneurs' characteristics can potentially affect outcomes after the start-up process. Unfocused policies that support entrepreneurship without considering the probability of success are unlikely to have much impact. For example, the Growing America through Entrepreneurship (GATE)

project was a large-scale free entrepreneurship training program. It targeted individuals interested starting a business, but otherwise assignment to training was random. The program's impact was minimal (Fairlie et al., 2015), implying that directing funding towards *anyone* that wants to be an entrepreneur is likely to waste valuable resources. The limited funds available to support entrepreneurs can be better used by targeting those who both want to be entrepreneurs *and* are likely to found successful ventures. Private funders (e.g. venture capitalists) already try to pick winners, but an improved understanding of the relationship between personal characteristics and entrepreneurial success can improve the process.

While there is a broad swath of characteristics that may differ between entrepreneurs and non-entrepreneurs this chapter focuses on preferences. Specifically, it focuses on risk preferences, preferences for autonomy, time preferences, preferences for competition, and social preferences. The approach is to survey how these characteristics have been analyzed using the approach of behavioral economics, broadly defined as learning to understand how entrepreneurs make choices rather than normatively asserting how they should behave.

The chapter begins with the type of preference most associated with entrepreneurship: risk tolerance. The works of Cantillon and Knight introduced the idea that entrepreneurs are distinguished by higher risk tolerance than other non-entrepreneurs. Building on Knight's framework, Kihlstrom and Laffont (1979) developed a general equilibrium model where "individuals decide whether to become entrepreneurs or workers by comparing the risky returns of entrepreneurship with the nonrisky wage determined by the competitive labor market." (p. 745). This model implies selection into entrepreneurship will favor individuals with higher risk tolerance. Aside from theoretical models, it's intuitive to think that entrepreneurs would exhibit a higher degree of risk tolerance than others, particularly if they have outside employment.

While risk is one of the most commonly assumed and therefore studied preferences, according to Shane (2008), "most people start businesses simply because they just don't like working for someone else." This suggests that there are non-pecuniary factors at play when deciding to become an entrepreneur and conventional models based on solely exploiting risky profit opportunities might miss an important driver of behavior (Croson and Minniti, 2012). In line with this, the second preference examined is the preference for autonomy.

Once a nascent entrepreneur has developed a concept for a business, the process of organizing begins. While the exact process varies by industry, it is typically complex. Common tasks include working to obtain funding, seeking out the necessary resources to begin the work, taking care of the legalities of initiating the firm and developing contracts. According to Reynolds and White (1997) the typical start-up process takes one year and that is only to firm formation. The amount of time before obtaining profits is even longer, taking far more time than a salaried employment search, where the large majority take under a year (Bureau of Labor Statistics, The Economics Daily, 2012). The lag between initial investments and returns is likely a concern for nascent entrepreneurs, suggesting that the time preferences of entrepreneurs and non-entrepreneurs differ. This is the third type of preference examined in this chapter.

The fourth preference examined is the preference for competition. Competition is an inherent characteristic of entrepreneurship. Entrepreneurs must compete to be the first to exploit a discovered opportunity. They must also compete against other entrepreneurs to obtain funding for their idea and with less than 0.03% of new firms created in the US financed by venture capital (Shane, 2008), the competition is fierce. Once past the start-up phase, a business must also evolve to maintain a competitive advantage over others. "One of the key questions for entrepreneurial strategy concerns how the entrepreneur appropriates the returns to the exploitation of an entrepreneurial opportunity, given that the act of

exploitation provides information to potential competitors about how to imitate the entrepreneur's actions (Shane, 2003, p. 195).” Given the competitive landscape faced by entrepreneurs, it seems probable that their preferences for competition would differ from the general population.

The final preference category is social preferences. In contrast to other preference categories, the predictions for social preferences are somewhat ambiguous. On one hand, the idea that an entrepreneur may have social motivations beyond pure profit may appear somewhat counter-intuitive since so much focus has been on the profit motive. Many entrepreneurs form non-profits, but Glaeser and Shleifer (2001) demonstrate how the non-profit organizational form can be explained even without the entrepreneur having altruistic preferences, as entrepreneurs can use the weakened profit motive as a signal to improve contracting. However, while a non-profit need not imply altruism, Occam's Razor suggests altruism as a likely explanation. Likewise, business success is often measured by job creation which may entail an altruistic aspect for the entrepreneur, and prominent entrepreneurs such as Rockefeller or more recently Gates are famous for their philanthropic efforts. At a more local level, experienced entrepreneurs often serve as mentors to nascent entrepreneurs through both formal organizations and informal channels. In sum, it is not obvious how much altruism matters for entrepreneurs, or how the altruistic tendency of entrepreneurs differs from the general population, making it a natural point of inquiry for behavioral economics.

In each of the preference categories, the evidence for differential characteristics is presented from both the field and experimental sources. Considering the evidence from both sources is important because there are clear methodological differences. Field evidence is typically survey based and non-incentivized while experimental economics stresses the use of incentivized environments to study decision making. In some lucky cases the results align, demonstrating robustness, but differences are the more typical case. While a complete analysis of each type of methodology is beyond the scope of this chapter, their strengths and weaknesses will be examined to the extent that they help explain potential differences in results. The overall intent is to provide a survey and critical review of current research and to help set an agenda for future research.

II. Preferences

Risk Preferences

Models like Kihlstrom and Laffont imply higher risk tolerance for entrepreneurs, and it is commonly accepted that a willingness to take risk is a central feature of entrepreneurship. But is this merely an unfounded stereotype, or are entrepreneurs actually more risk loving than non-entrepreneurs?

The initial approach to answering this question employed survey questions and the majority of survey-based studies use one of two basic approaches to measure risk attitudes of entrepreneurs. In the first approach, decisions are gathered for hypothetical scenarios. For example, a frequently adopted version developed by Barsky et al. (1997) offers a series of job/lifetime income choices using the staircase procedure (Cornsweet, 1962):

Suppose that you are the only income earner in the family, and you have a good job guaranteed to give your current (family) income every year for life. You are given the opportunity to take a new and equally good job, with a 50–50 chance it will double your (family) income and a 50–50 chance that it will cut your (family) income by a third. Would you take the new job?

If the respondent answers yes, the next question ratchets up the riskiness of the new job with the goal of discovering how much risk the respondent is willing to bear.

Suppose the chances were 50–50 that it would double your (family) income, and 50–50 that it would cut it in half. Would you still take the new job?

If the answer was no, the next question would lower the riskiness of the job to find how little risk is required to get the respondent to take the new job.

Suppose the chances were 50–50 that it would double your (family) income and 50–50 that it would cut it by 20 percent. Would you then take the new job?

In the second approach, individuals are directly asked about their risk preferences. For example, many studies employ the general risk question from the German Socio Economic Panel (SOEP) that Dohmen et al. (2011) popularized:

On a scale from 0 to 10, where 0 indicates not willing and 10 indicates very willing, how willing are you to take risks, in general?

In the first approach, the answers to the hypothetical questions are used to categorize the respondent into a risk category, whereas in the second approach, individuals are asked to directly categorize themselves.

Van Praag and Cramer (2001) find support for higher risk tolerance in a study of Dutch entrepreneurs. They take the first approach to measuring risk, using a survey question that asks the individual's reservation price for a lottery ticket. They found that non-entrepreneurs responded with significantly lower reservation prices than entrepreneurs.

Ahn (2010) examines survey data from the National Longitudinal Survey of Youth (NLSY), which uses a set of hypothetical scenarios from Barsky et al. (1997) and finds a positive relationship between risk tolerance and self-employment. Caliendo et al. (2014), drawing on data from the German SOEP, find a positive relationship between an individual's perception of their risk tolerance and both the probability of self-employment and entry into self-employment.

Hacamo and Kleiner (2019) also find evidence that entrepreneurs are more risk tolerant than non-entrepreneurs in a dataset compiled using LinkedIn. Risk attitudes are measured using a simple version of the first approach where individuals are assigned to risk categories using hypothetical survey questions about willingness to pay for lottery tickets. Interestingly, Hacamo and Kleiner not only compare the risk attitudes of entrepreneurs and non-entrepreneurs, they also compare risk tolerance between entrepreneurs. Entrepreneurs who graduated during periods of recession and decreased labor market opportunities are more risk averse than entrepreneurs who graduated in other years. This yields a nuanced story about entry into entrepreneurship. Entry is driven both by personal characteristics such as risk attitudes and economic circumstances. In a strong economy, there are individuals in wage employment who would be willing to become entrepreneurs if remaining in wage employment became less attractive due to a weak economy, and entrepreneurial skill differences do not appear to drive sorting as performance is no different for those that chose entrepreneurship in recessions. If one assumes that rational choice drives entry into entrepreneurship, this suggests that potential entrepreneurs are poor at estimating their likelihood of success.

The preceding leads to an important issue in studying the relationship between risk attitudes and entrepreneurship. Hacamo and Kleiner think carefully about the selection process into entrepreneurship, but, like much of the literature, they assume that risk attitudes are fixed and therefore exogenous. However, evidence comparing the macroeconomic conditions experienced by individuals and their risk attitudes (Malmendier and Nagel, 2011; Cohn et al. 2015) suggests that risk attitudes are *not* stable. Vis-à-vis entrepreneurship, it is plausible that becoming an entrepreneurs may affect an individual's risk

attitudes or that macroeconomics events may cause both changes in risk attitudes and the likelihood of entering self-employment. Either scenario implies that risk attitudes are endogenous. An IV approach may therefore be a better way of studying the entry decision into entrepreneurship. De Blasio et al. (2018) use exposure to earthquakes as an instrument for responses to a question on risk aversion from the Bank of Italy Survey of Household Income and Wealth (SHIW). This question, like the risk question from the German SOEP, asks individuals to categorize themselves; in the SHIW, the categorization is based on preferences for financial investments. De Blasio et al. find that risk aversion significantly reduces the probability an individual becomes an entrepreneur. While this result gives us some confidence in the preceding work that ignores endogeneity, more work of this type is certainly needed.

The study of risk preferences of entrepreneurs is also common outside of the discipline of economics. Stewart and Roth (2001) conducted a meta-analysis of risk propensity for entrepreneurs across 12 studies focused in the fields of management and psychology. Many of these studies compared managers to founders, which is generally favored as an apples-to-apples comparison approach. In some cases, however, an additional differentiation was made between income-based entrepreneurs (i.e. a small business owner whose main goal is to generate family income) and growth-oriented entrepreneurs. Overall the results support the idea that entrepreneurs have higher risk tolerance. In the comparison of managers to entrepreneurs, entrepreneurs are found to have a moderately higher risk propensity. The effects were even stronger when focusing on the subset of growth-oriented entrepreneurs.

In sum, the survey evidence largely supports the hypothesis that entrepreneurs have higher risk tolerance than others. However, all of the previously described studies relied on non-incentivized survey measures. There exists strong evidence that preferences elicited using hypothetical methods are systematically biased from those revealed in an equivalent incentivized environment (e.g. Holt and Laury 2002, 2005; Harrison, 2006). Therefore, the next part of this section turns to studies using incentivized measures of risk attitudes.

Before going into the details of any particular study, an understanding of the relevant methodology is necessary. Experimental economics has developed multiple incentivized measures of risk attitudes. The most commonly adopted protocol is the multiple price list (MPL) approach popularized by Holt and Laury (2002). Typically, experimental subjects are confronted with a list of binary choices between gambles. They make choices for all the pairs on the list, and then one is randomly selected for payment. Many variations have been employed in the literature, including ones where lotteries are compared with sure outcomes and experimental designs that combine choices across multiple lists to estimate risk preferences.

The list used by Holt and Laury (2002) is shown in Table 1 as an example of the MPL approach. In each choice, the individual picks between option A which has a low variance of payoffs and option B which has a higher variance of payoffs. The possible outcomes are held constant across all of the pairs, but the probabilities are varied, starting from a higher probability of the smaller payoff in both cases which decreases over the choices. The switch point between Option A and B indicates the degree of risk aversion (switching after the 5th decision indicates risk aversion). This assumes a degree of consistency in choices, with subjects only switching from A to B once as they go down the list. Unfortunately, some subjects exhibit multiple switches even though the majority are consistent. Holt and Laury (2002) report multiple switches for between 5% and 13% of subjects, with the lower figures coming from treatments with scaled-up payoffs. Other papers have seen similar patterns (e.g. see Bruner, 2011 for a discussion of this issue.)

Table 1 MPL Risk Aversion Measure (Holt and Laury, 2002, p. 1645)

Option A	Option B	Expected payoff difference
1/10 of \$2.00, 9/10 of \$1.60	1/10 of \$3.85, 9/10 of \$0.10	\$1.17
2/10 of \$2.00, 8/10 of \$1.60	1/10 of \$3.85, 9/10 of \$0.10	\$0.83
3/10 of \$2.00, 7/10 of \$1.60	1/10 of \$3.85, 9/10 of \$0.10	\$0.50
4/10 of \$2.00, 6/10 of \$1.60	1/10 of \$3.85, 9/10 of \$0.10	\$0.16
5/10 of \$2.00, 5/10 of \$1.60	1/10 of \$3.85, 9/10 of \$0.10	-\$0.18
6/10 of \$2.00, 4/10 of \$1.60	1/10 of \$3.85, 9/10 of \$0.10	-\$0.51
7/10 of \$2.00, 3/10 of \$1.60	1/10 of \$3.85, 9/10 of \$0.10	-\$0.85
8/10 of \$2.00, 2/10 of \$1.60	1/10 of \$3.85, 9/10 of \$0.10	-\$1.18
9/10 of \$2.00, 1/10 of \$1.60	1/10 of \$3.85, 9/10 of \$0.10	-\$1.52
10/10 of \$2.00, 0/10 of \$1.60	1/10 of \$3.85, 9/10 of \$0.10	-\$1.85

The inconsistent behavior observed when MPLs are used to elicit risk preferences suggest that the procedure is complex for individuals to understand. While a number of methods have been used to correct for inconsistent choices, all of these bias the results and fail to address the underlying issue – if a number of subjects are sufficiently confused that they are making inconsistent choices, there must also be many who make consistent choices but are also confused. A number of simpler procedures have been proposed to facilitate comprehension. For example, Eckel and Grossman (2002) propose a method where subjects make a single choice over a list of lotteries. Going down the list, the lotteries feature both greater expected payoffs and greater risk. Subjects' choices do not offer the fine-grained measure of risk preferences obtained from MPL approaches, but the simplicity of the choice and the ability to easily represent it in an intuitive form makes it more plausible that subjects understand the implications of their choices.

There are several other important methods of eliciting incentivized risk preferences that the preceding discussion has neglected, such as the investment task proposed by Gneezy and Potters (1997), the Balloon Analogue Risk Task of Lejuez et al., or the bomb risk elicitation task of Crosetto and Fillipin (2013), but the purpose of this section is not to provide readers with an encyclopedic review of methods used to elicit risk preferences (see Charness et al. (2013) for an overview of the strengths and weakness of the different approaches to eliciting risk preferences). Instead, the goal is to help readers appreciate the methodological difficulties hidden within the apparently simple task of implementing an incentivized risk measure. Differences in small details like how inconsistent choices are handled can make comparisons across studies difficult. Making matters even trickier, the literature finds both that the correlation between survey and incentivized measures is rather low *and* the various incentivized measures are poorly correlated with each other (e.g. Lönnqvist et al., 2015; Crosetto and Filippin, 2016). This suggests that all of the risk measures are imperfect tools for capturing risk preferences. The difficulties in interpreting the data increase yet again when one notes the strong evidence that risk preferences are domain dependent (Dohmen et al., 2011). There are good reasons to believe that incentivized measures give a less biased view of individuals' risk preferences, but the existing results need to be viewed cautiously given the unresolved problems with the underlying methodologies.

In contrast to non-incentivized survey results, which largely support higher levels of risk tolerance among entrepreneurs, the incentivized experimental results are mixed. Andersen et al. (2014) use the MPL approach to study entrepreneurs recruited at a Danish entrepreneurship trade fair. Assuming that individuals are expected utility maximizers with constant relative risk aversion, they estimate coefficients of relative risk aversion. They find no significant differences in risk preferences between those that report

self-employment status and a comparison group drawn from the general population. In an interesting extension, they depart from expected utility theory by considering rank dependent utility. Comparing estimated probability weighting functions, they find that entrepreneurs are uniformly more optimistic than non-entrepreneurs. It should be noted that the control group partially consisted of individuals that participated in the trade fair but reported no self-employment status. Given their attendance at the trade fair, these individuals may have had an interest in entrepreneurship. Thus, the results of Andersen et al. may underestimate the differences between entrepreneurs and non-entrepreneurs.

Jiang and Capra (2018) also use the MPL approach to test for differences between current entrepreneurs and those who expressed an interest in entrepreneurship (i.e. they have attended entrepreneurship classes or clubs) but are not currently firm owners. Their protocol includes lotteries with losses, so they were able to examine loss aversion as well as risk aversion. They do not find significant differences in their group of “active” entrepreneurs versus the control group. Given that all participants were enrolled in some activity related to entrepreneurship, the distinction is between individuals that actively own a business and those that did not own a business, but still exhibited an interest in entrepreneurship. This will again tend to underestimate the difference between entrepreneurs and the general population.

A large-scale experiment conducted by Holm et al. (2013) again uses the MPL approach to elicit risk preferences. A notable feature of this study is the careful construction of the sample. It is a relatively large sample, containing 700 entrepreneurs. These are all owners of firms that had survived at least three years and are relatively sizable. The control group of 200 individuals is drawn from the general population, matching the entrepreneurs by age and gender. They find no differences between the entrepreneurs and the non-entrepreneur control group in attitudes towards risk or ambiguity. The large size of their samples makes these null results hard to dismiss.

The incentivized studies summarized thus far indicate no differences in risk preferences for entrepreneurs, but Masclet et al. (2009) and Koudstaal et al. (2015) are exceptions to this general finding. Masclet et al. (2009), using a variant of MPL approach in where decisions were presented sequentially rather than simultaneously, find that self-employed individuals are significantly less likely to choose safe options than either university students or salaried workers.

Koudstaal et al. (2015) obtain mixed results from a comparison between entrepreneurs and two control groups consisting of salaried managers and employees. They argue that control groups comprised of managers and employees are more appropriate than a control group of the general population because they are relatively similar to the entrepreneurs on other dimensions (e.g. education, age, business interest). An attractive feature of this study is the large sample size, with approximately 900 entrepreneurs. Given that the study includes multiple measures of differences between entrepreneurs and the control groups, one may be more skeptical about the varying results if the sample was not so large. They use the MPL approach, but, to avoid issues of switching, they ask participants for their switching point directly, rather than having them make 10 individual decisions. They find that entrepreneurs are less risk averse than employees, but not significantly different from managers. Likewise, ambiguity aversion among entrepreneurs is not significantly different from the other two groups. These results contrast with findings from a survey, where entrepreneurs perceive themselves as significantly more risk tolerant than the other groups, as well as the results from an incentivized measure of loss aversion which finds that entrepreneurs are significantly less loss averse than the comparison groups. To explain this difference, Koudstaal et al. note that loss aversion is correlated with answers to the survey question on risk. What economists and psychologists view as distinct concepts may not be so well separated in the minds of experimental subjects.

There are several interesting studies that use neither non-incentivized survey measures nor incentivized experimental measures. Åstebro (2003) examines the return for Canadian inventions finding that the median realized return is negative. While the study is not explicitly designed to measure risk preferences, “these data suggest that investors behave like buyers of unfair lotteries where the expected value is negative but there is a small chance of a large gain.” (p. 227) Hvide and Panos (2014) use risk preference proxies developed from individual investment data. For example, individuals who choose to invest in stocks rather than lower risk bonds can be assumed, *ceteris paribus*, to have greater risk tolerance. In all proxies examined, they find a positive relationship between taking more risk and likelihood of becoming an entrepreneur. Critically, these results are robust to controls for differing wealth levels.

To summarize, the initial strong findings from surveys have not generally been supported by incentivized studies. This is not to say that entrepreneurs do *not* have distinctive risk preferences. The number of incentivized studies is still relatively small, the results are not entirely consistent and confounded by unresolved methodological issues that affect all studies of risk preferences, and results like those of Hvide and Panos suggest entrepreneurs may have distinctive risk preferences *within the financial domain* even if they are no different from the general population in other areas.

Preference for Autonomy

There is a common perception of entrepreneurs as lone wolves, boldly striking out on their own. This could reflect either relatively high preferences for autonomy or a need for more workplace flexibility. The number of studies on this topic is smaller than those studying risk, but the results suggest that the preferences of entrepreneurs may be more than an urban legend.

Blanchflower (2004) presents survey evidence that the self-employed are more likely to respond as “very satisfied with their work” than employees (62.5% versus 45.9%). Adding detail to this finding, survey results described by Hundley (2001) find that two key components driving higher satisfaction among the self-employed in the US are greater autonomy and variety of work. Similar results were found by Benz and Frey (2008). Of course, the survey evidence points to job satisfaction *after* choosing self-employment. Liking the autonomy associated with entrepreneurship implies neither that autonomy was a deciding factor in the decision to become an entrepreneur nor that entrepreneurs have a relatively high preference for autonomy.

Unlike the highly studied issue of risk preferences, survey measures with hypothetical scenarios to measure preferences for autonomy have not been developed. However, there exists incentivized experimental evidence that points to a preference for autonomy. Cooper and Saral (2013) test whether entrepreneurs are more willing to join a team in a setting with joint production. They use a three stage experimental design. In the first stage, subjects work on a real effort task (answering GMAT questions) for a piece rate. For the second stage, all subjects are put into two person teams. They once again perform the real effort task, but can allocate their output to either a team account or a private account. The piece rate is higher for the team account, but, because this account is split evenly between teammates, a self-regarding individual should always free-ride by allocating all of their output to the private account. Of course, based on previous experiments with social dilemmas, deviations from the free-riding equilibrium were anticipated. In the final stage, experimental subjects choose whether or not to participate in a team (with free-riding still possible) or play as an individual. The payoffs were structured so a self-regarding individual should always prefer to join a team. To measure the strength of the subjects’ preferences (willingness to pay for stated preference), Cooper and Saral use a variation of the Becker-DeGroot-Marschak (BDM) mechanism (Becker et al., 1964).

Cooper and Saral compare behavior across full-time entrepreneurs, part-time entrepreneurs, non-entrepreneurs (all of whom are business school alumni), MBA students, and undergraduates. They find that full-time entrepreneurs are not bad teammates; when forced to work on a team in the second stage of the experiment, they allocate as much to the team as non-entrepreneurs. But when given a choice to not participate in a team in the third stage, full-time entrepreneurs pay significantly more to avoid being in a team. This result is driven by long-term entrepreneurs, which suggests that the experience of being an entrepreneur influences preferences for autonomy. Along similar lines, those who are merely interested in entrepreneurship did not display a similar preference for autonomy.

Masclet et al. (2009) examine preferences for autonomy in decision making. Using the Holt and Laury (2002) lottery task described above, they compare the decisions of individuals and three-person groups. They then have a third stage where participants bid their willingness to pay to make the decision alone. They incentivize this by setting up a competitive auction that awards the three highest bids their choice. They find that self-employed individuals bid higher than others to avoid group decision making. Given that self-employed subjects in this experiment also had higher risk tolerance than average, this finding might be indicative of a preference to not have a group-imposed decision that is further away from their most preferred option rather than indicating a greater preference for autonomy.

In contrast to Cooper and Saral (2013) and Masclet et al. (2009), Czibor et al. (2017) find evidence that entrepreneurs are equally likely to join teams as others. They also use a version of the incentivized BDM mechanism to determine if participants would prefer to participate in a team. Treatments vary the form of team. In one treatment, teams involve joint production, while in the other treatment teams involve joint production *and* joint decision making in a separate risk elicitation task. There are strong synergies in joint production, so joining a team unambiguously improves payoffs and free-riding is *not* an issue. Joint decision making is unambiguously harmful in any sort of rational choice model, so individuals should be less willing to join teams in this treatment. In both cases, no significant differences are found between entrepreneurs and others. This result suggests that preferences for autonomy are specifically tied to free-riding. Joining a team in Cooper and Saral isn't costly per se, as long as you are willing to free ride, but does raise psychological tradeoffs between being self-interested and being both trusting and trustworthy. These issues don't arise in Czibor *et al.*.

The initial results mainly support the idea that entrepreneurs have a greater preference for autonomy than the general population. It may well be that a desire for greater workplace flexibility *also* contributes to entry in entrepreneurship. Given the small number of studies on this issue, there is an obvious need for more work examining entrepreneurs' preferences for autonomy. More generally, there is a need to develop validated measures of preferences for autonomy. It is difficult to compare results across studies when every study uses its own home-brewed measure.

Time Preferences

Time preferences are at least as important as risk preferences in governing the decision making of potential entrepreneurs, but researchers have paid surprisingly little attention to this topic. Survey measures have been developed to measure patience (e.g. Dohmen *et al.* 2010), and methods aimed at empirically estimating discount rates based on observed decisions in the field have also been used successfully (Warner and Pleeter, 2001), but the limited evidence on the time preferences of entrepreneurs has been solely gathered through experiments.

Andersen *et al.* (2014) elicited time preferences using a protocol adapted from Andersen et al. (2008) which is similar to the MPL approach used for eliciting risk preferences. An example of the choices faced

by subjects is presented in Table 2. Subjects make choices for multiple lists, and then one randomly selected choice from one randomly selected list is chosen for payment.

Table 2 Measure of Time Preferences (Andersen et al., 2008, p. 587)

Payoff Alternative	Payment Option A (1 month)	Payment Option B (7 months)	Annual Interest Rate	Annual Effective Interest Rate
1	3000 DKK	3075 DKK	5	5.09
2	3000 DKK	3152 DKK	10	10.38
3	3000 DKK	3229 DKK	15	15.87
4	3000 DKK	3308 DKK	20	21.55
5	3000 DKK	3387 DKK	25	27.44
6	3000 DKK	3467 DKK	30	33.55
7	3000 DKK	3548 DKK	35	39.87
8	3000 DKK	3630 DKK	40	46.41
9	3000 DKK	3713 DKK	45	53.18
10	3000 DKK	3797 DKK	50	60.18

In each row, participants choose between a sooner but lower payoff and a later but larger payoff. In addition to absolute payoff amounts, they are shown the annual interest rate and the annual effective interest rate to assist with decision making. Going down the table, the size of the later payoff is increased, making this more attractive. At some point, subjects should switch to the later, larger payoff. Maximum likelihood techniques are used to estimate discount rates from these switch points.

Once again, the subject pool is the group of Danish entrepreneurs recruited from a trade fair described previously when discussing risk preferences. Andersen et al., 2008 point out that estimating a discount rate solely from the switch points to later payment yields biased estimates. Using the data on risk preferences in conjunction with the data on time preferences makes it possible to account for the curvature of the utility function and yields more reasonable estimates of discount rates. Andersen et al. (2014) find that entrepreneurs are significantly more patient than non-entrepreneurs. It's important to note that the faster payment option was conducted immediately with the entrepreneurs (rather than 1 month delay), making it likelier that present-value bias would make the entrepreneurs appear to be *less* patient. Nevertheless, entrepreneurs are still significantly more patient.

In another study, Jiang and Capra (2018) also measure time preferences using a similar MPL approach, although their estimates are *not* corrected for risk preferences. The time frames are consistently 1 month versus 3 months for payments, limiting present-value bias. They find no significant differences in time preferences between those who own a business and those who did not, but recall that the comparison control group was recruited from entrepreneurship clubs, conferences, or class. While these individuals do not currently own businesses, they likely have entrepreneurial intentions or interest, so these results are most accurately described as demonstrating no difference between current entrepreneurs and those with an interest in entrepreneurship.

The literature on time preferences and entrepreneurship is far too scant to draw any firm conclusions. There is a clear need for more study of this topic.

Preferences for Competition and Overconfidence

Entrepreneurs often fail. Shane (2008, p. 98) notes that only 45% of new businesses last 5 years. In a study of ventured backed entrepreneurs, who are arguably starting from a stronger position than most entrepreneurs, Åstebro (2003) finds that the median return on inventions is negative for inventors with a few earning very large amounts. Given the low likelihood of success, why are so many willing to take the gamble? One possible explanation for excess entry is that that entrepreneurs are overconfident (Åstebro et al., 2014) – other entrepreneurs may fail, but they aren't me! Along similar lines, entrepreneurs may like the competition inherent to entrepreneurship where many enter but only a tiny fraction truly succeed.

The incentivized market entry game of Camerer and Lovo (1999) is designed to examine entry into competitive markets, with the specific aim to explain the persistence of entry despite the high failure rate of new businesses. In their set-up, participants choose whether or not to enter into a market. Other potential market participants are simultaneously making the same entry decision, and the market has a preset capacity which is lower than the number of potential entrants. The payoff to an entrant depends on how well they are able to complete a skill-based task (either solving puzzles or answering trivia questions) compared to other entrants and how many others entered the market. Choosing to stay out of the market guarantees the participant a fixed outside option payment (the initial stake). To distinguish overconfidence from systematic underestimation of the number of entrants, beliefs about the number of entrants are elicited and incentivized for correctness.

Camerer and Lovo find excess entry into this game and attribute it to overconfidence. About a third of the individuals who should not enter (in equilibrium) in fact enter, and the average profits of entrants are negative. As a point of comparison, entry is lower and profits are higher in control treatments where the ranking across entrants is randomly determined. Interestingly, entrants in the skill treatment expected low average profits for entrants. This is indicative of over-confidence; entrants don't expect entrants to do well in general, but believe that they will do better than the typical entrant. This paper does *not* specifically study individuals who are entrepreneurs, but does establish overconfidence as a cause of over-entry.

Elston et al. (2005) examine differences between full-time (FT) entrepreneurs, part-time (PT) entrepreneurs, and non-entrepreneurs in the Camerer and Lovo market entry game. They ran experiments at entrepreneurship conferences in the US, suggesting that their non-entrepreneurs were at least interested in entrepreneurship (and hence not a representative sample of non-entrepreneurs). They find no significant differences in entry rates between FT entrepreneurs and non-entrepreneurs; however, they do find that PT entrepreneurs are significantly less likely to enter into the market than FT entrepreneurs. They also measured overconfidence but found no systematic overconfidence for entrepreneurs (FT or PT). These results do not necessarily eliminate relative overconfidence as a reason for over-entry by entrepreneurs. The skill task used by Elston et al. was answering general knowledge questions, but over-confidence by entrepreneurs may be specific to business related domains.

Hölm et al. (2013) also use a variant of the Camerer and Lovo market entry game to examine the competitive preferences of Chinese entrepreneurs. They employ a list of choices, similar to the MPL approach, to determine willingness to pay for entry into a tournament. The choices are always between a fixed piece rate for successful completion of quiz questions and competitive tournament pay where the piece rate varied depending on whether or not they won the tournament. The tournament pay was held constant for all choices (50 CYN/question if they won and 5 CYN/question if they lost) and the fixed piece rate decreased from the maximum possible pay of 50 CYN/question to the minimum pay of 5 CYN/question. The switch point from option A to option B is used as a measure of willingness to compete. They find that entrepreneurs are more willing to choose competitive pay than non-entrepreneurs, but this difference is only significant when there are multiple competitors rather than a

single competitor. They do *not* find differences between non-entrepreneurs and entrepreneurs' beliefs of relative ability, suggesting that entrepreneurs' greater willingness to compete reflects a pure preference for competition rather than overconfidence.

Turning to measures focused directly on willingness to compete, Niederle and Vesterlund (2007) introduced the most commonly used protocol to investigate competitive preferences. Their goal was to examine gender differences in preferences for competition, motivated by the lack of women in top level positions (e.g. CEOs), but differing competitive preferences may also explain the gender gap observed in entrepreneurship. Their protocol involves three stages. In the first stage, participants are asked to complete a task (e.g. addition problems) and are paid a piece rate for each correctly completed task. In the second stage, participants are placed into a tournament pay scheme. In the last stage, participants choose between piece rate or tournament pay. A choice of tournament pay indicates a preference for competition.

Barbosa et al. (2018) use this protocol with a subject pool drawn from students at a prominent French business school. The pool is split between entrepreneurs, nascent entrepreneurs, and non-entrepreneurs. They find that entrepreneurs are significantly more likely to choose tournament pay in the third stage (79% vs. 46%). Nascent entrepreneurs fall somewhere between entrepreneurs and non-entrepreneurs (56%), and are not significantly different from either group. Interestingly, this result is *not* driven by the greater tendency of men to become entrepreneurs; they replicate the usual result that women are significantly less willing to choose tournament pay, but the difference between entrepreneurs and non-entrepreneurs is significant even after controlling for gender.

Studying a population of small-scale, mostly female entrepreneurs in Tanzania, Berge et al. (2015) use a shortened version of the Niederle and Vesterlund design. They find that entrepreneurs who are more competitive the lab also make more competitive choices in the field, leading to better performance. While studies of "necessity" entrepreneurship similar to this have been purposefully omitted from this survey to focus on high growth, "opportunity" entrepreneurship (Fairlie and Fossen, 2018), Berge et al.'s result suggests that competitive preferences may play an important role in both types of entrepreneurs, and, more importantly, may be necessary for successful entrepreneurship.

Along related lines, Reuben et al. (2015) use a modified version of the Niederle and Vesterlund design to measure the competitive preferences of MBA students in the US. They then track the career progression of these students. They find a correlation between selection into fields with both higher salaries and higher levels of competition (e.g. finance and consulting) and a choice of tournament entry. While Reuben et al. do not study entrepreneurship per se, their results imply that a preference for competition may be an important driver of entry into entrepreneurship given the highly competitive nature of entrepreneurship. Since gender differences in rates of entrepreneurship have been shown to be primary due to selection into the field rather than survival (Koellinger et al., 2013), this suggests the differing preferences for competition may play an important role in driving the gender gap in entrepreneurship.

The existing evidence is limited, but it appears that willingness to compete differs between entrepreneurs and non-entrepreneurs. It does *not* appear that this is driven by greater overconfidence among entrepreneurs. More research is obviously needed on this topic, but results like these may lead to useful policy suggestions on how to get more members of underrepresented populations involved with entrepreneurship.

Social Preferences

At first glance, entrepreneurship seems like a self-centered activity. In a well-known paper, Baumol (1990) assumes that entrepreneurs are driven strictly by monetary incentives, and are therefore willing

to engage in anti-social destructive activities (e.g. organized crime, promoting k-pop concerts) if the relative return to those activities is higher than socially desirable activities. Of course, Baumol is not unique in his assumption that entrepreneurs are primarily motivated by profit; this classic assumption goes back to early economic thought on entrepreneurs. Is it true that entrepreneurs are less likely to have pro-social preferences than others?

Several field studies have produced evidence in the spirit of Baumol's (1990) hypothesis, finding a positive relationship between anti-social behaviors and becoming an entrepreneur. Levine and Rubinstein (2017), using data from the Current Population Survey (CPS) and National Longitudinal Survey of Youth (NLSY), find that illicit activities (e.g. damaging property, fighting, shoplifting) as a youth predict status as an entrepreneur. Along similar lines, Fairlie (2002) uses the NLSY to show that drug-dealers are more likely to become self-employed than non-drug-dealers.

Turning to lab experiments, Weitzel et al. (2010) test the Baumol assumption that entrepreneurs are especially self-interested with variants of the dictator game. In the basic form of this game, an individual is given a sum of money with a choice of how to allocate these funds between themselves and others. Giving money to others is an indication of pro-social preferences. Rather than using established entrepreneurs as their subject pool, Weitzel et al. identified the entrepreneurial traits of students using a questionnaire. They find that general entrepreneurial talent (self-perceived) is positively related to more selfish behavior, but, mitigating this result, those with perceived higher levels of entrepreneurial creativity are relatively pro-social.

Social preferences in the form of reciprocity are measured in the trust game environment by Barbosa et al. (2018). This is a two player game where the first player chooses some amount of money to send (out of an initial endowment) to the second player. This amount is then tripled, and the second player chooses how much to return of the tripled amount. The participants play in both roles; the first role measures trust while the second role measures reciprocity. They find no differences between their subject pool of nascent entrepreneurs, current entrepreneurs, and non-entrepreneurs.

Social preferences are measured by Cooper and Saral (2013) in a joint production framework. In their set-up, participants answer business related multiple choice questions and are asked whether or not they want to donate their answer to an individual account or to a team account which split the proceeds between the team members. If individuals are strictly self-regarding, they should free-ride by contributing all of their answers to the individual account. Cooper and Saral find that entrepreneurs do not free-ride on contributions of others. More specifically, entrepreneurs give neither more nor less than non-entrepreneurs.

Along similar lines, Barbosa et al. (2018) study a VCM public goods game where subjects split an initial allocation between private and public accounts. Self-regarding agents should only contribute to the private account. Barbosa et al. use the technique pioneered by Fischbacher et al. (2001) which, in addition to an unconditional decision of allocating the endowment between accounts, also asks for conditional contributions given the average contribution of other group members. This serves as a measure of reciprocity or conditional cooperation. Barbosa et al. find no differences between entrepreneurs, nascent entrepreneurs, and non-entrepreneurs in either measure (conditional or unconditional allocations to the public account). Interestingly, they track the entrepreneurial status (current, nascent, or non-entrepreneurial) of their subject pool in a two year follow-up. They use the measures gathered in the initial study to examine determinants of changes in entrepreneurial status, finding that conditional contributions made in the public goods game were a good predictor of increased entrepreneurial status (i.e. becoming an entrepreneur) in the follow-up. This is striking because characteristics that differed in

the initial study (i.e. willingness to compete) did not have predictive power for changes in entrepreneurial status, but a characteristic which did not differ between entrepreneurs and non-entrepreneurs (trustworthiness) did have predictive power.

To summarize, there is not much evidence that entrepreneurs have distinctive social preferences relative to the general population, but social preferences may play a role in selection into entrepreneurship. It is somewhat surprising that relatively little attention has been paid to the interaction between social preferences and entrepreneurship, given the vast amount of ink spill on both topics separately. Hopefully this will be rectified in the future.

III. Summary

Small businesses accounted for 44% of non-farm GDP in 2014 (US SBA Office of Advocacy: Small Business GDP 1998–2014), and start-ups are important generators of new employment opportunities with a job creation rate of 5 per 1000 people for first year start-ups (Kauffman 2018 National Report on Early-stage Entrepreneurship). Given the important link between entrepreneurship and both economic growth and job creation, many governments have directed resources towards policies aimed at increasing entrepreneurship. The evidence presented in this chapter demonstrates that preferences may play an important role in who chooses to become an entrepreneur. If governments plan on directing policy towards increasing entrepreneurship (or, even better, successful entrepreneurship), it would be useful to know if there are certain traits that predict entry into entrepreneurship, as well as subsequent success or failure. For example, if individuals who like competition are more likely to choose entrepreneurship, directing efforts towards such people improves the odds of generating new enterprises. After all, it is easier to get a boulder to roll down a cliff if it starts near the edge. Alternatively, if potentially successful entrepreneurs are reluctant to enter because of time, risk, or competitive preferences, then policies aimed at these types may encourage more productive entrants into entrepreneurship.

In this chapter, five preference categories were examined. First was risk preferences, which have always been assumed to strongly matter for entry into entrepreneurship. The survey evidence robustly supports higher risk tolerance among entrepreneurs, but the incentivized evidence is more mixed and tends to find no differences. The second category examined was preferences for autonomy. Survey evidence and limited experimental evidence appear to support a stronger preference for autonomy among entrepreneurs. While this preference can be broadly interpreted, the survey evidence is typically framed as a preference to work for oneself. The experimental evidence points to both a preference to work alone and to make decisions alone, although entrepreneurs will still choose teams if the payoff is sufficiently high.

The next two preference categories examined are arguably the most easily targeted by policy interventions - time and competition preferences. The evidence for time preferences is limited but suggests that entrepreneurs are relatively patient. If potentially successful entrepreneurs are daunted by the prospect of long waits before any potential profits are realized, then policies aimed at shortening the start-up process may encourage these types to enter. Evidence on preferences for competition is also limited but strongly suggests that preferences for competition are linked to entrepreneurship. A better understanding of this link may lead to more insights into why so few women start businesses. Almost all of the papers reviewed in this chapter either focus exclusively on male entrepreneurs (e.g. Fairlie, 2002; Hamilton, 2000; and Hamilton et al., 2019) or have limited female entrepreneurs in their sample. This mirrors what is observed in the field outside of the development context. Women enter into entrepreneurship at a low rate. Approximately 20% of businesses with employees are women-owned in the U.S. (U.S. Census Bureau's 2016 Annual Survey of Entrepreneurs), and similar trends are observed

worldwide in other high-income countries (Global Entrepreneurship Monitor 2018-2019 Women's Report).

Social preferences were the final category discussed. It would be difficult to make any broad statements about the social preferences of entrepreneurs as the context of decision making is important. There is evidence of ties between anti-social behavior and entrepreneurship, but the lab studies generally find little difference between entrepreneurs and the general population. There is some evidence that social preferences may play an important role in the process of becoming an entrepreneur.

Moving forward.

This chapter focused on preferences as primary differential characteristics. A large body of research has also examined personality (e.g. Caliendo et al., 2014; Hamilton et al., 2019; see Kerr et al., 2018 for a review). The traditional personality measures of interest include overconfidence, locus of control, and the big 5, but alternative behavioral measures that are plausibly important have not yet been studied (e.g. grit, lie aversion, or creativity). Future studies should also work to address the issue of causality. The majority of research to date focuses largely on correlations between characteristics and entrepreneurial status, rather than examining whether these traits *cause* individuals to become entrepreneurs. There is some movement towards casual analysis (e.g. Barbosa et al., 2018), but there remains a gap in understanding as to whether the various characteristics previously discussed are inherent to the entrepreneur or if the process of becoming an entrepreneur changes the characteristic. For example, Cooper and Saral (2013) conduct a correlational study between preferences to join a team and entrepreneurial status, but conjecture that since the preference to work alone is strongest for long-term entrepreneurs, it is likely that preferences for autonomy developed through the process of being an entrepreneur rather than playing a major role in the selection process determining who becomes an entrepreneur.

This chapter took an entrepreneur-centric approach to the study of entrepreneurship, but the focus on the individual misses an important aspect of entrepreneurship: the presence of entrepreneurial opportunities and how these arise (Shane and Venkataraman, 2000). In fact, Kirzner (1973) argued that any individual is a potential entrepreneur if they discover the market opportunity (Van Praag, 1999). Consequently, entrepreneurship is more than the entrepreneur – it is “...an activity that involves the discovery, evaluation and exploitation of opportunities to introduce new goods and services, ways of organizing, markets, processes, and raw materials through organizing efforts that previously had not existed.” (Shane, 2003, p. 4). To focus on observed differences in individual characteristics as the main determinants of who becomes an entrepreneur ignores the importance of differences in opportunities. At the very least, analyzing characteristics alone without any controls for the opportunities may miss important aspects of the story (Shane, 2003) and yield flawed conclusions. This also suggests that one should study how such opportunities arise. For example, there have been a number of recent papers on creativity (Erat and Gneezy, 2016; Charness and Grieco, 2019; Dutcher and Rodet, 2019); it would be natural to explore the relationship between individual creativity, other personality traits, and entrepreneurship.

Finally, as summarized in the various sections of this chapter, an unfortunate theme emerged. It is important to understand the behavioral traits that lead to entry into entrepreneurship and success as an entrepreneur, but economists have spent surprisingly little effort on understanding how and why the preferences of entrepreneurs differ from the general population. For almost all of these topics there is an urgent need for agreement on common methodologies and a sufficient volume of studies so that firm conclusions can be drawn.

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