

## What Makes an Entrepreneur?

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**Abstract** We test two competing hypotheses on what makes an entrepreneur: nature - attitude towards risk, I.Q., and self-confidence; or nurture - family background and social networks. The results are based on data from a new survey on entrepreneurship in Brazil, of 400 entrepreneurs and 540 non-entrepreneurs of the same age, gender, education and location in 7 Brazilian cities. We find that family characteristics have the strongest influence on becoming an entrepreneur. In contrast, success as an entrepreneur is primarily determined by the individual's smartness and higher education in the family. Entrepreneurs are not more self-confident than non-entrepreneurs; and overconfidence is bad for business success.

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## **Introduction**

The Schumpeterian approach to growth advances the view that entrepreneurial dynamism is the key to innovation and growth. Schumpeter (1911) discussed the role of the entrepreneur in the process of economic development. He saw the entrepreneur as a creative, driven individual who finds “new combinations of [factors] of production” to develop a new product, corner a new market, or design a new technology. Schumpeter speculates about the psyche of the archetypal entrepreneur: he is motivated by a “dream to find a private kingdom, or dynasty... [driven by] the impulse to fight, to prove oneself superior to others, to succeed for the sake of... success itself.”

This is one of two distinct perspectives on entrepreneurship in the social sciences. Psychologists have long hypothesized about the personal traits associated with entrepreneurs – such as a need for achievement (McClellan, 1961), belief in the effect of personal effort on outcomes (McGhee and Crandall, 1968; Lao, 1970), self-confidence (Liles, 1974), and focus on control (Evans and Leighton, 1989). More recent research on *Inc 500* companies in the United States suggests that tolerance of ambiguity and decisiveness are the critical features of successful entrepreneurs (Bhide, 2000).

Personal characteristics of entrepreneurs is also a major theme of Lazear (2002), who used the survey data of Stanford University MBA graduates and found that those with a higher number of jobs and shorter job tenures before graduate school were most likely to become entrepreneurs afterwards. He concludes that individuals who become entrepreneurs have a special ability to acquire general skills, which they then apply to their own businesses.

An alternative view focuses on nurture: the sociological variables that are shaping entrepreneurship. This view emphasizes the role of values (Cochran, 1971) and social networks (Young, 1971) in promoting or discouraging entrepreneurial activities. Social networks may work through a variety of channels, such as family, relatives, friends, or social groups in general. Economists have recently studied the role of culture in promoting entrepreneurship (Iyer and Schoar, 2007).

In this paper we study entrepreneurship from these two perspectives using a survey conducted in Brazil in September 2006. The most striking result, which we also found in Russia and China (Djankov et al. 2005, 2006a, 2006b), is that entrepreneurs have many more entrepreneurs among their relatives (parents, aunts, uncles, siblings, cousins) and also among their childhood friends. There is a strong effect of the social environment on the choice to become an entrepreneur. We are able to provide some causal evidence of this, using the size of the father’s family as an instrument.

However, social network effects do not play a significant role in determining success once the business starts operations. Instead, we find that smartness and the human capital of the father are the most important explanatory variables. Interestingly, we find no evidence that entrepreneurs are more self-confident than non entrepreneurs. Finally, we find that overconfidence is bad for success in business.

This paper is linked to the recent literature on what factors in the business environment make entrepreneurship possible. Djankov et al (2008) investigate the effects of corporate taxes, labor regulation, and start-up procedures on the entry of new firms. The study, covering 85 countries, concludes that “a 10 percentage point increase in the 1st year effective corporate tax rate reduces business density by 1.9 firms per 100 people (average is 5), and the average entry rate by 1.4 percentage points (average is 8),” a large effect. Other burdensome regulations also retard entry. Klapper et al (2008) find that efficient business registries facilitate entrepreneurship. Ardagna and Lusardi (2008) find a negative effect on entrepreneurship of product market regulations, and an inefficient legal system.

The rest of the paper is organized as follows. Section 2 describes the data. Section 3 provides analysis on who becomes an entrepreneur. Section 4 analyzes the factors for being a successful entrepreneur. Section 5 concludes.

## **2. Data**

We surveyed a random sample of about 400 entrepreneurs – 100 in Sao Paulo and 50 in Curitiba and Londrina in the Sul region; Salvador and Feira de Santana in the Nordeste region; and Brazilia and Goiania in the Centro Oeste region. The random sample is drawn from the Brazilian household census for 2000, which tells us whether a person is an employer of 6 or more employees. We also drew non-entrepreneurs (people who are not employers) from the census, by adjusting the drawing probabilities so that the resulting distribution of age, gender, and education of non-entrepreneurs would be similar to the resulting sample of entrepreneurs.

We defined entrepreneur as an owner-manager of a business with six or more employees because we wanted to make sure that individuals whom we call entrepreneurs are not simply self-employed.

After completing the surveys of entrepreneurs, we conducted a survey of 540 non-entrepreneurs in the same cities (120 in Sao Paulo and 70 in each of the other cities) using a near-identical survey. We defined non-entrepreneurs as individuals who are not working for their own business. 80% of respondents in the non-entrepreneur sample was stratified in order to match the distribution of this sample by age, gender and educational attainment to the distribution in the entrepreneurs’ sample. 20% were chosen at random.

In order to weigh correctly the data, we used the Brazilian census to determine the proportion of entrepreneurs in the cities we surveyed. In all the empirical analysis, the observations are weighted with weights equal to the inverse of the probability for a particular respondent (entrepreneur or non-entrepreneur) to get into our sample. The weights reflect differences in entrepreneurship, age, gender, and education across cities in the population, as well as city size.

### *Individual characteristics*

We first provide characteristics from our entrepreneurs’ sample and compare those to non-entrepreneurs and failed entrepreneurs (people who once ran a business but closed it

down). All the means in Table 1 are conditional on age, gender and education. Brazilian entrepreneurs tend to come more from rural areas (24% against 9% for non entrepreneurs) and have lived in more localities than non entrepreneurs (Table 1a). However, failed entrepreneurs have lived in even more localities than entrepreneurs. A similar pattern can be found for the number of professional activities. Entrepreneurs are more likely to be protestant (15% against 9 % for non entrepreneurs) which is intriguing in an overwhelmingly catholic country. They are more likely to be married and less likely to be overweight. Entrepreneurs are roughly one cm taller than non entrepreneurs.

In terms of education, Brazilian entrepreneurs do not report that they were more often among the top 10% in school than non-entrepreneurs. Those who went to university were in fact less likely to report that they were among the top 10%. However, failed entrepreneurs were half as likely to have been among the top 10% compared to entrepreneurs.

Interestingly, Brazilian entrepreneurs do not exhibit more risk-loving attitudes than non entrepreneurs. They are, for example, less likely than non entrepreneurs to take risky gambles on their income. However, entrepreneurs are somewhat more ready to take a risky gamble compared to failed entrepreneurs. Entrepreneurs appear also more patient than non entrepreneurs. When asked what minimum return they would require one month later after having invested \$100 today, we found that the annual computed average discount rate was lower among entrepreneurs than among non entrepreneurs (18% against 24%). We asked similarly a question about hyperbolic discount rate (what return between \$100 a year from now and one month later) and found that the percentage of respondents with hyperbolic discount rate was somewhat lower among non entrepreneurs. More than half appeared to have hyperbolic discounting.

We performed a test of cognitive ability based on short term recall and found that entrepreneurs did significantly better than non entrepreneurs. We used the cognitive test to measure overconfidence and under-confidence of respondents. We asked respondents to rate themselves on the cognitive score. Respondents who stated that their answers were above average but were in reality below average were rated as overconfident whereas those who rated themselves as below average but were in reality above average were rates as under-confident. Looking at the conditional means we did not find here any significant differences between entrepreneurs and non entrepreneurs.

We next asked in our survey whether people would decide to retire if they received a windfall income equal to 100 times GDP per capita and 500 times GDP per capita (Table 1b). Entrepreneurs were significantly less ready to retire if they received a windfall income of 100 times GDP per capita (11% compared to 35% for non entrepreneurs). However, for 500 times GDP per capita there was no significant difference between the remaining entrepreneurs and non entrepreneurs (we tried even-larger differences and found the same result). Among the reasons for not being willing to retire, no significant difference was observed between entrepreneurs and non entrepreneurs. The main reason was the love of one's job. This motive is twice as high among entrepreneurs as among failed entrepreneurs whose main motive is greed.

Various questions were asked about social values to determine whether there are sharp differences between the values held by entrepreneurs compared to non entrepreneurs. The answer is no. Brazilian entrepreneurs put a significant higher value on the education of children than non entrepreneurs. Entrepreneurs value the importance of work significantly less than entrepreneurs. They value friendship significantly more. Such differences could be due to differences in values but they might also reflect a “cognitive dissonance” response to failure.

A significantly smaller share of entrepreneurs than of non-entrepreneurs claims that it could be justified to avoid payment for public transportation (33 vs 45 percent), but a larger share can justify the idea of paying bribes to avoid regulations (9% compared to 0%). In general, the responses show a surprisingly low tolerance for corruption.

Responses to questions about trust revealed that entrepreneurs show more trust than non entrepreneurs and failed entrepreneurs (Table 1c). This is true for generalized trust, trust in businessmen, subordinates and other townsmen but there is no significant difference for trust in government.

#### *Sociological characteristics*

The parents of entrepreneurs are not more highly educated than those of non entrepreneurs but the mothers of failed entrepreneurs were less highly educated than the mothers of entrepreneurs (Table 1d). The parents of entrepreneurs were, however, less likely to be workers. The difference is stark. In the entrepreneur sample 54% of fathers and 27% of mothers were directors or senior managers compared respectively to 18% and 3% for non entrepreneurs. Entrepreneurs come more often from wealthier families than non-entrepreneurs.

Entrepreneurs are much more likely to have friends and family who also run their own businesses. In Brazil, 81% of entrepreneurs have relatives who are businessmen, compared to 55 % among non entrepreneurs. Entrepreneurs report also more often to have relatives who are self-employed or who have a business with 5 or more employees. The average number of entrepreneurs in entrepreneur families is also significantly larger than among non entrepreneur families. We also asked people in the survey to remember their 5 best friends from school and then asked who became an entrepreneur. The difference is also striking here. We found that 70% of entrepreneurs had school friends who became entrepreneurs compared to 48% for non entrepreneurs. The same question about university friends yielded a positive answer with 78% of entrepreneurs compared to 33% for non entrepreneurs. Interestingly, few report that the experience of their school or university friends affected their career choice.

#### *Summary*

To summarize, there are some important differences between entrepreneurs and non entrepreneurs in Brazil. The most striking difference relates to the social origins and the social environment of entrepreneurs. Parents of entrepreneurs have had positions of

leadership in their job. There are significantly more entrepreneurs in the families of entrepreneurs and also among school and university friends.

These differences were equally striking in the surveys in Russia and China. There are, however, some differences. Risk-taking attitudes in Russia and especially in China were significantly higher among entrepreneurs compared to non entrepreneurs. Greed (not willing to retire because of money aspirations) seemed also to be driving entrepreneurs in Russia and China but not Brazil. The value of work also appeared to distinguish entrepreneurs more from non entrepreneurs in Russia and China. Brazilian entrepreneurs scored quite higher on cognitive scores which was not the case in China. Brazilian entrepreneurs exhibit more trust than non entrepreneurs, a characteristic which was not present in the other countries. However, the general level of trust in Brazil is not that high.

### **3. Who Becomes an Entrepreneur?**

In this section, we report the results of multivariate analysis of who becomes an entrepreneur. We study the choice of becoming an entrepreneur with probit and multinomial logit regressions (Tables 2 and 3). In all regressions, we control for age, gender and education (including a quadratic term) and include city fixed effects to account for differences in institutional environment.

The first column of Table 2 presents results of a probit regression explaining the probability for a respondent to become an entrepreneur. We report marginal effects on the probability to become an entrepreneur. (Essentially, as in the comparison of means, in this regression, we compare two groups of people – a random sample of active entrepreneurs and a random sample of non entrepreneurs, who never ran their own business.) The results confirm the descriptive analysis of the previous section. The main effects are related to the social environment. Having a father as a boss or a director has a positive effect on the probability of becoming an entrepreneur and so is the fact of having entrepreneurs among relatives or friends. Education of the father (controlling for whether he occupied high position) has a negative effect. Among the personal characteristics, the cognitive score and height have a positive effect and so does greed. Risk-taking is not significant and achievement in education (above the 10% in the last place of study) is not significant either. In these regressions, we control for birth order of the respondent, but they do not have a significant effect.

Column 2 presents OLS regression with the number of years as entrepreneur used as a dependent variable. The results are roughly the same except that fewer variables are statistically significant. The father's position is again important and so are entrepreneurs among childhood friends and height. Greed (measures as willingness to continue working in order to earn more money after receiving a large windfall of money) is insignificant and neither is the number of entrepreneurs in the family. However, being the only child has a positive effect.

The survey asked respondents to name their childhood friends and, then, asked whether any of them have become an entrepreneur. Entrepreneurs, however, may be more likely to remember their childhood friends who subsequently had similar careers to their own. In order to make sure that our results on “friends-entrepreneurs” variable are not driven by this recall bias, we compare two groups of non entrepreneurs: those who seriously thought of becoming an entrepreneur and those who did not have serious thought about becoming an entrepreneur. Column 3 of Table 2 reports results of the probit regression: Childhood friends running their own businesses are still positive and significant. As one would expect, friend’s careers influence the probability of seriously thinking of becoming an entrepreneur even greater than the probability of actually becoming an entrepreneur. Notice that cognitive score and greed are not significant and risk-taking has a negative coefficient. This mirrors our China results where we found the same differences except for the cognitive scores.<sup>1</sup>

So far we have not provided a causal link between the social environment and the choice to become an entrepreneur. It could very well be that unobserved variables affect both the choice of the individual and the choice of his parents, his other relatives, and friends to become an entrepreneur. In Table 3, we provide results of instrument variables estimation of the link between the choice of respondents to become an entrepreneur and the choice of respondent’s father or father’s siblings to become an entrepreneur. We instrument the dummy for “father or his siblings – entrepreneurs” with the size of the father’s family.

According to psychologists and sociologists, family size is said to influence one’s character and values (see e.g., Sulloway, 1997). A large family size may force children to fight more to survive and make them more likely to become entrepreneurs. It is important to note that excludability restriction is likely to be satisfied because the family size of the father is unlikely to have a direct effect on somebody’s choice to become an entrepreneur (not via the choice of the father and his siblings to become an entrepreneur).<sup>2</sup> Indeed, the size of the family of the father positively significantly affects his or his sibling’s choice to become an entrepreneur: the first three columns of Table 3 present results of the first stage. We report results for the three alternative samples: (1) for the full sample, and to check for robustness of our results, (2) for respondents, whose fathers’ families had no more than 18 kids, and (3) for respondents, whose fathers’ families had no more than 14 kids and whose business did not require initial financing (in order to eliminate any

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<sup>1</sup> We also introduced a distinction between entrepreneurs by opportunity and entrepreneurs by necessity. The former became business owners because they seized a business opportunity. They are the true entrepreneurs in the Schumpeterian sense. The latter became business owners primarily because they lost their job or because of economic decline in their previous sector. What are the main differences we found? Entrepreneurs by opportunity do better on the cognitive score and have stronger family and social links to entrepreneurs; their fathers were also more often in a position of leadership. (To save on space, we do not report results of these regressions.)

<sup>2</sup> A possible link between the size of the father’s family and the choice of a respondent to become an entrepreneur (other than through psychology) is through family bequests. Yet, larger families are associated with smaller bequests, holding everything constant. So, if there were such a link, it would have been negative (larger father’s families would have been associated with lower likelihood to become an entrepreneur), as starting one’s own business often requires initial financing. The second stage and the reduced form estimations yield the positive relationship.

potential bequest link between fathers' families and respondents' decision to become an entrepreneur).

Columns 4 to 9 of Table 3 report the results of the second stage for 2SLS and ivprobit estimation models. We find that coefficients on the instrumented "father or siblings – entrepreneurs" variable are large and statistically significant (in all but one regression). We conclude that there is a clear evidence of a causal link from the entrepreneurship in the family to entrepreneurship of respondent

#### **4. What makes a successful entrepreneur?**

The previous section looked at what affects the choice of becoming an entrepreneur. Now we raise a different question: what determines entrepreneurial success?

Table 4 looks at the differences between active entrepreneurs, failed entrepreneurs, and non entrepreneurs who never had their own business using a multinomial logit regression framework. The three possible outcomes are: an active entrepreneur, a failed entrepreneur, and non entrepreneur. As above, the table reports marginal effects on probabilities. Interestingly, we find that having family and relatives run a business not only increases the probability of a respondent to be an active entrepreneur but also (and to a significantly larger extent) the probability to be a "failed entrepreneur." Failed entrepreneurs are less smart, less greedy, and less risk-taking than active entrepreneurs. (The first two of these results are rather imprecisely estimated, however.) The most striking differences between active and failed entrepreneurs are as follows. Failed entrepreneurs are significantly less risk-taking. Interestingly, they report to have been significantly more often among top 10% in school even though they exhibited the lowest cognitive test scores. The low actual test scores point to the likely overestimation of failed entrepreneurs' self-reported performance in school.

Overall, the results suggest that social networks play a big role in the decision to become an entrepreneur but not in determining whether entrepreneur will be successful. In contrast, the absence of risk-taking and greed, poor cognitive abilities, and over-evaluation of one's self seem to be the main reasons to quit entrepreneurship. These results are similar to what we have found in Chinese survey (the data from Russia are not comparable).

As the next step, we consider determinants of success among active entrepreneurs. Table 6 present the regressions with sales growth as dependent variable. We asked entrepreneurs whether the sales growth in the previous year was negative, between 0 and 5%, between 5 and 10% and so on. (We report simple OLS regressions, but ordered probit and ordered logit regressions yield very similar results.) The findings are striking. The entrepreneurs in the family variables change sign to negative and become insignificant. Friends- entrepreneurs lose significance. The two main variables that play a positive role are school achievement (above 10% in the last place of study) and whether the father had a higher education or not.

Note that inheritance of a business has a significant negative coefficient. There are two alternative interpretations of that coefficient, however. On the one hand, it might reflect a higher initial size of business (which might thus grow slower). On the other hand, this may be an indication of lower competence and lower motivation of the business owner-manager if he or she inherited rather than started business herself. This results is consistent with the Bertrand et al. (2004) findings for performance of family firms in Thailand.

We used employment growth as an alternative dependent variable and found similar results, with the following exception: entrepreneurs among childhood friends and height also have a positive effect on employment growth (not reported).

Psychologists often suggest that successful entrepreneurs have the special character trait of being overconfident relative to the rest of the population. We measured overconfidence in two ways. Both have traditionally been used by psychologists. First, we have asked respondents to give 90% confidence intervals for their estimate of the length of the Nile river. People overconfident of their knowledge tend to give too narrow confidence intervals. We call a respondent “knowledge-overconfident” if the true value of the length of the Nile river lied outside the respondent’s confident interval.<sup>3</sup> We also measured overconfidence in one’s performance (usually referred to as better than average bias).

For that purpose we used cognitive test scores of our respondents. After the cognitive test, we asked respondents to estimate whether they think that they scored below or above average. We, thus, ranked people in four categories depending on their actual test score and their estimate of their own performance: “High-Normal” (above average score and correct guess of above average score), “Low-Normal” (below average score and correctly guess of below average score), “High-Modest” (above average actual score, but rating oneself below average) and “Low-Arrogant” (below average actual score, but rating oneself above average). The “High-Modest” types are deemed to be “underconfident” compared to the “High-Normal” types; while the “Low-Arrogant” types are deemed to be overconfident in the sense of having a “better-than-average bias” compared to “Low-Normal” types.

The results for all our main dependent variables are shown in Table 6.<sup>4</sup> We find no statistically significant effects of knowledge overconfidence in any of the regressions that we ran.

In contrast, there are interesting results about the effect of the “better-than-average” bias. For simplicity of presentation, we marked the coefficients of interest with bold font. The bold coefficients on “Low-Arrogant” dummy measure the effect of “better-than-average” overconfidence (since “Low-Normal” type is the omitted group in these regressions);

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<sup>3</sup> The measure overestimates overconfidence of respondents because the true value needs to be inside of the confidence interval only 9 out of 10 times.

<sup>4</sup> We use all the controls and variables shown in other tables but display here only the results on over- and under-confidence.

whereas the bold coefficients on “High-Modest” dummy measure the effect of under-confidence (since “High-Normal” is the omitted group in these regressions). The first two columns of Table 6 show the probit results for becoming an entrepreneur. We find no significant effect for either overconfidence or under-confidence in comparing one’s performance to others. The only effect we are picking up is that entrepreneurs having a higher cognitive score and being aware of it compared to non-entrepreneurs. The next two columns show probit regressions for failed entrepreneurs compared to non-entrepreneurs. We do not find a significant effect for overconfidence but find a negative coefficient associated to under-confidence which means that under-confident people are less likely to be found among failed entrepreneurs.

The next two columns give OLS results for years as an entrepreneur. Here we find a negative and significant coefficient associated to overconfidence. This suggests that overconfidence is not good for staying in business. The last two columns give the clearest results. Here the dependent variable is sales growth which measures success as an entrepreneur. Here we find that both overconfidence and under-confidence have a negative effect on sales growth suggesting that adequate evaluation of one’s self is conducive to business success. We conclude that overconfidence or under-confidence both play a negative role when it comes to determining success as an entrepreneur.

We also include the discount rate as a regressor and find that a higher discount rate, i.e., a lower patience is negatively associated with sales growth.

## **5. Conclusions**

We report the results of a new survey on entrepreneurship in Brazil. The data are used to test two competing hypotheses on entrepreneurship: nature vs. nurture. The results seem to indicate that nurture (the social environment) determines the decision to become an entrepreneur. Both nature and nurture play a role in business success, but individual characteristics (nature) are dominant.

As entrepreneurship is increasingly linked to growth (for example, Baumol, Litan and Schramm, 2007; Berkowitz and DeJong, 2005), understanding the characteristics that define an entrepreneur may help design policies to ease their entry into business.

## References

- Ardagna, Silvia and Annamaria Lusardi (2008). "Explaining International Differences in Entrepreneurship: The Role of Individual Characteristics and Regulatory Constraints," mimeo, Harvard University.
- Baumol, William, Robert Litan and Carl Schramm (2007). *Good Capitalism, Bad Capitalism, and the Economics of Growth and Prosperity*, Yale University Press, New Haven, Connecticut.
- Berkowitz, Daniel and David DeJong (2005). "Entrepreneurship and Post-Socialist Growth," *Oxford Bulletin of Economics and Statistics*, 67, 1: 25-46.
- Bertrand, M., Johnson, S. H., Samphantharak, K. and Schoar, A. (2004) "Mixing Family with Business: A Study of Thai Business Groups and the Families behind Them," mimeo, MIT. Available at SSRN: <http://ssrn.com/abstract=687299>
- Bhide, Amar (2000) *The Origin and Evolution of New Businesses*, Oxford University Press, London.
- Cochran, T. (1971) "The Entrepreneur in Economic Change", in *Entrepreneurship and Economic Development*, The Free Press.
- Djankov, Simeon, Edward Miguel, Yingyi Qian, Gerard Roland, and Ekaterina Zhuravskaya (2005). "Who Are Russia's Entrepreneurs?" *Journal of the European Economic Association*, Papers and Proceedings, 3(2-3), 587-597.
- Djankov, Simeon, Yingyi Qian, Gerard Roland, and Ekaterina Zhuravskaya (2006a). "Entrepreneurship in China and Russia Compared." *Journal of the European Economic Association*, Papers and Proceedings, 4(2-3), pp. 352-65.
- Djankov, Simeon, Yingyi Qian, Gerard Roland, and Ekaterina Zhuravskaya (2006b). "Who Are China's Entrepreneurs?" *American Economic Review*, 96, 2: 348-352.
- Djankov, Simeon, Tim Ganser, caralee McLiesh, Rita Ramalho, and Andrei Shleifer (2008). "The Effect of Corporate Taxes on Investment and Entrepreneurship," Working paper 13756, National Bureau for Economic Research, Cambridge, Massachusetts.
- Evans, David, and Linda Leighton (1989). "Some Empirical Aspects of Entrepreneurship," *American Economic Review*, 79, 3: 519-535.
- Iyer, Rajkamal and Antoinette Schoar (2007), "Are There Cultural Determinants of

- Entrepreneurship?," Sloan Business School, MIT, working paper.
- Klapper, Leora, Raphael Amit and Mauro F. Guillén (2008). "Entrepreneurship and Firm Formation across Countries," mimeo, The World Bank, Washington DC.
- Lao, R.C. (1970) "Internal-External Control and Competent and Innovative Behavior among Negro College Students", *Journal of Personality and Social Psychology*.
- Lazear, E. (2002) "Entrepreneurship" Working paper 9109, National Bureau of Economic Research, Cambridge, Massachusetts.
- Liles, P.R. (1971) *New Business Ventures and the Entrepreneur*, Richard D. Irwin.
- McClelland, D. (1961) *The Achieving Society*, Princeton: D. Van Nostrand.
- McGhee, P.E and V.C. Crandall. (1968) "Beliefs in Internal-External Control of Reinforcement and Academic Performance", *Child Development*.
- Schumpeter, J. (1911) *Theory of Economic Development* Cambridge University Press.
- Sulloway, F.J. (1997). *Born to Rebel: Birth Order, Family Dynamics, and Creative Lives*. New York: Vintage Books.
- Weber, M. (1905) *The Protestant Ethic and the Spirit of Capitalism*
- Young, Frank W. (1971) "A Macrosociological Interpretation of Entrepreneurship", in *Entrepreneurship and Economic Development*, The Free Press.

**Table 1a. Individual characteristics of Brazilian entrepreneurs relative to non entrepreneurs and failed entrepreneurs**

	Entrepreneurs	Non Entrepreneurs	p-value for test of difference in means	Failed entrepreneurs	p-value for test of difference in means
Born in rural area, %	24	09	0.00 ***	30	0.53
Number of localities lived in	2.65	2.30	0.04 **	3.67	0.06 *
Catholic, %	67	70	0.65	48	0.03 **
Protestant, %	15	09	0.02 **	28	0.18
Married, %	77	61	0.00 ***	46	0.00 ***
Was in top 10% in school, %	36	39	0.58	26	0.31
Was in top 10% in high school, %	34	30	0.51	17	0.02 **
Was in top 10% in university, %	33	43	0.09 *	18	0.05 *
Speaks foreign languages, %	29	19	0.05 **	18	0.27
Would participate in \$10 or \$20 gamble, %	46	51	0.41	38	0.36
Would participate in \$20 gamble, %	19	22	0.58	08	0.03 **
Would participate in 1 or 2 percent of monthly income gamble, %	43	49	0.44	38	0.62
Would participate in 2 percent of monthly income gamble, %	18	29	0.05 **	15	0.52
Discount rate, %	18	24	0.02 **	16	0.76
Hyperbolic discounting, %	62	59	0.70	44	0.09 *
Overconfidence (by I.Q. test)	09	14	0.13	02	0.19
Underconfidence (by I.Q. test)	29	24	0.36	20	0.27
I.Q. score	2.86	2.44	0.04 **	2.51	0.14

Notes: \*, \*\*, \*\*\* Significance at the 10 %, 5%, 1% level.

**Table 1b. Values of Brazilian entrepreneurs relative to non entrepreneurs and failed entrepreneurs**

	Entrepreneurs	Non Entrepreneurs	p-value for test of difference in means	Failed entrepreneurs	p-value for test of difference in means
Retire if won 100 times GDP per capita, %	11	35	0.00 ***	17	0.24
Retire if won 500 times GDP per capita, %	10	14	0.33	25	0.17
Not retire because likes job, %	61	58	0.68	30	0.00 ***
Not retire because wants more money, %	14	19	0.35	37	0.03 **
Friends are very important, %	63	68	0.40	79	0.00 ***
Relations with parents are very important, %	83	77	0.07 *	91	0.09 *
Education of children is very important, %	97	90	0.03 **	98	0.41
Financial well-being is very important, %	73	74	0.84	84	0.12
Personal independence is very important, %	70	70	0.99	65	0.61
Power is very important, %	18	14	0.29	13	0.52
Religion is very important, %	54	45	0.08 *	46	0.42
Work is very important, %	82	77	0.22	63	0.04 **
Intellectual achievement is very important, %	54	53	0.96	57	0.76
Can justify to some degree avoiding a fare on transport, %	33	45	0.03 **	39	0.44
Can justify to some degree paying bribe to avoid regulations, %	09	-01	0.00 ***	-02	0.03 **
Can justify to some degree paying bribe to avoid competition, %	03	02	0.72	02	0.55
Can justify to some degree accepting a bribe, %	02	01	0.62	02	0.90
Can justify to some degree buying stolen goods, %	01	06	0.31	01	0.03 **
Respect of others is very important for job satisfaction, %	55	70	0.03 **	48	0.34

**Table 1c. Trust of Brazilian entrepreneurs relative to non entrepreneurs and failed entrepreneurs**

	Entrepreneurs	Non Entrepreneurs	p-value for test of difference in means	Failed entrepreneurs	p-value for test of difference in means
Most people can be trusted, %	10	5	0.02 **	6	0.13
Trust in family members, %	74	75	0.63	60	0.13
Trust in friends, %	38	40	0.68	27	0.16
Trust in colleagues, %	83	76	0.18	79	0.59
Trust in businessmen, %	77	59	0.01 ***	67	0.31
Trust in subordinates, %	93	80	0.00 ***	70	0.01 ***
Trust in other people in town, %	69	53	0.04 **	62	0.48
Trust in compatriots, %	69	60	0.26	61	0.45
Trust in government, %	32	32	0.97	35	0.81

**Table 1d. Social characteristics of Brazilian entrepreneurs relative to non entrepreneurs and failed entrepreneurs**

	Entrepreneurs	Non Entrepreneurs	p-value for test of difference in means	Failed entrepreneurs	p-value for test of difference in means
Father with higher or uncompleted higher education, %	13	17	0.31	19	0.43
Father was director of organization or senior manager, %	54	18	0.00 ***	49	0.67
Father was a worker, %	32	52	0.00 ***	37	0.58
Father had 10 or more subordinates, %	26	12	0.00 ***	19	0.34
Mother with higher or uncompleted higher education, %	09	10	0.72	00	0.00 ***
Mother was director of organization or senior manager, %	27	03	0.00 ***	24	0.77
Mother was a worker, %	44	57	0.07 *	50	0.58
Mother had 10 or more subordinates, %	09	04	0.22	20	0.17
Family wealth was above average at 16, %	17	11	0.09 *	24	0.56
Has relatives who are self-employed, %	55	34	0.00 ***	53	0.85
Number of relatives who are self-employed	0.97	0.59	0.00 ***	1.03	0.77
Has relatives who are businessmen, %	81	55	0.00 ***	77	0.52
Number of relatives who are businessmen	2.05	0.99	0.00 ***	1.63	0.14
Has relatives who have a business with 5 or more employees, %	77	60	0.10 *	76	0.95
Number of relatives who have a business with 5 or more employees	1.28	0.46	0.00 ***	0.91	0.07 *
Has school friends who are entrepreneurs, %	70	48	0.02 **	67	0.77
Number of school friends who are entrepreneurs,	1.44	0.64	0.00 ***	1.27	0.52
Experience of school friends influenced career choice, %	04	03	0.80	09	0.09 *
Has university friends who are entrepreneurs, %	78	33	0.00 ***	63	0.17
Number of university friends who are entrepreneurs,	1.30	0.43	0.00 ***	0.63	0.00 ***
Experience of university friends influenced career choice, %	07	08	0.95	12	0.32

**Table 2. Who becomes an entrepreneur**

Dependent variable	Entrepreneur	Years as entrepreneur, OLS	Was an entrepreneur
Father had higher education	-0.00365 [0.01]**	-0.07741 [0.61]	0.07916 [0.39]
Father was a boss or director	0.00782 [0.00]***	0.65475 [0.00]***	0.05852 [0.48]
Mother was a boss or director	0.00558 [0.12]	0.18247 [0.60]	-0.02959 [0.83]
Members of family running a business	0.00501 [0.00]***	0.13377 [0.36]	0.18318 [0.02]**
Childhood friends running a business	0.0115 [0.00]***	0.65302 [0.00]***	0.17379 [0.01]**
Cognitive score	0.00109 [0.01]***	-0.02284 [0.68]	-0.03849 [0.30]
Height (cm)	0.00023 [0.01]***	0.01412 [0.07]*	-0.00245 [0.70]
Risk-taking (relative income gamble)	-0.00033 [0.81]	-0.04245 [0.76]	-0.1102 [0.05]**
Above 10% in school	0.00036 [0.76]	0.06752 [0.65]	0.12828 [0.05]**
Greed	0.0021 [0.04]**	0.1499 [0.14]	-0.02765 [0.70]
first child	-0.00009 [0.95]	0.29943 [0.11]	0.08069 [0.17]
last child	-0.00163 [0.25]	0.30018 [0.16]	0.13474 [0.29]
only child	-0.00292 [0.19]	0.63648 [0.05]*	0.41884 [0.02]**
log number of siblings	-0.00184 [0.19]	0.04119 [0.73]	0.0475 [0.56]
Observations	671	742	436
R-squared		0.08	

Note: Robust p values in brackets. All regressions control for age, gender, education and education squared and have city fixed effects.

**Table 3 Multinomial logit analysis of entrepreneurship**

Dependent variable	Entrepreneur	Failed Entrepreneur	Non Entrepreneur
Father had higher education	-0.00268 [0.20]	0.07217 [0.44]	-0.06949 [0.46]
Father was a boss or director	0.00477 [0.00]***	0.05929 [0.47]	-0.06405 [0.44]
Mother was a boss or director	-0.00114 [0.51]	-0.02873 [0.84]	0.02987 [0.83]
Members of family running a business	0.00641 [0.00]***	0.19565 [0.03]**	-0.20206 [0.02]**
Childhood friends running a business	0.0075 [0.00]***	0.16747 [0.02]**	-0.17496 [0.01]**
Cognitive score	0.00081 [0.15]	-0.03792 [0.33]	0.0371 [0.34]
Height (cm)	0.00017 [0.07]*	-0.00265 [0.69]	0.00249 [0.71]
Risk-taking (relative income gamble)	-0.00019 [0.88]	-0.11532 [0.05]**	0.11551 [0.05]**
Above 10% in last place of study	0.00091 [0.53]	0.12984 [0.03]**	-0.13076 [0.03]**
Greed	0.00518 [0.00]***	-0.03115 [0.67]	0.02597 [0.73]
first child	0.00169 [0.25]	0.0752 [0.18]	-0.07689 [0.18]
last child	-0.00052 [0.78]	0.13114 [0.28]	-0.13062 [0.29]
only child	0.00042 [0.93]	0.36853 [0.02]**	-0.36896 [0.02]**
Observations	788	788	788

Note: Robust p values in brackets. All regressions control for age, gender, education and education squared and have city fixed effects.

**Table 4 Two stage least square estimation of entrepreneurship**

Father or siblings entrepreneur	0.0948 [1.57]		0.1216 [2.16]**		0.0376 [1.84]*	
Father or siblings entrepreneur or Self-employed		0.1635 [1.66]*		0.1765 [1.70]*		0.0459 [1.86]*
Father had higher education	-0.0091 [0.71]	-0.001 [0.05]	-0.0073 [0.51]	0.0048 [0.23]	-0.0035 [0.48]	-0.0011 [0.13]
Father was a boss or director	-0.0122 [0.45]	-0.0282 [0.67]	-0.0284 [0.97]	-0.035 [0.73]	-0.0002 [0.02]	0.0013 [0.09]
Mother was a boss or director	-0.0074 [0.37]	-0.0227 [0.67]	-0.0121 [0.53]	-0.0244 [0.65]	0.0041 [0.37]	0.0026 [0.20]
Childhood friends running a business	0.0379 [3.30]***	0.0268 [1.64]	0.037 [2.85]***	0.0263 [1.43]	0.0146 [2.74]***	0.0122 [1.89]*
Cognitive score	0.0051 [1.32]	0.0048 [1.28]	0.0055 [1.30]	0.0055 [1.38]	0.0015 [0.86]	0.0015 [0.99]
Height (cm)	0.0006 [1.27]	0.0009 [1.22]	0.0006 [0.77]	0.0002 [0.20]	0.0002 [0.67]	0.0002 [0.44]
Risk-taking (relative income gamble)	-0.019 [1.74]*	-0.0261 [1.41]	-0.0243 [2.11]**	-0.0259 [1.38]	-0.0064 [1.32]	-0.0055 [1.05]
Above 10% in last place of study	-0.0049 [0.56]	-0.0014 [0.11]	-0.0071 [0.68]	-0.0025 [0.20]	-0.0024 [0.47]	-0.0014 [0.26]
Greed	0.0081 [0.79]	0.0055 [0.56]	0.0087 [0.69]	0.0068 [0.66]	0.0042 [0.80]	0.0042 [0.95]
first child	-0.0117 [0.79]	-0.0191 [1.05]	-0.0125 [0.83]	-0.0175 [1.07]	-0.0016 [0.27]	-0.0016 [0.30]
last child	-0.0124 [0.68]	-0.019 [0.79]	-0.017 [0.88]	-0.0216 [0.93]	-0.0041 [0.52]	-0.0042 [0.57]
Only child	0.0213 [1.39]	-0.0141 [0.33]	0.0269 [1.58]	-0.0305 [0.57]	0.015 [2.03]**	-0.0012 [0.08]
Observations	611	611	605	605	382	382

**Table 5 Instrumental variable probit estimation (maximum likelihood)  
of entrepreneurship**

Father or siblings entrepreneur	1.845		2.074		1.797	
	[0.641]***		[0.415]***		[0.802]**	
Father or siblings entrepreneur or self-employed		2.17		2.22		1.949
		[0.347]***		[0.297]***		[0.670]***
Father had higher education	-0.063	-0.03	-0.106	-0.123	-0.089	0.184
	[0.059]	[0.062]	[0.067]	[0.075]	[0.073]	[0.319]
Father was a boss or director	-0.354	-0.427	0.516	0.393	0.5	0.377
	[0.513]	[0.053]***	[0.075]***	[0.405]	[0.783]	[0.062]***
Mother was a boss or director	-0.108	0.258	0.283	0.265	0.056	0.286
	[0.363]	[0.333]	[0.327]	[0.083]***	[0.087]***	[0.092]***
Childhood friends running a business	-0.003	0.067	-0.003	0.059	-0.023	0.329
	[0.075]	[0.298]	[0.269]**	[0.304]	[0.354]	[0.427]
Cognitive score	0.124	0.089	-0.026	0.096	0.098	0.089
	[0.020]	[0.053]*	[0.020]	[0.019]	[0.024]	[0.024]
Height (cm)	0	0.013	0.003	0	0.004	0.002
	[0.004]	[0.005]	[0.005]	[0.011]	[0.005]	[0.016]
Risk-taking (relative income gamble)	0.185	-0.311	-0.361	-0.292	-0.194	0.123
	[0.053]***	[0.143]**	[0.137]***	[0.131]**	[0.304]	[0.052]**
Above 10% in last place of study	0.031	0.068	-0.01	-0.033	0.11	-0.048
	[0.063]	[0.157]	[0.156]	[0.062]	[0.204]	[0.063]
Greed	0.057	0.049	0.116	0.082	0.037	0.088
	[0.186]	[0.149]	[0.061]	[0.143]	[0.217]	[0.187]
first child	-0.217	-0.207	0.213	0.159	-0.215	0.174
	[0.095]**	[0.099]*	[0.345]	[0.106]	[0.112]	[0.120]
last child	0.169	0.17	0.181	0.139	0.143	-0.239
	[0.144]	[0.146]	[0.148]	[0.150]	[0.275]	[0.156]
Only child	-0.001	-0.097	0.166	-0.499	-0.736	-0.501
	[0.107]	[0.220]	[0.134]	[0.247]	[0.254]	[0.254]
chi2-test: (instrument)	19.43	3.02	15.79	3.15	15.15	4.64
p-value	0	0.08	0	0.08	0	.03
Observations	611	611	605	605	382	382

**Table 6 Characteristics of successful entrepreneurs**

Dependent variable	Sales growth	Sales growth
Father had higher education	0.25552 [0.07]*	0.31329 [0.06]*
Father was a boss or director	-0.07674 [0.63]	-0.11056 [0.41]
Mother was a boss or director	-0.08822 [0.66]	-0.00887 [0.96]
Members of family running a business	-0.11103 [0.68]	-0.10689 [0.70]
Childhood friends running a business	0.20469 [0.20]	0.20246 [0.22]
Cognitive score	0.04286 [0.45]	0.05562 [0.33]
Height (cm)	0.00405 [0.43]	0.00537 [0.38]
Risk-taking (relative income gamble)	-0.12937 [0.21]	-0.12704 [0.27]
Above 10% in last place of study	0.45975 [0.00]***	0.3846 [0.01]**
Greed	0.09043 [0.54]	0.12644 [0.34]
first child		0.4748 [0.08]*
last child		0.19051 [0.40]
only child		0.10177 [0.75]
inherited the business	-0.44697 [0.02]**	-0.41481 [0.05]*
Business size at start		
Observations	348	347
R-squared	0.14	0.16

Note: Robust p values in brackets.

**Table 7 Over-and under-confidence and discounting**

	Entrepreneurs relative to non entrepreneurs	Entrepreneurs relative to non entrepreneurs	Failed entrepreneurs	Failed entrepreneurs	Years as entrepreneur, OLS,	Years as entrepreneur, OLS,	Sales growth	Sales growth
Discount rate	-0.00084 [0.35]	-0.00084 [0.35]	-0.02417 [0.36]	-0.02417 [0.36]	-0.16931 [0.02]**	-0.16931 [0.02]**	-0.31305 [0.00]***	-0.31305 [0.00]***
Overconfidence (Nile interval)	-0.00055 [0.73]	-0.00055 [0.73]	0.02862 [0.72]	0.02862 [0.72]	-0.04618 [0.76]	-0.04618 [0.76]	-0.00078 [1.00]	-0.00078 [1.00]
Low arrogant	<b>-0.00097</b> [0.57]	-0.00286 [0.01]***	<b>-0.00457</b> [0.97]	-0.04605 [0.77]	<b>-0.43179</b> [0.00]***	-0.41523 [0.12]	<b>-0.6391</b> [0.08]*	-0.94297 [0.01]**
High modest	0.00425 [0.18]	<b>0.00022</b> [0.92]	-0.13119 [0.32]	<b>-0.16811</b> [0.07]*	-0.22797 [0.31]	<b>-0.21141</b> [0.45]	-0.08812 [0.72]	<b>-0.39199</b> [0.05]**
Low normal		-0.00308 [0.03]**		-0.04264 [0.72]		0.01656 [0.94]		-0.30387 [0.10]
High normal	0.00448 [0.03]**		0.04364 [0.72]		-0.01656 [0.94]		0.30387 [0.10]	
Inherited business							-0.59174 [0.01]***	-0.59174 [0.01]***
Observations	545	545	361	361	605	605	280	280
R-squared					0.09	0.09	0.23	0.23

Robust p values in brackets

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%