The 'making' of an entrepreneur: testing a model of entrepreneurial intent among engineering students at MIT

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In the present study a covariance structure model is tested to identify the causes of entrepreneurial intent among engineering students. Specifically, we explore whether steady personal dispositions or whether perceptions of contextual founding conditions have an impact on the intention to found one's own business.

The survey of 512 students at the MIT School of Engineering broadly confirms the model. Personality traits have a strong impact on the attitude towards self-employment. The entrepreneurial attitude is strongly linked with the intention to start a new venture. The students' personality therefore shows an indirect effect on intentions. Furthermore, the entrepreneurial intent is directly affected by perceived barriers and support factors in the entrepreneurship-related context. The findings have important implications for policy makers inside and outside universities.

1. Introduction

Fostering entrepreneurship has become a topic of the highest priority in public policy. In times of increasing concern about technological advance and strong international competition, entrepreneurial activities are regarded as a driving force for innovation (Drucker, 1999). Consequently a broad array of programmes and services have been implemented to provide a better infrastructure for new ventures. Part of these initiatives, e.g. business plan competitions, education centres and chairs for entrepreneurship are targeted on students as future entrepreneurs. Graduates in technical disciplines are more than others expected to found companies in dynamic and innovative areas, thus promoting significant economic growth and increase in employment (Roberts, 1991).

In fact, successful research universities such as the Massachusetts Institute of Technology in Cambridge seem to foster entrepreneurial activities. Approximately 4,000 MIT-related companies exist today, with total employment exceeding

1.1 million people and annual sales of $232 billion. If the companies founded by MIT graduates and faculty formed an independent nation, the companies would make that nation the 24th largest economy in the world (Ayers, 1997). Similar success stories are reported from Stanford University which is closely associated with most of the cutting-edge companies in Silicon Valley (Pfeiffer, 1997). Many US business schools present the number of companies founded by alumni and faculty as an indicator of their outstanding quality. Economic studies in different European regions indicate that the impact of universities on company creation can be observed outside the USA as well (Harhoff, 1999).

While there has been significant research on the causes of entrepreneurial propensity (Greenberger and Sexton, 1988; Learned, 1992; Naffziger *et al*., 1994; Brandstätter, 1997), only a limited number of studies has focused on the entrepreneurial intent among students. It is not widely known whether contextual founding conditions or personality traits drive the students' career decision towards self-employment. In order to design effective programmes, policy makers have to know which of these factors are decisive (Scott and Twomey, 1988). If the readiness to set up a new business is primarily shaped by the founding-related conditions, a change in these conditions should have an effect on the entrepreneurial intent. In this case, government and university policy makers would be well advised to sustain and expand their activities to improve education, infrastructure, legal conditions and financial support for potential business founders. However, these programs would be less likely to foster entrepreneurship if the founding intentions were primarily grounded not on contextual factors, but on the students' personality. Personality traits are comparatively stable and hard to change in the short term. To encourage new venture activities of students, a university would have to rely mainly on a (self-)selection of promising freshmen.

This discussion shows that a better understanding of the antecedents to career choices seems promising, both from an academic and a practical point of view. The research reported in this paper attempts to answer the following question: Is the students' entrepreneurial intent primarily pre-determined by steady personality characteristics or is it possible to foster propensity to self-employment through pragmatic government and university programmes?

The paper starts in section 2 with a short review of relevant literature on graduate entrepreneurship. On the basis of the presented findings, we develop in section 3 a structural model dedicated to explore the impact of contextual and personality factors on entrepreneurial propensity. In section 4 the research method is outlined. The findings are presented in section 5. In the final section 6 we discuss the implications of the findings on the design of entrepreneurship programmes.

2. Research on students' entrepreneurial behavior

Business college students and graduates often see the founding of a company as an attractive alternative to wage or salary employment. This may partly originate from an increasing disappointment with traditional occupations in (large) companies which in turn increases the desirability of self-employment (Kolvereid, 1996). As a reaction to international competition, organizations have gone through major cost cutting and restructuring processes. The employment-related advantages of established companies, mainly job security, reward of loyalty and stability, have lost their attraction (Jackson and Vitberg, 1987). At the same time, the work values usually connected with self-employment such as independence, challenge, and self-realization, have become more desirable in the work environment.

Empirical findings provide support for this trend. In a survey of English students 25% of the respondents indicated that they had a business idea and 41% were inclined to self-employment. Hart and Harrison (1992) explored the attitudes of high-school students in Northern Ireland and report that 47% expressed the wish to run their own business. The result of a survey in Ireland indicates a high average self-reported inclination to become an entrepreneur (Fleming, 1994). Similar findings exist for the USA. A study conducted by Karr (1985) shows that 46% of the college students consider an own business as a good opportunity to get ahead. A more pronounced enthusiasm for entrepreneurship was expressed by MBA students from top business schools across the USA. 44% of the students

selected 'to become an independent entrepreneur' as their primary long-term career goal (Sanholtz, 1990).

A lower level of entrepreneurial intent is found by Brenner *et al.* (1991). Although 55% of the responding senior students in business preferred, given a free choice, to operate their own business, only 5% of all students indicated this as their most probable employment status. Similar results are reported by Kolvereid (1996) for a sample of Norwegian business students. Approximately 43% preferred a career as self-employed, however, only 7% of all respondents estimated the chance to become entrepreneurs to be 75% or higher. Statistics support the comparatively low percentage of graduates starting a new business from scratch. In the early nineties between 2 and 2.5% of English alumni started a business immediately after graduation (Brown, 1990).

These findings reveal a difference between the attitude about entrepreneurship on the one side and entrepreneurial intent and actual behaviour on the other side. The question arises which factors determine the career choice of students and which factors may explain the inconsistency between attitudes and intentions.

Interdisciplinary research has been conducted to answer this question.[1] Psychological models strove to identify personality characteristics that distinguish business founders from non-entrepreneurs (Shaver and Scott, 1991; Brandstätter, 1997). This research field has established a number of significant traits, including risk taking propensity (Brockhaus, 1987; Hisrich and Peters, 1995), need for achievement (Johnson, 1990), and locus of control (Bonnett and Furnham, 1991) and has focused on particular attitudes towards entrepreneurship as antecedents of the career path choice (Robinson *et al.*, 1991b). Sociological theories emphasize a variety of social, cultural and economic contextual variables that may influence the readiness to undertake a new venture. The studies explore factors such as societal attitudes towards entrepreneurship, the availability of funds or the existence of small business incubators (Shapero, 1984). Similar to personality traits, these factors have been found to be important facilitators for entrepreneurial activities (Pennings and Kimberly, 1997; Hisrich and Peters, 1995). Some researchers have investigated the individual within the context of his/her environment to explain entrepreneurial intent. They propose models which include interactions between personality and environmental factors (Dubini, 1988; Greenberger and Sexton, 1988; Learned, 1992; Herron and Sapienza, 1992; Naffziger *et al.*, 1994).

Most of the cited studies are based on samples of professionals who have either founded a company (entrepreneurs) or have work experience as employees of organizations. It seems questionable to generalize these findings to students and graduates. Both populations can differ in a variety of important entrepreneurial characteristics which in turn would lead to inconsistent results (Robinson *et al.*, 1991a).

The few empirical studies based on student samples suggest that courses in entrepreneurship and the image of business founders within the university encourage graduates to become self-employed. A survey of technology students from four different countries reveals that the career preferences and entrepreneurial convictions are influenced by the image of entrepreneurship as a career alternative and the support received from the university environment (Autio *et al.*, 1997). A multi-country survey with MBA students points out that the social status of entrepreneurship is a good predictor of interest in starting a business (Begley *et al.*, 1997). In a survey of MBA students at a large US college, Chen *et al.* (1998) find that the number of management courses the students had taken were positively related to entrepreneurial intention. Further empirical evidence results from a comparison of small business students and students with other business and economics majors. The small business students have a higher need for achievement which in turn has a positive effect on the readiness to found a company (Sagie and Elizur, 1999). However, it is not clear whether self-selection effects or causal effects of the entrepreneurship courses are responsible for these results. Furthermore, Hostager and Decker (1999) in their preliminary study of students involved in an entrepreneurship programme cannot find a relationship between education and achievement motivation. An even more pessimistic view of the effects of universities on entrepreneurial propensity results from a longitudinal study of 89 business students: after four years of business courses the interest in pursuing self-employment seemed to dissipate (Whitlock and Masters,1996).

Other studies which explore the effects of the university environment on entrepreneurship activities focus more on faculty and university staff than on students (BenDaniel, 1999). Taken together, empirical research has seldom explored students as entrepreneurial subjects. The few findings that exist are partly inconsistent. Consequently, there is a lack of understanding how public policy and universities can effectively develop future high-tech business founders. The following survey is aimed to provide new insights concerning this topic.

3. A structural model of entrepreneurial intent

Based upon the existing literature, it appears promising to integrate both, individual traits and contextual factors into a structural model of entrepreneurial intent.

A combination of an extensive literature review and serial interviews with students and experts in entrepreneurship suggested to integrate the two personal characteristics 'risk taking propensity' and 'locus of control' into the structural model. Both constructs have frequently been enumerated as part of the 'personality' of new venture creators and have proven their importance in affecting the level of aspiration towards self-employment (Brockhaus and Horwitz, 1986; Shaver and Scott, 1991; Lumpkin and Erdogan, 1999; Robinson *et al*., 1991b; Stewart, 1996; Bonnett and Furnham, 1991).[2]

In order to compile a large set of contextual factors which might influence the intention to found a company, we conducted explorative interviews and scanned the relevant literature (e.g. Pennings and Kimberly, 1997; Naffziger *et al*., 1994). As a result, 44 items were generated. A questionnaire with these items was administered to 12 business students who were asked to assess the importance of each item for the decision to found a company. The ten items with the highest average importance score were selected. A confirmatory factor analysis suggested that these items can be segregated in perceived support factors and perceived barriers for founding a company.

In sum, the designed model focuses on four (latent) constructs to predict the propensity to start a new venture, namely the risk taking propensity, the locus of control, the environmental support, and the contextual barriers. All four constructs are expected to reveal a causal effect on entrepreneurial behaviour. Therefore, they should determine whether students decide in a positive or negative way concerning self-employment.

In alignment with new research evidence, the model proposes that the intention to become a business founder is moderated by the attitude about entrepreneurship. Attitude instruments tend to account for a big part of the variance of a wide range of behaviours (Ajzen and Madden, 1986; Ajzen and Fishbein, 1980). Consequently, many researchers have also recognized and proved the importance of domain-specific attitudes in understanding (future) business founders (Autio *et al*., 1997; Kolvereid, 1996; Robinson *et al*., 1991b). In the present model, attitudes act as the link between general personality traits and specific entrepreneurial behaviour. It is assumed that the characteristics of the individual indirectly influence the intention to become an entrepreneur through their effect on attitude. This leads us to the following three hypothesis:

H_1: *Individuals with a high risk taking propensity are more likely to have a positive attitude towards entrepreneurship.*

H_2: *Individuals with an internal locus of control are more likely to have a positive attitude towards entrepreneurship.*

H_3: *The more favourable the attitude with respect to becoming self-employed, the stronger the individuals' intention to become self-employed.*

The model proposes a direct impact of the perceptions of contextual factors (support and barriers) on entrepreneurial intentions. Hence, the environment is assumed to be responsible for the lack of a perfect attitude-intention correlation reported above (see chapter 2). A student might be willing to found a company, regardless of his comparatively bad attitude towards entrepreneurship, because he perceives the founding conditions as very favourable (trigger effect). Inversely, graduates with a positive attitude towards new venture creation may not decide to start their own business due to a negative perception of salient factors in the environment. This line of reasoning is known in attitude models as the contextual influence on the attitude-behaviour relationship (Abelson, 1982). Based

on these arguments we propose two additional hypotheses:

H_4: *The more insurmountable a student perceives barriers for founding a company to be, the weaker the individual's intention to become self-employed – irrespective of his attitude towards entrepreneurship.*

H_5: *The more favourable a student perceives supporting contextual factors to start up a new business to be, the stronger the individual's intention to become self-employed – irrespective of his attitude towards entrepreneurship.*

The factor which affect the entrepreneurial intent are presented in a structural model in Figure 1.

4. Research methodology

Previous to the main survey, eight preliminary studies involving 139 subjects were conducted to develop valid scales for the constructs in the model (see Figure 2). Most of the factors were designed through a standard scale development process for theoretical constructs (Bagozzi *et al.*, 1991). First, based on exploratory surveys and/or expert and student judges, a list of items is generated for each construct. Next, this list is screened and the number of items is narrowed through standard validity and reliability criterion (Cronbach α and exploratory factor analysis). The remaining items are the basis of the questionnaire in the main survey. Finally, a second validation of the scales is done on the basis of the survey data applying Cronbach α and confirmatory factors analysis.

Since entrepreneurial intent is the ultimate dependent construct in the model, considerable attention was turned to the design of the intention-scale. Similar to the operationalization used by Autio *et al.* (1997), the respondents were asked to rate the likeliness to become self-employed in the foreseeable future after graduation. In a first version, we designed a five-point scale and tested the validity in an exploratory study involving 15 students. The results revealed a skewed distribution: while the respondents often marked the middle scale-point, almost no student chose 'quite probable' and 'very probable'. A second preliminary study was conducted based on a four-point-scale ($n = 26$). The subjects were asked to make their ratings on the basis of the scale and to write a short statement concerning their career plans and their readiness to found a company. The statements were reviewed by independent raters and associated with one point on the scale. These judgements were linked with the original students' ratings leading to a correlation higher than 0.9. The four-point scale seems therefore to ensure a high-validity measurement of the individuals entrepreneurial intent.

The setting of the preliminary studies was provided by students in Germany. Thus, the questionnaire used in this study was first designed in German, slightly modified and than carefully translated into English by native speakers. The translation was pre-tested with business and technical students at MIT and proved to be both comprehensible and clear. Since e-mail and the internet are the most popular communication

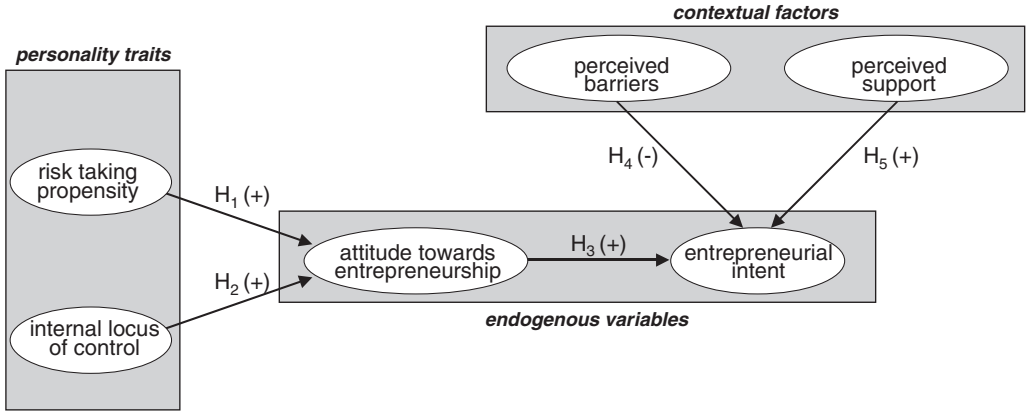


Figure 1. Structural model of entrepreneurial intent.

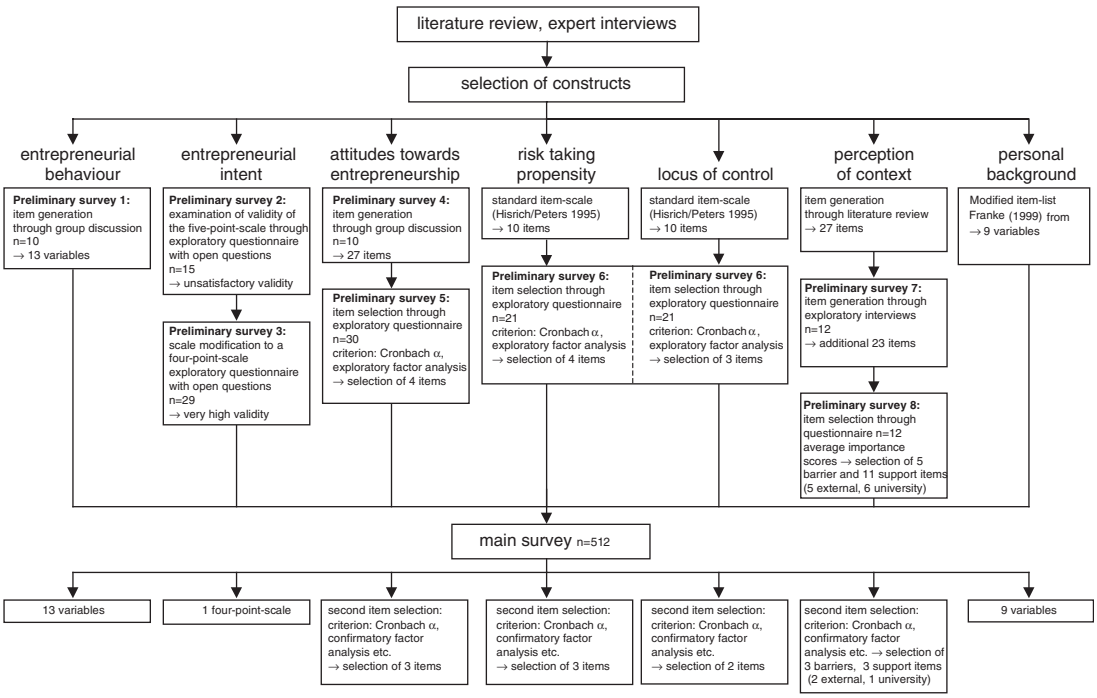


Figure 2. Operationalization of the model.

means used by students, an online-version of the questionnaire was designed.

The data for the main survey were collected from the target population of electrical engineering/computer science and mechanical engineering students at MIT School of Engineering. All students who were members of the official MIT e-mail list of the two departments were asked to participate. The target population (all students in the two departments) is bigger than the selected user population (students in mailing lists). However, the problem of 'undercoverage' does not seem to be critical. The official e-mail lists are used to disseminate important course and exam information. According to students' office administrators, the e-mail directories may therefore be viewed as a nearly complete listing of students in the two MIT departments. The combined sample size is 2,193 engineering students, of whom 1,536 were students in the electrical engineering/computer science department and 657 students had their major in mechanical engineering.

The students received an e-mail with a short explanation of the survey and a hypertext-link to the online-questionnaire. One week after the first mailing a reminder was sent. In all, 524 questionnaires were completed. The response rates were 24.2% in the electrical engineering/computer science department ($n = 378$) and 22.2% ($n = 146$) in the department of mechanical engineering. Twelve answers had to be excluded from further analysis leading to a number of 512 usable questionnaires. Descriptive information about the respondents is provided in Appendix 1.

5. Results

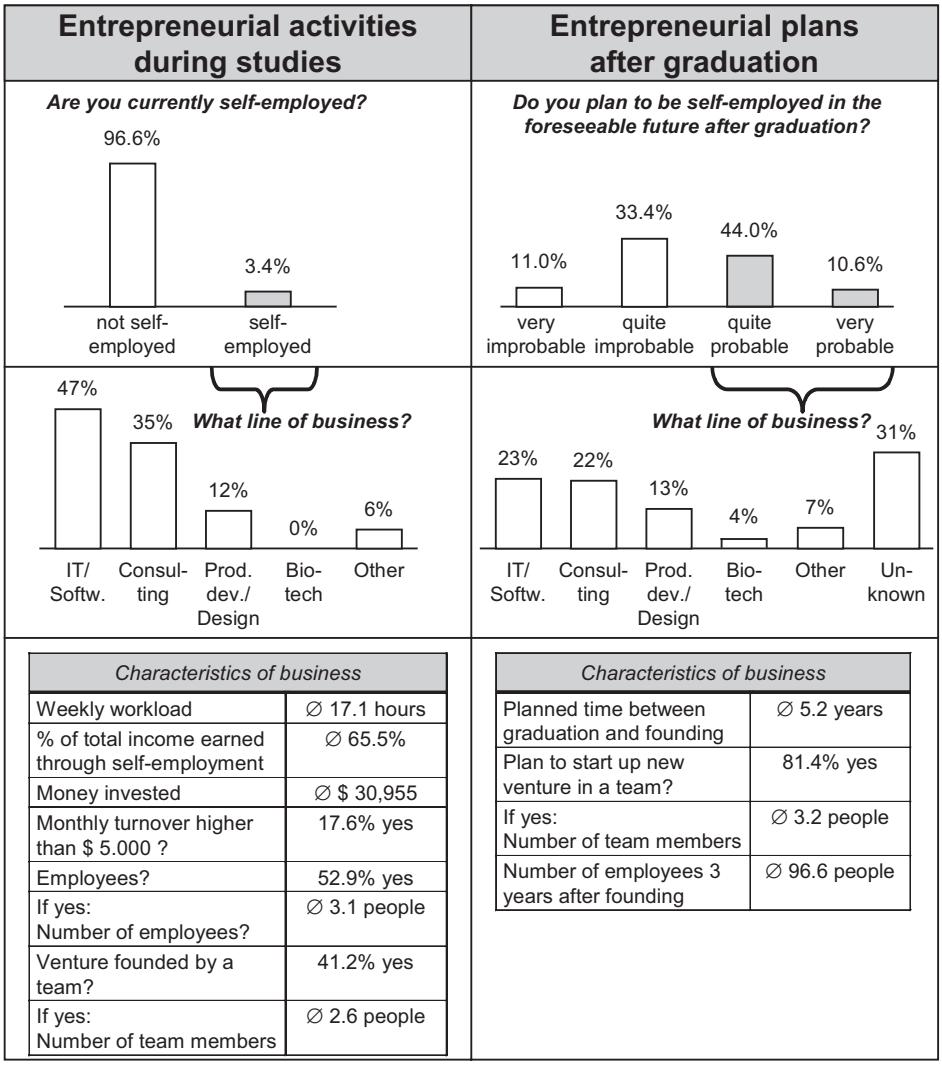
The research findings will be presented in two parts. First, we explore whether graduates can in fact be viewed as an important source of future business founders. The exploration of entrepreneurial activities among students is relevant only if a minimum of entrepreneurial spirit exists. Then, the covariance structure model is estimated in order to examine the causes of entrepreneurial intent.

5.1. Descriptive findings on students' entrepreneurial activities and plans

The descriptives show that the engineering students seldom undertake entrepreneurial

efforts in the course of study (see left column of Figure 3). Only 3.4% of the respondents indicated to be self-employed. This finding may be explained by the high opportunity cost of self-employment due to the extreme workload and the high tuition fees at MIT. However, the self-employed students run businesses of some importance. Almost half of them develop IT hardware and software, on average they have invested $31,000 and one out of two self-employed students already has employees.

More significant than the entrepreneurial activities in the course of study is the intention to start a new venture someday after graduation (see right column of Figure 3). More than half of the respondents indicate that they will 'quite probably' (44.0%) or 'very probably' (10.6%) run their own company in the foreseeable future after leaving university. The planned activities focus on dynamic and innovative areas such as IT hardware and software (23%), high-tech consulting (22%), and product development and design (13%). These companies, if realized, can be expected to have a significant impact on economic growth and increase in employment. On average the students plan to employ 96.6 people three years after founding. Taken together, the respondents in this sample who prefer to start a business may have more than 20,000 employees three years after starting the new business. These



Characteristics of business	
Weekly workload	∅ 17.1 hours
% of total income earned through self-employment	∅ 65.5%
Money invested	∅ $ 30,955
Monthly turnover higher than $ 5.000 ?	17.6% yes
Employees?	52.9% yes
If yes: Number of employees?	∅ 3.1 people
Venture founded by a team?	41.2% yes
If yes: Number of team members	∅ 2.6 people

Characteristics of business	
Planned time between graduation and founding	∅ 5.2 years
Plan to start up new venture in a team?	81.4% yes
If yes: Number of team members	∅ 3.2 people
Number of employees 3 years after founding	∅ 96.6 people

Figure 3. Descriptive findings concerning entrepreneurial activities and plans.

findings seem to fulfill the hopes of economic policy makers. Students at technical research universities are apparently a promising source of future high-tech entrepreneurs.

5.2. Model testing

The covariance structure model was estimated in order to explore the antecedents of the intentions to choose the entrepreneurial career path. Specifically, we investigate whether founding activities may be fostered by a favourable context inside and outside the university or are rather determined by students' personality.

The assessment of fit reveals that the model satisfactorily reproduces the sample matrix of variance and covariance (see Figure 4 and Appendix 2). All global goodness-of-fit measures reach a level that is usually regarded as acceptable: GFI = 0.952, AGFI = 0.933, RSMEA = 0.047, CFI = 0.939, χ^2/df = 2.11. The 'difference of chi-square test' compares the original model with competing models obtained by constraining one of the free parameters (Long, 1983). The results of this test indicate that the model constructs have a high discriminant validity (see Appendix 3).

The model parameters were estimated using the *maximum likelihood* method and are reported in Figure 4. The attitude towards entrepreneurship emerges as the most important antecedent of the intention to become self-employed. The attitude has a strong and highly significant effect on entrepreneurial conviction ($\beta = 0.508$***). Hypothesis 5 is therefore confirmed by the analysis. If public policy and university administration want to raise the number of graduates who decide to start their own business, an improvement of the students' attitude towards entrepreneurship apparently is an effective lever.

This attitude is influenced by the personality of the respondents (H_1 and H_2 are supported). In particular, the risk taking propensity stands out as a very strong influence, with a Beta of 0.464***. The impact of an internal locus of control on the attitude is also fairly high ($\beta = 0.300$**). Taken together, the findings imply that students who are willing to accept risks and who perceive control over the events in their life have a more favourable attitude towards running an own business. This way, personality traits have an *indirect* impact on the readiness to become self-employed.

H_4 and H_5 stated that the perceptions of entrepreneurship-related barriers and supporting factors contribute a *direct* explanation for the preferred employment status of the students. The findings support both hypothesis. The path between the perceived barriers and intentions is significant ($\beta = -0.127$**). If students realize an antagonistic environment for business founders, e.g., because they think that banks do not readily give loans, or because they rate the state laws as being too restrictive, they are less likely to become entrepreneurs. The path coefficient

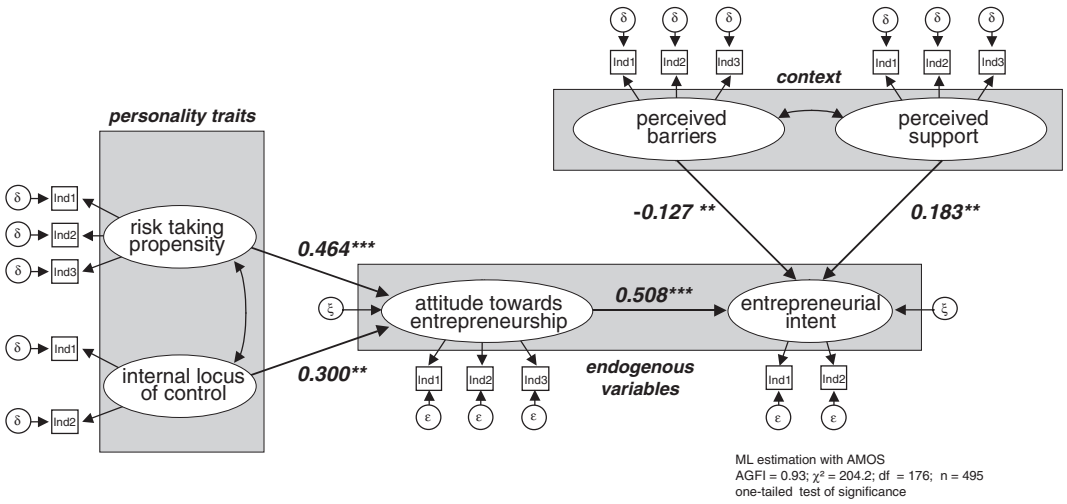


Figure 4. Results of model testing.

between the perceived support factors and entrepreneurial intent point in the same direction ($\beta = 0.183$**). An optimistic evaluation of help and facilities, which are available to potential business founders, is associated with a higher propensity to pursue a career as an entrepreneur. Overall, the perceptions of the context factors for entrepreneurship have a moderating influence on the attitude-intention relationship. This effect may explain why a student, despite a positive attitude about being self-employed, may not be willing to risk a new venture because he/she perceives the context as hostile. Inversely, students with a less favourable attitude may be encouraged to run their own business due to an optimistic perception of the environmental conditions for entrepreneurs.

The findings allow us to answer the research question of the present paper: the intentions of students to become business founders is influenced both indirectly by steady personality traits and directly by contextual factors, which are usually easier to modify. It has to be taken into account that we have not explored the 'objective', but the perceived contextual factors. Therefore, initiatives addressed to improve the founding conditions do not necessarily lead to an immediate improvement of entrepreneurial intentions and to higher business 'birth rates'.

To decide which of the two construct groups – personality traits or contextual founding conditions – has the stronger impact on the preferred career alternative, the causal effects represented by the path parameters are added up. The personal characteristics have a total indirect effect of $(0.300 + 0.464)*0.508 = 0.388$. The context factors show an overall direct impact of $(0.127 + 0.183) = 0.31$. This comparison is limited by the fact that the personality and the context are not entirely covered by the constructs included in the present research. However, for this sample of technical students at MIT both construct areas seem to have a similar effect on entrepreneurial intent.

6. Implications

The present survey provides evidence that the perceived contextual barriers and support factors play a significant role for the entrepreneurial behaviour of technical students. These perceptions may be altered and improved by suitable initiatives. Thus, public policy and universities would be well advised to intensify their activities to implement educational, research and resource programmes on entrepreneurship. Such programmes have to remove the perceived and the objective context factors which are adverse to starting a company. Furthermore, the image of entrepreneurship as a career alternative should be improved and support from the public and university environment should be intensified. The actions could entail, for example, using positive role models in teaching, establishing entrepreneurial support networks, and arranging business plan competitions.

Next, the findings also indicate that the conviction to start up a new venture is to some extent a question of personality structure. Those who are in charge of an economic policy meant to encourage technical students to found high-tech companies should be aware that the measures we propose will not have the same effects on all people. It seems more promising to focus the stimulating activities on the right students, particularly those with a propensity to high risk taking and an internal locus of control. In order to avoid misdirected budgets, policy makers and university faculty need to identify these students and encourage them to take part in entrepreneurship programmes. For instance, universities could try to base their selection process for courses in entrepreneurship partly on information provided by students about personality traits and preferences regarding entrepreneurship.

Finally, the attitude towards entrepreneurship proved to contribute the strongest explanation for entrepreneurial intentions of the technical students. We have focused on personality traits as causes of the attitude. However, other variables may have an impact on this attitude as well. If these factors are open to change, entrepreneurial attitudes may be influenced by educators, policy makers, and successful founders who can be powerful role models. Further research in the area of attitude formation holds promise for enhancing the understanding of the entrepreneurial intent and the effective cultivation of a business founding spirit among students.

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Notes

1. 'No one discipline or conceptual scheme can provide an adequate understanding of all aspects of entrepreneurship' (*Reynolds* 1991, p. 67).
2. Only two constructs were taken into consideration in order to keep the strain for the respondents on a low level.

Appendix

Appendix 1. Information about respondents

Age		Nationality		Gender		Student status	
0–20	40.0%	USA/Canada	69.0%	Female	23.9%	Undergraduate	71.6%
21–22	36.9%	Asia	21.3%	Male	76.1%	Graduate	28.4%
23–24	12.0%	Europe	4.2%	**Self-employed parents**		**Department**	
25–26	5.0%	Rest America	4.9%	Yes	30.1%	Electr./Comp.	72.7%
27–	6.1%	Other	0.6%	No	69.9%	Mechanical	27.3%
Mean	21.7						
Std. dev.	5.2						

Appendix 2. Results model testing

Factor	Indicator	Indicator reliability	Revalue of factor loadings	Item total correlat	Cornback α	Explained variance by *f*-factor	Factor retiability	Average explained variance
Risk	1	0.808	–	0.382				
	2	0.570	7.366	0.525	0.642	58.7%	0.652	0.388
	3	0.389	7.809	0.457				
Locus	4	0.667	–	0.315	0.478	65.7%	0.562	0.423
	6	0.147	2.372	0.315				
Barriers	7	0.417	–	0.405				
	8	0.204	5.086	0.309	0.533	52.2%	0.547	0.294
	9	0.262	5.070	0.343				
Support	10	0.361	–	0.371				
	11	0.213	4.895	0.306	0.522	51.2%	0.527	0.275
	12	0.245	4.873	0.334				
Attitude	13	0.788	–	0.606				
	14	0.243	9.764	0.426	0.690	62.1%	0.705	0.452
	19	0.394	12.003	0.492				
Entrep.	20	0.932	–	0.8643	0.867	93.22%	0.941	0.906
Intent	21	0.798	22.358	0.8643				
Global	$\chi^2 = 204.2$	GFI	$= 0.952$					
Fit	$df = 97$	AGFI	$= 0.933$					
Measures	$p = 0.000$	RMSEA	$= 0.047$					
	$\chi^2/df = 2.11$	CFI	$= 0.939$					$n = 495$

Appendix 3. Test of discriminant validity (χ^2-Test of difference)

	Risk	Locus	Barriers	Support	Attitude	Entrep. intent.
Risk						
Locus.	202.1					
Barriers	294.31	258.73				
Support	169.23	203.52	282.29			
Attitude	13.58	15.46	17.3	13.2		
Entrep. intent.	69.61	41.20	37.2	64.9	321.6	

Number in cells: Difference of χ^2 between original model and model with one additional (difference should be higher than 3.841).

Appendix 4. Items in analysis

Construct	Formulation of items
Risk taking propensity	5-point rating scale (1 = not at all accurate; 5 = very accurate); items; 'When I travel I tend to use new routes'; 'I like to try new things (e.g. exotic food or going to new places': 'I have taken a risk in the last six months'.
Locus of control	5-point rating scale (1 = not at all accurate; 5 = very accurate); items: 'I often feel 'That' just what the things are and there' nothing I can do about it' (scale inversed), 'When everything goes right, I think that it' mostly luck' (scale inversed).
Perceived barriers	5-point rating scale (1 = not at all accurate; 5 = very accurate); items: 'Banks do not readily give credit to start up companies'; 'State laws (rules and regulations) are adverse to running a company'; 'It is hard to find a business idea for a business that hasn't been realized before'.
Perceived support factors	5-point rating scale (1 = not at all accurate; 5 = very accurate); items: 'Entrepreneurs have a positive image with American society'; 'Qualified consultant and service support for new companies is available'; 'The creative MIT atmosphere inspires to develop ideas for new businesses'.
Attitude towards entrepreneurship	5-point rating scale (1 = not at all accurate; 5 = very accurate); items: 'I'd rather be my own boss than have a secure job'; 'You can only make big money if you are self-employed'; 'I'd rather found a new company than be the manager of an existing one'.
Entrepreneurial intent	'Do you plan to be self-employed in the foreseeable future after you leave the MIT?' 4-point rating scale (1 = very probable, 2 = quite probable, 3 = quite improbable; 4 = very improbable) and 'Are you currently self-employed' (yes/no).