Assessing Risk Perception, Self-efficacy, and Entrepreneurial Attitudes and Intentions: Implications for Entrepreneurship Education

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Entrepreneurship appears important as an economic and social phenomenon because it increases economic efficiencies, brings innovation, creates jobs (Shane and Venkataraman, 2000). Despite decades of research, we still have only a limited understanding of the process that lead an individual to become an entrepreneur (Markman, Balkin and Baron, 2002). The number of public and private initiatives to train and educate people to be more entrepreneurial have multiplied on both sides of the Atlantic (see for example Fayolle 2000a; Katz, 2003; Kuratko, 2005). Facing this multiplication of entrepreneurship education programmes and the increasing resources allocated to those initiatives it does appear strong needs to evaluate, compare and improve the design of such programmes.

The aim of this research, through the understanding of the perceived risk and self-efficacy constructs and their impact on individual’s entrepreneurial intention, is to study the possibility to orientate the design, the pedagogy and the contents of entrepreneurship education programmes in order they take wider and deeper into account these key dimensions.

Social psychology and cognitive theories offer several understandings of the role of some beliefs and attitudes in the phenomenon of new venture creation. Among all the factors that may influence entrepreneurial cognition, we have chosen to emphasize the role of two particular concepts supposed to impact one’s orientation of starting a new venture: risk perception and self-efficacy.

To do this, we incorporated scales measuring risk perception and self-efficacy in an existing instrument used to assess entrepreneurship teaching programmes based on the theory of planned behaviour (see Fayolle, 2003; Fayolle and Gailly, 2004; Fayolle, 2005; Fayolle et al., 2005). We suggest that risk perception and self-efficacy, as well as the antecedents of entrepreneurial behaviour described in the theory of planned behaviour (attitudes, subjective norms, perceived behavioural control, and intentions), may consist useful indicators to monitor in order to evaluate and improve entrepreneurship teaching programmes.

However, due to the timing of our research and its initial ambition, this work constitutes only a first step: testing our extended framework and proposed tools of measure. The discussion of the results will be done at the light of our main aim and so, the implications will address educational questions both at the theoretical and the practical levels.
1. INTRODUCTION

Entrepreneurship appears important as an economic and social phenomenon because it increases economic efficiencies, brings innovation, creates jobs (Shane and Venkataraman, 2000). Despite decades of research, we still have only a limited understanding of the process that lead an individual to become an entrepreneur (Markman, Balkin and Baron, 2002). The number of public and private initiatives to train and educate people to be more entrepreneurial have multiplied on both sides of the Atlantic (see for example Fayolle 2000a; Katz, 2003; Kuratko, 2005). Facing this multiplication of entrepreneurship education programmes and the increasing resources allocated to those initiatives it does appear strong needs to evaluate, compare and improve the design of such programmes.

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2. ENTREPRENEURSHIP AS A FIELD OF EDUCATION AND TRAINING: NEED OF ASSESSMENT

There has been a considerable proliferation in entrepreneurship education and training over institutions throughout the world (Vesper & Gartner, 1997; Katz, 2003; Kuratko, 2005) while published research in the field has tended to
be fragmented. This proliferation introduces variation in terms of short term objectives, target audiences, format and pedagogical approach. For this reason, policy makers and educators need a thorough understanding of the diverse aims and objectives of the entrepreneurship courses and programmes. At the same time, research also underlines the need to design and develop a common framework to evaluate, compare, and enhance the structure of those programmes. The proposed framework should include both a set of clearly identified criteria and a methodology for effective measurement. Authors underscore the need for developing new assessment indicators (Moro, Poli and Bernardi, 2004; Hytti and Kuopajärvi, 2004; Henry & al., 2004).

The increasing level of resources allocated to these initiatives has also generated a growing interest from providers and academics about the effectiveness and efficiency of programmes as well as the identification and diffusion of best practices (Fiet, 2001b). Hill and O’Cinnéide (1998) have noted that only very few studies have investigated the effects of entrepreneurship education. Realizing the underlying complexity of assessment, several researchers have explored new and alternative methods to programme evaluation, taking into consideration direct programmatic impacts, such as new venture and job creation, as well as indirect impacts (increasing entrepreneurial spirit) on economic development. According to several studies, limiting the evaluation of entrepreneurship teaching programmes (ETP) to direct micro-economic impact (new venture and job creation) can often be misleading and short-sighted. Because the impact of these programmes on participants is diversified across several disciplines, industries, and markets, the effectiveness of ETPs may not be readily or immediately apparent.

Gibb (1997) doubts about the relevancy of evaluation of ETPs effectiveness based on pay back. Furthermore, Wyckham (1989) has noted that there has been difficulty in identifying appropriate output measures.

The evaluation of entrepreneurship education programmes has to take into account both economic and academic issues. On one hand, ETP stakeholders need to validate and assess the nature and the intensity of the social and economic impact of these programmes (Hytti & Kuopajärvi, 2004; Pihkala & Miettinen, 2004). On the other hand, there is a lack of research regarding the outcomes of entrepreneurship education (Block and Stumpf, 1992; Garavan and O’Cinneide, 1994; Honig, 2004) and significant methodological concerns have been raised regarding that issue (Hindle and Cuttling, 2002; Peterman and Kennedy, 2003).

Based on an integration of psychology and entrepreneurship literatures, as well as previous empirical research in this field, we suggest a theoretical assessment model that includes attitudes, intention, self-efficacy and risk-perception.
3. ASSESSING ENTREPRENEURSHIP EDUCATION PROGRAMMES:
THEORY OF PLANNED BEHAVIOUR, SELF-EFFICACY AND RISK
PERCEPTION

Previous research has suggested the use of the theory of planned behaviour in assessing entrepreneurship education programmes (Fayolle, 2003; Fayolle and Gailly, 2004; Fayolle, 2005; Fayolle et al., 2005). These studies have explored the effects of entrepreneurship education on students’ intentions and attitudes toward the entrepreneurial behaviour. More precisely, such studies tried to assess the impact of an entrepreneurial teaching programme (ETP) on the antecedents of entrepreneurial behaviour as defined using Ajzen’s theory (1991; 2002), i.e., by using measures of attitude toward the behaviour, subjective norms, perceived behavioural control, and intention.

Following this line of research our purpose here is to suggest that two additional constructs should be taken into account to improve and extend the existing research model: risk perception and self-efficacy. Incorporating these two concepts in the model raises some interesting questions not only about how entrepreneurial education impacts risk perception and self-efficacy, but also about how these two concepts are related to the others already shown in the model (entrepreneurial intentions, attitudes, subjective norms, and perceived behavioural control).

3.1 The theory of planned behaviour

The theory of planned behaviour is an extension of the theory of reasoned action (Ajzen and Fishbein, 1980), including the factor of "perceived behavioural control". The central factor of this theory is the individual intention to perform a given behaviour.

Intention is the cognitive representation of a person’s readiness to perform a given behaviour, and is considered to be the immediate antecedent of behaviour. The first claim is that intention is the result of three conceptual determinants:

- **Attitude toward behaviour**: The degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour in question (Ajzen, 1991). When new issues arise requiring an evaluative response, people can draw on relevant information (beliefs) stored in their memories. Because each of these beliefs carries evaluative implications, attitudes are automatically formed.
- **Subjective norms**: Perceived social pressures to perform or not to perform the behaviour (Ajzen, 1991); in other words, the subject’s perception of other people’s opinions about the proposed behaviour. It is possible for theses pressures to have a strong or weak role in the creation of intention.
- **Perceived behavioural control**: Perceived ease or difficulty of performing a behaviour (Ajzen, 1991). This concept was introduced into the theory of planned behaviour to accommodate the non volitional elements inherent, at least potentially, in all behaviours (Ajzen, 2002). Krueger and Dickson (1994)
show us that an increase of perceived behavioural control increases the perception of opportunity.

3.2 Self-efficacy and entrepreneurial self-efficacy

Grounded in social cognitive theory of Bandura (1977a, 1977b, 1982, 1986), the self-efficacy construct is defined as an individual’s convictions about his/her abilities to mobilize cognitive, motivational and behavioural facilities needed to successfully execute a specific task within a given context.

Self-efficacy beliefs influence the choices people make and the courses of action they pursue. Most people engage in tasks in which they feel competent and confident and avoid those in which they do not (Pajares, 1996).

According to Bandura (1986), judgments of personal competence to engage in a behaviour differ from "judgments of the likely consequence that behavior will produce" (p. 391). Bandura (1984) argued that the outcomes people expect are largely dependent on their judgments of what they can accomplish.

The construct has been widely tested in varied disciplines and settings and have received support from a growing body of findings from diverse fields. Self-efficacy beliefs have been found related to clinical problems such as phobias (Bandura, 1983), addiction (Marlatt, Baer, & Quigley, 1995), depression (Davis & Yates, 1982), social skills (Moe & Zeiss, 1982), assertiveness (Lee, 1983, 1984); to stress in a variety of contexts (Jerusalem & Mittag, 1995); to smoking behaviour (Garcia, Schmitz, & Doerfler, 1990); to pain control (Manning & Wright, 1983); to health (O'Leary, 1985); and to athletic performance (Barling & Abel, 1983; Lee, 1982).

Self-efficacy beliefs have also received increasing attention in educational research, primarily in studies of academic motivation and of self-regulation (Pintrich & Schunk, 1995). In this area, some researchers have explored the link between efficacy beliefs and college major and career choices, particularly in science and mathematics (see Lent & Hackett, 1987, for a review). This line of inquiry has important implications for counselling and vocational psychology theory and practice, given that findings have provided insights into the career development.

Entrepreneurial self-efficacy (ESE) is defined as an individual’s confidence in his/her ability to successfully perform entrepreneurial roles and tasks. Previous work developed a theoretical model in which self-efficacy is proposed as an antecedent of entrepreneurship intentions and behaviour (Boyd & Vozikis, 1994). Thus an individual who perceives that he/she has capabilities in a certain area (entrepreneurship) will be more likely to initiate new behaviours in that field and persist in those activities. This motivational construct has been shown to influence an individual’s choice of activities, goal levels, persistence and performance in a range of contexts (Zhao, Seibert and Hill, 2005).
Based on some research works which have explored individual’s perceptions on their own entrepreneurial abilities (Boyd & Vozikis, 1994; Krueger & Brazeal, 1994; …), Chen & al. (1998) developed the construct of ESE as a specific form of self-efficacy by identifying a list of key tasks needed for entrepreneurship. The authors proposed a measurement scale including various aspects related to marketing, innovation, risk-taking, financial and general management.

While research has qualified the interest of ESE as relevant and promising (Forbes, 2005), we are still convinced that understanding this construct is important for the field of entrepreneurship education because it could affect participants’ and students’ willingness to engage in entrepreneurship. DeNoble & al. (1999) contend that entrepreneurs require high levels of self-efficacy to perform effectively. They argued that it would help entrepreneurship educators to design courses and programmes that build confidence in students and enable them to build skills fundamental to entrepreneurial success. DeNoble & al. (1999) also proposed an alternative entrepreneurial self-efficacy scale that contains six dimensions: 1. Developing new product and market opportunities, 2. Building an innovative environment, 3. Initiating investor relationship, 4. Defining Core purposes, 5. Coping with Unexpected challenges, 6. Developing critical human resources

ESE affects ‘potential’ entrepreneurs because individuals’ intentions are a function of the extent to which they perceive that it is both feasible and desirable to engage in an entrepreneurial process (Kolvereid, 1997; Krueger & Brazeal, 1994). ESE can influence the formation of entrepreneurial intention in this way (Forbes, 2005).

3.3 Risk perception

Risk perception is generally defined as a decision maker’s assessment of the risk inherent to a situation (Sitkin and Pablo, 1992). It includes (a) the decision maker’s labeling of situations, (b) probabilistic estimates of the extent and controllability of risks, and (c) confidence in those estimates. Since past research indicates that the perceived context is a more important determinant of risk-taking than personality (Brockhaus, 1980; Hogarth, 1987; Palich and Bagby, 1995; Delmar, 1996; Busenitz, 1999), it seems that a focus on risk perception is more helpful to understand entrepreneurial cognition and behaviour. Moreover, perceiving a lower level of risk seems to be associated with the decision to start a new venture (Simon et al., 2000).

Even though risk-taking is the common denominator for many definitions of entrepreneurship, it seems that we lack some knowledge about the dynamics of risk-taking from learning and teaching perspective, “which has been a neglected area in entrepreneurship education research.” (Kyrö and Tapani, 2007)

Risk and uncertainty constitute a key dimension of entrepreneurship, and generally people undertaking entrepreneurial behaviour face an uncertain environment. However, what we usually fail to recognize is that the source of uncertainty lies in us rather than in the environment (Hogarth, 1987). The
world is uncertain because our representation of it is necessarily imperfect, due to our limited information-processing capacity. Thus, effective entrepreneurship training should provide individuals with tools and competences that help them to better represent their situations (or the choice task) in their minds.

In other words, we join Kyrö and Tapani’s (2007) belief that risk-taking is a competence that can be both taught and learned. Moreover, we also join Hogarth (1987) in that “the key to understanding people’s choice behaviour lies in understanding how they have come to represent the choice task in their minds.” (p. 83) Hence the importance of perceptions.

Since risk-taking is a central dimension of entrepreneurial behaviour and a fundamental topic of effective entrepreneurship teaching programs (ETP), it seems important to assess the impact of an ETP on students’ risk perception as well as to understand the potential links between risk perception and other antecedents of entrepreneurial behaviour.

3.4 Discussion about possible relationships between risk perception, self-efficacy, and other antecedents of entrepreneurial behaviour

Past research gives some insights about possible relationships between both risk perception and self-efficacy with the other antecedents of entrepreneurial behaviour described in Ajzen’s theory.

As stated above, self-efficacy has already been proposed as an antecedent of entrepreneurial intentions and behaviour (Boyd & Vozikis, 1994). The underlying idea is that an individual who perceives himself/herself as having capabilities in entrepreneurship will be more likely to initiate new entrepreneurial behaviours and persist in those activities. A hypothesis one could thus formulate is that a higher degree of self-efficacy would be correlated to a higher degree of intention toward entrepreneurial behaviour. Such hypothesis seems to be consistent with the propositions advanced by Krueger and Carsrud (1993), which approximate perceived behavioural control and self-efficacy, and by Ajzen (1987), who points out that the concept of perceived behavioural control is closely related to the concept of self-efficacy (Bandura, 1977a, 1982). Also, Krueger (1993) suggests that perceived feasibility—the degree to which a person feels capable of successfully starting a business— is an important antecedent to the formation of entrepreneurial intentions.

Risk perception has also been proposed as an antecedent of entrepreneurial intentions and behaviour. Simon et al. (2000) found some empirical evidence that risk perception is negatively correlated to the decision to start a venture. The same authors also found some empirical evidence that risk perception was negatively related to a cognitive bias called “illusion of control” – which occurs when an individual overemphasizes the extent to which his or her skill can affect performance in situations where chance plays a large part and skill is not necessarily the deciding factor. According to Simon et al. (2000), an
illusion of control tends to decrease one’s perception of the level of risk associated with forming a venture, thus affecting positively the decision to start a venture. Therefore, one could logically hypothesize that risk perception is negatively correlated both to the intention of starting a venture and to the perceived control of such a behaviour.

Nevertheless, at this stage of research we do not attempt to test hypotheses. Our aim here is to emphasize that, when measuring the impact of an ETP in terms of self-efficacy, risk perception, entrepreneurial intentions and so on, in order to evaluate or improve the ETP, it is probably useful to have a wide and deep understanding of the relationships that may exist between those constructs.

In order to make a first step in this sense, we present below the results of an exploratory study where we pre-tested a questionnaire conceived to measure all the constructs mentioned: entrepreneurial intentions, attitudes, subjective norms, perceived behavioural control, self-efficacy, and risk perception.

4. AN EXPLORATORY STUDY AND THE FIRST TEST OF OUR RESEARCH MATERIAL

We applied a questionnaire to a small sample of students attending an entrepreneurship course. The objective was to pre-test the questionnaire, specially our measures of self-efficacy and risk perception. Results have no conclusive value, but do help ameliorating our questionnaire and could point interesting questions for future research.

4.1 Sample

Data has been collected from students attending an entrepreneurship course. This programme is offered to the students in the last year of Master of Science in Management at EM Lyon Business School. It includes structured interactive exercises, brainstorming sessions, case studies and discussions with the professor and entrepreneurs, taking place over a period of 3 months.

Our sample consists of 17 students in Management, with ages ranging from 22 to 26 years-old. 15 of them were French, and only two had already started a venture.

4.2 Method and measures

Students were asked to answer to the questionnaire during the class period, and were given enough time to do so (approximately 30 minutes). In addition to seven scales conceived to measure the constructs mentioned above, students were also asked to give some personal information and oral and written feedback about the questionnaire itself. This procedure enabled us to identify problems concerning the size of the questionnaire and the comprehension of some items (we will turn to this point later).
Since the measures assessing entrepreneurial intentions, attitudes, perceived behavioural control, and subjective norms, have already been presented, tested and used in past research (Fayolle and Gailly, 2004; Fayolle, 2005; Fayolle et al., 2005), we will focus here on the measures used to assess risk perception and self-efficacy.

In order to measure participants’ risk perception, we used two scales: (a) the first one adapted from Forlani and Mullins (2000), which we used to measure the perceived risk associated with the general idea of creating a new business; and (b) the second one adapted from Simon et al. (2000), which we use to measure the perceived risk associated with the specific new venture project carried out by the respondent.

To measure participants’ perceived self-efficacy, we use the Entrepreneurial Self-Efficacy Scale developed by DeNoble & al. (1999). It contains six dimensions where participants are asked to indicate their perceived confidence in accomplishing different tasks necessary to engage themselves in an entrepreneurial process.

4.3 Results and analysis

4.3.3 Validity and reliability analysis

Oral and written feedbacks about the questionnaire pointed three main concerns: (a) the size of the questionnaire; (b) redundancies; and (c) the lack of clarity in the scale measuring risk perception associated with the general idea of creating a new business (Perceived Risk in General). These observations have to be treated carefully. While the first ones may be seen as a normal result of an experimental questionnaire that needs improvement, the last one points to a problem of comprehension of a specific measure: the scale used to assess Perceived Risk in General, adapted from Forlani and Mullins (2000), is a semantic differential scale with three items – the problem pointed by the students in our sample is that the adjectives used (“High-Low”, “Minimal-Extreme”, “Not Risky-Very Risky”) may raise confusion.

Indeed, there were no missing values, except for the variables measuring risk perception. Two possible reasons for such a phenomena come to our minds: (a) the confusion raised by the scale measuring Perceived Risk in General; and/or (b) the fact that most of the respondents did not have a real venture project in mind. Given the sample size, the method used to deal with missing data was mean substitution.

Main descriptive statistics and Cronbach’s alphas are presented below:
Table 1: Descriptive statistics and alphas

<table>
<thead>
<tr>
<th>Measure</th>
<th>Number of items</th>
<th>Average score (7-point scale)</th>
<th>Standard deviation</th>
<th>Crombach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude toward the entrepreneurial behaviour</td>
<td>32</td>
<td>5.23</td>
<td>0.58</td>
<td>0.83</td>
</tr>
<tr>
<td>Attitude related to subjective norms</td>
<td>6</td>
<td>3.88</td>
<td>1.26</td>
<td>0.85</td>
</tr>
<tr>
<td>Attitude related to perceived control</td>
<td>6</td>
<td>4.17</td>
<td>1.02</td>
<td>0.80</td>
</tr>
<tr>
<td>Entrepreneurial intentions</td>
<td>3</td>
<td>4.65</td>
<td>1.74</td>
<td>0.89</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>24</td>
<td>4.91</td>
<td>0.75</td>
<td>0.85</td>
</tr>
<tr>
<td>Perceived risk in general</td>
<td>3</td>
<td>5.04</td>
<td>0.70</td>
<td>0.47</td>
</tr>
<tr>
<td>Perceived risk specific to a project</td>
<td>8</td>
<td>3.24</td>
<td>0.92</td>
<td>0.78</td>
</tr>
</tbody>
</table>

Note that the Crombach’s alpha obtained for the measure of Perceived Risk in General is not satisfactory, according to the generally agreed upon lower limit for this coefficient (Pedhazur and Schmelkin, 1991; Hair et al., 1998). This reinforces the observations made earlier about the weak reliability of this measure.

The other measures, however, seem to be more consistent.

4.3.4 Correlation analysis

Correlations between each construct measure are shown in the table below.

Table 2: Pearson’s Correlations

<table>
<thead>
<tr>
<th></th>
<th>ATTITUDE</th>
<th>NORMS</th>
<th>CONTR</th>
<th>SELF_E</th>
<th>INTENTI</th>
<th>RISK_G</th>
<th>RISK_SPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATTITUDE</td>
<td>1</td>
<td>.335</td>
<td>.598(*)</td>
<td>.412</td>
<td>.745(**)</td>
<td>-.343</td>
<td>-.448</td>
</tr>
<tr>
<td>NORMS</td>
<td>.335</td>
<td>1</td>
<td>.341</td>
<td>.368</td>
<td>.643(**)</td>
<td>-.167</td>
<td>-.245</td>
</tr>
<tr>
<td>CONTROL</td>
<td>.598(*)</td>
<td>.341</td>
<td>1</td>
<td>.368</td>
<td>.192</td>
<td>-.415</td>
<td>-.563(*)</td>
</tr>
<tr>
<td>SELF_EFF</td>
<td>.412</td>
<td>.341</td>
<td>.368</td>
<td>1</td>
<td>.192</td>
<td>-.309</td>
<td>.040</td>
</tr>
<tr>
<td>INTENTIO</td>
<td>.745(**)</td>
<td>.643(**)</td>
<td>.192</td>
<td>1</td>
<td>-400</td>
<td>1</td>
<td>.355</td>
</tr>
<tr>
<td>RISK_GEN</td>
<td>-.343</td>
<td>-.167</td>
<td>-.415</td>
<td>-.309</td>
<td>-.400</td>
<td>1</td>
<td>.355</td>
</tr>
<tr>
<td>RISK_SPE</td>
<td>-.448</td>
<td>.245</td>
<td>.563(*)</td>
<td>.040</td>
<td>-.351</td>
<td>.355</td>
<td>1</td>
</tr>
</tbody>
</table>

* p < 0.05  ** p < 0.01  N = 17

Note that significant correlations were found between entrepreneurial intentions (INTENTIO) and, respectively, attitude toward entrepreneurial behaviour (ATTITUDE), subjective norms affecting the behaviour (NORMS), and perceived behaviour control (CONTROL). This may be seen as an
evidence of the consistency of the theory of planned behaviour, whose elements appear to be positively correlated even in this small sample.

Another significant correlation was found between the perceived risk related to a specific venture project (RISK_SPE) and the perceived behavioural control (CONTROL). As expected, both variables correlate negatively.

No significant correlations were found for the perceived risk associated with the general idea of starting a venture (RISK_GEN). Given the poor reliability of this measure, this was not surprising.

However, what surprised us is that no significant correlations were found for perceived self-efficacy (SELF_EFF) either. Possible reasons for this are discussed in the following section.

4.4 Limitations and discussion

A serious limitation of this exploratory study is our sample size (N = 17). It impacted our analysis in several ways.

First, given the number of constructs and items being used, we were tempted to apply factor analysis to our data. Factor analysis is a powerful and useful tool for studying the internal structure of a set of indicators and assessing construct validity (Pedhazur and Schmelkin, 1991). However, large samples are imperative for stability of factor analytic results, and therefore we avoided using this kind of technique.

Second, since statistical tests are sensitive to sample size, our results must be analysed with caution. More statistically significant effects tend to appear with larger sample sizes. This may explain the relatively small number of significant correlations found in Table 2.

A surprising result was that no statistically significant correlations were found between entrepreneurial self-efficacy and the other constructs. This result is as more surprising as a very close factor (perceived behavioural control) has a very strong statistical impact on entrepreneurial intention and on other constructs such as attitude and perceived risk related to a specific venture project.

One possible reason for this could be that those correlations were calculated based on summated scales, and an implicit assumption for doing this is that the original scales are unidimensional. Since the scale we used to measure self-efficacy is multidimensional (DeNoble et al., 1999), results may be misleading. In order to address this problem we created summated scales for each dimension of the self-efficacy scale and calculated correlations between them and all the other metric variables. However, no significant results were obtained and no clear patterns could be identified.
Another possible reason for such a result is that the scale used to measure self-efficacy actually assess several aspects of attitudes, overlapping only in part with our measures of perceived behavioural control and attitude toward entrepreneurial behaviour. However, further research, using larger samples and factor analysis, are necessary to get to any conclusion on this subject.

Even if our results are subjected to caution, they raise some interesting insights about the constructs being measured and their relationship with entrepreneurial behaviour. On the one hand, they reinforce our belief in the theory of planned behaviour as a consistent conceptual framework providing reliable indicators of antecedents of entrepreneurial behaviour, which can be used to measure the effects of an entrepreneurship education programme. On the other hand, results reinforce our belief that risk perception also affects entrepreneurial behaviour, being related to its antecedents (in particular to perceived behavioural control). Therefore, perceived risk should not be neglected neither in the elaboration of entrepreneurship teaching programmes nor in the evaluation of their impacts.

In sum, our exploratory study allowed us mainly to pre-test our questionnaire. Measures of attitudes toward entrepreneurial behaviour, subjective norms, perceived behavioural control, entrepreneurial intentions, and perceived risk specific to a project, seem to be valid, reliable, and consistent. Our measure of entrepreneurial self-efficacy produced divergent results. Our measure of perceived risk in general presented poor reliability.

Further research is needed to investigate constructs’ dimensionality and improve our instruments.

5. CONCLUSION

In this research, we seek to measure the impact of entrepreneurial education on intention to become an entrepreneur, attitudes toward entrepreneurial behaviour, entrepreneurial self-efficacy and risk perception. This work does not present any effects’ results but it simply focuses on testing the validity of proposed measures.

The results we have presented and discussed in a previous section have implications at theoretical, methodological, educational levels and for different categories of individuals such as educators or researchers.

From a theoretical point of view our research brings a strong confirmation of the usefulness of the theory of planned behaviour as a relevant tool to explain the formation and the development of entrepreneurial intention and probably of entrepreneurial behaviour. The theoretical model we have previously proposed and experimented, based on the theory of planned behaviour and aimed at understanding the effects of entrepreneurship teaching programmes offers in the same line of thought a relevant framework to measure the impact of such programmes and to improve their design and pedagogical engineering.
Coming back on the methodological aspects our research underlines the importance of both the conception and the target adaptation of the tools and the scales of measures we are using. Our measures of entrepreneurial self-efficacy and risk perception in a general meaning but perhaps also in a more specific way need to be improved, redesigned and thought in very strong relation to our student target. A possible explanation of the weak reliability of the self-efficacy construct we have used perhaps relates to the nature and the consistence of specific competencies of the different Denoble’ tool dimensions far from the more general items included in the measure of the perceived behavioural control. It possibly means that student perceptions in our sample could seriously differ depending on the degree of generality of entrepreneurial competencies included in our measure indicators of self-efficacy or perceived control toward the entrepreneurial behaviour.

Finally, borrowing an educational perspective, some implications of our research could be drawn. Firstly, the results highlight the importance of the perceived behavioural control on entrepreneurial intention and possibly (it remains to clearly demonstrate this) on entrepreneurial behaviour. Educators and trainers in entrepreneurship should be fully convinced by this and should think about their pedagogical processes in terms of objectives, contents and methods to improve among students, through transfer of specific knowledge and development of particular abilities and competencies, their perceived behavioural control (and we are sure their self-efficacy) towards the entrepreneurial behaviour in a great variety of contexts and situations. Secondly, the results show the reverse relationship between the risk perception and the perceived behavioural control. At this level one can wonder how is it possible to teach the risk dimension in the context of entrepreneurship education. Risk is everywhere, in the entrepreneurial project, in the emerging organisation, in the environment and also in the mind of the would be entrepreneur or the experienced entrepreneur. Risk has to be taught in its different and interrelated dimensions. Students should be taught to learn how entrepreneurial risks could be identified, evaluated, integrated in strategies and personal or organisational behaviours. Avenues are opened here for research and pedagogical experimentations. Finally, behind the notions we have included in our research, others probably could be useful, should be conceptualised and placed in the entrepreneurship teaching programs to reach a key objective which is to teach and educate students in order to help them in becoming enterprising individuals. The concept itself of enterprising individual needs to be defined and put into pedagogical practice in a concrete and experimental way. In the past Allan Gibb opened the road, now researchers and educators should go further.

To conclude, in his classical book about human judgment and choice, Hogarth (1987) points out several “traps” to human reasoning. All these cognitive traps have their origin in human limited information-processing capacity. In order to avoid these traps, the author proposes two defences, one attitudinal, the other technical. “At the attitudinal level it is necessary to recognize that we live in a probabilistic environment. However, the environment is not probabilistic
because of its inherent properties; it is probabilistic because our representation of it is necessarily imperfect. That is, the source of the uncertainty lies in us rather than in the environment. (…) At the attitudinal level, therefore, it is necessary to be humble and accept ‘the probabilistic environment’. (…)” (p. 30). At a technical level, one needs tools and “decision aids” that can help counteract human fallibilities.

We believe that entrepreneurship teaching programs may and should act on both attitudinal and technical levels. And it is the main reason why we think there are interesting and socially usefulness research avenues in following the development of our theoretical and methodological framework to measure the impact of entrepreneurship education on attitudes, perceptions, entrepreneurial intention and behaviour.
6. BIBLIOGRAPHY


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i “This was clearly at the center of the first formal theory of entrepreneurship wherein Cantillon (1755) described entrepreneurs as the self-employed who “adjust themselves to risk” where the return is uncertain.” (Palich and Bagby, 1995, p. 426). As cited by Bruyat and Julien (2000, p. 167), Cantillon regarded the entrepreneur as “someone who assumes the risk and may legitimately appropriate any profits.”

ii Also used by the same authors in another study (Mullins and Forlani, 2005).


iv Even though there is no agreement as to what constitutes large, generally accepted rules of thumb suggest “at least 200 subjects” or “at least 10 times as many subjects as variables” (Pedhazur and Schmelkin, 1991; Hair et al., 1998).