
Describing the entrepreneurial profile: the entrepreneurial aptitude test (TAI)

Serena Cubico*, Elisa Bortolani,
Giuseppe Favretto and Riccardo Sartori

Department of Psychology and Cultural Anthropology,
University of Verona,
Via S. Francesco 22, 37129 Verona, Italy
E-mail: serena.cubico@univr.it
E-mail: elisa.bortolani@univr.it
E-mail: giuseppe.favretto@univr.it
E-mail: riccardo.sartori@univr.it
*Corresponding author

Abstract: The present article aims to illustrate metric characteristics and selected research applications of an instrument that can be used to define aptitude for an entrepreneurial profile (created in the 1990s). TAI ‘test di attitudine imprenditoriale – entrepreneurial aptitude test’ describes entrepreneurial potential with regards to eight factors. The entrepreneurial aptitude test has acceptable metric characteristics and sufficient criteria reliability; the instrument presents significant correlations with career development and entrepreneurial jobs. The analysis highlights that the TAI and its specific items can be used to discriminate between entrepreneurs and non-entrepreneurs.

The paper presents research carried out in different fields of applications: seniors and juniors in generational transition and small business management, and analysis of entrepreneurial success and career guidance.

Keywords: entrepreneur; aptitude; methodology; profile; test; family business; career guidance.

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Biographical notes: Serena Cubico received her PhD in Organisational Psychology from University of Verona, in 2007 and her Bachelor in Work and Organisational Psychology from University of Padova, in 1994. She came to academic research after ten years of working as a Consultant in small and medium sized businesses (entrepreneurship, human resources management, training, career guidance), and as a Coordinator of the Centre for Youth Entrepreneurial – University of Verona. Since October 2006, she is an Assistant Professor in Work and Organisational Psychology.

Elisa Bortolani has graduated in Psychology, Course of Work and Organisational Psychology, in 2001, at Padua University. In 2006, she received her PhD in Long Life Learning at Verona University, Department of Psychology and Cultural Anthropology. In 2006, she received a Grant for Research in Organisational Management. Her scientific production deals with organisational factors impacting both on work distress and mobbing, and entrepreneurship and its social aspects.

Giuseppe Favretto is a Full Professor of Management at the Verona University. He received a degree in Experimental Psychology (quantitative course) in 1975 at Padua University (thesis about industrial monotony and study address towards work psycho-sociology). He started his job as a Researcher/Teacher in 1979 in the same university. Now he teaches management and development of human resources at Verona University and Padua University. He is the Head both of the Centre for Youth Entrepreneurial and the Docimologico Centre (Assessment Development Centre) in University of Verona.

Riccardo Sartori has a degree in Psychology, Address of Work Psychology. He received his PhD in Perception and Psychophysics (Degree and PhD, University of Padova). Since October 2007, he is an Assistant Professor in Psychometrics at Verona University. In particular, he is interested in studying the concept of measurement in psychology and the possibility of measuring psychological constructs by psychological testing. He teaches vocational psychology and methods in psychological research.

1 Introduction

1.1 Entrepreneurship

The decision to become an entrepreneur is a significant choice that people make and it is a decision that determines innovation, competition and job creation at the social and industrial level.

“Yet relatively little is known about what goes on in the minds of the individuals who create new organizations.” [Forbes, (1999), p.415]

Entrepreneurship is an important path towards personal and economic development (Dowling and Schmude, 2007; Fritsch and Mueller, 2004).

Around the world, nine in 100 people of working age are involved in entrepreneurship (Reynolds et al., 2004).

Study and support of entrepreneurship is important: this phenomenon contributes to job creation and growth; it is crucial to competitiveness; it triggers personal potential and is a motivating force in the market economy (European Commission, 2003). The same Commission (2003, p.6) defines entrepreneurship as: “the mindset and process to create and develop economic activity by blending risk-taking, creativity and/or innovation with sound management, within a new or an existing organization”

As in other studies (Grilo and Thurik, 2004; GEM, 2005), we equate self-employment to entrepreneurship: these workers provide income for themselves in an independent way.

Entrepreneurship is a field of study that involves different approaches. “The entrepreneurship literature is vast, complex, and multifaceted. Spanning economics, sociology, business, and psychology” (Hisrich et al., 2007).

In the beginning, psychological studies investigated motivations and personal traits that underlie start-up and entrepreneurial success (cf. Begley and Boyd, 1987; Brandstätter, 1997; Brockhaus, 1982; Brockhaus and Horwitz, 1986; Chell, 1985; Chell et al., 1991; Hornaday and Ablund, 1971; McClelland, 1965). Over time, the focus turned increasingly towards models that integrate individual and environmental factors. In fact, recent research highlights ties between personal (motivations, aptitude, risk-taking

tendencies, innovativeness...) and contextual elements (expectations and family characteristics, social and institutional support...) (Baum et al., 2007a; Brockhaus and Nord, 1979).

Sociological studies have been oriented towards understanding social and family backgrounds of entrepreneurs and effects that entrepreneurial choices have on family, roles and social life in general (Blanchflower, 2000; Steele, 2004).

Economic factors (paucity, opportunity, costs and income), technological developments and their effects on work, and the demographical factors of entrepreneurs have dominated economic sciences (Audretsch and Thurik, 2001; Cuervo, 2005).

1.2 Psychological characteristics of the entrepreneur

The present work focuses on the personal/psychological characteristics of the entrepreneur; however, the importance of the different variables that are related to entrepreneurial choice and success are also included.

Our consideration is reinforced by Baum et al. (2007b, p.1) who see entrepreneurship as 'fundamentally personal': an entrepreneur is a person that integrates human and economic resources to create products and services that generate value. The same authors indicate that research in this field illustrates the diverse causes for success in the creation of new enterprises: personal, organisational, and external. Establishment of new ventures involves human vision and a sense of purpose so as to be able to come up with and change an idea of business into successful products and services.

The role of the individual in the entrepreneurial process encourages scholars to recognise those people with a greater entrepreneurial inclination through development of operational definitions, clarification and validation of instruments and methods and communication of results to policy makers and interesting parties (Cromie, 2000).

In the last decade, a growing cohort of researchers has increasingly developed interest in the personal characteristics of the entrepreneur; they have found that certain individual differences (i.e., traits, ability, attitude, cognition, values motives, goals, ...) are seen that distinguish between entrepreneurs and other people. Moreover, these personal qualities are present in different measures in successful entrepreneurs than in unsuccessful ones.

Personality variables could play an important role in the development of the theory of entrepreneurship (Zhao and Seibert, 2006); i.e., the areas related to entrepreneurial career intention (Crant, 1996; Zhao et al., 2005), entrepreneurial cognition and opportunity recognition (Ardichvili et al., 2003), and new venture survival (Ciavarella et al., 2004).

It is important at this point to remember that this area of research is often the object of criticism: Gartner (1989, p.48) takes up this idea: "I believe the attempt to answer the question 'Who is an entrepreneur?', which focuses on the traits and personality characteristics of entrepreneur, will neither lead us to a definition of the entrepreneur nor help us to understand the phenomenon of entrepreneurship".

According to Rauch and Frese (2007), entrepreneurial personality research can be improved through theories which better define the different objects of research and methodological approaches that study the phenomenon with evermore attention and the possibility of having different variables. In the same publication [Rauch and Frese, (2007), p.47], the authors present an interesting model of the entrepreneur's personality characteristics and success; in particular, we choose to highlight specific personality

traits: need for achievement, risk-taking, innovativeness, autonomy, locus of control, and self efficacy. These specific traits are affected by broad personality traits (extraversion, emotional stability, openness to experience, agreeableness, and conscientiousness) and have an effect on goals and action strategies. These are the characteristics that lead to business success. Moreover, specific traits are dependent on environmental variables as well.

Using a meta-analysis method, the same authors found that “specific traits produced higher relationships with both business creation and business success than global trait measures” (p.49). In particular: *need for achievement* is positively correlated with business success, *Innovativeness* is directly related to business creation and to business success, the relationship of *autonomy* and success is positive and significant, entrepreneurs have higher scores in *self-efficacy* than non-entrepreneurs, the effect of *risk-taking* propensity on entrepreneurship and business success is positive and significant (but small), and *internal locus of control* has positive correlation with success.

The personal trait of *creativity* is essential to entrepreneurship and organisational structure (Dexter, 2000), and with particular regard to the success of enterprise creation, research indicates that regions strong in creativity present an interesting number of new firms (Lee et al., 2004).

Other models describe the entrepreneurial phenomenon through approaches that highlight the importance of cognitive, strategic and behavioural elements (Glenn and Mosakowski, 1987; Haynie et al., 2008; Mosakowski, 1998; Krueger, 1993, 2007).

We would like to draw attention to an element of entrepreneurship that is often underestimated: Passion. It associates goal-directed cognition and behaviours positively (Cardon et al., 2009), defines the entrepreneur’s identity (Murnieks and Mosakowski, 2007), is present at the birth of the enterprise (Cardon et al., 2005), and leads to an understanding of the *entrepreneurial mind* (Carsrud and Brännback, 2009).

The literature on the entrepreneur and on specific traits that characterise business-owners often leaves out a quality that permits them:

“... to convince their costumers, external resources holders, and their employees of the viability, worthiness, and value of their vision... to paint a vision that is uplifting, convincing, and resonates with the desires of those who need to comply with their vision... to use this vision to inspire internal and external followers... to project and inspire confidence that the vision is achievable... to manage the process of organisational emergence in such a way as to achieve the transfer from a vision to an ongoing, institutionalised mode of transacting with a given social and economic context...: leadership”
[Antonakis and Autio, (2007), p.189]

Leadership is, in fact, a fundamental quality in the achievement the entrepreneurial goals.

1.3 Entrepreneurial aptitude

The American Psychological Association [APA, (2009), p.34] defines aptitude as: “the capacity to acquire competence or skill through training. Specific aptitude is potential in a particular area (e.g., artistic or mathematical aptitude); general aptitude is potential in several fields. Both are distinct from ABILITY, which is an existing competence.”

We can use this operational definition¹ to describe the entrepreneurial aptitude as *the potential toward creating and developing enterprise and self-employment*.

2 Measuring the entrepreneurial potential: the entrepreneurial aptitude test (TAI)

Considerations regarding the differences between entrepreneurs and non-entrepreneurs with such psychological characteristics as aptitudes, personality traits, attitudes, motivations and values, had led research to reflect on the possibility of creating instruments which are effectively able to detect and measure these characteristics (Power, 1971).

The possibility of detecting and measuring the psychological characteristics of a person is based on selected specific capacities and strengths of the tool utilised for the scope (Messick, 2008). The assessment of the metric characteristics of the instrument is an objective that can be attained through an appropriate validation process (Anastasi, 1986).

Each test created the aim of measuring must present specific characteristic of *validity* and *reliability*. The first refers to the degree to which the test measures the aspect it intends to measure. The second refers to the stability of the measures obtained by the test (how much they do not depend on statistical errors) (Sartori and Pasini, 2007).

The expression validation process generally stands for the act of demonstrating and documenting that a procedure (i.e., a test) operates effectively. Validation process is the means of ensuring and providing documentary evidence that a procedure (within its specified design parameters) is capable of consistently producing a finished product with the required quality (Mendoza et al., 2000).

At the present time, the entrepreneurial aptitude test (Sartori et al., 2007) is a 'paper and pencil test'² composed of 75 items with multiple choice responses; the test validation realised in 2002–2003, basically through a factor analysis model and principal components analysis (ways of monitoring construct validity), allowed for a reduction in items and for a better definition with less factors; the TAI now describes entrepreneurial potential with regards to eight factors (Favretto et al., 2003a):

- Factor 1: *Goal orientation* – tendencies toward creativity and innovation, degree of determination in reaching goals, and personal perception as to overall handling of work situations.
- Factor 2: *Leadership* – aptitudes toward management and leadership.
- Factor 3: *Adaptability* – ability to perceive environmental change and adaptability.
- Factor 4: *Need for achievement* – the desire for fame, success and social affirmation and respect from others.
- Factor 5: *Need for self-empowerment* – the desire to realise oneself through one's job which, apart from any economic goals, must be enjoyable, satisfying and interesting.
- Factor 6: *Innovation* – curiosity for what is new.
- Factor 7: *Flexibility* – tendency to reorient one's goals according to external situation.
- Factor 8: *Autonomy* – necessity of having one's own independent space to make decisions and choices.

As for the psychometric qualities, the entrepreneurial aptitude test shows more than acceptable metric characteristics of statistical reliability (internal consistency reliability – Cronbach alpha coefficients ranging from 0.83 to 0.94 according to sample; test-retest coefficients for each item ranging from 0.30 to 0.60, according to interval between the two administrations) and sufficient indexes of criterion validity (measured by the ‘performance questionnaire’, which is an external measure of some organisational and work criteria). Through the eight items of the performance questionnaire, improvement in professional career (from the beginning until the moment when the subject completes the test) can be measured. Validation by Spearman rho correlation coefficients indicates a statistically significant relationship between the TAI and the eight criteria (rho coefficients ranging from 0.30 to 0.40). Thus, it is possible to claim that the entrepreneurial aptitude test presents significant correlations with career development and entrepreneurial occupation.

When the aim is to create a test that is capable of measuring certain characteristics, a validation process begins in order to monitor each and every feature of the test (Anastasi, 1988): its aspect (*face validity* – how does the test appear? Does it appear valid to examinees who take it, personnel who administer it and other untrained observers?), content (*content validity* – are the items of the test pertinent and exhaustive?), and construct (*construct validity* – is the test made up according to the theoretical ideas on it? Does it measure what it purports to measure?). Another step of validation consists of correlating the measures of the test with the measures obtained from another adequate criterion, in order to verify the meaning of the scores of the test and to see if they behave as expected (*criterion-related validity*).

The TAI was created in the 1990s (Favretto et al., 2003a) in order to have a measurement instrument available for the construct from which the name of the test derives (entrepreneurial aptitude). To elaborate the first version of TAI (109 items), the author (Prof. G. Favretto) hypothesises 11 latent traits that synthesise different dimensions of entrepreneurial aptitude described in the literature (Begley and Boyd, 1987; Brockhaus, 1982; Brockhaus and Horwitz, 1986; Chell, 1985; Chell et al., 1991; Hornaday and Ablund, 1971): leadership, persistence, locus of control, innovation, social intelligence, flexibility, need for achievement, self-actualisation, autonomy, quality of work, and risk-taking.

Reference to the literature – especially to studies and research that show which characteristics are related and contribute to capture the construct of interest – is a way of collecting evidence that a test should measure some facets of the construct and not others. This operation is particularly important both for face validity and content validity.

3 Research application of the entrepreneurial aptitude test

3.1 Senior and junior in generational transition and small business management

Different studies (Favretto et al., 2003b; Favretto and Cubico, 2005; Favretto et al., 2007a; 2007b) of our group of research proposed to analyse the entrepreneurial aptitudes of the main people involved in generational transition in small business management: seniors and juniors.

The subjects are 94 entrepreneurs (47 enterprises; 47 couples: *father and son*); in particular, seniors: average age 57.9 – sd 7.4 (77% male) and juniors: average age 29.3 – sd 6.5 (74% male),

The results on the eight factors of the entrepreneurial aptitude indicate slight (but not significant) differences between the two generations (Table 1).

Table 1 Factors' results in senior and junior – TAI

		<i>Life stage</i>	<i>Mean</i>	<i>sd</i>	<i>Sign. t-test</i>
F1	Goal orientation	Senior	63.55	10.21	n.s
		Junior	64.77	9.25	
F2	Leadership	Senior	58.45	13.92	n.s
		Junior	56.53	13.70	
F3	Adaptability	Senior	64.74	7.69	n.s
		Junior	66.34	7.89	
F4	Need for achievement	Senior	56.51	15.35	n.s
		Junior	54.64	11.01	
F5	Need for empowerment	Senior	72.57	10.27	n.s
		Junior	71.06	10.74	
F6	Innovation	Senior	69.79	13.03	n.s
		Junior	72.45	14.67	
F7	Flexibility	Senior	67.13	11.36	n.s
		Junior	65.64	11.06	
F8	Autonomy	Senior	60.83	12.24	n.s
		Junior	61.94	13.37	

But, some significant statistics emerged (p value: <0.05) from the seniors' answers to specific items:

- If I give myself a goal at work, I want to realise it at all costs
- I want my work to give me the opportunity to be fulfilled
- I am willing to give up my days off if I have work that must be completed.

Seniors show more commitment and involvement.

In this case, the TAI allows us to reflect on the different views that seniors and juniors have towards work, and to see that the entrepreneurial aptitude is present in the same measure in the two generations in the family business. This finding helps in the understanding family-business owners' characteristics.

3.2 *Entrepreneurial success and career guidance*

The sample³ consists of 202 users (representative of population) of the Chamber of Commerce's New-Entrepreneurial-Service in Verona (2003–2006), who were contacted by telephone interview in August 2007 and September 2008.

The sample breakdown is as follows:

- sex: female 59.4%; male 40.6%

- average age: 32.6 (s.d. 7.6)
- origin: city 50.5%; non-city 49.5%.

In this group, 70 entrepreneurs emerge: 35% of the sample.

In this research, we used a shortened version of the TAI (23 items instead of 75), created through the partial credit model – PCM (Masters, 1982); the factor structure appears substantially the same as the original test (management, innovation, leadership, autonomy, need for achievement, goal orientation).

The first important result that emerges is the significant differences in entrepreneurial aptitude: subjects that created an enterprise have a score⁴ (3.08) that are higher than the non-entrepreneur (2.84), with significant p value = 0.036 (t-test). In particular, the t-test on the factor scores highlights significant differences in leadership (p value = 0.014) and in need for achievement (p value = 0.000); for both factors, entrepreneurs present higher scores (according to the cited literature).

Some significant statistics emerged (p value: <0.05) for the entrepreneurs' answers to specific items:

- I carry out my work mainly because I am interested in its contents
- I like having a managerial role
- I am satisfied with my job because it gives me the opportunity to be fulfilled
- I feel I have the skills and competencies to manage and to be in a position of control at work
- given that I am a skilled person, I am always successful in my job.

Worth noting are the different levels in the *TAI* score⁵ for the subgroup of 70 entrepreneurs where interest relationships emerge (Spearman's rho; p value <0.05):

- negative
- difficulty in receiving permits (rho = -0.265)
- difficulty in managing bureaucratic timing (rho = -265)
- positive
- confidence in having enough information in enterprise creation process (rho = 0.244).

This work allows us to reflect on aptitude in career guidance and on the decision to create enterprises; in fact, having a higher entrepreneurial aptitude appears to be an element of success. The knowledge of one's characteristics (as with aptitude) helps in making a mature choice on self-employment that avoids errors and disappointment. Moreover, the entrepreneurial aptitude test shows that the aspiring entrepreneur finds less difficulties in the process of enterprise creation and in the relationship with the environment (institutions and bureaucracy).

This information can help career guidance counsellors and experts to plan services and career paths that are more appropriate to the people who ask for support when making a professional career choice and to individuate those people who need most support than others.

4 Summary and conclusions

The importance of entrepreneurship in the economy, and the significance of the personal characteristics of the entrepreneur indicated in the literature and summarised in this article suggest that there are different researches approaches to consider.

Regarding personal aspects, entrepreneurial aptitude can be considered an interesting variable in understanding and illustrating the entrepreneurship phenomenon. From our work on the entrepreneurial aptitude test, we can see the validity of this idea, but it also permits us to presents moment in which we can support this idea and other in which we carve out useful results.

This research is our latest in the field and the most encouraging; indeed, the TAI provides us with the opportunity to interact with family businesses and aspiring entrepreneurs by giving them another instrument to help them reflect better and make choices.

We are aware that the entrepreneurial aptitude test needs to be improved and to be integrated with other models and instruments and we are working with a multidisciplinary research team in order to achieve this.

In our work, we have analysed the aptitude of entrepreneurs and have left out the element of the entrepreneurial profile that often gets forgotten: the so-called *dark side of entrepreneurship* (Kets de Vries, 1985; McKenna, 1996). This position allows us to highlight that “entrepreneurs can have personality quirks that make them hard people to work with” [Kets de Vries, (1985), p.161], and for this author the specific causes are: need of control, sense of distrust, desire of applause. It is interesting to enhance the study on the entrepreneurial profile by measuring the characteristics that accompany traditional positive traits.

Concerning public aspects, it is interesting to study the relationship between the person who aspired to create an enterprise and the information services that are available to realise the project. How many types of services do exist? What type of language do they use to communicate with the aspiring entrepreneur? Do people use and understand these services, and in what way?

As per academic and training aspects, it is important to identify the various modes utilised in the development of entrepreneurial competences, and to create an environment in which students can experience an entrepreneurial culture. In this field, research can be oriented to understanding attitudes, fears, and images that the young display toward self-employment and entrepreneurial occupation, and to conducting a census of courses and cultural initiatives that can spawn entrepreneurial ideas.

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Notes

- 1 In accordance with the APA Dictionary (2009), we define 'operational definition' as a description of a phenomenon in terms of the activities by which it can be observed and measured (procedures, actions, or processes).
- 2 An on line version is available at <http://cd.univr.it/tai>.
- 3 The score data are not comparable with the Table 1: the short version used in this research gave results in a different range.
- 4 This research is the completion of a work presented in Cubico et al. (2008).
- 5 The TAI scores are on a continuous scale and the other data in the questionnaire are collected on a five-point Likert scale. We have converted all data to the same scale in order to carry out Spearman's rho analysis.