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Explaining entrepreneurial intentions by means of the theory of planned behaviour

Marco van Gelderen
Massey University, Auckland, New Zealand
Maryse Brand
University of Groningen, Groningen, The Netherlands
Mirjam van Praag
University of Amsterdam, Amsterdam, The Netherlands
Wynand Bodewes
Erasmus University, Rotterdam, The Netherlands
Erik Poutsma
Radboud University Nijmegem, Nijmegen, The Netherlands, and
Anita van Gils
Maastricht University, Maastricht, The Netherlands

Abstract

Purpose – This paper sets out to present a detailed empirical investigation of the entrepreneurial intentions of business students. The authors employ the theory of planned behaviour (TPB), in which intentions are regarded as resulting from attitudes, perceived behavioural control, and subjective norms.

Design/methodology/approach – The methodology used was a replication study among samples of undergraduate students of business administration at four different universities (total $n = 1,225$). Five operationalisations of intentions are used as well as a composite measure. Prior to the main study, qualitative research conducted at two other universities (total $n = 373$) was held to operationalise the components of the TPB.

Findings – The results show that the two most important variables to explain entrepreneurial intentions are entrepreneurial alertness and the importance attached to financial security.

Research limitations/implications – Various research design features are used that result in better and more detailed explanations of entrepreneurial intentions.

Practical implications – Should one want to stimulate entrepreneurship in educational or training settings, then this paper's results provide guidance. Several suggestions are offered on how entrepreneurial alertness can be improved and financial security concerns can be reduced.

Originality/value – The study provides detailed and solid results on entrepreneurial intentions which are positioned in the career literature.

Keywords Entrepreneurialism, Careers, Business formation, Behaviour

Paper type Research paper

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Introduction

Entrepreneurship is an important vocational option. Individual work preferences are increasingly favouring self-reliance and self-direction (Baruch, 2004; Gibb, 2002a, b; Hall, 2002). At the same time, changes in the political and socio-economical environment have resulted in fewer opportunities for continuous organisational employment. On the macro-level, econometric research shows that new and small businesses contribute significantly to job creation, innovation and economic growth (Carree and Thurik, 2003).

Entrepreneurship is a concept that has been defined in various ways (Bruyat and Julien, 2001), ranging from narrow meanings such as starting one's own business, to broad conceptualisations such as a work attitude that emphasises self-reliance, initiative, innovativeness, and risk-taking. However regardless of definitional emphasis, entrepreneurship is of relevance to recent career concepts such as the protean career, the boundaryless career, the post-corporate career, and employability. The protean career (Hall, 2004) describes a career orientation in which the person, not the organisation, is in charge. Success criteria are subjective (psychological success) and the person's core values drive career decisions (Hall, 2004). Protean careers rely equally on adaptability to fit new situations and on a strong sense of identity. Entrepreneurship can be a vehicle for those pursuing a protean career as it offers opportunities for flexibility and self-expression simultaneously.

The boundaryless career, a related concept (DeFillippi and Arthur, 1994; Arthur and Rousseau, 1996), refers to a career in which people voluntary cross organisational boundaries, and possibly also industry and international ones. In the boundaryless career there is independence from, rather than dependence on, traditional career arrangements (Arthur and Rousseau, 1996). Inkson (2006) notes that it may be more accurate to speak of a boundary-crossing, as boundaries still exist. The reduced constraint of boundaries is exemplified in entrepreneurship (DeFillippi and Arthur, 1994, and Arthur and Rousseau, 1996, refer extensively to Silicon Valley and its entrepreneurial culture). Here, the entrepreneur can break away from the organisation in pursuit of his or her own venture, possibly in a different industry or region. Entrepreneurship can be transient: setting up a venture, selling it, including, for a limited time, one's own labour, after which new ventures may be pursued.

In writings on the post-corporate career (Peiperl and Baruch, 1997) the emphasis on self-employment and entrepreneurship is explicit. These new careers take place outside of large organisations, with individuals often serving the organisations they have left. These careers provide independence to individuals as well as the flexibility to respond quickly to demands and opportunities. Employability, finally, is the capability to move self-sufficiently within the labour market gaining initial employment, maintaining employment, and obtaining new employment if required (Fugate *et al.*, 2004). The concept of employability can easily be stretched to contain self-employment. Starting and running a business greatly contributes to (self-)employability as the entrepreneur is required to engage with a widely diverse set of tasks and challenges. Especially when the enterprise is small there is a holistic quality to it, as one not only sets the corporate strategy but also puts the rubbish bin out. A variety of skills and knowledge are acquired in the process, and the network expands as entrepreneurs often need to call on others in order to be successful (Gibb, 2002a, b).

What all new career concepts have in common are the notions that the individual is responsible for his or her career, that skills are preferably transferable across work settings, and that success does not just concern salary and position but also satisfaction, learning, work-life balance and autonomy. This resonates very well with entrepreneurship, if only because entrepreneurship comes in all shapes and sizes. In terms of Derr's success measures, entrepreneurship can mean "getting ahead" (growing a large business, acquiring wealth), "balance" (accommodating demands from other life spheres, for example by running a home-based business or a part-time business), "autonomy" (self-employment comes with increased possibilities to decide on the what, how, and when aspects of work), "challenge" (entrepreneurship offers ample opportunities for challenge and learning), and even "security" (with organisational employment offering less certainty, taking fate into one's own hands may enhance one's sense of perceived security).

Given the increasing importance of entrepreneurship in contemporary careers, this study aims to uncover the determinants of entrepreneurial intentions, i.e why some intend to start their own business whereas others do not. We study this question among samples of business students, for whom this choice has particular relevance. With the exception of accountants, graduation will not provide business students with an institutionalised professional identity, in comparison to, for example, doctors, engineers and lawyers. There is still leeway in terms of whether the business student will identify with a profession (such as a manager), an industry (e.g. a real estate developer, a retailer), or employment status (for instance, an entrepreneur). In addition, business students, being well educated and having multiple options, typically choose entrepreneurship because they feel pulled towards it, rather than being pushed into it. Finally, business students form a very important clientele for entrepreneurship education institutions. So in order to serve their educational needs well, it is important to know what determines their career choices and intentions (Peterman and Kennedy, 2003).

In this study we built on previous research arriving at an optimal design to investigate entrepreneurial intentions. We use the term "entrepreneurial" in a narrow sense as entrepreneurial intentions refer to intentions of setting up one's own business in the future, rather than as a type of attitude or interest (e.g. Holland's E-Type). The terms entrepreneurship, setting up a business, and self-employment will be used as synonyms. We study samples of undergraduate business students at four different universities in The Netherlands. We conclude by drawing implications for career choice and entrepreneurship education.

Previous research and research design development

Early studies of entrepreneurial career choice mainly focused on issues such as personality variables, demographics, personal history, and social contexts in their explanations of individuals' choices and preferences with respect to their entrepreneurial status (Gibb Dyer, 1994). As these explanations are all distal (Rauch and Frese, 2000), they merely apply to broad classes of behaviour, and their explanatory power turned out to be low, which makes it difficult to formulate guidelines for intervention. In the 1990s, researchers started to use social psychological models involving more proximal variables. The explanation of entrepreneurial intentions (EI) is an area of research where a sizeable body of comparable studies has

emerged. So far research has focused on the prediction of EI rather than on its realisation. Meta-analyses show that intentions are strong predictors of actual behaviour in other applied settings (Sutton, 1998; Armitage and Conner, 2001). To date, two models dominate the literature.

The first is Ajzen's (1988, 1991) theory of planned behaviour (TPB), which explains intentions by means of attitudes, perceived behavioural control (PBC), and subjective norms. The second model is proposed by Shapero and Sokol (1982), and explains EI on the basis of perceived desirability, perceived feasibility and the propensity to act. Although Krueger *et al.* (2000) regard these models as competing, they overlap to a large degree. Shapero's perceived desirability and perceived feasibility correspond to Ajzen's attitudes and perceived behavioural control, respectively (Krueger, 1993; Kolvereid, 1996b; Autio *et al.*, 1997). So in both models intentions are explained by willingness and capability. Both models have consistently received empirical support. In a direct comparison of the two models, Krueger *et al.* (2000) conclude that both models provide satisfactory predictions (Shapero model adjusted $r^2 = 0.41$ ($p < 0.00$) and TPB model adjusted $r^2 = 0.35$ ($p < 0.00$)). Effects for the PBC/feasibility component tend to be stronger than for the attitude/desirability component (Autio *et al.*, 1997; Davidsson, 1995; Kolvereid, 1996b; Krueger *et al.*, 2000; Tkachev and Kolvereid, 1999).

In our research design we use the theory of planned behaviour. This means that we do not use the Shapero model, and we disregard additional variables outside of the TPB that might explain EI. Our reasons for not using the Shapero model are related to its specification. Shapero and Sokol (1982, p. 83) conceptualise desirability in terms of social norms, while propensity to act is operationalised in terms of control measures (Krueger, 1993). Both specifications are confusing. The theoretical specification of the TPB is more detailed and consistent, and a great deal of research has been devoted to testing, advancing and criticising the TPB in a wide variety of fields (Fayolle *et al.*, 2006; Shook *et al.*, 2003).

With regard to the additional variables, additional variables such as gender, work experience, parental role models, and personality traits do in fact enhance our understanding of EI. However, we assume that the effect of these variables is mediated by the influence of the components of the TPB on EI. For example, DePillis and Reardon (2007) show that differing cultural perceptions of entrepreneurship in Ireland and the USA affect the level of EI, which would be mediated in the "subjective norms" component of the TPB. Drennan *et al.* (2005) demonstrate that parental business experience as well as a difficult childhood have a positive impact on both perceived desirability and perceived feasibility of starting one's own business. Whether the effects of these variables on EI are indeed only indirect is not the focus of this paper. By solely concentrating on the components that make up the TPB, we facilitate comparisons with previous research.

The attitude/desirability component has been researched with more specificity than the PBC/feasibility component. For example, attitude to autonomy was found to be related to EI by Douglas and Shepherd (2002) and by Kolvereid (1996b), although Davidsson (1995) did not find such an effect. Douglas and Shepherd (2002) further found attitudes towards risk to be related to EI, while workload and income attitudes were not. Davidsson (1995) reports that attitudes toward achievement and towards change explain EI. A range of other studies explaining EI by means of attitudes only

report outcomes for attitude on a generic level (see Table I). This goes for nearly all studies investigating the PCB/feasibility component (see Table I), with the exception of Kristiansen and Indarti (2004). They find EI to be explained by self-efficacy as well as by instrumental readiness, a contextual variable reflecting the individual's situation with regard to access to capital, information and networks. It is very useful to establish results on the level of the variables that make up the attitude and PBC components. Detailed knowledge of this kind is necessary for the design of interventions that may influence EI.

In addition, these variables should be selected with care. Attitudes, PBC, and subjective norms are theorised to be determined by two elements:

(1) beliefs about outcomes; and

(2) evaluations of these outcomes.

Pre-selection of relevant beliefs should be done carefully, as beliefs can be expected to vary among different populations. Younger people, for example, might have a different perception of the desirability or undesirability of factors associated with self-employment than older people. In order to capture the beliefs relevant to our population sample, we therefore included pilot studies in our research. Applying this procedure to our research project resulted in factors associated with students' perceived attractiveness or unattractiveness of self-employment as well as factors related to the perceived feasibility of starting or running one's own business. Still, we also included variables found to be important in the literature if they were hardly mentioned by the students. No previous studies (see Table I) selected variables based on the samples they studied, although Kolvereid (1996a) empirically derived career

	Design feature					
	SCV					
Source	ATT	PBC	VSDP	CAVO	URDV	RRSC
Krueger (1993)	○	○	○	○	○	○
Krueger *et al.* (2000)[a]	○	○	○	○	○	○
Davidsson (1995)	●	○	○	○	●	●
Kolvereid (1996a, b)[a]	●	○	●	●	○	○
Tkachev and Kolvereid (1999)[a]	●	○	○	○	○	○
Autio *et al.* (1997)[a]	○	○	○	○	○	●
Lee and Wong (2004)	N/A	N/A	○	○	●	○
Raijman (2001)	N/A	N/A	○	○	○	○
Douglas and Shepherd (2002)	●	N/A	○	○	○	○
Phan *et al.* (2002)	●	N/A	○	○	●	○
Lüthje and Franke (2003)	○	N/A	○	○	○	○
Kristiansen and Indarti (2004)	N/A	●	○	○	○	●
Wilson *et al.* (2004)	●	N/A	○	○	○	○
Wilson *et al.* (2007)	N/A	○	○	○	○	●

Notes: SCV, split components into variables; ATT, attitudes component; PBC, perceived behavioural control; VSDP, variable selection derived from population; CAVO, check for association of the variables with the outcome (organisational versus self-employment); URDV, report on a range of dependent variables; RRSC, replicate results in comparable samples; [a]used theory of planned behaviour; ●, design includes feature; ○, not so

Table I.
Design features employed in this paper

reasons from a sample of MBA students which he later (Kolvereid, 1996b) applied to the study of EI among university students.

While Kolvereid (1996a) found no such conflicting perceptions, Brenner *et al.* (1991) report that students sometimes favour organisational or self-employment for the same reasons: both groups expected to earn a higher income, to work with people they respect, and to have greater opportunities for development in their preferred employment mode as opposed to their non-preferred one. This means that these variables will only predict career status choice within the groups of preference, while for the aggregate sample the effects will cancel out. This adds another feature to our design, not included in previous studies (see Table I): to correct, if necessary, for association beliefs concerning the attributes of organisational employment versus self-employment.

We now turn to the dependent variable. Intentions represent a person's motivation to make an effort to act upon a conscious plan or decision (Conner and Armitage, 1998). However, in the social psychological literature controversy has emerged about the measurement of intentions (Warshaw and Davis, 1985; Bagozzi, 1992; Bagozzi and Kimmel, 1995; Armitage and Conner, 2001). Depending on the formulation of the questions, these measures represent desires (do you want to start a business?), preferences (if you could choose between being self-employed and being employed by someone, what would you prefer?), plans (are you planning to start a business?), or behavioural expectancies (estimate the probability that you will start your own business in the next five years).

This is especially relevant when studying the EI of samples of undergraduate students. Some students are as yet undecided when it comes to their career preference, and are still exploring their options (Nabi *et al.*, 2006; Schein, 1978, 1990). Others have goals that often change; in other words, they suffer from goal instability (Multon *et al.*, 1995). In a review on career decidedness types, Gordon (1998) postulates seven different subtypes ranging from very decided to chronically indecisive. In addition, it has been argued that behavioural expectancies provide better predictions of behaviour than other measures of intention (Warshaw and Davis, 1985). This is because behavioural expectancies include considerations regarding the possible choice of other, competing behaviours (Armitage and Conner, 2001; Silvia, 2001). Non-committal measures, such as desires, take no account of facilitating or inhibiting factors.

Different operationalisations of EI result in differing explanations and predictions. Empirical evidence (Bagozzi and Kimmel, 1995; Armitage and Conner, 2001) shows measures of perceived behavioural control (PBC) to be more closely associated with commitment measures, such as behavioural expectations. In studies of EI, Phan *et al.* (2002) found attitude to be a stronger predictor of interest in self-employment than of likelihood to start. Most studies listed in Table I have ignored this issue, or investigated other types of dependent variables (such as planning to start in one's own field or a different one; Lee and Wong, 2004). In this study, we operationalise EI in several ways, and verify whether this results in different levels of importance of the explanatory variables. In the remainder of this paper we will use the label "entrepreneurial intention" (EI) as an overarching term.

Replication is the final feature of our design. The obvious rationale for testing the robustness of our findings is to ascertain the stability and reliability of the results. Deploying multiple datasets in a single study to test a theoretical model makes it

possible to test for the stability of results (Davidsson, 2004). In previous studies on EI using replication designs, results were found to be stable across countries (Autio *et al.*, 1997; Kristiansen and Indarti, 2004), regions (Davidsson, 1995), and samples of MBA and university students (Wilson *et al.*, 2007).

Pilot studies and hypothesis development

Pilot studies

Pilot studies were conducted among undergraduate students of business administration of the Free University of Amsterdam ($n = 200$) and the University of Amsterdam ($n = 173$). Rather than working with individual beliefs, it is customary in studies based on the TPB to focus on modal beliefs identified in pilot studies (Ajzen, 2002). Usually a frequency-of-elicitation procedure is used, according to which the beliefs most often mentioned are included in the major study. So outcomes, referents and inhibitory/facilitating factors are not assessed per individual, but they are pre-selected. Using modal beliefs has the advantage that the whole sample can be compared on the basis of similar variables.

For the attitude formation open questions were used to gather data on outcome beliefs. Two questions were asked:

(1) What aspects do you think are attractive about self-employment?

(2) What aspects do you think are unattractive about self-employment?

The answers were used to select the attitude variables in our study (see below). Open questions were also used to determine the students' control beliefs:

(1) What is needed to set up a business?

(2) What is needed to successfully run a business?

The answers were used to select the PBC variables in our study (see below). Subjective norms were not investigated in our pilot studies. We assumed that they are related to spouse, family, friends and "important others" (Kolvereid, 1996b).

Attitudinal variables in the model

The answers to the open questions in the pilot study were content-analysed. Four outcomes occurred with the highest frequency, i.e. autonomy and challenge (attractive aspects), and lack of financial security and workload (unattractive aspects). Based on these beliefs, we hypothesised the importance attached to autonomy and challenge to be positively related, and the importance attached to financial security and the avoidance of work load to be negatively related to the students' intentions of setting up a business. In addition, based on the literature, we decided to add the importance attached to the accumulation of income and wealth as an additional variable. It is likely that students mention these factors less often out of social-desirability considerations (materialism is not regarded as a favourable trait by the Dutch, although one would hardly guess that from their behaviour). Wealth in the context of self-employment refers to the increase in the value of the firm as well as in salary and benefits. When working for an organization the amount of wealth that one can accumulate is relatively fixed, whereas in self-employment the opportunities to acquire wealth are (at least theoretically) infinite.

H1. Students who attach more importance to autonomy, challenge, and wealth accumulation, and less importance to financial security and work load avoidance, are more likely to have intentions of starting a business.

Perceived behavioural control variables in the model

The answers to the two questions regarding PBC beliefs were generally identical. In the opinion of the students, starting as well as successfully running a business primarily depend on perseverance and creativity. Based on the student beliefs, we hypothesise perseverance and creativity to be positively related to EI. In addition, based on the literature, we decided to add measures of entrepreneurial alertness and self-efficacy. Entrepreneurial alertness (Kirzner, 1973) was added, since business students might have overlooked that sensitivity to detecting business opportunities is a precondition for entrepreneurship. Self-efficacy was added as it is a common operationalisation of PBC. PBC was originally formulated as the perceived ease or difficulty with which the behaviour involved is performed. According to this formulation, PBC is compatible with Bandura's (1977, 1982) concept of perceived self-efficacy (Ajzen, 1991). Previous work presents empirical support for the relationship between entrepreneurial self-efficacy and EI (Kolvereid, 1996b, Krueger *et al.*, 2000; Wilson *et al.*, 2007).

H2. Students who rate themselves higher in terms of perseverance, creativity, entrepreneurial alertness, and entrepreneurial self-efficacy, are more likely to have intentions of starting a business.

Subjective norms

Previous EI research has proven subjective norms to be important (Krueger, 1993; Kolvereid, 1996b). One reason for this might be that generally students are still in the stage of finding out their career choice preferences. The opinions of parents, partners, friends and important others might be influential in this process.

H3. Students whose subjective norms towards self-employment are more positive are more likely to have intentions of setting up a business.

Method

Samples

The population studied consisted of undergraduate university business students. As mentioned above, pilot studies were conducted at the Free University of Amsterdam and the University of Amsterdam to ascertain modal beliefs with respect to attitudes and PBC. In order to diminish the possibility of capitalising on chance, the main study was replicated with still other samples of undergraduate business administration students. In order to test for the robustness of the results, the study was conducted at four different universities. Samples were taken from the North (University of Groningen), the West (Erasmus University Rotterdam), the East (Radboud University Nijmegen), and the South (University of Maastricht) of The Netherlands. Of the total sample of 1,301 students, 3.8 per cent (49 students) already owned a business. As our research design is limited to the explanation of intentions, we excluded the students who already owned a business from the sample, plus 17 students who had not disclosed whether they currently owned a business. The remaining samples consisted

of 291 (Groningen), 185 (Rotterdam), 420 (Nijmegen), and 339 (Maastricht) respondents, totalling 1,235. The students were in the second, third or fourth grade year of their study. The average age of the sample was 22, with 63 per cent male and 37 per cent female students.

Operationalisation of the dependent variables

Table II lists the questions and the responses for the dependent variables. Questions 1 and 5 were taken from Davidsson (1995), question 2 from Krueger (1993), and questions 3 and 4 from Brenner *et al.* (1991). Questions 2, 4 and 5 can be considered as behavioural expectancies. Question 2, however, is a behavioural expectancy without engagement or commitment. Question 1 concerns past interest in entrepreneurship and question 3 refers to career preference. The five variables run from relatively uncommitted (question 1) to specific behavioural expectancies (question 5). Using standardised scores they can also be conceived of as a composite, of which the descriptive results are given in Table III.

Operationalisation of the independent variables

Table III gives the scale characteristics (including Cronbach's α) of the explanatory variables. Whenever reliable and valid measures were available in the literature, they were used. Autonomy was measured by asking for the aspects of worker autonomy as indicated by Breaugh (1999), i.e. freedom with regard to the what, how and when of work. To account for the context of self-employment two items were added concerning the preference for a high level of responsibility (Van Gelderen and Jansen, 2006). The importance attached to money and wealth was measured by using items supplied by Mitchell and Mickel (1999) and Tang (1995). Measures of challenge, financial security and workload avoidance were derived from a domain analysis of the answers of the respondents to the open questions asked in the pilot studies. The measure of self-efficacy was taken from Kolvereid (1996b), as it is specific to the situation of starting a business and has been shown to be reliable in his research. Entrepreneurial

Shorthand[a]	Categories	G[b]	R[c]	N[d]	M[e]	Total
Q1. Ever start	Yes	48	65	51	60	55
Q2. Ever considered	Yes	56	62	52	68	59
Q3. Free to choose	Own business	48	54	46	53	50
Q4. Likely to choose	Own business	13	15	11	13	13
Q5. Percentage chance to start in five years	(Preferring their own business in Q3)	23	28	31	31	29

Notes: Figures shown are percentages. [a]Question 1: Do you think you will ever start a business?; Question 2: Have you ever considered founding your own firm?; Question 3: If the opportunity presented itself, and you were free to make any employment choice you desired, would you prefer to work for an organization/operate your own business? Question 4: Realistically, however, considering your actual situation and constraints upon your options (for example, lack of money), indicate which employment opportunity you're most likely to choose (work for an organisation/operate your own business); Question 5: How likely do you consider it to be that within five years from now you'll be running your own firm? __ per cent (of those preferring self-employment in question 3). [b]G, Groningen ($n = 291$); [c]R, Rotterdam ($n = 185$); [d]N, Nijmegen ($n = 420$); [e]M, Maastricht ($n = 339$). Total sample $n = 1,235$

Table II.
Frequency scores on the dependent variables

Component	Variables	Sample[a]	Reliability (Cronbach's α)	Mean	SD	No. of items	Range
Dependent (composite scale)	Entrepreneurial intentions	G	0.76	–	0.68	5	*z*-score
		R	0.71	–	0.66	5	
		N	0.77	–	0.70	5	
		M	0.75	–	0.68	5	
Attitude	Importance of autonomy	G	0.81	5.39	0.83	5	1-7
		R	0.82	5.51	0.81	5	
		N	0.63	5.51	0.67	4	
		M	0.67	5.43	0.67	5	
	Importance of wealth	G	0.73	4.33	0.93	6	1-7
		R	0.76	4.42	0.98	6	
		N	0.78	4.18	1.02	6	
		M	0.77	4.38	1.05	6	
	Challenge	G	0.83	5.52	0.82	6	1-7
		R	0.81	5.60	0.75	6	
		N	0.74	5.62	0.65	6	
		M	0.80	5.77	0.74	6	
	Financial security	G	0.65	4.70	1.08	3	1-7
		R	0.72	4.59	1.11	3	
		N	0.67	4.82	1.06	3	
		M	0.70	4.57	1.08	3	
	Work load avoidance	G	0.79	4.16	1.09	5	1-7
		R	0.79	3.97	1.07	5	
		N	0.78	4.00	1.05	5	
		M	0.79	3.90	1.13	5	
		T		4.01	1.09		
Perceived behavioural control	Perseverance	G	0.74	4.68	0.84	7	1-7
		R	0.75	5.14	0.80	7	
		N	0.65	5.12	0.68	7	
		M	0.67	5.15	0.75	6	
	Creativity	G	0.83	5.08	0.85	7	1-7
		R	0.78	5.11	0.72	7	
		N	0.77	5.07	0.68	7	
		M	0.70	5.15	0.67	7	
	Entrepreneurial alertness	G	0.80	4.23	1.12	5	1-7
		R	0.80	4.44	1.09	5	
		N	0.74	4.28	1.01	5	
		M	0.82	4.31	1.17	5	
	Self-efficacy	G	0.74	4.60	0.74	5	1-7
		R	0.76	4.70	0.74	5	
		N	0.72	4.55	0.71	5	
		M	0.66	4.82	0.85	3	
Subjective norm	Subjective norm	G	0.81	2.70	2.12	3	−9-9
		R	0.81	2.83	2.32	3	
		N	0.83	2.22	2.09	3	
		M	0.85	2.83	2.37	3	

Notes: [a]G, Groningen ($n = 291$); R, Rotterdam ($n = 185$); N, Nijmegen ($n = 420$); M, Maastricht ($n = 339$); T, total sample ($n = 1,235$)

Table III.
Reliabilities and descriptives

alertness was measured by items supplied by Busenitz (1996). Perseverance measurement was based on an adaptation of an NEO-FFI scale for entrepreneurship (Driessen, 1996). Creativity was assessed by means of a scale used in a Dutch policy study on successful entrepreneurship (Wennekes, 2001). Subjective norms were measured in the same way as in Kolvereid (1996b).

Following Brenner *et al.* (1991), we investigated whether groups of respondents that differed in their preference for self-employment or organisational employment also differed in their perceptions regarding the attributes of self-employment and organisational employment. The relevance of this check can be illustrated by means of two examples. One possibility is that students who prefer organisational employment believe that they can make more money when working for an organisation. At the same time, students who prefer self-employment may believe that more money can be made by starting their own business. Similarly, students who prefer organisational employment may believe that they will not have to work as hard, or for such long hours, as in the case when they would have their own business. *Vice versa*, students who prefer self-employment may believe that they can work less hard and long when having their own business because they can hire people to do the work for them. This would imply that the variables "importance of money" and "workload" are strong predictors of career preference for each respective group, but not in the sample as a whole.

For all independent variables, it was ascertained how the students associated these with self-employment and with organisational employment. The sample was split by dependent variable 3 (the question about career choice when free of restraints) and modal beliefs were computed for two groups. Both groups believed that self-employment was related to more autonomy, challenge, financial insecurity, and workload, and that it required more creativity and perseverance. Variables such as entrepreneurial alertness and self-efficacy were not investigated as they exclusively refer to self-employment.

However, with respect to the possibility of earning a large amount of money, both the advocates of organizational employment ($M = 4.92$ versus $M = 4.63$, seven-point scales) and those of self-employment ($M = 4.98$ versus $M = 4.80$) believed that their respective choices offered better possibilities to achieve this goal. A paired sample t-test for the mean difference (the difference between -0.29 and 0.18, totalling 0.47) proved to be statistically significant ($t = 5.46$, $p < 0.00$). Thus, a high degree of importance attached to wealth attainment is likely to inhibit EI if people believe that they will earn more money when working for an organization than when having their own firm. Therefore, an interaction term was used in the regression models, according to which the importance attached to money was multiplied by the level and sign of the individual's association regarding earning money with organisational employment ($-$) or with self-employment ($+$).

A summary of the research model is shown in Figure 1.

Results

The figures in Table II show that in each of the samples approximately about half of the respondents have intentions to set up a business (similar figures were obtained in the two pilot studies). The difference in response between question 3 and question 4 shows the impact of asking about a career preference or about a behavioural expectancy. About 75 per cent of the students who prefer to operate their own business

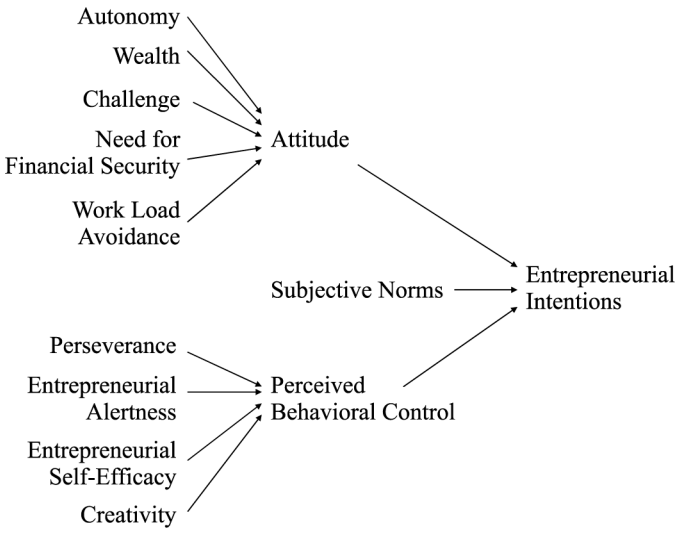

Figure 1.
Research model

do not pursue this when considering actual constraints. This may be less dramatic than it seems, as in response to an open question posed to students who prefer self-employment, but actually think they will opt for organisational employment, many indicate that they first want to gain more work experience in an organisational employment setting. The percentage of positive answers to each of the five variables ranks almost identical across all the universities sampled.

Table IV presents the correlations for the whole sample. For the subsamples we found similar patterns. All variables have significant first order correlations with the composite index of EI measures. Multicollinearity is not problematic though, given tolerance test statistics (lowest tolerance = 0.74) (Tabachnick and Fidell, 2001, p. 84) and the variance inflation factor (VIF) (highest VIF = 1.57). However, a factor analysis by means of Varimax rotation (unreported) performed on all items of the explanatory variables, showed that autonomy and challenge items load on the same factor. Entrepreneurial alertness and creativity items also load on a single factor. Whereas empirically these variables appear to be singular constructs, theoretically they are distinct. Therefore we chose not to collapse the items into composite variables. When regressing them to a dependent variable composite, to both the whole sample and the subsamples applied that the first- and second-order correlations of autonomy (0.22 and 0.12) were higher than those of challenge (0.15 and 0.08). Entrepreneurial alertness showed higher first- and second-order correlations (0.43 and 0.27) than creativity (0.29 and -0.02). From the negative partial correlations we concluded that challenge and creativity work as suppressor variables, and therefore they were dropped from the analysis.

Table V displays the results of the hierarchical logistic regression analyses, using the total sample, for the first four dependent measures. Table VI shows the results of the hierarchical linear regression analysis for the fifth dependent measure and the composite scale, also for the total sample. Gender and age were used as control (age

	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Entrepreneurial intentions	−0.06	0.69	–										
2. Autonomy	5.46	0.73	0.22	–									
3. Importance of wealth	4.30	1.00	0.18	−0.01	–								
4. Challenge	5.64	0.74	0.15	0.66	−0.03	–							
5. Financial security	4.69	1.08	−0.43	−0.07	−0.07	−0.07	–						
6. Work load avoidance	4.01	1.09	−0.29	−0.10	0.01	−0.19	0.48	–					
7. Perseverance	5.03	0.78	0.10	0.39	0.03	0.45	−0.03	−0.15	–				
8. Creativity	5.10	0.73	0.29	0.53	−0.02	0.62	−0.16	−0.17	0.40	–			
9. Entrepreneurial alertness	4.30	1.09	0.43	0.27	0.05	0.29	−0.24	−0.17	0.20	0.60	–		
10. Self-efficacy	4.66	0.77	0.33	0.25	0.10	0.22	−0.25	−0.20	0.14	0.33	0.25	–	
11. Subjective norms	2.59	2.22	0.32	0.20	0.06	0.17	−0.17	−0.15	0.08	0.19	0.22	0.33	–

Notes: $r > 0.06, p < 0.05$; $r > 0.08, p < 0.01$

Table IV.
Correlation table and descriptives (total sample, $n = 1,235$)

Variables	Q1			Q2			Q3			Q4		
	B	SE *B*	e^B	*B*	SE *B*	e^B	*B*	SE *B*	e^B	*B*	SE B	e^B
Importance of autonomy	0.21	0.11	1.2	−0.11	0.10	0.9	0.26*	0.11	1.3	0.54**	.17	1.7
Importance of wealth	0.03*	0.02	1.0	0.01	0.01	1.0	0.05**	0.01	1.1	0.04*	.02	1.0
Financial security	−0.62**	0.08	0.5	−0.27**	0.07	0.8	−0.58**	0.08	0.6	−0.50**	.11	.6
Work load avoidance	−0.15*	0.08	0.9	−0.04	0.07	1.0	−0.03	0.07	1.0	−0.17	.11	.8
Perseverance	0.04	0.11	1.0	0.02	0.10	1.0	0.00	0.10	1.0	0.00	.14	1.0
Entrepreneurial alertness	0.47**	0.08	1.6	0.38**	0.07	1.5	0.32**	0.07	1.4	0.41**	.11	1.5
Self-efficacy	0.28**	0.10	1.3	0.21*	0.10	1.2	−0.04	0.10	1.0	0.55**	.15	1.7
Subjective norm	0.18**	0.04	1.2	0.15**	0.03	1.2	0.19**	0.03	1.2	0.10*	.05	1.1
Constant	−2.75			−1.88			−0.38			−7.61		
χ^2 goodness-of-fit		190.4			387.6			277.3			188.7	
Nagelkerke r^2		0.21			0.39			0.29			0.28	
Percentage correctly classified		67			73			69			88	

Notes: $^*p < 0.05$; $^{**}p < 0.01$; e^B, exponentiated *B* (odds ratio). Controls (included in a first step) are age and gender (omitted from the table)

Table V.
Logistic regressions, composite sample

Variables	Q5			Composite index		
	B	SE *B*	β	*B*	SE *B*	β
(Constant)	−33.32	8.38		−1.35	0.24	
Importance of autonomy	0.92	0.84	0.03	0.07	0.03	0.08*
Importance of wealth	0.26	0.09	0.08**	0.01	0.00	0.11**
Financial security	−3.62	0.61	−0.18**	−0.16	0.02	−0.24**
Work load avoidance	−.93	0.59	−0.05	−0.04	0.02	−0.07*
Perseverance	0.17	0.80	0.01	0.00	0.02	0.00
Entrepreneurial alertness	4.61	0.58	0.23**	0.14	0.02	0.23**
Self-efficacy	3.86	0.80	0.14**	0.08	0.02	0.09**
Subjective norm	0.96	0.27	0.10**	0.05	0.01	0.16**
r^2		0.28			0.39	
Adjusted r^2		0.27			0.38	
F value		44.0			72.71	
F sign		0.000			0.000	

Notes: *$p < 0.05$; **$p < 0.01$

Table VI.
Multiple linear regression, composite sample

correlating 0.49 with grade year). For the composite dependent measure, the model explains 38 per cent of the variance in EI (Table VI, second column). Need for financial security, importance of wealth, entrepreneurial alertness, self-efficacy and social norms all explain EI on the 1 per cent significance level, and work load avoidance and autonomy on the 5 per cent significance level. Only perseverance is not related to EI. Need for financial security and entrepreneurial alertness consistently explain EI, regardless of the dependent variable used. Analysis of the data of all dependents on the subsample level (unreported here; detailed outcomes can be obtained from the corresponding author upon request) revealed that social norms are often important when the dependent variable is relatively non-committal, while self-efficacy is often important when the dependent variable is a strict behavioural expectancy. Results for the subsamples also show that only need for financial security and perseverance are consistently related to EI in each sample, whereas self-efficacy and subjective norms show most instability in their contribution.

Discussion

This study provides evidence for the usefulness of the theory of planned behaviour in explaining entrepreneurial intentions, and adds to the literature through its detailed findings. The perceived behavioural control component of the TPB was tested by means of four variables, with entrepreneurial alertness receiving consistent support, and perseverance a consistent lack of support in explaining EI. The participating students themselves nominated perseverance as an important variable affecting feasibility, which makes its lack of explanatory power puzzling. One possibility is that the operationalisation reflected conscientiousness rather than perseverance, for example in the case of items like "I usually finish what I've started". Consistent support was received for entrepreneurial alertness, which indicates that having an idea for setting up a business has motivating properties. The third variable making up the PCB component, self-efficacy, got inconsistent support, being important in some samples but not in others, and being important with some dependent variables, but not with others.

Out of the variables making up the attitude towards EI, a preference for financial security is a consistent predictor across samples and dependent variables. This finding is consistent with Douglas and Shepherd (2002). The risks involved put a lot of students off. Expectations of wealth and income attainment do not compensate for that, as those preferring organisational employment generally expected to earn more working for an organisation, whereas those preferring self-employment expected to attain more wealth and income being self-employed (a similar result was obtained by Brenner *et al.*, 1991). Attitude towards autonomy, in line with Davidsson (1995) but in contrast to Kolvereid (1996b) and Douglas and Shepherd (2002), is a poor predictor across samples and dependents. Autonomy is in fact highly valued by all students, whether their preference is for self-employment or for organisational employment, and this restriction of range is an explanation for the limited power of the autonomy measure to distinguish the two groups of students.

Social norms were important with many dependent variables and in many samples. Business students often have self-employed family members or friends, which may results in positive social norms with regard to self-employment (although negative experiences with self-employment could result in negative social norms). In addition, university business schools tend to look relatively favourably on entrepreneurship, reinforcing positive social norms.

Social norms were often a significant explanatory variable when the dependent variable was non-committal, and so was self-efficacy in the case of behavioural expectancies. Even when using a multi-item scale, it is important to be aware of the implications of the type of intention measure used. Similarly, the use of multiple samples provided solid evidence for the explanatory power of some variables (notably attitude towards financial security, and perseverance), while in the case of other variables a mixed picture emerged.

Half of the business students would prefer self-employment over organisational employment were they free to choose. This is a sizeable proportion that is in line with previous research findings (Henderson and Robertson, 2000). However, although half of the students prefer self-employment, only a third of those actually expect to become self-employed when considering actual constraints. Similar figures were obtained by Brenner *et al.* (1991). When queried about the reasons for this discrepancy most students respond that they prefer to gain organisational employment first (see also Galloway *et al.*, 2006). There they hope to acquire the skills, knowledge, and networks that will help them to become entrepreneurs later in their career journey.

This has interesting implications for existing businesses. The construct of entrepreneurial orientation (EO) has been developed to describe the degree of entrepreneurialism of companies (Lumpkin and Dess, 1996; Lumpkin, 2007; Wiklund and Shepherd, 2005). (Other terms describing a company starting a new venture are corporate entrepreneurship and intrapreneurship.) If a firm's strategy and actions can be characterised as innovative, proactive, autonomous, risk-taking, and competitively aggressive, that firm is said to be high in EO (Lumpkin and Dess, 1996; Lumpkin, 2007; Wiklund and Shepherd, 2005). Those firms will aim to hire team members that are capable of enterprising behaviour. Their challenge is that these people may ultimately want to venture out on their own. Organisational career management should aim to provide these employees with challenging assignments, learning opportunities, and skill development. In some cases enterprising individuals may start corporate spin-offs

or venture out on their own while retaining their former employer as a business partner (Peiperl and Baruch, 1997).

Our sample consisted of students, which makes the knowledge gained in this study particularly relevant to entrepreneurship education. The dependent variables show that the degree of interest that students take in entrepreneurship is high. We observed that a large number of people who prefer self-employment (if they are free to choose) opt for organisational employment (when considering the actual restraints), possibly to gain skills, knowledge and experience first. Still, the discrepancy also suggests that there is room for entrepreneurship education to have an impact (Collins *et al.*, 2004; Henderson and Robertson, 2000). Entrepreneurship education can increase awareness, confidence and enthusiasm, but also realism, so increasing the level of EI should not necessarily be the aim. However, should one want to increase the EI of their students, our results provide guidance.

One variable with high explanatory power appears to be entrepreneurial alertness. Sensitivity to opportunities can be trained by having students engage in idea generation exercises as well as in knowledge acquisition of industry trends and practices. Both form a basis for generating ideas (De Tienne and Chandler, 2004; Van Gelderen, 2006). Although Shook *et al.* (2003) claim that intentions precede opportunity discovery, this does not necessarily have to be the case. Our research cannot establish the direction of causality, but the correlations suggest that having an idea for setting up a business has motivating properties. This may be explained by expectancy theory (Vroom, 1964): developing ideas about business opportunities creates expectations about the gains that can eventually be made.

The need for financial security is a reversed predictor of EI. This suggests that students are not encouraged by the love of risk. Rather, they are discouraged by a fear of financial insecurity. Financial security can perhaps best be targeted at the belief level. At the belief level, the association of financial insecurity with self-employment can be modified by teaching students strategies that reduce this risk. Training students in developing self-efficacy may reduce the expectation that self-employment will inevitably mean financial insecurity. Training may build students' confidence that self-employment may offer a path to financial independence. The ideas of students about financial risks and gains may also be changed when they are brought into contact with entrepreneurs who can serve as role models (Henderson and Robertson, 2000). They could learn, for example, that many entrepreneurs have started their businesses without investing large amounts of money, but instead relied on bootstrapping strategies to mobilise their required resources (Sarasvathy, 2001). The other side of the coin is that entrepreneurship education should provide students who are over-optimistic, and who underestimate the possible financial consequences of self-employment, with a reality-check.

This study provides evidence for the usefulness of the TPB in explaining EI. Analysing the full sample, the model explains about 38 per cent of the variance in EI with the composite dependent measure. This is comparable with previous findings (explained variance is hardly reduced without the controls). In research by Krueger *et al.* (2000), the TPB explains 35 per cent of the variance in EI, and in a study by Tkachev and Kolvereid (1999), even 45 per cent is explained. Possibly the characteristics of the population made it difficult to arrive at higher degrees of explanation of EI. As discussed above, people at the average age of 22 who are still at

university are in general still uncertain and undecided about their career intentions. Although the overall variance in this study is not higher than in previous studies, our results can be argued to be higher in specificity, usefulness and reliability because of the various design features that were used.

Still, there are limitations that remain. One is common method bias: dependent and independent measures were derived from the same source. Another concern is that despite a careful selection of the variables, two couples of variables still showed construct overlap. A third is restriction of range. It may well be the case that a variable such as autonomy was generally not a strong predictor in this study because autonomy was highly valued by both students who preferred organisational employment and those who preferred self-employment. A fourth limitation is that from a career perspective, having free choice between self- or organisational employment is a prerogative of those who possess skills, experience, and labour market power, like our business students. Other samples may have different considerations (Peel and Inkson, 2004).

Future research should examine the relation between entrepreneurial intentions and subsequent behaviour, possibly with other samples than those of business students (Shook *et al.*, 2003). Another interesting avenue of further research is to study entrepreneurs from a career development perspective. Much focus, including this study, is on employment status choice. How do serial entrepreneurs, who set up one venture after another, view career progression? Entrepreneurs start at the top and grow a hierarchy beneath them. Still, there may be career patterns in the quality and quantity of the ventures that they pursue.

The popularity of self-employment is fitting in the present context of the boundaryless, protean, or post-corporate careers, which require increased self-reliance of individuals and which offer fewer career opportunities in the large corporations. We believe our study adds to the understanding of the determinants of employment status choice. For understanding modern careers as well as entrepreneurship, knowledge of the factors that explain entrepreneurial intentions is indispensable.

References

Ajzen, I. (1988), *Attitudes, Personality, and Behavior*, Dorsey Press, Chicago, IL.

Ajzen, I. (1991), "The theory of planned behaviour", *Organizational Behaviour and Human Decision Processes*, Vol. 50, pp. 179-211.

Ajzen, I. (2002), "Perceived behavioural control, self-efficacy, *locus*-of-control, and the theory of planned behaviour", *Journal of Applied Social Psychology*, Vol. 32 No. 4, pp. 665-83.

Armitage, C.J. and Conner, M. (2001), "Efficacy of the theory of planned behaviour: a meta-analytic review", *British Journal of Social Psychology*, Vol. 40, pp. 471-99.

Arthur, M.B. and Rousseau, D.M. (1996), *The Boundaryless Career*, Oxford University Press, New York, NY.

Autio, E., Keeley, R.H., Klofsten, M. and Ulfstedt, T. (1997), "Entrepreneurial intent among students in Scandinavia and in the USA", *Enterprise and Innovation Management Studies*, Vol. 2 No. 2, pp. 145-60.

Bagozzi, R.P. (1992), "The self-regulation of attitudes, intentions, and behaviour", *Social Psychology Quarterly*, Vol. 55, pp. 178-204.

Bagozzi, R.P. and Kimmel, S.K. (1995), "A comparison of leading theories for the prediction of goal-directed behaviours", *British Journal of Social Psychology*, Vol. 34, pp. 437-61.

Bandura, A. (1977), "Self-efficacy: toward a unifying theory of behavioural change", *Psychological Review*, Vol. 84, pp. 191-215.

Bandura, A. (1982), "Self-efficacy mechanism in human agency", *American Psychologist*, Vol. 37, pp. 122-47.

Baruch, Y. (2004), *Managing Careers*, Pearson, Harlow.

Breaugh, J.A. (1999), "Further investigation of the work autonomy scales: two studies", *Journal of Business and Psychology*, Vol. 13, pp. 357-73.

Brenner, O.C., Pringle, C.D. and Greenhaus, J.H. (1991), "Perceived fulfilment of organizational employment versus entrepreneurship: work values and career intentions of business college graduates", *Journal of Small Business Management*, Vol. 29, pp. 62-73.

Bruyat, C. and Julien, P.A. (2001), "Defining the field of research in entrepreneurship", *Journal of Business Venturing*, Vol. 16 No. 2, pp. 165-80.

Busenitz, L.W. (1996), "Research on entrepreneurial alertness: sampling, measurement, and theoretical issues", *Journal of Small Business Management*, Vol. 34, pp. 35-44.

Carree, M.A. and Thurik, A.R. (2003), "The impact of entrepreneurship on economic growth", in Audretsch, D.B. and Acs, Z.J. (Eds), *Handbook of Entrepreneurship Research*, Kluwer Academic, Boston, MA/Dordrecht, pp. 437-71.

Collins, L., Hannon, P.D. and Smith, A. (2004), "Enacting entrepreneurial intent: the gaps between student needs and higher education capability", *Education + Training*, Vol. 46 Nos 8/9, pp. 454-63.

Conner, M. and Armitage, C.J. (1998), "Extending the theory of planned behaviour: a review and avenues for further research", *Journal of Applied Social Psychology*, Vol. 28 No. 15, pp. 1429-64.

Davidsson, P. (1995), "Determinants of entrepreneurial intentions", *RENT (Research in ENTrepreneurship) Conference, IX, Piacenza, 23-24 November* (also Working Paper Series 1995-1, Jonkoping International Business School, Jonkoping).

Davidsson, P. (2004), *Researching Entrepreneurship*, Springer, Boston, MA.

DeFillippi, R.J. and Arthur, M.B. (1994), "The boundaryless career: a competency based perspective", *Journal of Organisational Behaviour*, Vol. 15 No. 4, pp. 307-24.

DePillis, E. and Reardon, K.K. (2007), "The influence of personality traits and persuasive messages on entrepreneurial intention", *Career Development International*, Vol. 12 No. 4, pp. 382-96.

De Tienne, D.R. and Chandler, G.N. (2004), "Opportunity identification and its role in the entrepreneurial classroom: a pedagogical approach and empirical test", *Academy of Management Learning and Education*, Vol. 3 No. 3, pp. 242-57.

Douglas, E.J. and Shepherd, D.A. (2002), "Self-employment as a career choice: attitudes, entrepreneurial intentions, and utility maximization", *Entrepreneurship Theory and Practice*, Vol. 26 No. 3, pp. 81-90.

Drennan, J., Kennedy, J. and Renfrow, P. (2005), "Impact of childhood experiences on the development of entrepreneurial intentions", *International Journal of Entrepreneurship and Innovation*, Vol. 6 No. 4, pp. 231-8.

Driessen, M.P. (1996), "The entrepreneurship scan", doctoral thesis, University of Nijmegen, Nijmegen.

Fayolle, A., Gailly, B. and Lassas-Clerc, N. (2006), "Assessing the impact of entrepreneurship education programmes: a new methodology", *Journal of European Industrial Training*, Vol. 30 No. 9, pp. 701-20.

Fugate, M., Kinicki, A.J. and Ashfort, B.E. (2004), "Employability: a psycho-social construct, its dimensions, and applications", *Journal of Vocational Behaviour*, Vol. 65, pp. 14-38.

Galloway, L., Brown, W., Anderson, M. and Wilson, L. (2006), "Investigating the potentials of entrepreneurship education", *International Journal of Management Education*, Vol. 5 No. 1, pp. 57-65.

Gibb, A.A. (2002a), "In pursuit of a new 'enterprise' and 'entrepreneurship' paradigm for learning: creative destruction, new values, new ways of doing things and new combinations of knowledge", *International Journal of Management Reviews*, Vol. 4 No. 3, pp. 233-69.

Gibb, A.A. (2002b), "Creating conducive environments for learning and entrepreneurship", *Industry and Higher Education*, Vol. 16 No. 3, pp. 135-47.

Gibb Dyer, W. Jr (1994), "Toward a theory of entrepreneurial careers", *Entrepreneurship Theory and Practice*, Vol. 19 No. 2, pp. 7-21.

Gordon, V.N. (1998), "Career decidedness types: a literature review", *Career Development Quarterly*, Vol. 46, pp. 386-403.

Hall, D.T. (2002), *Careers in and out of Organizations*, Sage Publications, Thousand Oaks, CA.

Hall, D.T. (2004), "The protean career: a quarter century journey", *Journal of Vocational Behaviour*, Vol. 65, pp. 1-13.

Henderson, R. and Robertson, M. (2000), "Who wants to be an entrepreneur? Young adult attitudes to entrepreneurship as a career", *Career Development International*, Vol. 5 No. 6, pp. 279-87.

Inkson, K. (2006), "Protean and boundaryless careers as metaphors", *Journal of Vocational Behavior*, Vol. 69, pp. 48-63.

Kirzner, I. (1973), *Competition and Entrepreneurship*, University of Chicago Press, Chicago, IL.

Kolvereid, L. (1996a), "Organizational employment versus self-employment: reasons for career choice intentions", *Entrepreneurship Theory and Practice*, Vol. 20 No. 3, pp. 23-31.

Kolvereid, L. (1996b), "Predictions of employment status choice intentions", *Entrepreneurship Theory and Practice*, Vol. 21 No. 1, pp. 47-57.

Kristiansen, S. and Indarti, N. (2004), "Entrepreneurial intention among Indonesian and Norwegian students", *Journal of Enterprising Culture*, Vol. 12 No. 1, pp. 55-78.

Krueger, N. (1993), "The impact of prior entrepreneurial exposure on perceptions of new venture feasibility and desirability", *Entrepreneurship Theory and Practice*, Vol. 18 No. 1, pp. 5-21.

Krueger, N.F. Jr, Reilly, M.D. and Carsrud, A.L. (2000), "Competing models of entrepreneurial intentions", *Journal of Business Venturing*, Vol. 15, pp. 411-32.

Lee, S.H. and Wong, P.K. (2004), "An exploratory study of technopreneurial intentions: a career anchor perspective", *Journal of Business Venturing*, Vol. 19, pp. 7-28.

Lumpkin, G.T. (2007) in Baum, J.R., Frese, M. and Baron, R.A. (Eds), *The Psychology of Entrepreneurship*, SIOP Organizational Frontiers Series, Lawrence Erlbaum Associates, Mahwah, NJ.

Lumpkin, G.T. and Dess, G.G. (1996), "Clarifying the entrepreneurial orientation construct and linking it to performance", *Academy of Management Review*, Vol. 21 No. 1, pp. 135-72.

Lüthje, C. and Franke, N. (2003), "The 'making' of an entrepreneur: testing a model of entrepreneurial intent among engineering students at MIT", *R&D Management*, Vol. 33 No. 2, pp. 135-47.

Mitchell, T.R. and Mickel, A.E. (1999), "The meaning of money: an individual-difference perspective", *Academy of Management Review*, Vol. 24, pp. 568-78.

Multon, K.D., Heppner, M.J. and Lapan, R.T. (1995), "An empirical derivation of career decision subtypes in a high school sample", *Journal of Vocational Behaviour*, Vol. 47, pp. 76-92.

Nabi, G., Holden, R. and Walmsley, A. (2006), "Graduate career-making and business start-up: a literature review", *Education + Training*, Vol. 48 No. 5, pp. 373-85.

Peel, S. and Inkson, K. (2004), "Contracting and careers: choosing between self and organisational employment", *Career Development International*, Vol. 9 No. 6, pp. 542-58.

Peiperl, M. and Baruch, Y. (1997), "Back to square zero: the post-corporate career", *Organizational Dynamics*, Vol. 25 No. 4, pp. 7-22.

Peterman, N.E. and Kennedy, J. (2003), "Enterprise education: influencing students' perceptions of entrepreneurship", *Entrepreneurship Theory and Practice*, Vol. 28 No. 2, pp. 129-44.

Phan, P.H., Wong, P.K. and Wang, C.L. (2002), "Antecedents to entrepreneurship among university students in Singapore: beliefs, attitudes and background", *Journal of Enterprising Culture*, Vol. 10 No. 2, pp. 151-74.

Raijman, R. (2001), "Determinants of entrepreneurial intentions: Mexican immigrants in Chicago", *Journal of Socio-Economics*, Vol. 30, pp. 393-411.

Rauch, A. and Frese, M. (2000), "Psychological approaches to entrepreneurial success: a general model and an overview of findings", *International Review of Industrial and Organizational Psychology*, Vol. 15, pp. 101-43.

Sarasvathy, S.D. (2001), "Causation and effectuation: toward a theoretical shift from economic inevitability to entrepreneurial contingency", *Academy of Management Review*, Vol. 26 No. 2, pp. 243-63.

Schein, E. (1978), *Career Dynamics: Matching Individual and Organizational Needs*, Addison-Wesley, Reading, MA.

Schein, E. (1990), *Career Anchors: Discovering Your Real Values*, Pfeiffer & Co., San Diego, CA.

Shapero, A. and Sokol, L. (1982), "Social dimensions of entrepreneurship", in Kent, C., Sexton, D. and Vesper, K. (Eds), *The Encyclopedia of Entrepreneurship*, Prentice-Hall, Englewood Cliffs, NJ, pp. 72-90.

Shook, C.L., Priem, R.L. and McGee, J.E. (2003), "Venture creation and the enterprising individual: a review and synthesis", *Journal of Management*, Vol. 29 No. 3, pp. 379-99.

Silvia, P.J. (2001), "Expressed and measured vocational interests: distinctions and definitions", *Journal of Vocational Behaviour*, Vol. 59, pp. 382-93.

Sutton, S. (1998), "Predicting and explaining intentions and behaviour: how well are we doing?", *Journal of Applied Social Psychology*, Vol. 28 No. 15, pp. 1317-38.

Tabachnick, B.G. and Fidell, L.S. (2001), *Using Multivariate Statistics*, Allyn & Bacon, Boston, MA.

Tang, T.L.P. (1995), "The development of a short money ethic scale: attitudes toward money and pay satisfaction revisited", *Personality and Individual Differences*, Vol. 19, pp. 809-16.

Tkachev, A. and Kolvereid, L. (1999), "Self-employment intentions among Russian students", *Entrepreneurship and Regional Development*, Vol. 11, pp. 269-80.

Van Gelderen, M.W. (2006), "Meaning in life as an opportunity for enterprise", *Journal of Enterprising Culture*, Vol. 14 No. 4, pp. 307-21.

Van Gelderen, M.W. and Jansen, O. (2006), "Autonomy as a startup motive", *Journal of Small Business and Enterprise Development*, Vol. 13 No. 1, pp. 23-32.

Vroom, V.H. (1964), *Work and Motivation*, Wiley, New York, NY.

Warshaw, P.R. and Davis, F.D. (1985), "Disentangling behavioural intention and behavioural expectation", *Journal of Experimental Social Psychology*, Vol. 21, pp. 213-28.

Wennekes, W. (2001), *De succesvolle ondernemer. Ondernemers vertellen over hun succes en falen*, Publication No. 11B112, Ministerie van Economische Zaken, Den Haag.

Wiklund, J. and Shepherd, D. (2005), "Entrepreneurial orientation and small business performance: a configurational approach", *Journal of Business Venturing*, Vol. 20 No. 1, pp. 71-91.

Wilson, F., Kickul, J. and Marlino, D. (2007), "Gender, entrepreneurial self-efficacy, and entrepreneurial career intentions: implications for entrepreneurship education", *Entrepreneurship Theory & Practice*, Vol. 31 No. 3, pp. 387-406.

Wilson, F., Marlino, D. and Kickul, J. (2004), "Our entrepreneurial future: examining the diverse attitudes and motivations of teens across gender and ethnic identity", *Journal of Developmental Entrepreneurship*, Vol. 9 No. 3, pp. 177-97.

About the authors

Marco van Gelderen is in the College of Business, Department of Management and International Business, Massey University, Auckland, New Zealand. Marco van Gelderen is the corresponding author and can be contacted at: m.vangelderen@massey.ac.nz

Maryse Brand is at the University of Groningen, Groningen, The Netherlands.

Mirjam van Praag is at the Amsterdam School of Economics/Business School, University of Amsterdam, Amsterdam, The Netherlands.

Wynand Boclewes is at Erasmus Center for Entrepreneurship and New Business Venturing, Rotterdam School of Management, Erasmus University, Rotterdam, The Netherlands.

Erik Poutsma is at Nijmegen School of Management, Radboud University Nijmegen, Nijmegen, The Netherlands.

Anita van Gils is in the Faculty of Economics and Business, Department of Organization and Strategy, Maastricht University, Maastricht, The Netherlands.