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## Who Becomes an Entrepreneur? A 30-Years-Review of Individual-Level Research and an Agenda for Future Research

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# **WHO BECOMES AN ENTREPRENEUR? A 30-YEARS-REVIEW OF INDIVIDUAL-LEVEL RESEARCH AND AN AGENDA FOR FUTURE RESEARCH**

*Simon Heinrichs und Sascha Walter*

## **Abstract**

This article reviews the theoretical background and cumulates findings of 126 published studies (1980 - 2009) on individual determinants of entrepreneurial status. We categorize determinants into one of six paradigms (trait, cognitive, affective, intentions, learning, and economic) and review findings for 46 repeatedly studied variables. We then examine trends in the field and propose an agenda for future research. Our article complements prior reviews and meta-analyses by picturing the breadth of the field and adding important points to the research agenda.

## 1 Introduction

Any firm formation begins with the actions of particular persons. Understanding why and how these persons act is therefore crucial to comprehending entrepreneurial activity (Baron, 2004). Since Schumpeter's (1934) seminal work an extensive and diverse body of research has addressed this important question. For instance, scholars have argued that some people and not others choose to become an entrepreneur for several reasons: They are more risk-taking and more achievement motivated (trait perspective, Brockhaus, 1980; McClelland, 1965). They have a more positive evaluation of being an entrepreneur that is eventually biased (cognitive perspective, Baron, 2004; Tversky and Kahneman, 1974) and influenced by emotions and feelings (affective perspective, Baron, 2008). They consider an entrepreneurial career as more desirable and feasible (intentions perspective, Ajzen, 1991; Shapero and Sokol, 1982). They follow the sample of a valued role model (learning perspective, Scherer et al., 1989). They rationally weigh costs and benefits of being self-employed (economic perspective, Becker, 1964).

More than three decades of empirical research have largely fragmented the maturing field, leading some scholars to doubt the consistency of prior findings (Chell, 1985; Gartner, 1989; Robinson et al., 1991). More recently, narrative reviews (Shane, 2003; Shook et al., 2003) and meta-analyses (Collins et al., 2004; Miner and Raju, 2004; Rauch and Frese, 2007; Stewart Jr. and Roth, 2001; Zhao and Seibert, 2006) have effectively consolidated prior work. These studies have often focused on few, selected individual-level influences or on factors with consistent findings. However, to date and to our best knowledge, few attempts have been made to review the considerable breadth of the field.

Our article cumulates published empirical studies (1980 - 2009) on the relationship between individual variables and entrepreneurial status. We categorize repeatedly analysed determinants into the six, abovementioned perspectives, review empirical findings for each determinant and each perspective, investigate trends in the field, and propose avenues for future research. By mapping the state of the art, our article aims to assist entrepreneurship scholars in efficiently identifying under-researched areas and in deriving and testing theoretically grounded models. The paper is organized as follows. In the next section, we describe the methods of our literature search. In the third section, we characterize six distinct theoretical perspectives. In the

fourth section, we review empirical findings for variables associated with each perspective. In the fifth section, we examine temporal trends in the field and, finally, suggest an agenda for future research.

## **2 Methodology**

### **2.1 Defining the entrepreneur**

The literature provided a wide range of definitions for the term “entrepreneur”, for instance as founder of a new venture (Begley and Boyd, 1987b) or owner of a small business (Masters and Meier, 1988). To be as inclusive as possible, our study defines the entrepreneur broadly as an individual independently owning and actively managing a business (Carland et al., 1984; Stewart Jr. and Roth, 2001). This allows us to present a more comprehensive picture of the research field that is typically confronted with such a definitional dilemma.

### **2.2 Literature search and data set**

We identified published studies in four phases. First, literature reviews (Johnson, 1990; Shane, 2003; Shook et al., 2003) and prior meta-analyses (Collins et al., 2004; Miner and Raju, 2004; Rauch and Frese, 2007; Stewart Jr. and Roth, 2001; Zhao and Seibert, 2006) were examined. Second, we conducted a keyword search in the online databases EBSCO, JSTOR, and Science Direct as well as in Google Scholar using the keywords *self-employ\**, *entrepreneur\**, and *venture creat\**. Third, we browsed the table of contents of several major entrepreneurship research outlets from 1980 to 2009, such as *Entrepreneurship & Regional Development*, *Entrepreneurship Theory & Practice*, *Frontiers of Entrepreneurship Research*, *Journal of Business Venturing*, *Journal of Small Business Management*, and *Small Business Economics*. In the last phase, the reference sections of all articles retrieved were consulted to account for publications which may have been overlooked.

Articles that failed to meet one or more criteria of our definition of the entrepreneur were excluded. Two researchers extracted variables from the final set of articles and assigned them to

one of the abovementioned theoretical perspectives. A comparison of both codings revealed an inter-rater agreement of 95 percent, respectively. We resolved remaining discrepancies via discussion and reaching consensus. This resulted in our final data set of 389 relationships from 126 studies containing 133 samples with an average size of 13,391 (minimum 40, maximum 487,062). The samples originated from the US (58%), the UK (11%), Sweden (5%), Finland (4%), and other countries (22%).

As shown in Table 1, the studies into one of three categories: (1) Studies on entrepreneurial intentions (EI, 22%; e.g., Krueger et al., 2000) that adopt an ex-ante perspective to explore entrepreneurial intentions and view these intentions as a predictor of actual start-up activity, (2) studies on entrepreneurial status (ES, 45%; e.g., Amit et al., 1995) that analyse determinants of starting a venture from an ex-post perspective, and (3) studies on differences between the entrepreneurial person and other groups (EP, 33%; e.g., Palich and Bagby, 1995). Research in this field was predominantly published in entrepreneurship journals (48%), followed by economics (33%), psychology (8%), and strategic management (8%) journals.

**Table 1:** Journal overview

Journal	Number of studies <sup>a</sup>			Total
	EI	ES	EP	
<i>Economics</i>	2	36	4	42
Applied Economics	0	4	0	4
Journal of Political Economy	0	4	0	4
Journal of Socio-Economics	0	3	1	4
Journal of Labor Economics	0	3	0	3
Oxford Bulletin of Economics & Statistics	0	3	0	3
Economics Letters	0	2	0	2
European Economic Review	1	1	0	2
Journal of Applied Econometrics	0	2	0	2
Journal of Economic Psychology	1	0	1	2
Journal of Vocational Behavior	0	0	2	2
Labour Economics	0	2	0	2
Others	0	12	0	12

**Table 1:** Journal overview (continued)

Journal	Number of studies <sup>a</sup>			Total
	EI	ES	EP	
<i>Entrepreneurship</i>	21	17	24	62
Journal of Business Venturing	5	6	5	16
Journal of Small Business Management	5	1	6	12
Small Business Economics	0	7	1	8
Entrepreneurship Theory & Practice	4	1	2	7
Frontiers of Entrepreneurship Research	3	1	3	7
Entrepreneurship & Regional Development	2	1	1	4
International Journal of Entrepreneurial Behaviour & Research	0	0	2	2
International Small Business Journal	0	0	2	2
Others	2	0	2	4
<i>Psychology</i>	3	1	6	10
Journal of Applied Psychology	1	0	1	2
Others	2	1	5	8
<i>Strategic Management</i>	2	2	6	10
British Journal of Management	0	0	2	2
Others	2	2	4	8
<i>Others</i>	0	2	2	4
<b>Total</b>	<b>28</b>	<b>58</b>	<b>42</b>	<b>128</b>

<sup>a</sup> EI: entrepreneurial intentions, ES: entrepreneurial status, EP: differences between entrepreneurial person and others.

### 3. Theoretical perspectives

Since Schumpeter's (1934) seminal work, the role of the individual in creating ventures has attracted enormous scholarly interest. Researchers have adopted a diverse set of theoretical perspectives that we categorize as the (1) *trait perspective*, (2) *cognitive perspective*, (3) *affective perspective*, (4) *intentions perspective*, (5) *learning perspective*, and (6) *economic perspective*. The following subsection outlines each perspective.

### 3.1 Trait perspective

The trait perspective focuses on individual traits and dispositions, i.e. tendencies to respond to situations in a particular, predetermined manner and include personality factors, need states, preferences, and motives (House et al., 1996). Personality psychologists assume they are partly shaped through social learning processes in early childhood (Carland et al., 1988) and partly determined by heritage or environmental influences (McCrae, 1994; Pervin, 1994), for instance emanating from the national culture (Mueller and Thomas, 2001). While many dispositions are generally stable in the short-run, researchers still discuss to what extent they change over a long time and in different situations (McCrae, 1994; Pervin, 1994). Proponents of the trait perspective argue that some individuals possess specific dispositions that lead them to “self-select” into entrepreneurial careers. This notion is contained in several widely accepted theories, such as career anchor theory (Schein, 1978), RIASEC occupational types (Holland, 1978), and the five-factor model of personality (Costa and McCrae, 1992).

### 3.2 Cognitive perspective

The cognitive perspective holds that the decision to become an entrepreneur is strongly driven by cognitive processes to acquire, store, transform, and use information, rather than by a distinguishing personality profile (Baron, 2004; Busenitz and Lau, 1996). Entrepreneurial decision-making is believed to be driven by heuristics, i.e. “rules of thumb” or simplifying strategies, rather than formal analysis (Busenitz and Barney, 1997; Kahneman et al., 1982; Manimala, 1992). Heuristics reduce the amount of critical information to process and yield efficient and often acceptable solutions in situations characterized by a lack of time, information, or information processing capacity. Entrepreneurs are believed to rely on heuristics more often than managers as they are typically confronted with highly uncertain and complex decision-making scenarios (Busenitz and Barney, 1997). Similarly, individuals with a preference for heuristics are more likely to self-select into entrepreneurial careers, whereas other individuals would often feel overburdened with entrepreneurial tasks and tend to wage-employment. Prominent examples of heuristics include: (1) *Anchoring*, i.e. the tendency to rely too heavily on one trait or single piece of information when making decisions, (2) *availability*, i.e. the tendency

to judge the likelihood of an event by the ease with which the relevant instance come to mind, and (3) *representativeness*, i.e. the tendency to generalize from small, non-representative samples (Busenitz and Lau, 1996; Shaver and Scott, 1991; Tversky and Kahneman, 1971). Furthermore, the use of heuristics can invoke cognitive biases, particularly in situations involving high degrees of information overload, uncertainty, intense emotions, and time pressure (Baron, 1998). They can affect start-up decisions either directly or by influencing risk perceptions (Simon et al., 2000).

### **3.3 Affective perspective**

The affective perspective focuses on the role of emotions and feelings in entrepreneurial decision-making (Baron, 2008; Goss, 2005). Affect encompasses shifts in current moods triggered by external events (state affect) and the tendency to show specific affective reactions that are relatively stable across various situations (trait affect, Isen, 1999). Rather than exerting a direct effect on behaviour, affect is believed to influence cognition, which in turn influences behaviour, such as the decision to start a venture (Goss, 2008). For instance, positive affect may promote opportunity recognition by enhancing creativity. It may also increase the persuasiveness of entrepreneurs thereby facilitating the acquisition of critical start-up resources (Baron, 2008). Several theories are typically associated the affective paradigm (Goss, 2008). Affect event theory, as the first, posits that work events lead to positive or negative feelings which directly result in work attitudes and judgment-driven behaviour (Ashkanasy et al., 2002). Moreover, the affect infusion model suggests that affective states influence information processing and judgments (Forgas, 1995). Finally, according to the affect theory of social exchange, emotions produced by social exchange affect social ties and ultimately generate solidarity and cohesion (Lawler, 2001).

### **3.4 Intentions perspective**

In viewing entrepreneurial behaviour as an intentional act, the intentions perspective explores drivers of entrepreneurial intentions. It, essentially, encompasses two partly overlapping theories. The first is Ajzen's (1991) theory of planned behaviour (TPB) that proposes intentions as the main driver of general human behaviour. Intentions, in turn, are determined by three conceptually



distinct factors: (1) *Attitude toward the behaviour*, i.e. the extent to which a person has a favourable or unfavourable evaluation of the behaviour, (2) *subjective norm*, i.e. the perceived social pressure to perform or not perform the behaviour, and (3) *perceived behavioural control*, i.e. the perceived ease or difficulty of performing the behaviour. From this lens, individuals who evaluate entrepreneurship positively and who consider it as socially desirable and/or feasible are more likely to start new ventures (Kolvereid, 1996; Krueger et al., 2000). The second theory is Shapero's (1982) model of the entrepreneurial event that was directly developed to explain venturing decisions. It proposes three drivers of entrepreneurial intentions: (1) *Perceived desirability*, i.e. the attractiveness (both intra-personal and extra-personal) of starting a venture, (2) *perceived feasibility*, i.e. the degree to which a person feels capable of starting a venture, and (3) *propensity to act*, i.e. the personal predisposition to act on one's decisions.

### **3.5 Learning perspective**

The learning perspective emphasizes the role of observational learning in the socialization of entrepreneurs. Social learning theory (Bandura, 1977) posits that an individual learns new behaviour by observing the social behaviour in other people as well as subsequent positive or negative consequences (reinforcement or punishment). If the observer recognizes positive, desired outcomes or has been positively reinforced for engaging in activities related to the behaviour, he or she will tend to imitate and adopt the behaviour (Krumboltz, 1976; Scherer et al., 1989). In this vein, role models may encourage or also discourage individuals to pursue entrepreneurial careers.

### **3.6 Economic perspective**

The economic perspective incorporates logic from human capital and decision theory and holds that vocational choices are driven by utility-maximization (Douglas and Shepherd, 2002). Campell (1992), for instance, models the choice between wage-employment and self-employment as a decision-theoretic problem. The prevalent decision criterion in his model is the net present value, which consists of the (1) expected return from entrepreneurship and the attitude toward risk minus (2) the monetary and psychic costs of entrepreneurship and expected returns

from wage labour. A similar rationale is suggested by human capital theory (Boskin, 1974): An individual rationally weighs benefits (primarily expected earnings and non-monetary benefits) and costs (primarily expected forgone earnings and training) of alternative occupations. Table 2 summarizes key differences of the theoretical perspective reviewed above.

**Table 2:** Overview of theoretical perspectives

Perspective	Origin	Explanation of venturing decision	Key concepts and theories
Trait perspective	Psychology	Individuals with specific dispositions self-select into an entrepreneurial career because it best matches their vocational needs and qualifications.	Career anchor theory (Schein, 1978), RIASEC occupational types (Holland, 1978), five-factor-model of personality (Costa and McCrae, 1992)
Cognitive perspective	Psychology	Individuals differ in their cognitive processes that lead to the venturing decision. Some persons have a more positive, possibly biased evaluation of being an entrepreneur and therefore start new ventures.	Prospect theory, heuristics and biases (Tversky and Kahneman, 1974)
Affective perspective	Psychology	Emotions and feelings exert a strong influence on the cognitive evaluation of an entrepreneur, and thereby influence the decision to create a new venture.	Affect event theory (Ashkanasy et al., 2002), affect infusion model (Forgas, 1995), affect theory of social exchange (Lawler, 2001)
Intentions perspective	Psychology	Some individuals (intent to) start new ventures because they perceive this option as more desirable and more feasible than others.	Theory of planned behaviour (Ajzen, 1991), Shapero's model of the entrepreneurial event (Shapero and Sokol, 1982)
Learning perspective	Psychology	Individuals observe entrepreneurial role models and tend to imitate their behaviour under certain conditions.	Social learning theory (Bandura, 1977)
Economic perspective	Economics	Individuals rationally choose self-employment based on a cost-benefit-rationale.	Normative decision theory, human capital theory (Becker, 1964; Boskin, 1974)

#### 4. Empirical findings

Table 3 reports empirical findings for influences on the likelihood of becoming self-employed. The results are widely based on regression analysis (35%) and variance analysis (35%), but also

on discriminant analysis (11%), *t*-tests (11%), structural equation models (7%), and chi-square tests (3%). We review the findings per theoretical perspective in the following subsections.

**Table 3:** Empirical findings

Independent variable	Hypothesized effect	# tests	% tests	# supported	% supported	Study example
<i>Trait perspective</i>		140	36%	99	71%	
Risk-taking propensity	+	33	6%	26	79%	Begley (1995)
Need for achievement	+	29	5%	22	76%	DeMartino et al. (2006)
Need for independence	+	19	4%	14	74%	Lee and Wong (2004)
Internal locus of control	+	18	3%	13	72%	Hansemark (2003)
Innovativeness	+	9	2%	7	78%	Miner et al. (1989)
Creativity	+	7	1%	6	86%	Caird, 1991
Extraversion	+	6	1%	2	33%	Wooten et al. (1999)
Agreeableness	-	4	1%	2	50%	Brodsky (1993)
Neuroticism	-	3	1%	0	0%	Malach-Pines et al. (2002)
Openness to experience	+	3	1%	1	33%	Envick and Langford (2000)
Tolerance of ambiguity	+	3	1%	3	100%	Schere (1982)
Conscientiousness	+	2	0%	0	0%	Wooten et al. (1999)
Proactive behaviour	+	2	0%	1	50%	Crant (1996)
Type-A behaviour	+	2	0%	2	100%	Begley and Boyd (1987a)
<i>Cognitive perspective</i>		8	2%	7	88%	
Risk perception	-	3	1%	3	100%	Norton and Moore (2006)
Overconfidence	+	3	1%	2	67%	Busenitz and Barney (1997)
Representativeness	+	2	0%	2	100%	Simonin (1999)
<i>Intentions perspective</i>		39	10%	36	92%	
Perceived behavioural control	+	9	2%	9	100%	Souitaris et al. (2007)
Self-efficacy	+	8	2%	6	75%	Chen et al. (1998)
Attitude toward the behaviour	+	6	1%	6	100%	Souitaris et al. (2007)
Subjective norm	+	5	1%	4	80%	Souitaris et al. (2007)
Perceived desirability	+	4	1%	4	100%	Krueger (1993)
Perceived feasibility	+	4	1%	4	100%	Krueger (1993)
Propensity to act	+	3	1%	3	100%	Krueger (1993)
<i>Learning perspective</i>		34	9%	26	76%	
Existence of role models	+	32	6%	24	75%	Arenius and Minniti (2005)
Performance of role models	+	2	0%	2	100%	Scherer et al. (1989)

**Table 3:** Empirical findings (continued)

Independent variable	Hypothesized effect	# tests	% tests	# supported	% supported	Study example
<i>Economic perspective</i>		168	43%	101	60%	
Education	+	55	10%	19	35%	Ritsila and Tervo (2002)
Unemployment	+	18	3%	12	67%	Schiller and Crewson (1997)
Entrepreneurial experience	+	15	3%	10	67%	Evans and Leighton (1989)
Income	-	15	3%	13	87%	Amit et al. (1995)
Work experience	+	15	3%	9	60%	Davidsson and Honig (2003)
Personal wealth	+	14	3%	14	100%	Eisenhauser (1995)
Real estate	+	8	2%	8	100%	Henley (2004)
Windfall gains	+	8	2%	3	38%	Georgellis et al. (2005)
Vocational qualification	+	7	1%	5	71%	Burke et al. (2000)
Management experience	+	5	1%	4	80%	Henley (2004)
Parents' wealth	+	4	1%	4	100%	Uusitalo (2001)
Working time	-	4	1%	0	0%	Douglas and Shepherd (2002)
<i>Controls</i>		140	36%	/	/	
Age	+/-	42	8%	/	/	Taylor (1996)
Gender (female)	-	40	8%	31	78%	Matthews and Moser (1996)
Marital status (married)	+/-	37	7%	/	/	Alba-Ramirez (1994)
Children	+/-	19	4%	/	/	Holtz-Eakin et al. (1994)
Business idea	+	2	0%	2	100%	Scott and Twomey (1988)

#### 4.1 Trait perspective

Variables associated with the trait perspective accounted for a large share of all identified tests (36%). The most frequently studied trait is *risk-taking propensity*, i.e. an individual's orientation toward taking chances in a decision-making scenario (Stewart Jr. et al., 1999). Entrepreneurs are generally believed to be more risk-tolerant than others because they have to cope with less structured, more uncertain problems and bear the ultimate responsibility for a decision (Stewart Jr. and Roth, 2001) – an argument supported by most tests (79%). *Need for achievement*, i.e. expectations of doing something better or faster than anybody else or better than the person's own accomplishments (Hansemark, 2003) has received similar levels of support (76%). Individuals high in achievement motivation prefer occupations such as entrepreneurship that allow for more control over outcomes and provide more direct and immediate feedback on performance (McClelland, 1965). Moreover, entrepreneurship is believed to attract individuals

high in *need for independence*, i.e. the desire to do and say as one likes despite conventional expectations (Caird, 1991), as it allows to make decisions without supervision, to set own goals, to develop own action plans, and to control goal achievement. Most tests (74%) point to a positive relationship with entrepreneurial tendencies.

Individuals with an *internal locus of control* believe that events result primarily from their own actions and behaviours rather than from powerful others, fate, or chance (Rotter, 1966). As suggested in most tests (72%), they are more likely than others to exploit a given opportunity because its evaluation depends in part on the perceived ability to exploit it (Shane, 2003). *Innovativeness*, i.e. a person's interest to look for novel ways of action (Stewart Jr. et al., 1999), and *creativity*, i.e. the tendency to be imaginative, innovate, curious, and versatile (Lee and Wong, 2004) are other traits with empirical support (78% and 86% of the tests, respectively). Less often analyzed were *tolerance of ambiguity*, i.e. one's ability to deal with situations that are vague, incomplete, unstructured, uncertain, or unclear (Schere, 1982), *proactive behaviour*, i.e. a personal disposition for initiative behaviour (Crant, 1996), and *type-A behaviour*, which is conceptually related to the achievement motive and incorporates characteristics such as being impatient, highly competitive, and ambitious. Yet, most or all tests suggest a positive relationship of these traits with entrepreneurial tendencies.

Other researchers have adopted the lens of the five-factor model of personality (Costa and McCrae, 1992). *Neuroticism* describes individual differences in adjustment and emotional stability. Individuals scoring low on neuroticism can be characterized as self-confident, calm, and even-tempered - traits considered valuable for entrepreneurial functions (Zhao and Seibert, 2006). Yet, none of the three tests supported this argument. *Extraversion* represents the extent to which people are assertive, energetic, active, talkative, and enthusiastic (Costa and McCrae, 1992). It is positively related to entrepreneurial status because entrepreneurship typically requires more direct social interaction with important constituents than do other occupations. Few studies have provided support for extraversion (33%). *Openness to experience* characterizes someone who is intellectually curious, tends to seek new experiences, and explore new ideas (Costa and McCrae, 1992). *Conscientiousness* represents one's degree of organization, persistence, hard work, and motivation in the pursuit of goal accomplishment. Both traits were positively related to entrepreneurial tendencies in few tests (33% and 0%, respectively). Finally, *agreeableness*

reflects an individual's interpersonal orientation. Low scores characterize a manipulative, self-centred, suspicious, and ruthless personality, enabling individuals to drive hard bargains that are often part of entrepreneurial activities (Zhao & Seibert, 2006). Some tests (50%) supported this argument.

Overall, 99 of 140 (71%) tests of traits were confirmed. Meta-analyses have provided similar results for need for independence, need for achievement, risk-taking propensity, internal locus of control, and innovativeness (Collins et al., 2004; Rauch and Frese, 2007; Stewart Jr. and Roth, 2001; but not Miner and Raju, 2004). While our review yields no support for the five-factor model (neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness), Zhao and Seibert (2006) found that four of the factors (not extraversion) significantly differentiate entrepreneurs from managers. One explanation is that they assign personality scales, for instance locus of control, to this model which we consider as individual influences.

#### **4.2 Cognitive perspective**

With a total of eight tests (2% of all tests), influences within the cognitive perspective have received relatively little attention. All tests of *risk perception* support the argument that, compared to other persons, entrepreneurs do not seem to have a higher overall propensity to take risks but to be susceptible to underestimating the amount of risk involved in starting a new venture (Simon et al., 2000). Findings for the heuristic *representativeness* consistently showed a positive relationship with entrepreneurial tendencies. Moreover, *overconfidence* encourages a founding decision when the decision-maker is overoptimistic in his or her initial assessment of a business opportunity and then is slow to consider additional information about this opportunity because of his or her initial overconfidence (Busenitz and Barney, 1997; Oskamp, 1965) – an argument supported by most tests (67%). In sum, tenets of the cognitive perspective received great empirical support (88%).

#### **4.3 Affective perspective**

To date, empirical research on the role of affect in the entrepreneurial process is still scarce, but growing. A recent study by Maw-Der et al. (2009), for instance, revealed a positive link between

an entrepreneur's affect and venture effort. However, our review could not identify studies on venturing decisions.

#### **4.4 Intentions perspective**

The intentions perspective has received some empirical attention (10% of all tests). The variables suggested by the theory of planned behaviour consistently showed the expected positive relationship with entrepreneurial tendencies, including *attitude toward the behaviour* (100% of the tests), *subjective norm* (80%), and *perceived behavioural control* (100%). A construct conceptually related to the latter is *self-efficacy*, i.e. an individual's confidence in his or her ability to successfully perform entrepreneurial roles and tasks (Zhao, Seibert, & Hills, 2005). This variable also received great support (75%), as did the variables proposed by Shapero's model: *Perceived desirability*, *perceived feasibility* (both 100%), and *propensity to act* (100%). Taken together, 36 of 39 (92%) tests confirm predictions of the intentions perspective.

#### **4.5 Learning perspective**

Variables categorized into the learning perspective have also often been tested (9% of all tests). This include the *existence of role models* (e.g., Tervo, 2006) and the *performance of role models* (e.g., Scherer et al., 1989) particularly among parents. Empirical studies have linked both factors to the likelihood of seeking self-employment (75% and 100% of the tests, respectively), lending great support for the tenets of the learning perspective.

#### **4.6 Economic Perspective**

Variables within the economic perspective have received major attention in empirical research (43% of all tests). Normative decision theory and human capital theory propose that individuals high in *entrepreneurial experience* (Davidsson and Honig, 2003), *work experience* (Bates, 1995), *management experience* (Boden Jr., 1996), *education* (Rees and Shah, 1986), or having a *vocational qualification* (Dolton and Makepeace, 1990) tend to become entrepreneurs as their human capital endowment facilitate deriving a higher utility from a given opportunity. The

majority of tests supports this notion, except for education. A high *income* from wage-employment and a high expected *working time* as an entrepreneur make an entrepreneurial career less attractive. A negative relationship with entrepreneurial tendency was confirmed for income (87% of the tests), but not for working time (0%). Moreover, *unemployment* reduces the cost of entrepreneurship by decreasing the alternative income. Most tests indicate a positive relationship with entrepreneurial tendency (67%). In addition, financial resources, including *personal wealth*, *parents' wealth*, *real estate* or *windfall gains* (i.e. unexpected income), are often considered key resources in overcoming liquidity constraints (Arenius and Minniti, 2005). All empirical tests support the first three factors, but not windfall gains (38%). Overall, most of the abovementioned findings (101 of 168; 60%) are in line with the economic perspective, although results for some factors, such as education and working time, were mixed.

## 5. Evolution of the field

We examine temporal trends in the three decades from 1980 to 2009 next. As illustrated in Table 4, the interest in individual-level research grew in the 80s, reached a peak in the 90s and then declined again. A similar trend is visible for studies on the intent to start a new business (EI) and differences between entrepreneurs and other groups (EP). Studies on the status of being self-employed (ES) are a notable exception as they increased from 68 in the 90s to 95 in the subsequent decade.

**Table 4:** Temporal trends per dependent variable<sup>a</sup>

Time period		Dependent variable <sup>a</sup>			Total
		EI	ES	EP	
1980-1989	# studies	4	9	12	25
	% studies	16%	36%	48%	100%
1990-1999	# studies	13	23	23	59
	% studies	22%	39%	39%	100%
2000-2009	# studies	12	25	7	44
	% studies	27%	57%	16%	100%
<b>Total</b>		<b>29</b>	<b>57</b>	<b>42</b>	<b>128</b>

<sup>a</sup> EI: entrepreneurial intentions, ES: entrepreneurial status, EP: differences between entrepreneurial person and others.



Table 5 compares the frequency to which variables associated with the theoretical perspectives were considered over time. Trait research typically examined interpersonal differences (EP). Already by the late 80s inconsistent and partly conflicting results from empirical studies have led many narrative reviewers to question the future of the trait paradigm (Chell, 1985; Gartner, 1989; Robinson et al., 1991). Interestingly, the perspective was most popular in the 90s, when the highest number of studies incorporated traits. More recent meta-analyses, indeed, suggest that calls to abandon the paradigm have been premature (Collins et al., 2004; Rauch and Frese, 2007; Zhao and Seibert, 2006). For the cognitive perspective, we count a maximum number of six tests in the 90s and only two tests after that. After entrepreneurship researchers (e.g. Baron, 1998; Busenitz and Barney, 1997) started to adopt this perspective more than a decade ago, the field appears, to date, still relatively under-researched – despite its potential contribution for understanding entrepreneurial tendencies and actions (Shook et al., 2003). Moreover, we could identify no tests of the affective perspective. The role of emotions has attracted the interest of entrepreneurship researchers only recently (e.g. Baron, 2008). Thus, the youth of the paradigm may explain the observed lack of empirical research.

The intentions perspective and the learning perspective have reached similar levels of attention in empirical research, with an upward trend between 1980 and 2009. A similar development can be reported for the economic perspective. Notably, there was a strong emphasize on examining the status of being self-employed (ES) rather than other aspects. This might, in part, reflect that many economists seem to prefer studying facts (not intentions or interpersonal differences) and using publicly available, “hard” data (e.g. Borjas and Bronars, 1989; Evans and Leighton, 1989).

**Table 5:** Temporal trends per theoretical perspective

Time period	Dependent variable <sup>a</sup>						Total
	EI		ES		EP		
	# tests	% of tests	# tests	% of tests	# tests	% of tests	
<i>1980-1989</i>	11	16%	30	43%	28	41%	69
Trait perspective	7	21%	3	9%	24	71%	34
Cognitive perspective	0	0%	0	0%	0	0%	0
Affective perspective	0	0%	0	0%	0	0%	0
Intentions perspective	0	0%	0	0%	1	100%	1
Learning perspective	3	50%	2	33%	1	17%	6
Economic perspective	1	4%	25	89%	2	7%	28
<i>1990-1999</i>	34	20%	68	39%	71	41%	173
Trait perspective	10	14%	4	6%	58	81%	72
Cognitive perspective	3	50%	0	0%	3	50%	6
Affective perspective	0	0%	0	0%	0	0%	0
Intentions perspective	11	73%	0	0%	4	27%	15
Learning perspective	6	46%	6	46%	1	8%	13
Economic perspective	4	6%	58	87%	5	7%	67
<i>2000-2009</i>	30	20%	95	65%	22	15%	147
Trait perspective	6	18%	11	32%	17	50%	34
Cognitive perspective	0	0%	1	50%	1	50%	2
Affective perspective	0	0%	0	0%	0	0%	0
Intentions perspective	19	83%	0	0%	4	17%	23
Learning perspective	1	7%	14	93%	0	0%	15
Economic perspective	5	7%	68	93%	0	0%	73
<b>Total</b>	<b>75</b>	<b>20%</b>	<b>193</b>	<b>49%</b>	<b>121</b>	<b>31%</b>	<b>389</b>

<sup>a</sup> EI: entrepreneurial intentions, ES: entrepreneurial status, EP: differences between entrepreneurial person and others.

## 6. Future directions

Our review points to several interesting avenues for future research. The first is to further integrate the theoretical perspectives. Few studies have taken initial steps into this direction by simultaneously testing determinants from different perspectives. Douglas and Shepherd (2002), for example, combined economic and psychological variables in their utility maximization model. A full-blown integration may also include testing mediation and/or moderation effects across perspectives. In Kolvereid's (1996) study, family background indirectly influenced

entrepreneurial intentions through the effect on attitude, subjective norm, and perceived behavioural control – evidence for a mediation effect. Furthermore, Chlosta et al. (forthcoming) demonstrated that personality moderates the relationship between parental role models and entrepreneurial status. More research along these lines appears desirable and could illuminate, for instance, interesting links between the affective and cognitive perspectives. Both perspectives are considered theoretically interrelated as affect is believed to drive action via their influence on cognitions (Baron, 2008). Understanding the role of affect, heuristics, and biases in entrepreneurial decision-making can help (prospective) entrepreneurs to critically reflect upon their judgments and ultimately make better venturing decisions. Also more research on the connections between the trait and cognitive perspectives may be a fruitful route (Shook et al., 2003). Although integrating the perspectives may involve considerable challenges, such as resolving conflicting assumptions, it promises to provide a richer picture of venturing decisions.

Moreover, more research on the temporal stability of influences is needed. This issue has been intensively debated for the five-factor model of personality (McCrae, 1994; Pervin, 1994) but less so for other influences we reviewed. While time may generally play an important role in theory and theory building (George and Jones, 2000), knowledge of which of the abovementioned variables can change over time is crucial for understanding and supporting entrepreneurial activity. Such knowledge facilitates specifying theoretical relationships between variables, particularly when the researcher is interested in mediating or moderating effects. Research on temporal stability can clarify the extent to which individual variables are the cause or result of entrepreneurial activity. It enables initiatives to promote entrepreneurship to concentrate on aspects that are indeed changeable. Prior studies have already demonstrated inter-temporal changes in variables suggested by the intentions perspective (Peterman and Kennedy, 2003; Souitaris et al., 2007). However, relatively little is known about the other perspectives. For example, do individuals learn to “think entrepreneurially”, leading them to exhibit different cognitive processes prior to and after start-up? This research avenue seems fruitful, yet stony, as longitudinal research designs are typically challenging and resource consuming.

A final and, as we believe, a particularly promising avenue is to develop and test cross-level models that incorporate contextual influences into individual-level explanations of entrepreneurial activity. Few studies in our review have accounted for the regional or

organizational context (e.g. Bernhardt, 1994; Lee and Wong, 2004). However, the person-situation interaction rather than personal influences alone may ultimately drive human behaviour (Davis-Blake and Pfeffer, 1989; House et al., 1996). Entrepreneurship researchers can achieve greater rigor by theorizing across levels of analysis (Hitt et al., 2007; Klein et al., 1999). This does not only involve testing the generalizability of prior findings across different countries (Shook et al., 2003, but to develop full-blown cross-level models.

Three types of models are possible (Hofmann, 1997). First, higher-level influences affect individual-level influences which, in turn, affect venturing decisions. One example is Busenitz and Lau (1996) suggesting that cultural values indirectly impact the decision to start a new venture by influencing individual cognition. Indeed, entrepreneurs across different countries were found to vary significantly on their psychological characteristics (McGrath and MacMillan, 1992). Second, higher-level influences directly affect venturing decisions, thus influences at both levels should be tested simultaneously. Walter et al. (forthcoming), for instance, show that both personality traits and offers of entrepreneurship education at university departments affect students' self-employment intentions. Finally, higher-level influences moderate individual-level relationships. To give one example, Mitchell et al. (2000) found interactive effects between cultural values and social cognition on venture creation decisions. The need to control for additional moderation effects is emphasized by recent meta-analyses revealing substantial variation in effect sizes for personality traits (Rauch and Frese, 2007; Zhao and Seibert, 2006).

Future studies could examine the interplay between variables at various levels. This includes, but is not restricted to, the country (e.g. cultural influences, innovation inputs), region (e.g., start-up intensity, human capital density), organization (e.g., organizational culture, corporate venturing), and group (e.g., group think phenomenon, founding team heterogeneity). Another possibility is examining changes within persons where relatively time-invariant individual variables (e.g. traits) provide the context for time-variant variables (e.g. attitudes). Consequently, our knowledge in the field may be substantially extended if future research on venturing decisions starts to cross levels of analysis. We hope to see a cross-level decade in this field coming.

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