Entrepreneurial Behavior and Business Performance
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Entrepreneurial Behavior and Business Performance

Frédéric Delmar
Preface

This report, carried out at the Economic Research Institute, is submitted as a doctor's thesis at the Stockholm School of Economics.

The author has been entirely free to conduct his research in his own ways as an expression of his own ideas.

The Institute is grateful for the financial support, which has made this research possible.

Stockholm in July 1996

Sven-Erik Sjöstrand
Director of the Institute

Lennart Sjöberg
Professor in Economic Psychology
Head of the Center for Risk Research
Aknowledgments

Entrepreneurial behavior has since long been a core research topic in economic psychology. This thesis analyzes different aspects of entrepreneurial behavior. Following an introductory chapter are six separate empirical studies describing my effort to better understand entrepreneurial behavior. However, this thesis would have not existed without the support that I have gratefully received.

I would like to thank my dissertation committee for their helpful comments: Lennart Sjöberg (chairman), Christer Karlsson and Per Davidsson., especially Lennart Sjöberg and Per Davidsson who have followed me from the beginning. Per Davidsson lured me into the topic of entrepreneurial behavior with his over enthusiasm and optimism. He was always there with a good comment and a helpful hand. Lennart Sjöberg had a different approach. He would only give a comment or a suggestion when absolutely necessary, and his comments and suggestions had a crucial impact on this work. Lennart also made me feel a capable and independent researcher. The future will tell if he was right.

I would also like to thank the following persons: Carl-Johan Westholm at Företagarnas Riksorganisation for writing an introduction letter to the entrepreneurs about this research project, Richard Wahlund for helping me understand PLS (please read study 6 for an explanation), Anita Lignell Du Rietz who was the co-author of study 3, Bo Green for starting the risk research group, Rune Castenås for his administrative skills, and Kristina Eddon who kindly checked the English.

My colleagues and friends at the Department of Economic Psychology, at the Foundation for Distribution Research, and at Umeå Business School have been a great support. I am grateful for your help and support. I will not name you all, but you know who you are.

I would also like to thank all the entrepreneurs who have participated. Without you, this thesis would never have been a reality.
The financial support from Nutek, Sparbankernas Research Foundation, and Ruben Rausing's Foundation for Research on New Firm Creation and Innovations is gratefully acknowledged.

Last by not least, I would like to thank my family, especially my wife Maria and my daughter Elin, for being there and making life worth living.

Stockholm, July 1996

Frédéric Delmar
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ENTREPRENEURIAL BEHAVIOR AND BUSINESS PERFORMANCE: A STUDY OF THE IMPACT OF INDIVIDUAL DIFFERENCES AND ENVIRONMENTAL CHARACTERISTICS ON BUSINESS GROWTH AND EFFICIENCY

Frédéric Delmar
Entrepreneurial Behavior and Business Performance: A Study of the Impact of Individual Differences and Environmental Characteristics on Business Growth and Efficiency

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Abstract
The purpose of this thesis is to present and evaluate a model of entrepreneurial performance, and to study how entrepreneurial performance affects business growth and business efficiency. It is based on several empirical studies, and presented in six papers. In the introduction the theoretical background is given along with a definition of the studied area. Emphasis is thereafter placed on earlier research on entrepreneurial behavior from a psychological perspective. It is followed by a review of motivation theories. The roles of interests and intrinsic motivation are especially discussed. Mental testing and theories on cognitive ability are also commented upon. The empirical papers are then summarized.

The main results from the studies are (a) job interests contributed significantly to performance, (b) intellectual ability as measured by IQ was unrelated to performance, (c) values had little ability to predict performance, but could differentiate moderately between entrepreneurs and non-entrepreneurs, (d) entrepreneurs' predictions of future performance were highly dependent on the perceived causes of their present situation, and (e) growth motivation was explained by previous growth, interests, attitudes, and opportunity recognition. The results are discussed in relation to current theory, the entrepreneurial performance model, and implications for future research.

Introduction
Entrepreneurs and the small business sector have more and more become recognized as important factors determining the dynamics of an economy. They are therefore interesting and important to study. In this thesis I
have chosen to study entrepreneurship from an economic-psychological perspective. More specifically, I argue that an economic process such as entrepreneurial behavior is best understood from a psychological perspective. It is assumed that the experience and behavior of the economic agent that I call entrepreneur is the core of the entrepreneurial process. Without the perseverance, the ideas, goals and actions of one or several individuals no new business and innovations would be introduced on the market. The aim of this thesis is to try to shed some light on some of the aspects of entrepreneurial behavior and thereby better understand the entrepreneurial process. I have a special interest in performance, i.e., which factors determine an economic outcome and why. Thus, this thesis will primarily deal with how psychological factors can explain the behavior of entrepreneurs, and how these behaviors affect their business performance.

Previous studies in entrepreneurship have either focused on the stable characteristics of the entrepreneur or the impact of the environment on the venture performance. Few studies have actually tried to model and understand the impact of both entrepreneurial behavior and the environmental context. This thesis tries to incorporate both, i.e., entrepreneurial behavior is assumed to be determined by both individual differences and task characteristics. By focusing on stable determinants of individual performance and behavior such as intellectual ability and motivation, as well as environmental determinants I hope to enlighten somewhat the complex matter of business growth and financial performance.

This thesis is based on an integrated economic-psychological model of entrepreneurial behavior and business performance. The present thesis is "economic” because it focuses on the handling of scarce resources and expresses activities and outcomes of activities in monetary terms. It is "psychological” because it is concerned with human experience and behavior (Wärmeryd, 1988). Attention is drawn to new insights in motivation and the interaction between motivation and ability, and how these determinants of human behavior are influenced by environmental characteristics. The model is not intended to be a complete theory but rather an organizing device that identifies the main concepts and their interrelationship.
Definitions

One of the most central problems of entrepreneurship research is the definition of entrepreneurship and entrepreneur. It is a problem because research in this field is highly heterogeneous: every social science (e.g., economics, history, psychology, sociology, geography) is more or less related to the problem area, and everyone brings with it a definition suitable to its specific perspective. Therefore, there is no general theory of entrepreneurship or definition of the term and it is consequently difficult to compare research findings. On the other hand, entrepreneurship is such an important and interesting research area that multiple perspectives are needed to explain its complexity. It is not probable that one theory can encompass all features of entrepreneurship.

As a result of this heterogeneity, several researchers have proposed different systems to categorize and make comparison possible. Amit, Glossten and Muller (1993) and Kets de Vries (1977) argue that research can be best understood by focusing on the entrepreneurial role. They see the entrepreneur as fulfilling a role or a function in the economy such as innovation (creation of new combinations and changes in the economy), managing-coordinating (business growth and expansion), or risk-taking (the bearers of risk and uncertainty in society) (Buchanan & Di Pierro, 1980). Here, the distinction between the individual and the process is not always clear. This is because the classification is based on entrepreneurship in economic theory where societal processes are more interesting to the theorists than the individuals carrying them out. Furthermore, this research is often theory driven.

Others like Elkjær (1992) and Low and MacMillan (1988) separate the study of the individual from the study of the function. Stated differently, studies of the individual tie the entrepreneurial process to a person or a small group of persons whereas studies of the entrepreneurial function downplay the role of the individual and highlight the importance of society. An example of the former is McClelland’s (1961) attempt to explain economic development with the need for achievement motive. This research mainly deals with traits and motives specific to the entrepreneur. Johannisson (1988), on the other hand, argues that entrepreneurship is not related to an individual but to the interaction between several individuals.
It is therefore more fruitful to study different exchanges (e.g., of information, of money) in networks and how these networks evolve. Focus is therefore on inter individual processes rather than on individual actions (Aldrich & Zimmer, 1986; Birley, 1985; Larson, 1992; Lipparini & Sobrero, 1994; Ostgaard & Birley, 1994; Zhao & Aram, 1995). A third perspective downplays the importance of the individual and concentrates on how the infrastructure facilitates and constrains entrepreneurship. It is here assumed that the actions of one or even a few key entrepreneurs cannot alone change the infrastructure. Changes are dependent of numerous institutional events such as law, general technical development, taxes, politics, but also demographics. Entrepreneurship is therefore viewed as a collective achievement (Cento Bull, Pitt, & Szarka, 1991; Cooke & Imrie, 1989; Etzioni, 1987; Greffe, 1990; Malecki, 1990, 1994; Reynolds, Storey, & Westhead, 1994; Van de Ven, 1993).

In addition, another important difference is the process of study. Entrepreneurship research mainly concentrates on two phases, the first of which concerns the creation of enterprises. Here the mere creation of a business and its determinants are of focus. Research in this area is mainly interested in understanding what factors affect start-up frequency and the survival of the newly established firms. The second phase concerns continued entrepreneurship, i.e., which factors affect the expansion of business in terms of innovation and growth. The problem is that different factors affect venture creation and the future venture expansion.

Briefly, the definition of entrepreneurship depends on if the researcher focuses on entrepreneurship as an economic function, or as the result of an individual’s action or a collective achievement, but also if venture creation or continued entrepreneurship is the focus. Depending on how the researcher combines these dimensions, different definitions are reached and thereby different results. As a consequence, comparisons of research results are difficult and generalizations dubious. In this thesis, I have chosen to concentrate on the individual and I see entrepreneurship primarily as a result of his or her actions. Entrepreneurship is an active initiation, commitment, and leadership of a change process that results in durable consequences on the supply side of the market. Furthermore, the initiators may gain financial benefits. That is:
There is a business establishment (heritage/buy/start, one or several units)
- Expansion is a goal (turn over, employees, export)
- Innovations of some sort characterize the business (patent, own products, product development, a market concept)

In this context, it means that an entrepreneur has entered the market through some sort of establishment, but contrary to the normal small business manager, expansion is a goal. This means that they may at some point in life be small firm manager. Furthermore, he or she does not need to be the inventor, but the entrepreneur has to recognize and exploit the potential market value of the invention. Last but not least, the entrepreneur is in some degree involved in and dependent on the financial performance of the venture. That is, the entrepreneur, contrary to the venture capitalist, is actively involved in the leadership of the business.

**Entrepreneurial Behavior and Performance**

**A Model of Entrepreneurial Behavior and Performance**

There are four major concepts in this model: business performance, entrepreneurial performance, the individual (motivation and ability), and the environment. The model is shown in figure 1.
1.- *Business performance* is determined by the response of the environment (i.e., market) to the actions of the entrepreneurs. Differently stated, the business will perform well if there is a demand for the products or services offered by the business. Therefore, business performance is dependent on entrepreneurial performance (arrow a) and the action of both the internal (e.g., the personnel's reaction to different decisions) and external environment (e.g., changes in customer relations) (arrow b). In this model, entrepreneurial performance is distinct from business performance. An entrepreneur can be performing highly, but his or her business performs poorly because of unforeseen events or events not controllable by the entrepreneur. For example, an entrepreneur may wish to expand his or her business, but the competition is too intensive, or expansion is hindered by a political decision. Differently stated, an entrepreneur can never control all factors determining business performance, and therefore it is more logical to define entrepreneurial performance as the specific tasks that can be or should be controlled. Business performance is here either measured as the ability to survive or to grow. Growth is seen as an direct indication of entrepreneurship. Survival is *per se* not sufficient as an entrepreneurship indicator, but it is an indicator of durability on the market.
2.- *Entrepreneurial performance* or behavior is defined by the actions taken by the entrepreneur to reach desired goals. Entrepreneurial performance is restricted to tasks that are or can be under the control of the entrepreneur, such as the role of the board, organization, decision making, and goals and strategies. The basic argument is that an understanding of entrepreneurial behavior is better understood by examination of behaviors that are under the control of the entrepreneur. Only when we understand the determinants of entrepreneurial performance can we link entrepreneurial behavior to business performance. Differently stated, we have to know what an entrepreneurs does and why, and how these actions affect business performance. Entrepreneurial performance is determined by the environment (arrow c) and the individual capacity and will (i.e., ability and motivation) (arrow d) to deal with the environment (organizational design and context). The entrepreneur is assumed to act on the environment in accordance with his or her goals. The actual performance of the entrepreneur is difficult to measure and is often confounded with the business performance in empirical tests, but it is important to note that the two are not always the same.

3.- The *environment* is divided into the internal organization and the surrounding context. The organizational design is the product at time period $t_1$ of the entrepreneur’s interpretation of the environmental threats and possibilities at time period $t_0$. In other words, the entrepreneur creates an organization that she or he thinks will be most effective in the present context to achieve the goal or goals of the venture. This organization will be more or less effective. The organization and the context represent the environment on which the entrepreneur acts. The model is of course static, and in a dynamic model it could be assumed that the entrepreneur also affects and changes the environment in the next time period $t_2$.

4.- *The individual* is defined by the entrepreneur’s dispositions, i.e., ability and motivation. The entrepreneur’s actions are based on his or her individual dispositions and the characteristics of the environment (arrow e). Differences in entrepreneurial performance due to the individual vary with the ability and motivation. The concept of *ability* is based on procedural and cognitive knowledge. Declarative knowledge is knowledge about facts (e.g., facts, values, goals, and self-knowledge). It represents
the understanding and requirements for a given task. Procedural knowledge and skills (e.g., social and cognitive abilities, and perception) are achieved when it is successfully combined with knowledge of how to do it.

Motivation is a direct determinant of performance. Motivation is a combined effect of three choices: (a) the choice to direct the strain in some direction, (b) the choice of increasing the level of strain, and (c) the choice of maintaining the strain level. In other words, the direction, the extensiveness, and the time for a certain behavior are the basis of motivation. This is a cognitive definition of motivation. A more general definition of motivation is given by Kanfer (1991). She defines motivation as:

"... intra- and interindividual variability in behavior not due solely to individual differences in ability or to overwhelming environmental demands that coerce or force action." (p. 78)

The model is based on certain assumptions from psychological performance theory. Firstly, entrepreneurial performance arises only when there is a choice of acting with a certain intensity and during a certain time. Motivation is therefore a determinant of performance. Performance is not possible without a minimum level of talent being met and therefore there is a complex interaction between procedural knowledge and motivation. The greater the talent, the greater the tendency to choose to perform, but talent per se has no relation to the choice of strain level. Secondly, declarative knowledge is necessary for procedural knowledge. This means that when one performs a task, one has to know what to do. This distinction is important, because performance can deteriorate because procedural knowledge has never been developed or because declarative knowledge has never been acquired or is obsolete. More simply stated, the performance model indicates that to perform a task an entrepreneur must (a) possess the prerequisite knowledge, (b) master the prerequisite skills, and then (c) actually choose to work on the job tasks for some period of time at some level of effort (McCloy, Campbell, & Cudeck, 1994).
Ability, Motivation and Performance

In the preceding section I have stated that difference in individual job performance can be seen as a function of ability and motivation without discussing which of the two is the most important determinant. Recent research in psychology, as exemplified by the Project A (U.S. Army selection and classification project) has shown that cognitive ability is the best predictor of job performance (Hunter & Hunter, 1984; McCloy, Campbell, & Cudeck, 1994; McHenry, Hough, Toquam, Hanson, & Ashworth, 1990; Ree, Earles, & Teachout, 1994). Furthermore, the prediction of job performance is improved by adding non-cognitive predictors such as interest and personality to a cognitive test. Vocational and job interest has been less attended to than personality. It is a predictor closely related to intrinsic motivation (Dawis, 1991), and refers to likes and dislikes of the individual. Thus, recent psychological research agrees that intellectual ability is the most important determinant of job performance. However the picture is not as conclusive when leadership and performance are considered.

The results of leadership research are interesting to consider, because the entrepreneur is among other things a leader. The relation between intellectual abilities and leadership performance is consistently low (Bass, 1990; Fiedler, 1995). The possible explanations of why intellectual ability fails to successfully predict leadership performance is discussed later on in a special section dealing with the predictive ability of mental testing. Nevertheless, we do not know how intellectual ability does relate to entrepreneurial performance.

The question is still unanswered. Even if entrepreneurial personality has been much researched, little or no attention has been given intellectual ability as measured by IQ. An exception is de Wit & van Widen's (1989) study on the relation between self-employment and intellectual ability showing that high IQ increased the probability to become self-employed. Entrepreneurship research in performance has concentrated on individual background (personality, values, and societal background) and environmentally related variables. Little work as has been done to examine and to relate modern psychological results and theories on the importance of cognitive ability and motivation to entrepreneurial performance.
To sum up, these two sections on entrepreneurial behavior and performance show two things. Firstly, that business performance as an indicator of entrepreneurial performance is contaminated; more variables than the individual and the error term control the variance in measures of business performance even in small businesses which are the unit of analysis in most entrepreneurship studies (Davidsson, 1989). That is, performance is here seen in two stages. The first stage is the entrepreneurial performance which is determined by how the individual chooses to act. The second stage is the business performance which is a product of entrepreneurial performance and the environmental characteristics. Here, the number of variables determining performance is much larger and therefore the relative impact of the individual on the venture performance is reduced. Secondly, the present section shows the interconnectedness between the individual and the environment, and on the individual level the association between motivation and ability. To be able to understand entrepreneurial performance we must penetrate more deeply the concepts of motivation and ability, and how they are affected by the situation.

The Organization of the Thesis

The focus of this thesis on individual differences in performance is the result of a pilot study (Delmar, 1994) which is reported in this thesis. In this study, I studied the risk management of more or less successful entrepreneurs. The results indicated that creators of successful and expansive enterprises were motivated to expand and seemed to be more able to manage the firm than less successful entrepreneurs. Less successful entrepreneurs were either not motivated to expand or did not have the ability required. The results from this preliminary study suggested that more work should be done on the determinants of individual performance and the relationship to entrepreneurship. Therefore this thesis concentrates on how psychological research in individual performance can be applied on the problem of entrepreneurship.

In the previous section it was stated that research interested in the psychology of the entrepreneur has mainly focused on traits and different attributes. In the next section this research will be reviewed. Thereafter, in the following sections, psychological research related to motivation
and cognitive ability is commented upon. The focus is on the importance of task or job interest and how it is related to performance. The section dealing with cognitive ability focuses on ability testing, but also on the more recent work on information processing. These three sections form the theoretical background of this thesis. Much of the research commented on here, is related to learning in its broadest construct. Learning refers here to the life-long process in which the individuals make contact with and assimilate their environment. Learning is thus among the most natural of psychological processes because the tendency to explore and assimilate is an innate endowment of a human being (Rigby, Deci, Patrick, & Ryan, 1992).

The theoretical background is followed by a presentation of the six papers representing the empirical work of this thesis. They deal with several aspects of entrepreneurial motivation and performance. The main focus is on entrepreneurial performance. A comprehensive analysis and general discussion finishes the thesis.

Entrepreneurship Research and Psychology

The psychological perspective in entrepreneurship research has mainly concentrated on finding stable characteristics. The purpose of these studies has been twofold: those that attempt to link various characteristics with the state, or being of entrepreneurship; and those attempting to use characteristics as performance predictors among entrepreneurs or the business they run. Among the most popular characteristics to be found in the literature are; 1) need for achievement; 2) internal locus of control; 3) risk taking propensity; 4) tolerance for ambiguity; 5) overoptimism; and 6) need for autonomy. However, these traits cannot explain more than a minor share of entrepreneurial behavior and differences in performance. These disappointing results can be explained by theoretical as well as methodological problems characterizing the perspective.

The first problem of the perspective is its inconsistency. There is a large amount and variants of traits. Further the researchers have not reached consensus on the traits' relevance, their importance, and how they vary in different situations. It is therefore difficult to reach a common frame of reference. The second problem is the assumption that the variables char-
acterizing the entrepreneur and the environment are stable. The environ-
ment changes constantly and traits alone have a very little ability to ex-
plain behavior. The third problem is that the theory and methods in use
are, in relation to modern psychological research, obsolete. For example,
personality is not one dimensional but multi dimensional. An individual's
personality is now mainly measured in five broad dimensions called the
"Big Five" (e.g., Goldberg [1993], Hogan [1991]). Hence, when meas-
uring personality, the measures should include at least these five dimen-
sions of interpersonal evaluation. It is insufficient to define personality in
terms of simple measures as locus of control or need for achievement.
The inability to handle those problems has led to the abandonment of the
perspective of identifying a single trait to favor other more complex ap-
proaches in the hope of more fruitful results (Carsrud & Johnson, 1989;

**Characteristics of Entrepreneurs**

This research mainly focuses on differences between entrepreneurs and
other professional groups such as managers. Entrepreneurs are here often
defined as business founders.

*Need for Achievement.* One of the most popular characteristic associated
with entrepreneurs is McClelland’s need for achievement (McClelland,
1961; McClelland & Winter, 1969). According to McClelland, entrepre-
neurs are individuals that have a high need for achievement, and that
characteristic makes them especially suitable to create ventures. McClel-
land’s theory identifies the situations preferred by individuals high in
need for achievement, and which situations arouse the achievement moti-
vation. Individuals who are high achievers will choose a situation char-
acterized by (a) individual responsibility, (b) moderate risk taking as a
function of skill, (c) knowledge of results of decisions, (d) novel instru-
mental activity, and (e) anticipation of future possibilities. It is the pros-
pect of achievement satisfaction, not money, that drives the entrepreneur.
Money is important primarily as a measure on how well one is doing.
McClelland’s theory has received some empirical support (Bellu, 1988;
Begley & Boyd, 1987; Davidsson, 1989; McClelland, 1961; Perry,
MacArthur, Meredith, & Cunnington, 1986), even if the relation is weak.
Recently Miner and his associates have developed McClelland’s achievement motivation theory by developing five motive patterns instead of the single achievement motive. This task motivation theory suggests that it is not possible to predict behavior or performance on the basis of a single value, as is the case of need for achievement, but that performance can be predicted by a complex set of values or motive patterns. Miner’s five motive patterns form an overall index of task motivation. They are: (1) self-achievement, (2) risk-taking, (3) feedback of results, (4) personal innovation, and (5) planning for the future. Results show that the Miner Scales have consistent validity, in that scores (especially total score on all scales combined) correlate significantly with entrepreneurial performance particularly growth (correlations around 0.40) (Bellu, 1993; Miner, Smith, & Bracker, 1994; Miner, Smith, & Bracker, 1992; Miner, 1990; Miner, Smith, & Bracker, 1989).

Locus of Control. The concept can be traced back to Rotter’s social learning theory (Rotter, 1966). The theory assumes that the individual categorizes events and situations based on their underlying, shared properties. One such category concerns whether a potential end or goal can be attained through one’s actions or follows from luck or other uncontrolled external factors. A person believing that the achievement of goal is dependent on his or her own behavior or characteristics, believes in internal control. If, on the other hand, a person believes that an achievement is the result of luck and external factors, he or she believes in external control. Therefore, locus of control is conceived as one determinant of the expectancy of success (Weiner, 1992). Empirical results have found a low to moderate positive correlation between internal control and entrepreneurs (Brockhaus, 1982; Perry, MacArthur, Meredith, & Cunnington, 1986), and there is a weak tendency that a high internal orientation is associated with better performance (Brockhaus, 1982; Miller & Toulouse, 1986). However a number of studies have reported no significant differences between entrepreneurs and managers with respect to locus of control (cf. Sexton & Bowman, 1985). In psychology, the concept and measurement of locus of control has been heavily criticized (Furnham & Steele, 1993), and the concept has been more or less abandoned in favor of attribution theory which has a more complex view on causality orientation.
(Anderson, 1991; Weiner, 1985). It is my opinion that locus of control is a concept which should not be included in future empirical research.

*Overoptimism.* Overoptimism is closely related to locus of control, because both are related to expectancy of success. Cooper, Dunkelberg, and Woo (1986) have studied entrepreneurs perceived chances of success shortly after they became business-owners. Their responses were then compared to the actual success rate in the respective industries. When asked about the chances for a business resembling their own to survive, most of the entrepreneurs were optimistic (78% considered the chances of survival to 5 out of 10 or higher). When asked about their own success chances the entrepreneurs were extremely optimistic (81% considered the chances of survival to be 7 out of 10 or higher). Egge (1987) also found that a majority of entrepreneurs were overoptimistic about their success rates (also see, Hornaday [1982]). This can be compared to the research made on personal and general risk. Personal risk is defined as ratings made by the respondents of a risk as pertaining to him- or herself; ratings of a risk pertaining to people in general are called general risk rating. Personal risks are often rated as lower than common risks. That is, we have a tendency to believe that risk, e.g., of being hit by a car or of alcohol abuse, is larger for others than for ourselves. The difference between them is related to perceived control (Sjöberg, 1995). Consequently, these differences between personal and general risk perception are of a general nature and not unique to entrepreneurship and the business setting.

*Risk taking propensity.* According to economic theory, one of the important roles of the entrepreneur is the role of risk taker or bearer. Can we therefore assume that the entrepreneur is more attracted to risk than others? The answer is no. A number of studies have found no significant differences between entrepreneurs and others when measuring general risk propensity (Brockhaus, 1980; Masters & Meier, 1988; Peacock, 1986). Scheré (1982) found, when examining *tolerance for ambiguity*, which is a concept related to risk taking, that entrepreneurs have a somewhat greater degree of tolerance than managers. Tolerance of ambiguity is an emotional reaction to ambiguity and uncertainty. A low tolerance results in stress and unpleasantness in a complex situation. Individuals with high tolerance, on the contrary, find such situations desirable and
challenging. Therefore, individuals with high tolerance would expose themselves to higher risks than individuals with low tolerance, who prefer well-known situations. A mistake made in these studies is that they assume that risk taking is independent of the situation. On the contrary, it has been found that risk-taking is extremely context dependent (Hogarth, 1987). Studies taking the context into consideration have found relationships between entrepreneurs and risk taking (Schwer & Yucelt, 1984). Risk taking was dependent on the entrepreneur’s age, motivation, business experience, age, number of years in business, and education. Ray (1986, 1994) found that entrepreneurs are able to give up job security and take specific risks because they have confidence that they will succeed. To sum up, results from research on risks and entrepreneurs are mixed, but apparently the perceived context is a more important determinant of risk taking than personality.

Desire for autonomy. Entrepreneurs have been found to have a high need for autonomy (Sexton & Bowman, 1985) and fear of external control (Smith, 1967). Entrepreneurs value individualism and freedom more (i.e., the possibility to make a difference for oneself) than the general public or managers, even if those values imply some inequalities in society (Fagenson, 1993; McGrath, MacMillan, & Scheinberg, 1992). This desire to manage one’s own business is a central feature of entrepreneurship, but it is difficult to explain the causal order. That is, do individuals with a high desire for autonomy start a venture because they want autonomy, or do they want autonomy because they do not want others to take control of what they have once created? Differently stated, desire for autonomy can result in venture creation, but can also be a result of having created a business.

The above mentioned characteristics have mainly been examined by concentrating on differences between entrepreneurs and other groups (managers in particular). This is a problem, because it assumes that entrepreneurs are a homogenous group. However, people start or buy business for different reasons. The group contains everything from small mom and pop stores to future large corporations. It is therefore more accurate to assume heterogeneity and focus on differences between different entrepreneurs, i.e., entrepreneurial performance. Another problem is
that research is mainly based on U.S. samples. It has been argued that many of these characteristics (especially need for achievement) are culturally dependent, and as a consequence lacking of predictive power in other cultures (Spence, 1985). Research findings give some support to this argument (Stimpson, Robinson, Waranusuntikule, & Zheng, 1990), at least when the U.S. are compared to Asian countries. Nevertheless, the general conclusion is that the search for specific characteristics of entrepreneurs has given mixed results, and has been facing both methodological and theoretical problems. One way of reducing these problems is to focus on differences in venture performance.

**Entrepreneurial Characteristics and Venture Performance**

Research on venture or business performance is one of the largest fields in entrepreneurship. Here, I will concentrate on those studies which are related to a psychological perspective and the purpose of this thesis. Despite the growing number of empirical studies addressing performance, there is no clear picture of how different predictors are related to subsequent performance. Findings across studies are difficult to compare and often inconsistent. There are four possible reasons for this development:

(1) Samples are difficult to compare because of wide variation in venture age, industry sector, and definitions.

(2) Performance has been studied either as the ability to grow, survive, or financial performance. The choice of performance measure influences the findings, both in which predictors are found to be relevant but also their impact on performance.

(3) Earlier studies have often relied on univariate analysis, and only recently multivariate methods are used to examine the joint effects of predictors (Cooper, Gimeno-Gascon, & Woo, 1994).

(4) Results are based on small samples with low response rates. It is rare to find studies that report response rates higher than 30%. It is therefore difficult to rely on results from a single study.

For those studies supplying the explained variance of their model, it varies between 0.17- 0.52 for growth as performance. The difference in explained variance can be attributed to the choice of growth measures. For example, Barkham (1994) tested the same model on two different growth
measures. When measuring growth as change in turnover, the explained variance was 0.42, but with growth as change in number of employees, the explained variance dropped to 0.21. When performance is measured as financial performance, explained variance varies between 0.10-0.33. The included predictors are often the same, therefore much of this difference in variance can be attributed to poor instruments and to sample randomness. A problem when evaluating the explained variance in different studies is that it is not always clear if adjusted figures are reported or not. Studies concentrating on survival rely on discriminant analysis or logistic regression. The correct classification rate varies between 0.70-0.80.

Some of the most recurrent factors that positively affect growth are: the numbers of partners (Barkham, 1994; Cooper, Gimeno-Gascon, & Woo, 1994), education (Barkham, 1994; Cooper et al., 1994; Davidsson, 1989), and entrepreneurial, managerial, or industry experience (Barkham, 1994; Box, Watts, & Hisrich, 1994; Box, White, & Barr, 1993; Cooper et al., 1994; Davidsson, 1989; Siegel, Siegel, & MacMillan, 1993). Enterprises of entrepreneurs with higher education and greater experience also tend to grow more than enterprises of less educated and experienced entrepreneurs. Creation instead of heritage and buyout, and the stage in the venture’s life cycle have a positive effect on growth (Davidsson, 1989; Dodge & Robbins, 1992; Ming-Hone Tsai, MacMillan, & Low, 1991). Both the entrepreneur’s and the business’ age have also been found to influence growth. Younger businesses (and therefore at a different stage in the life cycle) and entrepreneurs have been found to be more likely to grow than older (Box, Watts, & Hisrich, 1994; Chandler & Hanks, 1994; Davidsson, 1989). Strategies favoring growth and the entrepreneur’s scanning ability (ability to gather information) also have a positive effect (Box et al., 1994; Box et al., 1993; Miller, 1987; Ming-Hone Tsai et al., 1991; Siegel et al., 1993). Several studies have also shown the importance of the entrepreneur's motivation (Barkham, 1994; Davidsson, 1989; Miner et al., 1992; Miner et al., 1989). However, little or no relationship has been found between characteristics such as need for achievement, locus of control, risk taking, and performance (Begley & Boyd, 1987; Box et al., 1994; Box et al., 1993; Miller & Toulouse, 1986). The most important environment variables are market structure, and industry which are found as significant predictors in almost every study.
However, growth, survival, and financial performance are not necessarily caused by the same factors. The probability of survival is positively affected by having self-employed parents (Cooper et al., 1994). Relatively slow growth (Laitinen, 1992; Ming-Hone Tsai et al., 1991), buying and heritage, instead of creating a business (Chaganti & Schneer, 1994; Douma, 1991) positively affect subsequent survival and financial performance. Furthermore, older companies and entrepreneurs have a higher possibility of survival, and better financial performance than younger ones (Chaganti & Schneer, 1994). Important factors that positively affect growth, survival and financial performance are planning (Lussier, 1995), the entrepreneur’s education and experience, and a positive market structure (i.e., being active on an expanding market).

To sum up, venture performance has been mainly measured as (a) the ability to run the business effectively, and (b) the ability to expand it. Furthermore, different factors, both individual and task related, affect the efficiency and growth of the venture. An always reoccurring important determinant of performance is the entrepreneur’s education and experience, which are indicators of cognitive ability. This is in line with main findings in psychology that underline cognitive ability as the most important determinant of performance. The conclusion is that the role of an entrepreneur’s performance can only be assessed if differences in the situation are taken into account, since entrepreneurial performance and the changes in the environment affect venture performance. Thus, a purpose in this study is to try to explain some of the factors determining both growth and survival by modeling both environmental and entrepreneurship characteristics.

Work Motivation

Motivation and Performance

It is important to note that motivation theories in general have a different perspective than performance theories. Mainstream motivation theories focus on the determinants and processes underlying choice behaviors,
volitional activities, and the development of intentions. The individual’s overt and/or covert behaviors are the products of these motivational processes. In contrast, performance theory refers to an evaluation of the individual’s behaviors. For example, an entrepreneur motivated to expand his or her business by hiring more people, may still perform badly according to a criterion that the business must meet a minimum return on assets. Furthermore, as stated in the subsection describing the performance model, performance theory (Kanfer, 1991) differs from motivation theories in that performance prediction requires more factors, e.g., environmental factors such as situational constraints, and task demands, and the inclusion of individual differences such as abilities and task comprehension.

The distinction between performance and behavior is important, especially when studying complex tasks such as entrepreneurship. Much of motivational research work is concerned with simple tasks and in laboratory settings (e.g., playing a pinball game, solving different puzzles). In laboratory experimental settings only a small range of behaviors is measured. In addition, variance due to other factors than motivation (i.e., cognitive abilities) is minimized through experimental design. This is important to remember when trying to explain and predict the effects of motivation on performance in complex tasks or involving behavior over extended time periods as in entrepreneurship. The demands on the actors are quite different from tasks such as playing pinball compared to those of starting and maintaining a business. Campbell (1988) takes business venturing as an example of the highest degree of complexity. These are so called fuzzy tasks, characterized by the presence of both multiple desired end-states and multiple ways of attaining each of the desired outcomes. They are also characterized by uncertainty, and conflicting interdependence. In such a case, the relation between behavior and performance is weakened by the interactive effects between motivational processes, cognitive abilities and environmental factors. Not acknowledging this lack of correspondence between behavior and performance has serious consequences for understanding the effects of motivation on entrepreneurial performance. For example, motivation can yield high levels of cognitive effort but misdirected, and thus fails to affect performance (Kanfer, 1991).
Considering the above (i.e., abundance of motivation theories, reliance on experimental work, behavior-performance distinction) several criteria must be met to choose a motivational theory that can appropriately describe behavior and performance in a task as complex as entrepreneurship. The chosen motivation theory must:

(a) Be theoretically interesting, that is, offer some new insights into the entrepreneurship process. Since entrepreneurship is a complex process extending over a long period of time and many different tasks, the theory cannot be too proximal. A good theory must therefore be more general (distal) to be able to account for these complexities. A negative aspect is that a more distal theory will probably have a lower prediction power, because of the loss of focus.

(b) Give stable and validated results. A theory that is solely based on experiment and has not been tested in more applied settings, is probably not a good candidate, especially considering the difference between complex and simple tasks. The theory must be relatively easy to operationalize.

(c) Easily fit into a performance perspective. That is, the theory must be able to deal with individual differences in motivation, i.e., the theory must give us information to understand why an option was chosen instead of another. Therefore the motivation theory can not be of a general nature.

To sum up, the distinction between performance and motivated behavior has been underlined. This discussion has led to three selection criteria to be met by a motivation theory in order to be an effective contribution to the entrepreneurial performance problem. In the next section, different work motivation theories will be reviewed briefly, based on their appropriateness to this work.

*Different concepts in Motivation*

Probably, the most confusing area in organizational behavior and industrial-organizational psychology is motivation. There are plenty of theo-
ries, yet somehow they do not fit with each other or with the research findings. A prime reason for this, not considering some of the theories may be wrong, is that the different theories involve different levels of analysis and thus deal with different stages of the motivation process (Kanfer, 1991; Locke & Henne, 1986). To illustrate this and to show that to the present day none of the theories are complete, this review will be organized around a motivation model based on the four major concepts: needs, values, goals, and emotions. Theories can also be discussed based on their conceptual distance to action. Distal theories are more general and deal with concepts such as needs and values, compared to proximal theories that are closely related to actions (goals and emotions) (Ackerman, Kanfer, & Goff, 1995). Cognition is more or less involved in all stages of the motivational process. The major difference between older and more recent theories of work motivation is the inclusion of cognitive processes and the attempt to incorporate different levels in the motivational process.

The model proposed here is inspired from Locke and Henne’s (1986) model and Kanfer’s (1991) framework, and is used to discuss, and to orient the reader in, the major theories in terms of this model. The purpose of the model is not to propose a general theory, but to function as an organizational device that identifies the major motivational concepts and their main interrelationships. The model is shown in Figure 2.
Needs

The basic motivational concept is that of need. It is assumed that a need, either actual or potential, precedes or accompanies the action of an individual. The need is often said to motivate or drive the associated action. Because of these motivational characteristics of needs they are assumed to produce primary drives (e.g., need for food, hunger; water, thirst; sleep). Examples of more psychological needs are pleasure and self-esteem. Physical and psychological needs are interdependent (Weiner, 1992). Theories dealing with needs are called drive theories.

In work motivation, Maslow’s need hierarchy theory is perhaps the most well-known. In short, the theory states that once a basic need is fulfilled,
an individual will strive to fulfill a higher need. The need hierarchy theory has been proven inadequate, because of its fuzzy theoretical concepts and difficulty to test empirically (Locke & Henne, 1986; Sjöberg & Lind, 1994).

The problem with needs is that drive theories by themselves are inadequate to explain human action. They can explain why an individual has to act, and why he or she acts, but not why he or she acts in a certain direction (i.e., they do not account for individual differences). For example, the craving for food will lead to an attempt to eat, but we cannot say how this hungry person will satisfy his or her need. The person can either choose to eat an hamburger or cook a gourmet dinner. Drive theories are therefore no longer dominant in work motivation (Locke & Henne, 1986; Weiner, 1992). It is here assumed that entrepreneurship is a volitional act, and therefore drive theories are not an option.

Values and Attitudes
Values are judgments, evaluations made of abstract objects or end states of human existence (e.g., equality, freedom, achievement, tradition). Values are the criteria people use to select and justify actions and to evaluate people (including the self) and events. Such evaluation is made on the relative importance of things to the person. Values refer to what the person finds important/unimportant and they are relatively enduring over time (Dawis, 1991; Eagly & Chaiken, 1993; Olson & Zanna, 1993; Schwartz, 1992; Sjöberg, 1993). Values differ from attitudes, even if they are closely related. The term attitude is defined as the valuation of a concept or an object, i.e., to which extent the object or the concept is judged as good or bad in a general, global meaning (e.g., attitudes to a political party, offshore oil drilling, pollution). Attitudes also change more easily over time. The object or concept to be valued is either general or specific, but usually it is rather specific (Eagly & Chaiken, 1993; Sjöberg, 1993). Values are viewed as potential determinants of attitudes (Olson & Zanna, 1993). To conclude, values and attitudes are the same sort of concept but differ in the abstraction of the judged object and the stability of this judgment over time.
Most work motivation theories are basically value or attitude theories. It is here we will find the most theories, because attitudes and values are assumed to be central to motivation since they probably influence other central concepts such as emotions and goals. Value theories concentrate on the influence of one or several values, such as justice (equity), or achievement on action, or on values in general (value expectancy theory). They are more proximal than need theories, but are incomplete in the sense that we have to know how an individual’s evaluations of a concept or an object are translated into action. Value theories offer an understanding of how choices are made and why, but not of how they are translated into action. Goals/ intentions, which is the third motivational concept in the model, are products of evaluations, and give us information about the level of chosen effort and the persistence.

**Goals and Intentions**

Goals are more specific than values; they are means of actualizing attitudes and values. That is, they are the mechanism by which attitudes are translated into action. The main difference between intentions and goals is that the latter implies a particular end state to which action is aimed while the former only describes a determination to go in a certain direction.

To clarify the connection between values and goals, consider an individual who values power. Power is an abstract motive, and attaining that value involves deciding what task or tasks to work for (e.g., trying to make a career in a bureaucracy where one’s power status is very clear). Goals are closer to action than either needs or attitudes. Goals give us information about the chosen level of commitment (persistence) and the intensity (how much energy we are prepared to invest). As a consequence, goals are assumed to predict and explain behavior better than attitudes and needs, even if a full explanation would involve all three (Kanfer, 1991; Locke & Henne, 1986). Goal theories mainly deal with how goal commitment (Locke, Latham, & Erez, 1988; Tubbs, 1994; Wright, O'Leary-Kelly, Cortina, Klein, & Hollenbeck, 1994), goal setting, and goal specificity and difficulty affect performance (Campbell & Furrer, 1995; Cropanzano, Citera, & Howes, 1995; Tubbs, 1986). It has been found that difficult and specific goals result in better performance
than easy or non-specific goals, but that competition has a dysfunctional effect. These results are only valid when commitment is high. The problem with goal theories is, from an entrepreneurship research perspective, that they deal almost exclusively with explaining the work of subordinates and not the goal behavior of independent economic agents. However, observe that goals are highly important in achievement contexts like entrepreneurship.

**Emotions**

Emotions (e.g., anger, joy, love, hate, stress) are an essential part of any complete theory of motivation. Emotions are at the same time a product of an action and a reason to further action. They are the result of goal and attitude appraisals. Emotions are defined as genetic and acquired motivational predispositions (in terms of subjective experiences or feelings) to respond experientially (joy, hate, sadness, stress), physiologically (heart rate increase, sweating, smiling) and with goal directed behavior (attack, flight) to internal (values, attitudes, and needs) and external variables (results of actions, social interaction) (Carlson & Hatfeild, 1992). For example, a person might feel satisfied because she or he has reached a goal, i.e., satisfaction arises from the fact that the engaged action has led to goal attainment. Thus, the results of the action are compared with the value standard. Dissatisfaction will arise when the results are below the value standard. The emotional appraisals are automatic and subconscious rather than intentional and planned (Locke & Henne, 1986).

The problem with emotions is that there is no general theory, and much of the research on emotions is still dominated by physiological speculations. There is still no agreement about the number of emotions, their stability, and how they exactly relate to other psychological functions. Therefore, it is reasonable to concentrate on a few, assumed more central, emotions to entrepreneurship. Some examples are joy, interests, stress, pride.

**Cognition**

Cognition is not explicitly considered as a separate part of the model, as it is related to every concept in the model. Emotions and needs are not
only motivational, but they also give information. Pain or hunger indicates that something is wrong, and that actions must be taken to remedy this. We also analyze our attitudes and values and transform them into goals, and then act in order to fulfill them. In order to act, we have to process and organize information, i.e., set goals and determine the means to achieve them. Once we have acted, we often try to analyze the result and our actual part in that final result (i.e., could I have made a better choice, this is not my fault). Hence, there is a continuous interaction between motivation and cognition. No motivational theories, except for early need theories, exclude the concept of cognition.

As noted in the performance model, we differ in our cognitive abilities: how we develop conceptions of our self and our identity, our capabilities, abilities, and skills. These influence the goals we set and the means chosen to attain them. Thus cognitive processes are central to motivation and affect all other concepts. Cognitive abilities will therefore be reviewed more deeply in a separate section.

I have here reviewed some central concepts in work motivation, and the pros and cons related to different theories. Need theories are not appropriate because they are too distal to the action. Values and attitudes form the base of most motivational theories, but to be effective they must relate to other concepts such as goals and intentions, and emotions, and values are especially inefficient as predictors.

**Interest**

Theories about job interests or vocational interests have the capacity to integrate values, goals, and emotions. Interest is closely connected to the emotion of enjoyment, and it is an important factor in achievement settings. It is therefore easily incorporated in a performance perspective. Furthermore it is relatively easy to measure, and gives valid results. Values differ from interests. The latter refers to what the individual likes/dislikes and the former to what the individual finds important/unimportant. Thus, certain events can be considered important, but not interesting, and vice versa. Together values and interests can be assumed to form a set of preferences that guides our choices between different alternatives in decision making. Preferences are used when we, through
rank-ordering, assess the alternatives in choice situations. Interests, values, and preferences therefore reflect the affective value of the cognitive representations of reality. Interest apparently plays a central role in entrepreneurial motivation. Interest can also be assumed to be central to the entrepreneurial process, since an entrepreneur has, in some sense, to be interested (or attracted to) in some aspect of entrepreneurship. It is closely connected to central entrepreneurial concepts such as achievement, autonomy and creation, but has received little or no attention in entrepreneurship research.

**Definition**

The purpose of this section is firstly to define interest, and secondly to describe some of its characteristics. As mentioned above, interest is an emotion with great motivational potential since it affects our values, goals and emotions. According to Dawis (1991), interest can therefore be decomposed as an emotional state composed of: (a) a dispositional variable (tendency); (b) that has a cognitive (attention), a behavioral (experience), and an affective (satisfaction, enjoyment) component; and furthermore has (c) a dimension of intensity (strength of tendency) and duration (continuation in experience). Considering this decomposition of the concept, I now turn to discuss how people experience interest and how it arises.

Csikzentmihaly (1992, 1985) has studied the experience of interest in expert performers (e.g., mountain climbers and expert surgeons), and reported that interest is a psychological state characterized by strong concentration and a certain sense of enjoyment. This state is described as "flow". The subjects characterize it as being highly concentrated; so strongly focused on the task that they lost the time perspective and the rest of the world tended to disappear; and that they also felt joy and satisfaction. According to Csikzentmihaly, the ability to experience flow is central to mental health and happiness. Furthermore, interest is a prerequisite condition to a really creative contribution. Creativity on a high level demands a great devotion to a certain kind of activity and one is not willing to do so if one does not feel a great interest for the activity. Csikzentmihaly joins Izard (1984), which sees interest primarily as an important positive emotion motivating cognitive and motor search and
exploratory behavior. Interest is a significant determinant of selective attention and hence of the contents of perception and cognition.

Interest is highly personal and varies strongly between different individuals, and it is stable over time. Lubinski, Benbow and Ryan (1995) studied the vocational interest of highly intellectually gifted from adolescence to adulthood in a 15-year longitudinal study. They reported a retest correlation varying from 0.52 to 0.21 (mean = 0.40) for different interests. Swanson and Hansen (1988) studied a sample of adults over a 12-year period and found a test-retest correlation to be 0.60 for male and 0.58 for female.

Interest has also a strong genetic component. Lykken, Bouchard, McGue and Tellegen (1993) could in a twin study establish that about 50% of interest variance was associated to genetic variation. They, however, underlined that interests are learned traits. The genetic factor only contributes to the variance of interest. A potential entrepreneur will not express interest in entrepreneurship if she or he has never participated in such experience or does not know what it is. They conclude that it seems reasonable to suppose that certain precursor traits (e.g., personality, cognitive ability, or interest) which are in part genetically determined, in the context of a given "cafeteria of experience", help to determine both (a) which experiences are selected and (b) how the individual reacts to those experiences. For example, it is well known that a high percentage of entrepreneurs have parents or near relatives who are or have been entrepreneurs. The choice of also becoming an entrepreneur can here be explained from an experience-interest perspective. That is, they have positive experiences and have therefore developed an interest in entrepreneurship. Deci (1992) mainly agrees with Lykken et al. (1993). He assumes that interest can be developed when three demands are fulfilled: (a) the individual must have a certain specific ability and sensitivity, (b) there are environmental possibilities, and (c) there is social support. Deci is more focused on the social context of the experiment (the social support), and he assumes that a minimum level of ability must exist in order to foster a certain interest. This would mean that only those who have a certain ability (e.g., a minimum IQ-level) could be interested in entrepreneurship.
To sum up, interest is a psychological state characterized by strong concentration and a certain sense of enjoyment. It has effects on cognition, affect and behavior. Interest not only determines the choices made, but also intensity and strength of an experience. The direction of interest is highly personal and varies strongly between different individuals. It probably has its background in the personal development. It is attached to an inborn ability and sensitivity, and the possibilities and support given by the environment. Interest is a function of challenge and ability, which in its turn determines what is a moderately difficult challenge. It is important that the challenge can stimulate to an activity where the individual has a good chance, but is not certain to succeed. Interest is also a prerequisite condition to a really creative contribution. The explanation is that creativity on a high level demands a great devotion to a certain kind of activity and one is not willing to do so if one does not feel a great interest for the activity. Vocational or job interests can therefore better help understand what leads to entrepreneurial behavior and how it is manifested. In the next section, interest will be integrated in theories of work motivation, especially the one concerning extrinsic and intrinsic motivation.

Intrinsic and Extrinsic Motivation

Intrinsic motivation is closely connected to interest; many researchers even equate interest and enjoyment to intrinsic motivation (cf. Elliot & Harackiewicz, 1994; Deci, 1992; Amabile, Hill, Hennesey, & Tighe, 1994). Any discussion of interest in motivation would therefore be incomplete without discussing the concepts of intrinsic and extrinsic motivation. This section is problem oriented, since theories related to the concepts of intrinsic motivation have suffered severe criticisms, mainly because the distinction between intrinsic and extrinsic motivation is not as clear as might be believed at a first glance.

Intrinsic motivation is most often defined as action engaged in for its own sake, contrary to extrinsic motivation where external motivators play a central role to motivate behavior (e.g., acting to get a reward, and not because the task itself is attractive). In other words, intrinsically motivated behaviors are ones for which there is no apparent reward except for
the activity itself. On the other hand, extrinsically motivated behaviors refer to behaviors in which an external controlling variable can be readily identified. Furthermore, theories dealing with intrinsic motivation are based on an assumption that extrinsic rewards or reinforcements have a negative effect on intrinsic motivation.

The criticism directed against the intrinsic/extrinsic distinction concerns the identification of intrinsically motivated behavior and the negative effect of extrinsic motivation. Even if many behaviors seem to occur without any obvious or apparent extrinsic consequences, they may, in fact, be due to anticipated future benefits or intermittent reinforcement. This would mean that intrinsically motivated behavior is simply behavior for which appropriate controlling stimuli have yet to be specified (Cameron & Pierce, 1994). Furthermore, intrinsic motivation theories are based on the assumption that extrinsic rewards and reinforcements have a negative effect on intrinsic motivation. Several recent meta-analysis contradict that assumption (Cameron & Pierce, 1994; Wiersma, 1992). Cameron and Pierce (1994) found that the only negative effect appears when expected tangible rewards are given to individuals simply for doing a task, and even under this condition the effect is minimal.

The component of interest in human motivation is however still of vital concern. The criticism presented above only says that interest and extrinsic rewards are not contradictory. In other words extrinsic rewards do not automatically diminish interest and enjoyment in a task. The motivational characteristics of intrinsic motivation are more complex than proposed by this simple assumption. Thierry (1990) argues that the intrinsic-extrinsic motivation distinction resides in naive psychology, since motivation should be considered as affected by both personal and situational characteristics, which relate interactively to one another and not as simple opposites.

The probably best known intrinsic motivation theory is Cognitive evaluation theory (CET) (Deci, 1975). The basic assumption of the theory is that the perceived environment affects the critical psychological states of mastery and the perception of personal control. These psychological states influence affective and behavioral responses (Kanfer,
In other words, it is not contextual factors in a straightforward sense that determine behavior, but the psychological meaning given to those contextual factors. Meaning is the critical element in determination of behavior. But at the same time, CET concentrates on how environmental features such as the reward contingency or the type of performance feedback, influence task interest, behavior, and perceived mastery and control. Thompson, Chaiken and Hazlewood (1993) have in series of experiments shown that the individual's desire for control and need for cognition are positively related to the experience of intrinsic motivation (mean correlation = 0.53).

This could be compared to another well-known intrinsic motivation theory: Job characteristic theory (JCT) views the job as an entity and tries to identify the aggregate job characteristics (e.g., task variety, task identity, and task significance) that influence critical psychological states (Hackman & Oldham, 1976; Lambert, 1991). The core of JCT is the demonstration of links between structural facets of the job, intrinsic outcomes, and work performance. The main difference between CET and JCT is the level of analysis. CET concentrates on discrete process features of environmental events, and JCT emphasizes the cumulative aggregate effects of specific structural features of the job. Furthermore, the aim of JCT is offer a possibility to design jobs for employees. Entrepreneurs do not belong to that category, because they themselves create and design their jobs. CET offers a possibility to understand how individuals interpret environmental factors and use that information to act, especially in contexts where interest is supposed to be central to behavior.

Cognitive Evaluation Theory and Self-determination

Until 1985 CET was mainly a social psychological theory focusing on the effect of extrinsic motivators on intrinsic motivation, but the intense criticism directed against the CET framework led to further evolution. The theory has evolved towards including individual differences in perception. Thereby the problem with objectively defining the intrinsic-extrinsic motivation trap concept, i.e., having two states in which acts are either truly intrinsic or extrinsic, is eliminated. Self-determination theory assumes that it is the significance of the contextual factors given by the person that defines if context is interpreted as either controlling or auton-
omy supportive (i.e., promoting interest and enjoyment). This means also an important change in the methodological perspective; where CET earlier relied on observation, it now relies more on self-reported measures since the attribution of different motivators are made by the individual, and are not directly observable (Deci, 1992; Deci & Ryan, 1987; Rigby, Deci, Patrick, & Ryan, 1992).

The core of the theory is that some intentional behaviors are initiated and regulated through choice as an expression of oneself, whereas other intentional behaviors are pressured and coerced by environmental and intrapsychic forces and accordingly do not represent true choice. The former behaviors are characterized by autonomous initiation and regulation, and are referred to as self-determined; the latter behaviors are characterized by heteronomous initiation and regulation, and are called controlled. This distinction between self-determined and controlled behaviors has an effect on the quality of action and experience, and is about the study of both personality and social contexts. Stated differently, motivators are perceived as qualitatively different, and this difference affects behavior.

The idea of autonomy is a theoretical rather than an empirical one, even if it has clear empirical consequences. An inner endorsement of one's actions is the condition of autonomy, the sense that they come from oneself and are one's own. Autonomous action is therefore chosen, but not as a cognitive concept (i.e., as decisions among different options), but an organistic idea anchored in the sense of fuller, more integrated functioning. The more autonomous the behavior, the more is it endorsed by the whole self and is experienced as action for which one is responsible (Deci and Ryan, 1987). When people act autonomously, they experience themselves as initiators of their own behavior; they choose the desired outcomes and how to achieve them. Regulation through choice is characterized by the absence of pressure and flexibility. Controlled behavior is characterized by the experience of having to do what one is doing and with greater rigidity. There is an intention, but lack of a true sense of choice. An individual, e.g., who is starting a very attractive education (e.g., law or medicine), only because the family expects it, shows intentional behavior, but it is not autonomous because it is not perceived as a true choice. Another example of controlled behavior, is the drug seeking
of a drug-addict. The behavior is intentional, but hardly autonomous, since the initiating factor is the experience of abstinence and no longer the choice of seeking pleasure.

An intentional behavior can thus be described as either autonomous or controlled, and in general the behavior is initiated and regulated by different contextual factors. Deci and Ryan (1987) argue that these contextual factors do not, in a straightforward sense, decide the behavior. Instead the individual gives psychological meaning (functional significance) to those factors, and that meaning is the critical determinant of behavior. It is of central concern to the issue of autonomy and control in behavior whether people construct contexts as supporting their autonomy (i.e., encouraging them to make their own choices) or controlling their behavior (i.e., pressuring them toward a particular outcome).

The research in this area shows that the distinction is relevant to specific external events, interpersonal contexts, specific internal events, and personality orientations. Hence the distinction is about whether one's analysis focuses on social psychological variables or personality variables. A social psychological approach focuses on which situations people experience as either autonomy supportive or controlling and a personality approach focuses on individual differences in people's interpretation of contextual factors as either autonomy supportive or controlling (their orientation). That is, varied social-contextual factors have a functional significance of being either autonomy supportive or controlling, and it will affect the quality of people's experience and behavior. Furthermore, there are individual differences in the functional significance people give to contextual factors, and measures of autonomy and control orientation are used to predict people's experience and behavior, without reference to contextual factors. It has been empirically shown that autonomy support, compared to controlled support, has generally been associated with more intrinsic motivation, greater interest, more creativity, more cognitive flexibility, better conceptual learning, higher self-esteem, more trust, greater persistence of behavior change, and better physical and psychological health.
As suggested earlier, people have general orientations regarding what they attend to and how they initiate and regulate their behavior. These orientations are conceptualized following the autonomy-control distinction, and they are assumed to affect the degree to which inputs are experienced as autonomy supportive or controlling. These personality characteristics are called causality orientations and are labeled the autonomy orientation or control orientation, respectively. Autonomy orientation correlates with ego development, self-esteem, and self-actualization (Kasser & Ryan, 1993). By contrast, control orientation correlates with Type A coronary-prone behavior, which represents a pressured, competitive, ego-involved behavior. It has been found to moderately correlated with external locus of control. Finally, control orientation is negatively correlated with learning and academic performance (Deci & Ryan, 1987; Ryan & Connell, 1989).

This theory is a useful tool to understand behavior and development, and individual differences in functional significance entrepreneurs give to contextual factors. Entrepreneurs that are more autonomy oriented (i.e., feeling joy and interest) have greater possibilities to manage the venture, since they are more interested, have a more positive emotional tone, and are more cognitively flexible and creative than control oriented entrepreneurs. The contribution of self-determination theory is that it acknowledges qualitative differences in motivators, something that other motivation theories seldom do. In the next section research dealing with the effects qualitatively different motivators on performance in achievement context is reviewed.

**Goals in Achievement Contexts**

The relation between goal setting and interest and enjoyment is based on the assumption that when people are engaged in interesting activities, they often have goals for what they want to accomplish (Harackiewicz & Elliot, 1993). For example, an entrepreneur might start a business to expand into a larger business, find a pleasurable professional activity, or escape unemployment. An entrepreneur may generate such goals on their own, or the goals may be implicit in a particular situation. An achievement orientated entrepreneur may strive to expand the venture in any situation, or the situation itself may be structured to elicit achievement
situations (e.g., a highly competitive industry as the computer hardware industry). These goals could also be influenced by other people, as family, friends, or capital providers which try to prompt the adoption of particular goals for performance.

A class of goals that has received particular attention is that of achievement goals, defined as the desire to attain, develop, or demonstrate competence at an activity (Dweck, 1986; Dweck & Leggett, 1988; Elliot & Harackiewicz, 1994; Harackiewicz, Abrahams, & Wageman, 1987; Harackiewicz & Elliot, 1993). Several researchers have contrasted different types of achievement goals and examined their effects on motivational, affective, and cognitive processes. Dweck and her associates (Dweck, 1986; Dweck & Leggett, 1988) have contrasted between learning and performance goals; and Ryan and his colleagues (Deci & Ryan, 1987; Ryan & Connell, 1989) have differentiated between ego involvement, task involvement, and neutral control conditions; and others have compared mastery and performance goals (Ames & Archer, 1988; Butler, 1992; Elliot & Harackiewicz, 1994; Epstein & Harackiewicz, 1992; Harackiewicz, Abrahams, & Wageman, 1987; Harackiewicz & Elliot, 1993). These goal differentiations are however variations on the same theme, and it is argued here that the differences in theoretical conceptualization and operationalization can converge on a distinction between performance goals (performance and ego involvement) and mastery goals (learning and task involvement). Persons with mastery goals refer to themselves, focus on the development of skill and competence relative to the task and on their past performance. On the other hand, persons with performance goals tend to highlight normatively based standards and try to demonstrate their ability in relation to others.

Dweck and her colleagues demonstrated in a series of experiments that the manipulation of personal goals for task engagement and self-perceived ability altered the subjects' overall performance. The behavior of subjects assigned performance goals depended on the assessment of their ability to do the task. Subjects with low self-perceived ability demonstrated helplessness and poorer performance than subjects with high self-perceived ability. Subjects holding learning-oriented goals demonstrated an effective pattern of achievement behavior when confronted with be-
havior, independently of self-assessment of ability. These differences in preferences for learning versus performance goals among subjects are suggested to stem from the subjects’ conceptualization about the controllability of cognitive ability (intelligence). In other words, it is the individuals’ implicit theories about themselves and intelligence in particular, by generating different concerns, that would orient them towards different goals. Dweck and her colleagues showed that subjects who perceive intelligence to be personally controllable (holding an incremental view) were more likely to adopt learning goals in achievement context than subjects perceiving intelligence as an internal but uncontrollable trait (holding an entity view).

Ryan and associates have also stressed the importance of the individual’s conception of his or her ability and attributional patterns associated with learning and performance goals. In the Ryan and associates’ formulation, ego-involvement renders into a causality orientation that equate high effort with low capabilities. An individual is ego-involved when she or he feels that she or he must act to prove her/his value to the environment. Similarly, the Dweck framework suggests that among persons holding performance goals, effort is viewed as compensatory to a fixed ability level. On the other hand, when the person acts, because it has a personal value, the person is task-involved. Ego-involvement is controlling and negatively affects interest and intrinsic motivation. It means that one primarily concentrates on the competitive aspect and on avoiding failure, but task-involvement gives a larger possibility to achieve a higher and more even level of performance (Deci and Ryan, 1987). Task-involvement and learning goals are associated with internal, (via effort) controllable perceptions of capability. Individuals adopting a learning goal are more influenced by the potential capabilities for outcome than the current level of self-perceived ability. Therefore a failure can be attributed to lack of effort and a currently low, but modifiable, level of capacity (Kanfer, 1991). Thus interest in the task can be upheld or even promoted.

However, Harackiewicz and Elliot (1993) point out that the differences between goal states are much less evident when individuals are performing well or perceive themselves as competent. Therefore the effect of perceived competence is not as clear as earlier stated. Mastery goals do
not always promote interest by fostering challenge seeking, persistence and task involvement, and performance goals will not always generate evaluative pressure and anxiety about performance. The effects of performance goals are more complex than suggested. Harackiewicz and colleagues have therefore concentrated their research on the mediating processes between interest/enjoyment and goal setting. They have found that high- and low-achievement-oriented individuals manifest divergent patterns when placed under evaluation. Epstein and Harackiewicz (1992) found that enjoyment in an interesting activity was enhanced for achievement-oriented subjects, but undermined for those low in achievement orientation. Harackiewicz and Elliot (1993) found that emphasis on performance goals raised interest for achievement-oriented individuals, whereas emphasis on mastery goals enhanced interest for those low in achievement orientation. In more recent research (Elliot & Harackiewicz, 1994) it was found that not only achievement orientation was an important determinant, but also how competence was evaluated (the degree to which individuals care about doing well at an activity and reflect an affective commitment to attain competence), and task involvement (the degree to which an individual concentrates and becomes absorbed in an activity). They found that high achievement oriented individuals valued competence most in performance situations, whereas low achievement oriented individuals valued competence most and became more task involved when assigned mastery goals. That is, performance goals enabled high achievers to demonstrate competence, whereas mastery goals enabled low achievers to develop their ability at their own pace. Nevertheless, mastery-focused goals have a more positive effect on interest than do performance-oriented goals.

We have here seen that achievement goals can be divided into mastery (learning and attaining competence) or performance goals (demonstrating ability). Mastery goals have in general a positive effect on interest and performance. However, high-achievement oriented individuals perform well in performance settings, because they take it as an opportunity to demonstrate their ability. From an entrepreneurship research perspective these results place the relation between entrepreneurs and achievement orientation in a new light. In the future more work must be done on entrepreneurial goal formulation (what goals are formulated and in which
context) and its relation to the entrepreneurs' achievement orientation. The results here indicate that entrepreneurs who are more mastery oriented would perform better in the long run than more performance oriented entrepreneurs, but that this relation is mediated by the type of achievement orientation.

However, I must issue a warning. The research reviewed above do not automatically generalize to other fields. This research is mainly experimentally based, where subjects (mostly school children and students) are asked to participate in task of low complexity and not profoundly interesting (e.g., playing pinball). This means several things. First, the degree of task complexity will probably affect behavior. I have already drawn the attention to the high task complexity represented by business venturing. It is difficult to see that the same principles applies to such different levels of complexity. Secondly, we have seen that working in a profoundly interesting area gives the individual an experience of "flow", and this experience has important effects on subsequent performance. The acts of starting and developing a business are probably more interesting than playing pinball, and therefore the experience and interest will probably be different. Thirdly, it is relatively easier to isolate an effect in an experiment than in a survey which is mostly used in entrepreneurship research. This means that the reported effects could be "washed away" when other methods are used. Research in more applied settings, where the subjects are involved in interesting tasks is needed to further explore the relation between goal setting and interest.

**Summary**

This section on interest has focused on three topics: (a) the development of interest in tasks, (b) the cognitive, affective, and behavioral correlates of interest, and (c) the influence of different goals in achievement contexts. We have seen that interest is stable over time, it has an important genetic component, but environmental support is needed to develop interest. Interest can be defined as emotion with important consequences for creativity, achievement and performance.

Theories concerning interest have after an intensive debate evolved from seeing interest as opposed to extrinsic motivators, to being complemen-
tary. Interest has a positive affect on performance. In performance set-

tings, interest is affected by how the goals are formulated. Mastery goals

have in general a more positive effect on interest and performance, be-

cause the development of personal control and mastery are emphasized.

Performance goals have a negative effect on performance, except when

individuals are highly achievement oriented because performance goals
give the possibility to demonstrate their competence.

Theories of interest are of concern for explaining entrepreneurial behav-

ior and performance, because it is highly related to emotions such as en-

joyment, goal formulation, and to performance. It is stable over time, and

furthermore quite easy to measure. It is furthermore reasonable to assume

that entrepreneurs opt to act in a certain direction because they find the

option interesting and enjoyable. In the next section the role of intellec-
tual ability in performance is examined. As stated earlier, research has

shown that intellectual ability is regarded as the most important determin-
nant of job performance.

**Intellectual Ability**

Research has shown that intelligence is the most important determinant

of performance, but what is intelligence? The notion is hard to define, but

we have intelligence tests, and there are many of them. They have been
developed primarily to fulfill certain practical needs. Although we may
not understand exactly what they assess, but for many practical purposes
these tests work quite well. The discussion of intelligence as a theoretical
term is the parallel discussion of tests and testing. There is no consensus

on a definition of intelligence and therefore no clear-cut validity criterion

for a test that claims to measure it (Landy, Shankster, & Kohler, 1994).

However recent research has made advances in understanding why some
individuals develop abilities at an expertise level and others not. First, I
will comment upon mental testing.

**Different Perspective on Intelligence**

Intelligence as a general cognitive capacity. The French psychologist
Alfred Binet took the first pioneering steps towards test development in
the beginning of the century. On appointment by the French minister of
public instruction, Binet was given the goal to develop an objective diagnostic instrument to assess school children's intellectual state. In his work on intelligence he made two major assumptions (Ackerman & Goff, 1996; Gleitman, 1991; Neisser et al., 1996).

Binet's first assumption was that intelligence is a general cognitive capacity, i.e., a general attribute that manifests itself in many spheres of cognitive functioning. This view led to a development of a test that ranged over many areas. It included tasks that varied in both difficulty and content - repeating a string of digits, copying a drawing, explaining absurdities, recognizing coins and making change. The performance of the child on all these subtests yielded a composite score.

The second assumption Binet made, was that intelligence develops with age until maturity is reached. In other words, an average group of five-year-olds does not intellectually match an average group of nine-year-olds. It is not only that they have less knowledge; they are not as smart. This conception was the basis for the test's scoring system. Binet devised a ladder of tasks of increasing difficulty that measured the kinds of changes in intelligence ordinarily associated with growing older. The higher the child could climb the ladder in correctly answering the items, the higher was his or her mental age (MA). The MA assesses an absolute level of cognitive capacity. The mental age of the child was compared with his or her chronological age (CA) as determined by the time of birth to decide if the child was bright or dull. To the extent that MA is larger than CA, the child is regarded as bright. The opposite is true if the MA is below the CA. The intelligence quotient or IQ can be computed by dividing the MA by the CA. The quotient is multiplied by 100 to get rid of decimals. By definition an IQ of 100 shows an average intelligence. The major problem with Binet's mental age ladder was that it stopped at sixteen. The test was, however, modified to measure adults by comparing the test score with an appropriate comparison sample (Gleitman, 1991).

Intelligence as a set of factors. As mentioned earlier, there is no consensus on definition of intelligence and thus no clear-cut validity criterion for an intelligence test. However, psychologists would agree that such instruments developed by Binet and his pupils, do distinguish people in
ways that have a rough correspondence with the intuitive conception of intelligence (Gleitman, 1991). But is intelligence a general cognitive ability?

The psychometric approach says that intelligence consists a set of different factors, i.e., the tests sample a number of mental abilities that are relatively independent of one another. By applying factor analysis to a set of tests, different factors emerged. Spearman (1904 as cited in Gleitman, 1991) suggested that there is a general factor described as general intelligence, or \( g \), a mental attribute called upon in any intellectual task a person has to perform. A test, according to Spearman, measured the \( g \)-factor, an \( s \)-factor specific for the test, and the errors of measurement (Neisser et al., 1996).

Thurstone (1938 as cited in Gleitman, 1991) objected to Spearman's emphasis on general intelligence. According to Thurstone intelligence could be broken down to several abilities. Using factor analysis Thurstone extracted seven factors as the primary mental abilities revealed by intelligence tests: number, space, perceptual speed, word fluency, verbal comprehension, memory, and reasoning.

The problem with this approach is that the lack of consistency in the number and kinds of factors raises doubts about the validity of the factorial approach. However, factor analysis continues to be a principal technique for the study of intellectual performance.

The Predictive Ability of Mental Tests

Recent research in psychology, as exemplified by the Project A (U.S. Army selection and classification project) has shown that cognitive ability is the best predictor of job performance (Hunter & Hunter, 1984; McCloy, Campbell, & Cudeck, 1994; McHenry, Hough, Toquam, Hanson, & Ashworth, 1990; Ree, Earles, & Teachout, 1994), compared to other predictors as for example, personality, vocational interest, and values. However, there are problems with ability testing. They are culturally biased (Humphreys, 1992; Landy, Shankster, & Kohler, 1994). Scores are age-related, i.e., scores begin to decline in middle adulthood whereas real-world performance continues to improve until old age. Test are much
less predictive for job performance than for academic success. Thus, large amounts of variance are not accounted for in real-world performance when traditional ability tests (e.g., IQ) are used as predictors.

On average mental tests predict between 0.40-0.44 of the performance correlation for U.S. Air Force enlistees (Ree, Earles, & Teachout, 1994), and 0.35-0.23 for leaders (Fiedler, 1995). Non-cognitive predictors only add minimally to the total explained variance. This does not mean that it does not matter if leaders are bright or not, only that there is not a straightforward relation. Bass indicates that (a) highly intelligent persons may suffer from self-preoccupation, (b) their abilities make it difficult to communicate with others, and (c) only those who already have above average intelligence are likely to achieve top management positions and therefore intelligence tests cannot discriminate poorer from better performance at the top of the organization. Examining the results from the Project A, it seems that the choice of performance criterion has an important impact on the relation between performance and intellectual ability. McHenry et al. (1990) used five performance factors: (1) core technical task proficiency, (2) general task proficiency, (3) peer support and leadership, effort and self development, (4) maintaining personal discipline, and (5) physical fitness and military bearing. The correlations were highest for the first two task proficiency measures with correlations above .60. For the last three performance factors, the correlations dropped to below .30. The results indicated that intellectual ability best predicts performance in task where the task is well defined (e.g., solving a math problem, assembling a complicated machine) but diminished when performance becomes dependent of some sort of social interaction. That is, when performance becomes dependent on interactions with others, the predictive power of intellectual ability diminishes drastically. Possible explanations are (a) the task complexity, and (b) the role of social interactions. Firstly, leadership is a complex performance where several goals must be achieved and there are several ways to achieve them. It would mean that the choices of goals and ways of attaining them are dependent on other factors than intellectual ability such as attitudes, interests, and emotions. In this case, performance leadership is more easily predicted by motivational factors. Secondly, leadership performance is no longer only dependent on the leader, but on how the leader is perceived...
by others (e.g., the leader may make sound decision, but he or she is not perceived as creditable, and how the leader perceives his or her subordinates.). This would mean that the importance of intellectual ability is diminished in relation to others factors such as social perception. These two explanations indicate that leadership performance cannot be effectively predicted by intellectual ability as defined by IQ or g. Either, leadership performance is not primarily depending on intellectual ability or the concept of intellectual ability must be broaden.

As a consequence, researchers have begun to explore new constructs in search of measures to supplement existing mental ability tests as predictors of real-world performance. A possible explanation to the difference in prediction between real-world and academic performance is that traditional tests do not measure the abilities needed in the real-world setting. Sternberg, Wagner, Williams, and Horvath (1995) argue that a distinction should be made between academic intelligence and practical intelligence, and that traditional tests only measure the first.

Practical knowledge or tacit knowledge refers to action-oriented knowledge (and therefore closely related to procedural knowledge). It is acquired without direct help, and allows individuals to achieve goals they personally value. Findings from the tacit knowledge research program indicate that measures of tacit knowledge have a low correlation with standard mental tests and add significantly to the explained variance (an average increase of 27%). Furthermore, tacit knowledge tests are stable for both differences in age and culture (Sternberg et al., 1995).

To conclude, cognitive abilities are the most important determinant of job performance, but much work remains to be done to find better measures. An interesting new construct is practical intelligence or common sense, which as shown to add significantly to more traditional tests. In the next session, I will continue to discuss alternative ways of regarding cognitive ability and how the field of research has developed.

Inelligence as Information-Processing

The advantages of the psychometric approach and the Binet test are that they can diagnose severe forms of intellectual deficits, and they also pre-
dict academic performance at least for a middle class population. These tests probably measure an underlying set of abilities, some of which are more or less general. These results have practical importance for diagnosis, guidance, and selection. Intelligence tests, however, have been unsuccessful in accounting for individual differences in levels of performance in the arts and sciences and advanced professions, as measured by social indicators (e.g., financial performance, status) and judgments (e.g., prize awards) (Ericsson & Smith, 1991). Further, they have not helped us to understand the processes that underlie more or less intelligent behavior.

A possible answer to this question will probably come from the analysis of the relevant cognitive operations that intelligence tests and reality call for. We must analyze individual differences in information processing behavior. The idea is to link differences in test performance (e.g., chess, simulations) to the analysis of individual differences in the way information is processed as individuals perceive, attend, learn, remember, and think.

This field of research is better known as research on expertise where the goal is to understand why and how certain individuals excel in certain domains when others do not. The basic assumption is that experts are not only superior because of inherited characteristics, but because of acquired characteristics. Hence, research is focused on identifying not only the acquired characteristics but also the process by which they have been acquired (Ericsson & Smith, 1991; Ericsson & Charness, 1994). The expertise approach does not use social indicators as criterion variables of outstanding performance. Instead, it requires the design of a set of standardized tasks in which the superior performance can be shown and reliably reproduced. Findings have shown that expertise is not innate, but a product of long and specialized training. The effects of extended deliberate practice can lead to the acquirement of skills that circumvent basic limits on working memory capacity and sequential processing, and thereby resulting in expert performance (Driskell, Copper, & Moran, 1994; Ericsson & Smith, 1991).
A special branch of the expertise approach that is of interest for entrepreneurship research is dynamic decision making, also called complex decision making. It is especially interesting, because it focuses on cognitive processes in highly complex situations (e.g., management of a town, or of a forest fire, or a medical diagnosis), contrary to other branches of expertise dealing with less complex problems such as chess, typewriting or Morse code operators. Research in dynamic decision making has been made possible by using computers that give the possibility to construct advanced simulations (so-called micro worlds) with which the decision maker interacts (Brehmer, 1992; Brehmer & Dörner, 1993). This approach gives us valuable information about the cognitive processes deciding excellent and poor performance in situations that are close to the real life situation of the entrepreneur.

Dynamic decision making research focuses on decision making which requires a series of decisions, where the decisions are not independent, where the state of the world changes, both autonomously and as a consequence of the decision maker's actions, and where decisions have to be made in real time. The results from experiments showed that there are big differences in performance between individuals, but no correlation between performance in micro worlds and scores on traditional intelligence or personality tests has been found (Brehmer, 1992). However, the results showed that performance correlates with a new variable, called heuristic competence. The variable can be interpreted as the individual’s general competence to handle complex systems. This variable is closely connected to the task ability as researched by Sternberg et al. (1995).

This ability to handle complex dynamic system is referred by Dörner and Schölkopf (1991) as "grandmother's know-how", an ability based on a common set of rules (e.g., to take one step at the time, get your goals clear in your mind). It seems that people that gather more information, are systematic, set up adequate goals for their chosen strategy, analyze feedback and are generally more systematic, also perform better. The problem is to know when and how to use a rule. The general conclusion is that those subjects who behave in a way that makes it more likely that they will acquire a good model of the task also learn to control the task better, and therefore perform better (Brehmer, 1992). This is in line with
the empirical results from other expertise studies. Experts exhibit superior ability to plan and they have superior memory performance, i.e., an immediate access to relevant knowledge (Ericsson and Smith, 1991). These are hardly surprising results, and one wonders if superior performance is only due to the appliance of commonly known heuristic rules. Why, if this is the case, are there so few superior performances and so many mediocre or poor performances? What are the cognitive processes characterizing low ability individuals?

Studies concerning a person's failure to control complex systems and therefore perform poorly give us some interesting results. The studies revealed a number of cognitive processes that are unsuitable to control a complex situation. Brehmer (1992) called them pathologies of decision making. The pathologies are themselves negative and tend to be self reinforcing cycles leading to even larger failures. The pathologies can be divided in two groups. The first group represents the individual's failure to formulate adequate goals in the process. The second group can be interpreted as the decision maker's resistance to learn by experience. That is an emotional protection when one's own competence is not sufficient. Furthermore, some pathologies are stable characteristics, while other pathologies arise as the subject has a faint model of the system, and therefore fails (cf. Delmar, 1995).

Research in dynamic decision making and complex problem solving is still an emerging research area in psychology and still has some methodological problems. The generality of the results has not yet been assessed, even if they are intuitively very compelling. Furthermore, research on dynamic decision making has not started to incorporate the motivation factor in studies of individual differences. The present research in entrepreneurial behavior should thus first explore the more main stream psychological research in cognitive ability since (a) intelligence tests are more reliable and valid than other measures of individual differences (Hunter & Hunter, 1984) and (b) if there is a difference, tests based on the factorial approach can help us understand what factors are important to entrepreneurial performance.
Summary and Overview

Motivation and cognitive abilities represent the two basic determinants of performance. The substantial positive relationship between cognitive abilities and performance has been shown earlier. From a different perspective, motivational theorists have shown the influence of non-cognitive factors (e.g., incentives, need achievement, dispositions, environment) on goal choice, intended effort, task behavior, and performance. At the same time researchers have been aware of the important interaction between ability and motivation.

Kanfer and Ackerman (1989) made a breakthrough by developing an information processing framework integrating cognitive abilities and motivation. The framework is based on an impressive amount of empirical research. It simultaneously considers individual differences in (a) cognitive abilities, (b) self-regulatory processes of motivation, and (c) information processing demands (task characteristics), especially during skill acquisition. It is based on the theoretical construct of cognitive resources or attentional resources that provides a linkage between ability and motivation, and the influences of objective task characteristics on the ability/motivation-performance relation. The purpose is to understand the effect of various task characteristics on the relations between attentional effort (defined as cognitive resources of limited availability) and task performance.

By describing abilities (seen as general intelligence) and motivation as a function of performance-resource, Kanfer and Ackerman (1989) state that any individual's performance can be represented as a joint function of the individual's relative attentional capacity and the proportion of the individual's total capacity actually devoted to the task (motivation).

They have found that (a) motivational processes direct the changes in the amount of used capacity and policy allocation of attention; (b) abilities, motivation and task characteristics determine the changes in performance; (c) distal and proximal processes influence the reallocation of capacity to various activities. The major mechanism to cause changes in the allocation policy and resource capacity is self-regulation. Furthermore, the total amount of resources that can be devoted to any set of activities is
determined by individual differences in ability level and resource capacity. That is, low-capacity individuals must devote a greater portion of their capacity than high-ability individuals to achieve the same levels of performance (Kanfer and Ackerman, 1989).

Several conclusions can be drawn from the results. The effectiveness of motivational interventions on task performance must be considered in the light of individual differences in resource capacity and attentional demands imposed by the task. In other words (Kanfer, 1991, p. 150):

"As attentional demands imposed by the task decrease with learning, individual differences in general intellectual ability become relatively less important determinants of performance while proximal motivational processes that sustain on-task attention over time become relatively more important."

Integrative approaches as the one just described indicate how motivation affects skill acquisition and when and for whom motivational intervention might be most useful (Kanfer, 1991). For research in entrepreneurial behavior, we now have an integrated model that can help us to better understand performance. The entrepreneurial task is resource-demanding. The entrepreneurial task of starting and in some cases expanding a business can be described as genuinely uncertain, because of the staking in a venture without prior extensive knowledge. Therefore the attentional demands are high and the general intellectual ability an important factor in entrepreneurial performance.

The entrepreneur's goal setting depends on the distal and proximal motivational processes. That is, in the best case goals will be matched with abilities, and the venture will grow or stay small, but survive. For example, it would mean that situations demanding learning, such as going into a new market or creating a venture, demand higher attention. Intellectual ability would then be more critical than in a more normal situation were motivation processes are more important. This could explain why some entrepreneurs chose not to expand their business, as they perceive themselves as not having the cognitive capacity required. The entrepreneurial aspirations are matched with entrepreneurial ability. In the worst case,
there is a discrepancy between goals and ability. The entrepreneur will overestimate his or her abilities and the venture will fail. The entrepreneurial aspirations are not matched to the entrepreneurial ability. To sum up, such an integrative approach might give us valuable information about entrepreneurial performance and its functioning.

In the following section, I will present a summary of the major results of the individual studies that are included in this dissertation. In the theoretical framework, we have seen that individual performance is best understood as differences in motivation and intellectual ability. The best predictor of performance was intellectual ability, but has been shown inappropriate in successfully predicting leadership performance. Motivation is also an important determinant of performance, because motivation enable us to understand why we choose to act in way instead of another. In the following studies, I have tested how different motivational factors (such as values, attitudes, interests, perception and attribution) and intellectual ability can explain and predict entrepreneurial as well as business performance. A final, general discussion will follow the summaries of the studies.

Summary of the Studies

Study 1: The Risk Management of the Entrepreneur: An Economic-Psychological Perspective

The results from this study formed the basis for this dissertation and the included studies. The purpose of this paper was to study the risk management of three categories of entrepreneurs (super-entrepreneurs, small business owner-managers, and failed entrepreneurs) from an economic-psychological perspective. Entrepreneurial risk behavior was analyzed from three different perspectives: (a) uncertainty acceptance, (b) risk management ability, and (c) risk behavior as framed by the situation.

In total, fifteen entrepreneurs and their enterprises were studied. Five entrepreneurs in each group were selected. The cases were selected and classified on pre-determined criteria. In order not to confound entrepreneur category effects with effects of industry, three entrepreneurs from
five different industries were selected. This selection allowed comparisons within and across industries. The data were gathered mainly by personal interviews, focusing directly and indirectly on the risk behavior and risk management of the respondents in the business context.

Two different reactions to uncertainty were identified in the three categories of entrepreneurs. The first reaction was positive to uncertainty, that is, to situations where there was no prior experience. However, the resulting behavior was quite different for the super-entrepreneur and the failed "super wanna bees". These two groups had the motivation to expand in common. The former responded with exhaustive information seeking and processing in order to reduce the uncertainty while the latter did not feel the same need for information and was more oriented to action. The second reaction was a low tolerance of uncertainty which was typical of small business owner-managers and some failed entrepreneurs. Control was emphasized by these groups. The former balanced the need of control and certainty with the dynamics of the market. The latter tried to maintain status quo in their reluctance to take risks. Hence, the latter's response to changes in demands from the market was small or non-existing which, eventually, led to bankruptcy. Therefore, there was a relationship between the reaction to uncertainty and the motivation of the different groups of entrepreneurs. A positive reaction was related to growth motivation and negative reactions to a status quo orientation. The difference between success and failure lay in the ability to manage risk. The super-entrepreneurs outperformed the "super wanna-bees" in proactive risk management whereas the small business owner-managers appeared to handle reactive risk management more successfully than the defensive failed entrepreneurs.

Successful entrepreneurs perceived risk-taking as a positive motivating factor. However, the study indicates that risk taking was domain specific. The entrepreneurs took risks in the domain(s) in which they assumed to have sufficient knowledge. This pattern was evident in super-entrepreneurs. They primarily took risks at the operational level where they had their basic competence. However, financial matters were closely supervised in order to avoid large losses. The small business owner-managers favored the operational level and mainly supervised financial matters that
were necessary for survival. The failed entrepreneurs had difficulties in supervising either of the risk categories. The most important difference among the three groups of entrepreneurs was that acquired knowledge was most systematically used by the super-entrepreneurs. Also, the super-entrepreneurs were, in comparison, more problem oriented. That is, they identified, analyzed and solved problems. They had a more realistic, almost “boring” perspective of their enterprises. The failed entrepreneurs, on the other hand, did not seem to perceive any problems in their enterprise.

In order to achieve long-term goals, the super-entrepreneurs worked proactively. This allowed them to retain an initiative that would boost the business and help to establish it in the market. The proactive behavior made the super-entrepreneurs stronger than the situation, that is, they took the opportunity when they considered themselves ready to take it. The small business owner-managers were more reactive than proactive in their behavior. Instead of pursuing changes, they adapted to the situation. This study suggests that they did not consider themselves competent enough to be proactive. The failed entrepreneurs were victims of the situation. In other words, the situation controlled them rather than the other way round. Because of poor risk management, they encountered difficulty in surviving. Eventually, they were forced to cease as independent economic actors. The demands of the situations were stronger than the entrepreneurs’ ability to manage the business successfully. Therefore, the success or failure of an entrepreneur seems to depend on a proactive behavior.

The results indicated that the risk perspective gave interesting insights but was too limited in order to understand entrepreneurial behavior. Differences in outcome would be better understood if the perspective was broadened to account for differences in motivation, ability, and task characteristics. The advantages of the risk perspective was the acknowledgment that an business outcome is partially aleatory.
Study 2: The Effect of Entrepreneurs' Job Interest and Values on Growth as a Business Goal

The aim of this paper was to examine the relationship between growth as a business goal, job interests and values. As noted in the first paper, motivation was the most important discriminating factor between growth oriented and non growth oriented entrepreneurs. Job interests and values are assumed to be two of the most important determinants of motivation. Values differ from interests; the former refer to what the individual finds important or unimportant, and the latter refer to what the individual likes or dislikes. Together values and interest form a set of preferences. Interests, values, and preferences therefore reflect the affective value of the cognitive representations of reality. Hence the three concepts can be assumed to have a strong impact on motivation and are therefore of crucial interest in the study of entrepreneurial motivation. The combinations have a potential to explain both the differences in goals set up by the entrepreneur, and if the differences depend on the emotional evaluation of the cognitive representations of reality.

Of 730 contacted entrepreneurs, 259 (35%) completed both a telephone interview and a follow-up mail questionnaire. Growth willingness was measured with an open-ended question about the entrepreneurs' business goals. The advantage was that social desirability of the response was reduced and that the respondent had the freedom to express his or her goal in her or his words. Discriminant analysis was used to discriminate or separate growth oriented from non growth oriented entrepreneurs as clearly as possible based on differences in job interest and values.

The entrepreneur's age and interest in market relations were retained when the discriminating ability of interest was tested. The rate of correctly classified cases was 67.0 % (adj. $R^2 = .09$). The results showed that economic control, strategic management, and human resources did not give any further valuable information to the function. When values were tested, achievement and age remained as the only significant variables. The function correctly classified 61.97 % (adj. $R^2 = .07$) of the cases. The other value types were eliminated and they did not have a strong impact on the function's classification rate.
In the combined interests-values model, the only remaining interest factor was market relation, but this was also the most important of the included independent variables. The included value variables were benevolence and universalism. The correct classification rate of the preference model was 67.4% (adj. $R^2 = .10$), a minimal increase compared to the previous models. It was concluded that interests and values can partly explain why some entrepreneurs chose to expand their enterprises and others do not. The effect was however not impressive.

**Study 3: The Determining Factors of the Entrepreneurs' Forecasts of their Business Development: An Attribution Theory Perspective**

Earlier studies in entrepreneurship research have mainly concentrated on the relationship between traits and behavior, and are based on cross-sectional data. The purpose of this paper was to analyze the psychological factors that affect small business managers' ability to predict their future performance over time. A theory of motivation and emotion was proposed in which causal attribution plays a central role. It is assumed that the perceived causes of success and failure affect motivated behavior.

A telephone survey was performed in September 1992, 1993, 1994 and 1995. A stratified random sample of about 350 firms was drawn from the population, a procedure repeated every year. That is, a new sample was drawn every year. The mean response rate was 81% with a standard deviation of 5%.

Firstly, the relationship between expectancies for the firm and expectancies for the external environment, and how this relationship affected prediction was examined. There was a difference in optimism between the two groups A (entrepreneurs perceiving themselves as successful) and B (entrepreneurs perceiving themselves as failing), concerning the firm's development in relation to the industry and the country. Group A had a higher level of optimism than group B, but group A was more pessimistic about the firm's development compared to the industry and country. Group B was always more optimistic about the firm's future than about
the future the country and industry. This was perhaps because the small business managers when in a loss situation needed to protect their self-esteem by assuming their ability to perform better in the future.

Secondly, we focused on the performance prediction and differences in the two groups. The purpose was to assess how differences in perceived performance affected future performance, and what was the outcome. Group A was more able to predict future outcomes than B, which was mainly overoptimistic. This was mainly due to the failure situation of group B, because when the situation was ameliorated, the differences in prediction ability shrank.

Thirdly, differences in causal attribution between the two were examined. The purpose was to examine if there were any differences in attributed causes between the two groups. The only significant difference between the two groups concerned the attribution of external and internal causes. Both groups believed they could change their present situation. This could either be done by changing their own strategies or by adapting to the perceived causes. It seems that the locus dimension was the most important dimension for entrepreneurs, and that stability and controllability had little impact on performance prediction.

The results indicate that the validity of entrepreneurs' forecast ability was more easily explained by examining the perception of the present situation, rather than examining differences in personality. We have seen that goal expectancies were dictated by the perception of causal structure and that it was closely connected to the concepts of pride, self-esteem, and hopefulness. Furthermore the entrepreneurs had difficulties in predicting negative outcomes. It was also concluded that entrepreneurs in a loss situation attributed their situation to external rather than to internal causes. We did not find any support for the hypothesis that other dimensions were used.

**Study 4: The Impact of Intellectual Ability and Motivation on Venture Performance**

This study was the first study that tested the entrepreneurial performance model. The study focused on the impact of individual differences in in-
Intellectual ability and motivation on venture performance. Intellectual ability of entrepreneurs was tested by an intelligence test taken earlier during the enlistment test of the national service in Sweden. Performance was measured as the risk buffer (the difference between return on investments and return on debts), debt-equity ratio and ability to grow (turnover and numbers of employees).

The study is based on the same data as study 2. Of the respondents, 105 were male and born in 1951 or later; 50% of these gave their permission to us to retrieve the results of the intelligence test they performed during conscription to national service. Of the 53 positive responses, 45 were usable for this study. Due to missing values the used sample in the analysis was somewhat smaller. Only the cases where data on IQ were available are used in the present paper.

The analysis was made in two stages. First, each variable category (decision styles, intellectual ability, motivation, and environment) was examined separately to find the best predictors of each group. In the second stage, all variables were analyzed together in order to maximize the fit of the model. This procedure was repeated for all four dependent performance variables. Multiple regression with backward elimination was used.

The environment functions were on average the best predictors of the business performance (maximum adj. $R^2 = .32$). However, little information was gained about the entrepreneur's role from them. Focusing on the entrepreneur, we can conclude that the intellectual ability of the entrepreneur had a small effect on performance, as measured by education and experience (maximum adj. $R^2 = .13$). Cognitive capacity as measured by the military service aptitude test did not yield any interesting results. Motivation gave little but significant addition to the functions, especially the growth functions (maximum adj. $R^2 = .20$). The most confusing results concern the decision style. The effect was however small (maximum adj. $R^2 = .17$) and the reliability of the scales was problematic.

The interaction model was much more powerful than the separate models, perhaps because performance is due to the combined effect of an en-
entrepreneur and the environment (adj. $R^2$: Risk buffer = .63, Debt-equity ratio = .48, Growth in turnover = .34, Growth in nr. of employees = .40). Motivation and especially interests played a more important role in the growth functions, whereas ability and the environmentally related factors dominated the efficiency functions. Intellectual abilities, as measured by IQ, seemed to have only little effect on performance, thereby confirming the results from earlier leadership research. However, declarative knowledge (experience, education, and decision styles) did in these combined models offer an important contribution to the explained variance. Growth was best explained by the direction of the entrepreneur's interest and persistence. Ventures founded by the present entrepreneur grew faster than other ventures but they had higher financial risk, and lower risk buffer. The variables governing growth and financial performance were not the same; growth was not necessarily the way to achieve good finances and vice versa.

*Study 5: Values and Entrepreneurship*

Research in entrepreneurial behavior has historically been more or less equated with research on traits and values. I therefore found it interesting to examine more closely the roles of values in entrepreneurship. The relationship between values and entrepreneurship was studied from two perspectives: The first dealing with individual differences in values (the individualistic perspective) and the second with regional differences (the social legitimization perspective). In the first case, it is assumed that it is those individuals who have more entrepreneurial values who are more likely to behave entrepreneurially. As a contrast to this individualistic perspective, a more social perspective proposes that the prevailing values and beliefs constitute a social norm-base that more or less restricts entrepreneurial behavior regardless of the values and beliefs held by the actual business founders. From the social legitimization perspective a relationship between values and aggregate entrepreneurship does not require a corresponding relationship between values and entrepreneurial behavior on the individual level. It therefore made sense to study both differences between entrepreneurs and non-entrepreneurs, and between low and high start-up areas, because if values are of some importance to economic development, it will be shown in either or in both cases.

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The sample in this study was a combination of two survey samples gathered at different points in time and with different aims. The first survey was directed to a group of small business owner-managers in Sweden, and was supposed to measure and assess determinants of growth and entrepreneurship. The second sample was aimed to assess determinants of environmentally responsible behavior and was directed to Swedish citizens aged 18-65 years. The reason that I chose to merge the two samples was that they represent both the general population and the small business owner-manager, and gave a large sample size (N= 1234).

On the individual level, we have seen that values had a moderately good ability to discriminate between entrepreneurs and non-entrepreneurs. The correct classification rate was high and cross-validation showed that the model was stable, 30 percent of the variance was explained (76.17% correctly classified). It was found that entrepreneurs valued personal success, independence, and stimulation more than the rest of the population, even if it meant accepting inequalities in society. The results are easily incorporated with earlier findings. The differences were strongly influenced by age and gender, such that older and male respondents were more likely to be self-employed.

The results from the socialization perspective were less encouraging. Values had virtually no ability at all to discriminate between regions that were high and low in new enterprise formation rate. It was difficult to find a single function, and therefore two functions were presented. In the first function, tradition was able to discriminate somewhat between the two regions. In the second function self-direction and universalism were included. Both functions showed an extremely low ability to discriminate between the two groups. The two functions were only able to correctly classify 57% of the cases and the explained variance was at its best 0.03. Hence, there were some significant value differences between regions, but they were very small. Regions high in new enterprise rate were more open to change and valued traditions less than regions low in new enterprise rate. Both the contents and the strength of the function are in line with earlier research. However, it is important to note that an alternative interpretation is that the tested regional differences are more attributable to differences between cultures in large cities and rural areas than differ-
ences in new enterprise rates. The conclusion is that entrepreneurs and non-entrepreneurs had different value systems and that these results were stable across studies and the use of slightly different value systems. The idea of social legitimization where values are an important explanation to differences in start-up rate received poor support.

**Study 6: Determinants of Growth Motivation: A Structural Equation Model of Entrepreneurial Behavior**

This study resembles study 4. Here, the entrepreneurial performance model was tested on a larger sample, but without measures of IQ. Business performance was measured as risk buffer and previous growth, entrepreneurial performance as growth motivation. Both multiple regression and structural equation modeling were used to test the model.

The same data were used here as in study 2 and 4. The complete sample was used (N= 259). Data were analyzed using both multiple regression and structural equation modeling (also known as causal modeling or structure modeling). These different methods were chosen, because they answer different questions. Multiple regression assumes that all independent variables are not heavily correlated with each other and therefore contribute uniquely to the explained variance. Structural equation models on the contrary can test a complex model (i.e., the variation in the dependent variable is caused by a complex set of independent variables that both correlate with the dependent and other independent variables) on empirical data. Another difference between the two methods is that structural equation models use latent variables when estimating the model compared to multiple regression that only uses manifest variables.

Results from the regression analyzes showed that predictions for individual differences in performance were quite poor (adj. \( R^2 \): Risk buffer = .10, Previous growth= .16) but for growth motivation it was very good (adj. \( R^2 \)= .76). Job interests were significantly related to all dependent variables, especially interest in human resources that was negatively associated. That is, entrepreneurs less interested in personnel and personal development performed better. An explanation is that many of the business owner-managers do not want to grow, because they want to keep an informal and familiar atmosphere in the business, or that they do not
want to delegate control. Values were also significantly related to performance, but not the traditional achievement value. Quite on the contrary, values such as benevolence and universalism were positively associated to performance. Conformity and tradition values were negatively related to performance. Benevolence and universalism, as well as tradition and conformity are very close to each other in terms of contents. It was concluded that the well performing entrepreneurs valued welfare, were broad minded, and did not conform to old patterns. Ability, as measured here, had little or no relationship to performance, and motivation was completely dominant as representative of individual differences. It should be noted that ability was not satisfactorily measured, and better measures could alter the results. Task characteristics were of course important, but different variables influenced performance except for customer concentration. Entrepreneurs who had chosen to concentrate on few customers also performed better.

Because of the shrinkage in explained variance and the low explained variance in the regression analysis, it was not judged interesting to estimate structural models for risk buffer and previous growth. Consequently, only growth motivation was modeled. This model had a substantially lower explained variance ($R^2 = .52$). The structural model gave some support to the hypothesized performance model. All relationships were confirmed, except for the relationship between environment and previous entrepreneurial performance. Furthermore, the direct relationships between self-determination and growth motivation, and between entrepreneurial background and growth motivation were not anticipated. The environment affected business performance directly and also the proximal individual variables (attitudes and opportunity). The more distal variables were not at all or not strongly related to the environment, which was expected. The relationship between previous entrepreneurial performance and growth motivation was substantial. There was a clear and important relationship between ability and motivation (job interests and motivation) confirming the basic assumptions of the performance model.
Discussion

Introduction

The purpose of this thesis is to try to shed some light on some of the aspects of entrepreneurial behavior and thereby better understand the entrepreneurial process. I have a special interest in performance, i.e., which psychological factors determine performance and why. Explanations of differences in performance have been sought in differences in the entrepreneur's ability, motivation, and task characteristics. It is assumed that the experience and behavior of the entrepreneur is the core of the entrepreneurial process. It is the perseverance, ideas, goals and actions of one or several individuals that create and develop new business. The environment either facilitates or hinders the entrepreneurial process.

In this section conclusions and implications of the thesis will be discussed. Only a few of the results will be repeated. More detailed results and interpretations can be found in the separate empirical studies. Here I will first focus on some of the major findings, and the more problematic and conflicting results from the different studies. Then I will incorporate the main results in a modified entrepreneurship performance model. Furthermore, implications for future research will be discussed.

Major Findings

The major findings were:

1) There were behavioral differences in risk management between more or less successful entrepreneurs. More successful entrepreneurs had at an early state of the business development decided to expand their business. They were more successful because they were cautious, used long term planning, and external competence to compensate for their own weaknesses. Small business owner-managers preferred control to business expansion. They were also conscious of their own weaknesses. Failed entrepreneurs had a poor social network, did not plan ahead, had poor knowledge of financial matters, and were badly organized. This was independent of whether the failed entrepreneurs were growth oriented or not.
2) Job interests and values had little power in predicting growth as a business goal. Younger entrepreneurs interested in market relations, and valuing universalism but not benevolence, were more growth oriented.

3) Values were able to differentiate moderately between non-entrepreneurs and entrepreneurs, and thereby giving some support to the individualistic perspective. However, the social legitimization perspective received little or no support. Values had little ability to predict differences between regions that were high or low in new firms start-up rate.

4) Predictions by entrepreneurs regarding future performance were highly dependent on the perceived causes of their present situation. Entrepreneurs perceiving themselves as successful were more accurate than entrepreneurs perceiving themselves as failing. Entrepreneurs in a loss situation attributed their failure to external causes, whereas successful entrepreneurs attributed their present situation to internal causes.

5) Intellectual ability as measured by IQ had little or no impact on business performance. However, the mean IQ for entrepreneurs was above the population mean, suggesting that a floor level intelligence is needed for business survival. Ability measures related to experience, education, and decision styles had an impact on performance, especially when performance was measured as the risk buffer or debt-equity ratio. The most important determinant of performance related to the entrepreneur was motivation, especially for business growth. Job interests had an important impact on growth. Values had a small but significant impact on performance. Important task characteristics were market structure (e.g., competition), but also factors related to the firms such as innovation capacity and a positive attitude among the employees to news and changes in the organization.

6) Growth motivation was explained by interests, attitudes, and opportunity recognition. Growth motivation was strongly influenced by previous growth, i.e., the experience of growth leads to growth motivation. When growth motivation was assessed with a structural equation model, the relations were somewhat altered. Job interest and ability had only indirect effect on growth motivation. The effect was mediated by variables such
as opportunity recognition and previous entrepreneurial performance. Self-determination, a variable closely related to intrinsic motivation and interests, also had an important impact. Thus, growth motivation was determined by motivation, perception of the environment, previous performance and ability.

Some conflicting results have arisen. Interest was an important determinant of growth, as measured either as a business goal or optimal size (study 2, 4, and 6). However, when modeling the two dependent variables different interest factors were significant. In study 2, interest in market relations was the most important factor, but it was insignificant in study 4 and 6. This might seem as a small problem, but has important consequences for the choice of predictor. The correlation between business goal and optimal business size was low (0.14; sign= 0.03), indicating that there was an important difference between the two concepts. The same variables found as significant to predict growth motivation in study 6 could only explain a minor share of the variance (adj. $R^2 = .04$) in growth as a business goal. Using backward regression with the same variables as used in study 6 yielded a different model altogether. It was found that entrepreneurs with growth as a business goal were active in younger enterprises, had little industry experience, favored fast decisions, and saw growth as a possibility to achieve higher control. Interest in market relations was the most important variable after the start up year. The level of explained variance was low (adj. $R^2 = .17$). Apparently the choice of predictor is of outmost importance. This choice is important to take into consideration when different studies are compared. Another example is found in study 4, where growth in numbers of employees and growth in turnover yielded slightly different models.

This difference between the two dependent variables can either be seen as the result of the question structure, i.e., a methodological artifact, or that there is an actual difference between the two dependent variables. The choice of business goal was assessed with an open ended question. Optimal size was assessed by asking the respondent specifically about the optimal size of the enterprise in five years. In open questions, respondents tend to answer what first comes to mind. The advantage of an open ended question is that social desirability of the response is reduced and
that the respondents have the freedom to express their goals in their own words. On the other hand, they diminish the possibilities to control the options, and the result can be unwanted biases. Closed questions have the advantage to force the respondent to reflect on all alternatives. In brief, we cannot expect the same response variance using these different questions.

Another possibility is that growth as a goal and optimal growth are two totally different questions in terms of content. Growth as a goal is one goal among others, and optimal growth can be the result of the achievement of an array of different goals including the more specific growth goal. For example if the business goal is survival, then growth can be the result of an adjustment to the market demands. The choice between the variables is then a theoretical choice, i.e., is growth in any case enough to be defined as entrepreneurial behavior or has growth to be a cherished goal?

Another problem when comparing these studies was the large differences in explained variance between study 4 and 6. One difference between the two studies was that study 4 was based on a smaller sample, and two outliers were excluded. When the models were rerun with the two outliers included the explained variance dropped (adj. $R^2$: from .63 to .20 for risk buffer, unchanged for growth). Nevertheless, explained variance was substantially above the results from the larger study 6 (adj. $R^2 = .10$ for risk buffer, adj. $R^2 = .16$ for growth). There were no obvious differences between the samples, except that the entrepreneurs in study 4 were younger than in study 6. They were also more educated and managed younger firms. Nevertheless, none of these differences can explain the difference in explained variance. It is concluded that the high level of explained variance in study 4 was primarily an effect of small sample variability. The results to be trusted are those found in study 6, because they were based on a larger sample. Study 4 apparently represented a specific group of entrepreneurs. The main contribution from study 4 was the test of IQ as a determinant of performance.

To sum up, individual differences in ability and motivation as measured in this study had a moderate impact on business performance. The reason
was that business performance was not solely contingent on the performance of the entrepreneur as defined here. A strong relationship between the individual entrepreneur and performance can only be found when the behavior is under the entrepreneur’s complete volitional control. However, business performance requires resources, the cooperation of others, and skills. The entrepreneur may have the intention to perform in a particular manner, but may be hindered because this behavior is not under his or her volitional control. This explains why growth motivation was successfully predicted, but not business performance. Distal variables such as IQ, values, self-determination, and interests could only predict a minor share of performance variation. More proximal variables such as task characteristics, attitudes, perception of the environment, and past behaviors will increase performance prediction.

How Do These Findings Add to Research and How Do They Support, Refute, or Inform Current Theory?

In this section I will discuss how the results from this thesis relate to current theory on entrepreneurship behavior. This discussion is done from the perspective of a revised entrepreneurial performance model (shown in figure 3). This revision of the model is mainly based on the results from the PLS model found in study 6. The major revision was that the relationship between the environment and entrepreneurial performance was excluded. The relations to current theory will be discussed from the perspective of each component and relationship in the model.

On a general level the contribution of this thesis is the attempt to update the psychological perspective of entrepreneurial behavior by describing entrepreneurial behavior and performance as depending on two determinants, ability and motivation. Recent theories and findings concerning motivation and ability have been presented and commented upon, but also tested empirically. The empirical tests are based on well validated instruments, and have been chosen on the basis on a theoretical model.
Business performance: Little relation was found between business performance and the tested motivation and ability variables. This is in line with current empirical findings both from entrepreneurship and leadership research. It is, nevertheless, premature to conclude that the behaviors of the entrepreneurs do not affect business performance in any large degree. Most research, including this research, has used distal variables in their models. That is, most research has used stable characteristics such as values, personality, and ability to estimate performance. However, the results from this thesis and from other studies indicate that other behavior related variables should be examined. Proximal variables, which are close in terms of content will probably yield better results. An example is the job interests variables used here, which could explain differences in performance. It was also shown that the use of attitude, and opportunity recognition variables could contribute significantly to prediction, at least to growth motivation. However, the best predictors were past behaviors and actions. Differently stated, the best performance prediction is made by assessing past behavior. There is a large probability that this behavior will be repeated in the future.

Entrepreneurial performance is performance restricted to tasks that can be under the control of the entrepreneur, such as the organization of the enterprise, the role of the board, decision making, ability to negotiate, goals
and strategies. The basic argument is that the factors determining entrepreneurial behavior are better assessed by focusing on behavior that is under the control of the entrepreneur. This is simply because there is an enormous amount of different variables that affect business performance, and entrepreneurial performance is one of those. It is only when we fully understand the determinants of entrepreneurial performance that we can successfully link the entrepreneur’s performance to business performance. Stated differently, business performance is the outcome, not of a single behavior, but of complex sequences of coordinated acts. Only when we understand how these acts are initiated (e.g., how entrepreneurs gain skill, locate opportunities, access resources, and the social context of behavior), can we understand the relation between entrepreneurial behavior and business performance. This differentiation between entrepreneurial and business performance is new, and will hopefully augment the awareness of business venturing as an utterly complex matter that cannot be measured using simple variables. The differentiation between entrepreneurial and business performance will be further discussed in the section on future research.

The environment: The importance of task characteristics cannot be overvalued. We have seen that performance was strongly dependent on these variables. This is not something new, and it has been argued that entrepreneurial behavior is not best understood from an individual perspective, but as result of networks and infrastructure (Aldrich & Zimmer, 1986; Birley, 1985; Larson, 1992; Reynolds, Storey, & Westhead, 1994; Van de Ven, 1993). The most important variable in this category was the characteristics of the market. Competition, what sort of customers, and the relation to each customer were the most important determinants of performance. Also of importance were the attitudes of the employees, such as if there was a positive climate accepting news and changes. The main deviation from the theorized entrepreneurial performance model occurred here, where the relationship between the environment and entrepreneurial performance was eliminated. It was found that the environment had a direct effect on business performance and the individual, but not on entrepreneurial performance. The effect was indirect; the actions of the entrepreneur were based on the judgment of the environment. To conclude, task characteristics had a relatively higher predictive ability
than individual characteristics, because the environment had an indirect effect via the perceptions of the entrepreneur, but also a direct effect.

The individual: It has been stated that entrepreneurial performance is best understood by understanding differences in motivation and ability. Results from this thesis indicate that motivation is more important than ability as measured in this thesis. Ability has been measured on a general level, and it is possible that ability measures more close to the performance criterion may yield better results.

The importance of motivation in performance, especially growth, has been recognized in earlier research (Barkham, 1994; Davidsson, 1989; Miner et al., 1992; Miner et al., 1989). However, in such highly complex task as entrepreneurship, motivation and ability are intimately connected to each other. The results from the PLS model suggest that ability and interests were closely connected. Interest can develop as a function of inborn abilities, but abilities are also augmented if the individual is highly interested. The contribution of this thesis is to underline the relationship between motivation and ability, and to focus on interests that are important determinants of volitional behavior.

Furthermore the importance of values and attitudes were examined. It was found that the use of a comprehensive value system could differentiate between entrepreneurs and non-entrepreneurs at a moderate level. The results therefore confirmed recent research also using other value systems. Furthermore, it was found that values had little or no ability to predict or explain entrepreneurial behavior. The reason that values fail is that they are too distal, and their importance is based on faulty theoretical assumptions. Distal variables are general and are seen as representing trait constructs. Consequently, we cannot expect them to contribute highly to the explanation of a specific behavior. Furthermore, value theories assume that human behavior is determined by the need to achieve abstract goals specific to the cherished value. Human behavior is much more complex, and therefore this approach fails. Attitudes are more proximal, and have better predictive ability. Variables related to intrinsic motivation (i.e., interests, enjoyment, and self-determination) were more important in explaining entrepreneurial motivation, even if they could be
considered as distal variables. The entrepreneur's emotional response was of higher importance than more rational evaluations.

To conclude, this thesis has shown that the inability of psychological perspective to understand entrepreneurial behavior is mainly the result of use of trait explanations. By focusing on other perspectives such as individual differences in ability and motivation, it has been exemplified that entrepreneurial behavior can be satisfactorily explained by using results and theories from modern psychology. Furthermore, the importance of choosing the right performance criterion has been focused upon.

What Limitations or Qualifiers Must Be Placed on the Study Given Methodology and Design Issues?

A number of choices have been made during this research process. These choices have of course affected the quality of this work. Some of these limitations would be eliminated or better controlled if I would have the possibility to do everything once again. I consider the following indications of the quality of this work are:

- The use of up to date psychological theories and results, and a pilot study in order to test a theoretical framework at a higher level of abstraction.
- The concepts of motivation and intellectual ability have been discussed and tested.

The model has been tested in parts but also in full with different methods, such as discriminant analysis, multiple regression, and structural equation modeling. Data have therefore been examined from different angles and at different levels. Different results have emerged, giving a more complex picture of entrepreneurial behavior.

The use of both cross-sectional and longitudinal samples has permitted testing of how perception and expectations not only change with different entrepreneurs, but also change over time.

The use of a large array of variables trying to measure a large number of aspects supposed to influence business performance. I have tried to incorporate and measure the complexity of business venturing.
The rich possibilities that the above points gave for comparison with theory, with earlier results, between the effects of different types of variables, and between groups.

Here are the limitations:
The response rate was relatively low for studies 2, 4 and 6. A higher response rate would have been favorable. The advantages of larger samples are better estimations of coefficients, and higher generality. This is a problem well known from the beginning and it was balanced against the possibility of in depth knowledge of each case.

No performance measures concerning the development after the interviews were collected in the cross-sectional studies and were therefore not included in the analyses. This means that most causal interpretations of the results (both the direction and the causal nature of the direction) can be challenged.

Other measures could have been used, for example intellectual ability was only measured properly for a very small subsample. The use of more complex measures of intellectual ability might yield different results. However, such research cannot be done with surveys. This is further commented upon in the next section on future research. Furthermore, I should have asked about significant changes during the study period. The importance of windows of opportunity and event restrictions were results from my pilot study that could easily have been tested in the larger study.

Comparisons with earlier entrepreneurship research are difficult because of differences in sampling frames, used measures, and used analytical methods.

I did not test all the hypotheses generated in my pilot study. First, the group "failed entrepreneurs" was excluded in the follow up studies, because they were judged to be difficult to reach with a mail survey. Secondly, supposed important factors such as social ability were not measured. It was judged that there was no satisfactory way to measure this variable with the chosen research design.
The results are probably somewhat dependent on the time frame. All studies were carried out during the most severe recession Sweden had since the 1930’s.

What Research Follows From the Study to Move the Field Forward?

The following discussion will be concerned with different topics: (1) the entrepreneurial performance model (2) the role of performance criterion, (3) the role of ability, (4) different aspects of motivation, (4) methodology and design. I do not know if this should be considered a limitation or a qualifier for this study, but I feel that I have raised more problems and questions in this thesis than I have answered.

The entrepreneurial performance model: The advantage of the entrepreneurial performance model is that it is relatively abstract and general, and it is hopefully based on recent findings from psychological research. Therefore, the model can take the inherent complexity of entrepreneurial behavior into consideration. When a large number of variables are assumed to influence a phenomenon, it is crucial to control this complexity in order to understand the studied phenomenon. However, this model is still a simplification and suffers from an important drawback. It does not take into consideration the role of personality, or the importance of social relations and how others perceive the entrepreneur. Personality can probably only give a minor contribution in explaining performance, but the role of social perception has been neglected.

The model assumes that entrepreneurial behavior is explained by how the entrepreneurs interpret a situation and generate appropriate responses. This is a cognitive explanation of the relationship between the individual and the environment. However, how the entrepreneur is perceived by others (e.g., employees, customers, bankers) involved in the process affects social perception and self-evaluations, and enhances or hinders the ability of the entrepreneur to provide the resources needed by the enterprise. Thus, performance is probably substantially dependent on the social processes that guide both parties in an interaction (Lord & Maher, 1993). The importance of social perceptions can possibly explain why intellectual ability has so little power in predicting leadership perform-
ance. Thus, further research is needed from a social psychological perspective.

In brief, future studies should take into consideration the impact of social perceptions, recognize entrepreneurship behavior as a complex phenomenon, and use recent psychological research. Job interests and Miner's task motivation theory (Miner, 1990) are examples of applied modern psychology research which could contribute to a better understanding of the entrepreneurship problem.

*The performance criterion:* The differences between entrepreneurial and business performance have already been discussed. However, it is important that future research takes these differences into consideration. I have argued that entrepreneurial performance can be satisfactorily understood only if the performance criterion is narrowly defined to a task under the entrepreneur's control, e.g., creativity, negotiation, growth motivation, strategies, goal determination. By focusing on such variables, we can better understand the performance of entrepreneurs, and also how this performance is related to business performance. For example, we could first examine factors determining growth motivation, and then examine what effect growth motivation has on business performance. Different factors probably affect the motivation to expand the enterprise, and the actual actions taken to reach that goal.

Furthermore, future research has to acknowledge the difference between performance prediction, goals, and intentions when measuring motivation. We have seen that the choice of predictor has an important impact on the resulting empirical model. This has to be taken into consideration when research is compared. According to Henry (1994), performance predictions are conceptually distinct from (a) self-set goals and (b) self efficacy judgments, behavioral self-predictions, and intentions. Goals represent the intended level of performance the individual is striving for, and they have as a consequence motivating properties. Performance predictions are supposed to represent the accurate level of performance and are assumed not to have motivating properties. The individual's belief about how well he or she can do is represented by self-efficacy judg-
ments. Behavioral self-predictions and intentions relate to upcoming behavior instead of the outcome of those behaviors.

When choosing a business performance criterion, we have seen that different factors affected the efficiency and the growth of a business, and that there was a difference if growth was measured as growth in turnover or numbers of employees. For example, the mode of entry had different impact on the risk buffer and growth. Enterprises created by the present entrepreneur were more growth oriented than buyout and inherited enterprises. On the other hand, the latter had a higher risk buffer. Further research on venture performance should take these results under consideration. A possibility would be to try to compare high profit/high growth ventures with low profit/low growth ventures. However, the problems of using financial ratios have to be considered. Even after these studies I am not convinced that financial ratios can contribute important information for small or newly started enterprises.

In brief, much more work must be done on the choice of performance predictor. These choices are where performance should be measured (entrepreneurial or business performance), what measures should be used (goal, intentions, performance prediction, business efficiency, turnover, or employees), and how these choices relate to earlier research.

The role of ability: More work has to be done on assessing the role of ability for entrepreneurship. This and other research indicates that ability is relatively unimportant for business performance. This is somewhat paradoxical and may be due to the fact that we have yet not fully understood or learned to measure what abilities determine successful entrepreneurship behavior. I have here tested the importance of intellectual ability on a small sample and found little relation to performance. In the earlier section discussing the predictive ability of mental tests, it was argued that a distinction should be made between academic intelligence and practical intelligence. Traditional tests only measure the first, and this would explain their failure to predict real world performance. Practical knowledge or tacit knowledge refers to action-oriented knowledge (and therefore closely related to procedural knowledge). It is acquired without direct help, and allows individuals to achieve goals they personally value. It is
possible that the development of instruments that measure tacit knowledge specific to entrepreneurship (both as venture creation and business development) might yield some interesting results. We have little knowledge of the procedural (social and cognitive abilities, and perceptions) and declarative (facts, goals, self-knowledge) knowledge required in entrepreneurship settings. It is to be hoped that we will also be able to apply results from expertise research, and better understand how entrepreneurial performance on a high level arises.

More research is also needed on the decision styles adopted by entrepreneurs. The results from this thesis indicated that high performance is achieved by adopting non-rational decision styles. The reliability and validity of the results can be questioned due to the low reliability of the instruments. However, the results are interesting and potentially important, because of the assumed importance of decision making ability in the management literature and in economics.

*The role of motivation:* The role of attitudes, emotions, and goals will be commented upon, but also the relationship between motivation, ability, and task characteristics.

I have argued that attitudes are better predictors than values, because they are more proximal. If we want to better understand and predict entrepreneurial behavior, attitude measures should replace value measures. However, social cognition is influenced not only by attitudes, but also by self-esteem and stereotypes. Furthermore, social cognition is both implicit and explicit. This means that not only general attitudes to new firm formation or growth have to be investigated, but also that self-esteem and stereotypes about entrepreneurs are in accordance with each other. Furthermore, questionnaires only tap explicit social cognition, and other indirect measures are needed to assess the role of implicit cognition (e.g., projective measures as once used by McClelland [1961]). I suggest that the measures trying to link judgments to entrepreneurial behavior should be more focused on attitudes, self-esteem and stereotypes connected to entrepreneurship and entrepreneurs. For example, we know that a large percentage of self-employed people also have self-employed members in their families. These role models are important, because they give the
future entrepreneur a possibility of hands-on experience. However, we do not know if entrepreneurs who are growth oriented also have had positive role models.

Emotions are important determinants of motivation. We have seen that job interests have an important impact on motivation and opportunity recognition. There are a number of emotions (e.g., anger, stress, love, hate, shame) that can have an impact on performance. Emotions are relatively proximal, some are stable over time and others are not, but they have a direct impact on goals, and actions. They probably have an important impact on how entrepreneurs define their goals as either mastery or performance goals.

Other dimensions that seem promising and interesting are goal formulation and commitment. Goal is the motivational concept which is nearest to actual action, and should therefore have high predictive ability. We know little about how one goal is chosen instead of others, the importance of goal specificity, and how commitment to those goals affects performance in entrepreneurship. Closely related to the concept of goals are strategies. The formulation of strategies, goals, commitment, and how they are communicated to others is still a "black box" in entrepreneurship research. Goal formulation is probably closely related to interests and opportunity recognition. This research area has received an important amount of attention in organizational psychology, because goals are closely related to performance. There are well-developed instruments and theories (cf. Lee, Bobko, Earley, & Locke, 1991). Rapid and important results could be obtained by applying this knowledge from organizational psychology to the field of entrepreneurship research.

The relations among ability, motivation, and task characteristics are important. We have seen that entrepreneurs altered their expectations depending on how the situation was judged. It has also been discussed that the relative importance between motivation and ability depends on demands imposed by the task. Future research could try to assess when in the entrepreneurial process abilities are relatively more important than motivation. It is possible that new tasks, such as the creation of a venture, put higher demands on the entrepreneur's intellectual capacity than on
motivational capacity. Interests and abilities are also related to each other. It would be interesting to study how they evolve, because they are both prerequisite conditions to expert performance.

*Methodology and design:* First, larger samples are needed to satisfactorily use structural equation models and make cross validations. One of the drawbacks of entrepreneurship research is that it has often relied on small samples. More work has to be done on securing larger samples. This is however a financial problem, and many entrepreneurs find research too time consuming. Second, the samples must be better controlled to enable comparison. Thirdly, more work must be done with advanced statistical techniques such as structural equation modeling to test the complexity of our models.

Furthermore, both cross sectional and longitudinal studies are needed. Entrepreneurship research is still dominated by cross sectional research. The strength of longitudinal studies is that causality is more easily assessed. The main weakness is the high mortality.

Disregarding the chosen design, I would recommend a more direct access to the entrepreneurs, and not the usual mail survey. This may lead to smaller samples, but would allow the possibility to better involve and commit the respondents and to use larger, more complex measuring instruments. Mail surveys often restrict us in our choice of measuring instruments, and there is a risk of sampling bias (not sampling the defined population). Good research is primarily dependent on reliable, valid instruments, and a well defined sample. It would be possible to satisfactorily measure concepts such as for example ability, actions, and commitment. The possibility to measure several aspects of entrepreneurship would enable us to actually test complex models. It would also be possible to study less attended groups of entrepreneurs such as failed entrepreneurs, and entrepreneurs that only create a venture with the specific idea of selling it after a short while. The drawbacks are that it is time consuming, expensive, and also difficult to generate large samples. The optimum would be to work with samples with more than 500 respondents and have good access. This would give the possibility to use cross vali-
dation, reliable instruments, and advanced statistical techniques as structure modeling.

A Final Word

In developing my model of entrepreneurial performance, I have focused extensively on the individual and the relationship to the environment. Other levels should in future also be integrated within my framework. For example, the role of social perception, and the understanding of small-group performance is critical to entrepreneurship.

Much of the work has emphasized the importance of motivation and ability as determinants of performance, and thereby excluded others. My focus on individual differences should not be interpreted to mean that it is the only way to understand entrepreneurial performance. For example, networking, political processes, conflict, influence, institutions, and financial resources are also significant elements in understanding entrepreneurship, and though I have underemphasized those processes in my model, I recognize that they are needed for a more comprehensive understanding of entrepreneurship.
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Study 1:

THE RISK MANAGEMENT OF THE ENTREPRENEUR: AN ECONOMIC-PSYCHOLOGICAL PERSPECTIVE

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The Risk Management of the Entrepreneur: An Economic-Psychological Perspective

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Abstract
The risk management of the entrepreneur is an important factor that can explain the success or failure of a business venture. The problem of risk management is here approached from an economic-psychological perspective. In this study the risk management of entrepreneurs is analyzed. The entrepreneurs are divided into three subgroups; super-entrepreneurs, small business owner-managers, and failed entrepreneurs (who went bankrupt).

Some interesting results were found. There seemed to be some differences in how the categories of entrepreneurs manage risk. An entrepreneur's acceptance of uncertainty, ability to manage risk and perception of the situation are discussed. In general, the results indicated the super-entrepreneur as risk averse and highly motivated, and the success of the business as being attributable to this combination. The small business owner-manager preferred control to growth. The failed entrepreneur did not use his or her social network and had no financial buffer for problems.

Introduction
To start and manage a business is generally seen as very risky. How entrepreneurs perceive and manage risk in their environment is central for the survival of a business. This makes the area highly relevant for empirical research. Earlier research on the entrepreneur's risk behavior has

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1 An earlier version was published in Journal of Enterprising Culture, Vol. 2, No. 2, (July 1994) 735-751
mainly focused on the attitudes toward risk and the entrepreneur's general risk propensity (e.g., Begley & Boyd, 1987; Brockhaus, 1980). These studies have regarded all business owner-managers as entrepreneurs and this group is compared to the general population. The results indicate that it might be more fruitful to focus on especially successful or innovative entrepreneurs' risk management and compare it with the behavior of a large group of small business managers.

**Purpose**

The purpose of this paper is to study the risk management of three categories of entrepreneurs (super-entrepreneurs, small business owner-managers, failed entrepreneurs) from an economic-psychological perspective. The theoretical frame of reference is a combination of financial theory and cognitive psychology.

**Entrepreneurial Risk Management**

Entrepreneurial behavior can be seen as a special case of behavior. Therefore, we can probably apply large parts of cognitive theory in order to understand and explain entrepreneurial behavior. A better understanding of entrepreneurial actions could be obtained through the application of motivation and cognition theories in combination with the knowledge that already exists about the entrepreneur's psychological profile.

Human behavior is best understood as an interaction between the situation and the individual (Bandura, 1982). Stated differently, we have to search for the explanation to the behavior or of an outcome in the person and in the characteristics of the situations. The entrepreneur is an individual who tries to control a complex system of risky and uncertain situations. Entrepreneurial behavior can therefore be seen as:

An acceptance of uncertainty - How does the psychological reaction to uncertainty affect the entrepreneur's motivation to further develop his/her business?
An ability to manage risk - Is successful data gathering through knowledge of the business domain the secret of successful entrepreneurship?

A response to the situation - Is the perception of the situation important?

Acceptance of Uncertainty. An indication that the risk behavior of the entrepreneur can be seen as a reflection of a larger acceptance of uncertainty is shown in the Scheré (1982) study. Scheré studied the difference in tolerance of ambiguity between entrepreneurs and managers. Uncertainty is a state of mind that results from ambiguity. Ambiguity is defined as a description of a situation characterized by vagueness, unclarity and incompleteness (Scheré, 1982).

Entrepreneurs have a greater degree of acceptance of ambiguity than managers (Scheré 1982). Tolerance of ambiguity is an reaction to ambiguity. A low tolerance results in stress and unpleasantness in a contradictory situation. Individuals with high tolerance, on the contrary, find such situations desirable and challenging. Thus, the difference in reaction can determine the sort of situation one is attracted to and how one gathers and processes information. Therefore, individuals with high tolerance would expose themselves to higher risks than individuals with low tolerance, seeking well-known situations.

Ability to Manage Risk. In tests of objective risk-taking propensity, risk taking in several different domains was tested (Brockhaus, 1980; Masters & Meier, 1988; Peacock, 1986). Thus, the aim of the test was to establish the general risk profile of the subjects. A possible reason for the finding that entrepreneurs are not different from the general population is that they are risk takers only in business decision.

Cognitive theory supports the hypotheses that risk taking is mainly domain specific (Heath & Tversky, 1991; Sjöberg, 1978). Heath & Tversky argue that the will to bet on an uncertain outcome not only depends on the estimated probabilities and certainty of that estimation, but also on the general knowledge or understanding of the relevant context.
"The consequences of each bet include, besides the monetary payoffs, the credit and blame associated with the outcome. Psychic payoffs of satisfaction or embarrassment can result from self-evaluation or from evaluation by others. In either case, the credit and the blame associated with an outcome depend, we suggest, on attributions for success and failure. In the domain of chance, both success and failure are attributed primarily to luck . . . In contrast, if the decision maker is an expert, success is attributable to knowledge, whereas failure can sometimes be attributed to chance." (Heath & Tversky, 1991, pp. 7-8)

Heath & Tversky argue that their theory could explain why a majority of decision makers do not see a calculated risk as a chance. Thus, the entrepreneur is more inclined to take risks in a domain where he/she is seen as an expert. This means that an individual will be risk averse in domains in which he/she has little or no knowledge useful to estimate the probabilities for different outcomes. In spite of the findings that entrepreneurs do not have a higher risk-taking propensity, they do take risks. The reason might be that they have or think they have a greater ability to manage risk in the specific domain represented by the venture.

There is some empirical evidence of the entrepreneur as a risk-taker in a specific domain. Ray (1986) has studied a sample of entrepreneurs and non-entrepreneurs in Singapore. One of the study’s main results was that risk taking propensity is not a general behavior but is context dependent. The difference between entrepreneurs and non-entrepreneurs is minimal in day-to-day situations, but significant concerning business decisions and decisions related to the start-up of a business. Non-entrepreneurs put great emphasis on factors such as job security, which keeps them at status quo, whereas the possibility of loss in self-respect and status is a driving force for the entrepreneur. That is, the entrepreneur is able to take risks, such as giving up job security, if there is a possibility to succeed as a business founder and manager.

One of the most debated personal characteristics of the entrepreneur is the need for achievement (Nach). While trait based explanations for entrepreneurship are not in the current fashion, there is some empirical evi-
dence that need for achievement is weakly associated with moderate risk
taking in a specific business context and entrepreneurial behavior (Begley &
Boyd, 1987; Bellu, 1988; McClelland, 1961; Perry, MacArthur, Mered­
dith & Cunnington, 1986).

The entrepreneur is apparently attracted to the possibility of successfully
managing and influencing the outcome and the risk, rather than to games
of chance. We do not know how a successful risk management operates.
However, we know that to start and manage a business successfully is a
function of how well the entrepreneur manages his/her strengths and
weaknesses (Green, 1988), and builds up and uses a network of different

Response to the Situation. In general, people have an exaggerated ten­
dency to explain human behavior in different situations from their per­
sonal characteristics, rather as a response to the characteristics of the
situation. Ross (1977) called this tendency "the fundamental attribution
error". In reality, human behavior is highly dependent on situations
(Bandura, 1982; Kahneman & Tversky, 1979, 1984).

Risk taking may not depend on entrepreneurs' attitude to risk, but occurs
because entrepreneurs find themselves in situations in which they are
more prone to risk taking. The difference from the above "ability" is that
here the behavior is directed by external factors that influence the per­
ception of the entrepreneur. The situation frames the entrepreneur to per­
form a certain behavior. Most business start-ups are situation related, for
example:

(i) A large percentage of entrepreneurs has parents that have
been business owners (Shapero & Shokol, 1982).

(ii) The start-up reasons mentioned by entrepreneurs are usually
situational factors such as threatening unemployment and new
opportunities (Ray, 1986; Shapero & Shokol, 1982).
(iii) Infant enterprises, smaller enterprises, and enterprises where the manager is new are more prone to expansion (Davidsson, 1989).

Therefore, there are a number of possible explanations stating that entrepreneurial risk taking does not depend on the risk propensity of the entrepreneur, but that the entrepreneur is in a situation where he/she is more prone to accept risk.

Method

Sample

In total, fifteen entrepreneurs and their enterprises were studied. Five entrepreneurs in each of the following groups were selected:

"Super-entrepreneurs" - Entrepreneurs that had shown to be very successful in starting-up and managing or taking over a business. The business had shown a remarkable development.

Small business owners/managers - They had not been active in their pursuit of expanding the business. The number of employees and the turnover had been quite constant for an extended period of time.

"Failed entrepreneurs" - Entrepreneurs that had failed in the sense that their business ceased to exist on the market. The enterprises went bankrupt or had to be taken over by a competitor in order to survive.

The cases were selected and classified on pre-determined criteria. In order not to confound entrepreneur category effects with effects of industry, three entrepreneurs from five different industries were selected. This selection allowed comparisons within and across other industries.
Data
The data were gathered mainly by personal interviews, focusing directly and indirectly on the risk behavior and risk management of the respondents in the business context. The interviews centered on the historical development of the business and how the entrepreneur managed critical events or milestones. Interview data were supplemented with business data from annual reports and the analyses of the bankruptcy trustee. This information was gathered to verify the validity of the interview data.

A comparative analysis was used (Glaser & Strauss, 1967). By maximizing and minimizing the differences (i.e., different industries and different categories of entrepreneurs) in the sample, it is possible to generate and analyze the properties and their interrelations more successfully. No statistical analysis was used because of the small sample and the explorative purpose of the study.

Results

Acceptance of Uncertainty
The development of a business venture is often an evolution through several stages, where each stage has special demands on management, financing and organizational solutions (Dodge & Robins, 1992; Stumpf, 1992).

The super-entrepreneurs had the ability to adapt to these different stages. However, this has demanded a great effort of personal development. Apparently, the most difficult step to take for the entrepreneurs was to decide whether the business should remain a small controllable unit or to be expanded and, perhaps, to lose some direct personal supervision (Davidsson, 1989). There is great ambivalence related to this decision, as stated in the interviews: "... from being a technician to becoming a type of businessman." and "It is the only time during all these years that I was so nervous I had stomach pains." However, the super-entrepreneur is highly motivated and attracted to new situations. The interviewees admitted that the dream and the motivation to expand had been present from the start. It seems that the super-entrepreneurs had a larger accep-
tance for ambiguous situations as they succeeded in developing their own competence and the business during an extended period of time. They were probably successful in searching for and in interpreting information. This, in combination with a high motivation to expand, could give rise to a successful management of the growing venture.

The group of small business owner-managers did not show the same willingness to expand. A probable cause was the need to retain full control over the business. To keep the actual structure of an organization that they can control was to them more important than the motivation to expand. The members of this group did not consider themselves as having enough competence to make the changes. They were concentrated on making the business more efficient and secure. They strove for a stable business. Thus, the idea of expansion became foreign to them as there was an uncertainty about their capability to adjust.

The category of failed entrepreneurs could be divided into two subgroups according to the entrepreneurs' response to uncertainty. The first subgroup consisted of the "super wanna bees". They were highly motivated to expand. They looked for new challenges and worked actively on expanding the business fast. Unnecessary and large risks were taken. The organization became very sensitive to unanticipated changes inside and outside the business. The entrepreneur did not have the possibility to develop his or her capabilities at the same pace, thus leading to a partial or total loss of control.

The second subgroup resembled the small business owner-manager, and they had a very low motivation to expand. Their goal was to secure the business, but there were only a few (one or two) key customers who supported the business. The risk spread became unsatisfactory. When a customer was lost, the result was devastating. The entrepreneur had been living in an illusion that status quo would continue and had no financial buffer to handle the crises.

**Ability to Manage Risk**

To start and manage a venture can be seen as a function of the entrepreneur's management of his or her strengths and weaknesses. In this re-
spect, the super-entrepreneurs seemed to exercise a certain degree of caution although they may be positive towards uncertainty and risk in their business venture. Caution does not mean a fear of action, but to interpret and understand the possible consequences before acting. Financial resources were built up in order to retain the ability to develop the business according to one’s ideas, and at the same time, to have the ability to survive a business rebound. Risks were taken in the operative field while the financial risk exposure was minimized (i.e., low debt-equity ratio and high liquidity compared to small enterprises in the sample). A possible reason for the higher operative risk exposure was that they considered themselves as having a better knowledge and/or understanding of the relevant details of the decision situation. The enterprises remained small (up to a maximum of 15 employees including the entrepreneur) for a long period, i.e., from four to fifteen years, before they started to grow. This period was used as a learning period for the entrepreneurs, and also served to build a strong base of knowledge and financial resources for expansion. The strong motivation to expand the business was manifested in elaborate long-term planning and well-defined goals; as some of the interviewees reported: "... We see ourselves as careful generals. We are not much for speculation.", "... it’s all about taking one step at a time." and "... you must know what you want in order to obtain it!" Thus, caution was a combination of a need to secure what already was achieved and a need to exploit future opportunities.

The super-entrepreneurs were conscious of their own management weaknesses and tried to eliminate them by taking advantage of external competence. Thus, at an early stage of venture external competence was recruited to professionalize the board or the management team. The main reason was to obtain a broad view of the business for better information.

A difference between the super-entrepreneurs and the small business owner-managers was that the latter reduced the risk exposure through the maintenance of stability of the business. The small business owner-managers were, as the super-entrepreneurs, conscious of their weaknesses and they acted according to them. This meant two different types of behavior. The first was to compensate with external competence. This external competence consisted mainly of the auditor and/or the local bank.
Thus, the offered advice was of a more general than specific nature. This was often the only financial competence the small business owner-manager had access too. In the second case, no external competence was utilized. Instead the small business owner-manager managed risk by avoiding the implementation of new strategies. Therefore development was restricted. The need to have a stable income was apparently more important than the possibility of expansion and further commercial success.

The small business owner-manager group was aware of the needs of the customers. They understood the demands of the market for their products. They knew the importance of cost control, price setting, and how low they could go before they withdrew from a deal.

The "failed" entrepreneurs had several weaknesses in risk management. The most striking feature was the poor social network. They had few and/or unpleasant encounters with auditors, banks and government agencies. These partners were, consequently, not recognized by the entrepreneurs as natural in business negotiations. Failed entrepreneurs lacked knowledge and understanding of financial problems. Their costs and prices were higher than those of their competitors. As stated by one of the failed entrepreneurs, "They [the customers] did not care about the price. They were only interested in getting a job well done." The financial buffer was also very low. The result was a business vulnerable to changes in demand. These enterprises were strongly dependent on a small number of customers. A possible explanation for this was that the business was in an early developmental phase and the entrepreneur did not have time to attract more customers. Alternatively, they chose to serve only a small number of customers. The central point is that the termination of cooperation by a customer affected the business drastically. To make matters worse, the failed entrepreneur had little or no knowledge of marketing strategies to generate new customers.

Strategic management was also a problem area. The failed entrepreneurs appeared to have difficulties in formulating long-term goals. There was no functioning information system and, in some cases, the management team had internal conflicts that hindered effective cooperation. The ex-
ternal parties of interest (such as suppliers, banks and customers) did not receive clear signals, resulting in a lack of trust. Attention was often directed to operative issues and little concern was given to the strategic as well as financial ones.

Response to the Situation

The super-entrepreneurs were the masters of the situation. The super-entrepreneurs were characterized by a need for independence and had a professional attitude to the business (i.e., one who tried to separate personal issues from professional). The possibilities of developing a venture were only taken when the super-entrepreneurs felt mature enough to manage a change. Extensive networking and information gathering provided the super-entrepreneurs with numerous opportunities. They could, therefore, choose when and where an action should be taken. The result of this behavior was that eventually a positive key situation occurred and worked like a window of opportunity. These were very important because they boosted the business resulting in follow-up orders and establishing the business in the market. The positive key situation was not so much a product of luck but a product of hard and determined work. In other words, an individual's motivation seems to be a stronger determinant of the super-entrepreneur's success than situational factors.

The major difference between the super-entrepreneurs and the small business owner-managers was the lack of growth motivation of the latter. A possible cause was the restricting characteristics of the situation. That is, non-expansion was not only due to need of security but also to a restriction in the situation. A geographical restriction occurred when the business was located in a peripheral market where it was not judged to be lucrative to expand to other markets. A negative event can also restrict the motivation to expand. The small business owner-managers may have tried to expand but have failed for some reason. It was no longer seen as an attractive possibility for the business as the risk was perceived as too high.

It was astonishing that enterprises of failed entrepreneurs did not go bankrupt sooner in view of their strategies in risk management. Many of these enterprises survived for long periods with a low buffer against
problems. With no redundancy in the organization, there was no necessity to analyze the problems of the business. Hence, the entrepreneurs did not need to change its mode of functioning in constructive ways. Thus, the entrepreneurs and their enterprises became victims of the situations, leaving little or no room for individual action. The failed entrepreneurs "shrank" the business to a minimum and tried to survive by using their own funds. Bankruptcy was often a last option, and was chosen on the advice of an auditor or a bank.

The results from the study are summarized in Table 1 where a comparison of the three groups is made. The results indicated a clear difference in risk management between different categories of entrepreneurs.
Table 1

*Entrepreneurial Risk Management*

<table>
<thead>
<tr>
<th></th>
<th>Super-entrepreneur</th>
<th>Small business manager/owner</th>
<th>&quot;Failed&quot; entrepreneur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncertainty</td>
<td>Acceptance, because of the motivation to expand</td>
<td>Aversive. Total control preferred</td>
<td>Two subgroups:</td>
</tr>
<tr>
<td>Risk Management</td>
<td>- Caution instead of risk-taking</td>
<td>- Conscious of weaknesses</td>
<td>- Poor use of social network</td>
</tr>
<tr>
<td></td>
<td>- Long-term planning</td>
<td>- External competence was used to secure the actual state</td>
<td>- Poor knowledge of financial matters</td>
</tr>
<tr>
<td></td>
<td>- External competence</td>
<td>- Problem seeking and solving</td>
<td>- Great dependence on a few customers</td>
</tr>
<tr>
<td>Situation</td>
<td>- Key situations, window of opportunity</td>
<td>Restrictions:</td>
<td>- Management group ineffective</td>
</tr>
<tr>
<td></td>
<td>- Takes advantage</td>
<td>- Geographical</td>
<td>- No long-term planning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Event</td>
<td>- No buffer for problems</td>
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<td></td>
<td></td>
<td></td>
<td>- Victim of the situation</td>
</tr>
</tbody>
</table>

**Conclusion**

*Acceptance of Uncertainty*

How does the psychological reaction to uncertainty affect the growth motivation of an entrepreneur? Two different reactions to uncertainty have been identified in the three categories of entrepreneurs. The first reaction was positive to uncertainty, i.e., to situations where there was no prior experience. However, the resulting behavior was quite different for the super-entrepreneurs and the failed "super wanna bees". They had the
motivation to expand in common. The former responded with exhaustive information seeking and processing in order to reduce the uncertainty. The latter did not feel the same need for information and was more oriented to action.

The second reaction was a low tolerance of uncertainty which was typical of small business owner-managers and some failed entrepreneurs. Control was emphasized by these groups. The former balanced the need of control and certainty with the dynamics of the market. The latter tried to maintain status quo in their reluctance to take risks. Hence, the latter’s response to changes in demands from the market was small or non-existing which, eventually, led to bankruptcy.

Therefore, there was a relation between the reaction to uncertainty and the motivation of the different groups of entrepreneurs. A positive reaction was related to growth motivation and negative reactions to a status quo orientation. The difference between success and failure lay in the ability to manage risk. The super-entrepreneurs outperformed the “super wanna-bees” in proactive risk management whereas the small business owner-managers appeared to handle reactive risk management more successfully than the defensive failed entrepreneurs.

**Ability to Manage Risk**

It seems that successful entrepreneurs perceived risk-taking as a positive motivating factor. However, the study indicates that risk taking is domain specific. The entrepreneurs took risks in the domain(s) in which they assumed to have sufficient knowledge. This pattern was evident in super-entrepreneurs. They primarily took risks at the operational level where they had their basic competence. However, financial matters were closely supervised in order to avoid large losses. The small business owner-managers favored the operational level and mainly supervised financial matters that were necessary for survival. The failed entrepreneurs had difficulties in supervising either of the risk categories. The most important difference among the three groups of entrepreneurs was that acquired knowledge was most systematically used by the super-entrepreneurs.
Also, the super-entrepreneurs were, in comparison, more problem oriented. That is, they identified, analyzed and solved problems. They had a more realistic, almost "boring" perspective of their enterprises. The failed entrepreneurs, on the other hand, did not seem to perceive any problems in their enterprises subgroup.

It was clearly not the case that the higher the entrepreneur's risk-taking propensity, the more successful the business would be. It seems that the opposite was true. At least, the most successful group showed the greatest awareness of the risks involved in decision-making. Apparently, there was a paradox between risk aversion and accepting the risk exposure associated with expansion. A possible explanation is given by Tsur, Sternberg and Hochman (1990), they found that risk aversion positively affects the adoption of an innovation. In other words, a risk averse individual is not willing to bear the risk of not trying and learning because this may affect her/his survival in the long-run.

Response to the Situation

Is the perception of the situation important? Different perceptions of a situation will result in differences in behavior.

In order to achieve long-term goals, the super-entrepreneurs worked proactively. This allowed them to retain an initiative that would boost the business and help to establish it in the market. The proactive behavior made the super-entrepreneurs stronger than the situation, i.e., they took the opportunity when they considered themselves ready to take it.

The small business owner-managers were more reactive than proactive in their behavior. Instead of pursuing changes, they adapted to the situation. This study suggests that they did not consider themselves competent enough to be proactive.

The failed entrepreneurs were victims of the situation. In other words, the situation controlled them rather than the other way round. Because of poor risk management, they encountered difficulty in surviving. Eventually, they were forced to cease as independent economic actors. The demands of the situations were stronger than the entrepreneur's ability to
manage the business successfully. Therefore, the success or failure of an entrepreneur depends on a proactive behavior.

Further Research

The results in this paper were based on an explorative study and it is, therefore, inadequate for making any generalizations. It is important to point out that the data gathering in this paper was done under the most severe economic crises Sweden has experienced since World War Two. This may have influenced the outcome of the different behavioral types presented in this paper, i.e., under "normal" conditions, other types of behavior would have been more or less successful. The paper only points out some behavioral aspects that may be interesting in a more detailed research.

One of the main conclusions of this paper is that modern cognitive theory is useful in interpreting and understanding entrepreneurial behavior. However, it will not provide a complete understanding of behavior. For example, the emotional aspect of entrepreneurship has yet to be analyzed and understood.

Further research should be undertaken in order to understand the dynamic decision-making of the entrepreneur. Greater knowledge is needed to understand the paradox of an entrepreneur's risk aversion and adoption of a growth process.
References


Study 2:

THE EFFECT OF ENTREPRENEURS’ JOB INTERESTS AND VALUES ON GROWTH AS A BUSINESS GOAL

Frédéric Delmar
The Effect of Entrepreneurs' Job Interests and Values on Growth as a Business Goal\textsuperscript{2}

Frédéric Delmar
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Abstract

The motivation of an entrepreneur to grow or not to grow his or her enterprise is not entirely a choice based on cognition, it is also affected by the emotional representation of reality. Two of the most important factors determining the emotional representation are job interests and values. The aim of this paper is to examine the relationship between growth as a business goal on one hand, and job interests and values on the other hand.

The results show that interest and values could discriminate between growth and non growth oriented entrepreneurs. Growth oriented entrepreneurs were more interested in customer relations, they valued benevolence less and universalism more than non growth oriented entrepreneurs. It is concluded that emotions have an impact on the choice of growth as a business goal. Therefore entrepreneurial motivation cannot be seen as purely cognitive process, and emotions must be incorporated in future research on entrepreneurial behavior.

Introduction

Business growth and innovation are central features of continued entrepreneurship, and it is therefore important to study the determinants of the processes. The performance (i.e., growth) of the entrepreneur depends on his or her abilities and motivation. Even if the perspective of individual differences has been much criticized, the fact remains that there are differences between different entrepreneurs. Some of them are more inclined towards growth and changes, and others are inclined towards stability. Of special interest are the patterns of intrinsic and extrinsic moti-

\textsuperscript{2} An earlier version was presented at the 1995 Babson College Entrepreneurship Research Conference held at the London Business School, England, April 9-12, 1995.
vation that govern entrepreneurial behavior. Motivation is defined as the choice, the persistence, the intensity, and emotional reaction to act in a special way. This paper will focus on the affective factors determining the entrepreneur's choice to grow or not to grow.

Motivation is a complex subject. There are many determinants of an action that are located within the person as well as in the environment. Two of the most important factors related to the person are job interests and values. Values differ from interests, the latter refers to what the individual likes or dislikes and the former to what the individual finds important or unimportant. Thus, certain events can be considered as important, but not interesting, and vice versa. Together values and interests form a set of preferences that guides our choices between different alternatives in a choice situation. Preferences are used when we, through rank-ordering, assess the alternatives in choice situations. Interests, values, and preferences therefore reflect the affective value of the cognitive representations of reality. Hence the three concepts have a strong impact on motivation and are therefore of crucial interest in the study of entrepreneurial motivation. The combinations have a potential to explain the differences in goals set up by the entrepreneur, and if the differences depend on the emotional evaluation of the cognitive representations of reality. The aim of this paper is to examine the relationship between growth motivation (growth as a business goal), job interests and values.

**Interest**

One of the most cited reasons to start and manage your own business is the need for autonomy (Sexton & Bowman, 1985). Even if the choice of starting a business depends on a complex set of interactions between extrinsic and intrinsic motivation, intrinsic motivation can be regarded as a very important factor determining the behavior of independent individuals as entrepreneurs.

Interest is strongly dependent on the possibility of autonomy. We tend to lose interest if we perceive outside control. Interest is a psychological state characterized by strong concentration and a certain sense of enjoyment (Csikszentmihalyi, 1992). The direction of interest is highly personal and varies strongly between different individuals. It probably has
its background in the personal history of development. It is attached to an inborn ability and sensitivity, and the possibilities and support provided by the environment. Interest is a function of challenge and ability, which in its turn determines what is a moderately difficult challenge. It is important that the challenge can stimulate an activity where the individual has a good chance, but is not certain to succeed. Interest is also a prerequisite condition to a really creative contribution. The explanation is that creativity on a high level demands a great devotion to a certain kind of activity and one is not willing to do so if one does not feel a great interest for the activity (Sjöberg, 1994).

Interest probably plays a central role in entrepreneurial motivation. It is closely connected to central entrepreneurial concepts such as achievement, autonomy and creation. The study of interest is however still a virgin field in psychology and specific hypotheses are difficult to state. This part of the paper will therefore be exploratory.

Values

As stated in the introduction values are not qualities inherent in objects, but the criteria people use to select and justify actions and to evaluate people and events. In addition, the content of a value is the type of goal or motivational concern that it expresses. According to Schwartz (1992) there is a value structure that is universal in its content. Schwartz has distinguished 10 types of values that are likely to be recognized within and across cultures and used to form value priorities that guide us in our behavior. The 10 motivational types of values are:

**Self-Direction.** The goal of this value type is the possibility to choose, create, and explore independently.

**Stimulation.** This is the need for variety and stimulation to maintain an optimal level of activation.

**Hedonism.** The pleasure of satisfying one's needs, it is the pleasure or sensuous gratification for oneself.
Achievement. The need for personal success through the demonstration of competence according to social standards. This differs from McClelland's view of achievement motivation to meet internal standards of excellence. McClelland's definition is more closely related to self-direction values.

Power. Power values emphasize the attainment or preservation of a dominant position within a general system. Achievement values, on the contrary, focus on the active demonstration of competence in concrete interaction.

Security. Safety, harmony, stability of society, relationships, and of self are the motivational goals of this value type.

Conformity. The restrainement of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms.

Tradition. The respect, commitment, and acceptance of the customs and ideas that culture or religion impose on the individual.

Benevolence. The motivational goal is enhancement and preservation of the welfare of people with whom one is in frequent personal contact.

Universalism. The goal of universalism is understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.

The values represent all aspects of the content domain, and therefore fill almost evenly the geometrical space formed to represent the intercorrelations among them. This means that the values types can be ordered around a bipolar value dimension (Self-transcendence vs. Self-enhancement and Openness to change vs. Conservation). Conformity, tradition and security are grouped in the conservation dimension. Universalism and benevolence are grouped in the self-transcendence dimension. Openness to change is represented by self-direction and stimulation. Achievement and power are found in the self-enhancement dimensions. Hedonism is stuck in the middle between openness to change and self-enhancement. In sum, Schwartz argues that motivational differences be-
between value types can be seen as continuous rather than discrete. For practical reason (i.e., to examine differences in value priorities and to relate specific priorities to other variables) it is better to see them as discrete categories, but the precise locations of the partition lines are arbitrary, i.e., it is difficult to decide where one type of motivation ends and where another begins. The theory of value structure can be an important contribution to entrepreneurship research, since it gives us the possibility to form hypotheses about how the whole integrated system of value priorities relates to background, attitude, and behavior variables. All are assumed to be central aspects for research dealing with the behavior of the entrepreneur.

Method

The Sample

The sample was taken from Statistics Sweden register of all Swedish companies. Several restrictions were imposed. First, the sample was restricted to enterprises between 5 to 49 employees. The 1 to 5 employees class was not included because it contains a large part of part time enterprises. The classes above 50 employees were not included, since the actual effect of the entrepreneur’s behavior on the business probably diminishes with an increasing number of employees. Secondly, only certain industries were sampled (high tech, production, services, professional services). Thirdly, the sample was restricted to independent firms, i.e., firms that are not subsidiaries of other firms. The sample was stratified to ensure equal representation from different size classes and industries.

Of the 730 contacted entrepreneurs, 259 (35%) completed both a telephone interview and a follow-up mail questionnaire. The survey aimed to capture data, that according to theory and earlier empirical studies, might explain entrepreneurial and business performance. The first reason to use telephone interviews was the higher probability of a high response rate. The second reason was the large number of questions, the interview and mail questionnaire contained together 261 questions. A split was reasonable to keep up the respondent’s attention. The third reason was that the
telephone interview gave a possibility to check that the right person was interviewed. The data were collected during October -December of 1994.

Data on Interest

No validated and carefully developed measurement instrument was available for the measurement of job interests. Instead I had to construct my own instrument. A set of 18 variables measured interest. The respondent was asked to mark on a five point Likert scale how interested s/he was in a certain work task (e.g., marketing, personal development).

By mean of exploratory factor analysis (Kim & Mueller, 1978) the set of variables was reduced to five underlying factors. The fundamental assumption was of course that some underlying interest factors, which are smaller in number than the number of observed variables, are responsible for the covariation among observed variables. The factors were extracted by principal component analysis. To enhance the possibilities of meaningful identification of the factors, the matrix resulting from the principal component analysis was rotated. The simplest structure was achieved by an oblique rotation. The problem is that the rotated factors were no longer uncorrelated with each other, but on the other hand the interpretation of the factors was much more straightforward. The factor scores were standardized (mean = 0 and standard deviation = 1) and represent the entrepreneur’s estimated score on the factor. A positive factor score value indicates that the entrepreneur’s interest in a factor is above average. A negative value means that the entrepreneurs interest is below average. Further details on the instrument and the factor analysis are given in the appendix. The interpretation of the five identified interest factors is shown in Table 1.
### Table 3

**Interpretation of the factor analysis**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Interpretation</th>
<th>Score above average</th>
<th>Score below average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Supply and credits</td>
<td>The entrepreneur is <em>more</em> interested in supplies, contacts with the suppliers, and the credit management of the customers</td>
<td>The entrepreneur is <em>less</em> interested in supplies, contacts with the suppliers, and the credit management of the customers</td>
</tr>
<tr>
<td>2</td>
<td>Strategic management</td>
<td>The entrepreneur is <em>more</em> interested in innovation, planning for the future of the business and marketing plans</td>
<td>The entrepreneur is <em>less</em> interested in innovation, planning for the future of the business and marketing plans</td>
</tr>
<tr>
<td>3</td>
<td>Financial control</td>
<td>The entrepreneur is <em>more</em> interested in budgeting, financing, and bookkeeping</td>
<td>The entrepreneur is <em>less</em> interested in budgeting, financing, and bookkeeping</td>
</tr>
<tr>
<td>4</td>
<td>Market orientation</td>
<td>The entrepreneur is <em>more</em> interested in direct production, and <em>less</em> interested in customer relations</td>
<td>The entrepreneur is <em>less</em> interested in direct production, and <em>more</em> interested in customer relations</td>
</tr>
<tr>
<td>5</td>
<td>Human resources</td>
<td>The entrepreneur is <em>more</em> interested in personnel development and relation, in the board, and personal development</td>
<td>The entrepreneur is <em>less</em> interested in personnel development and relation, in the board, and personal development</td>
</tr>
</tbody>
</table>

### Data on Values

Values were measured with an established and well-validated measurement instrument. The instrument is a Swedish version of Schwartz' (1992) instrument. The instrument contains 56 value items. According to the definition of values as guiding principles in the individual's life, the survey asks the respondents to rate each value "as a guiding principle in my life", using the following nine point scale: of supreme importance (7), very important (6), (unlabeled; 5, 4), Important (3), (unlabeled; 2, 1), not important (0), opposed to my values (-1). Ratings were employed instead of ranking so that the information-processing capacities were not overtaxed. Rating also gave the possibility to measure "negative" values.
The reliability of the scales was tested with Cronbach’s alpha. The alpha coefficient for the ten scales varied between 0.79 and 0.64, which can be considered above average for value scales (Peterson, 1994). Further details on instrument and the scales are given in the appendix.

**Measuring Growth Willingness**

The dependent variable in this paper is the entrepreneur’s willingness to grow. In earlier studies, growth willingness was measured as the difference between the present size of the business and the optimal number of employees and/or turnover in a number of years ahead (cf. Davidsson, 1989, Kolvereid, 1992). In this study growth willingness was measured with an open-ended question about the entrepreneurs' business goals. The question was asked during the telephone interview and before the respondents had any information about the purpose of the interview. The advantage is that social desirability of the response was reduced and that the respondent had the freedom to express his or her goal in her or his words. For many business managers/owners growth is not a manifest and valued goal. A majority is ambivalent or has not considered the issue of growth. There is therefore an important methodological point to measure growth willingness as a goal among others with an open-ended question. The hope is that growth willingness is measured as a conscious choice by the entrepreneur, and not as an answer to please the interviewer. The answers were later combined into 13 classes of goals. Later during the interview, questions were also asked about optimal growth.

To simplify the data analyses the 13 classes of business goals were reduced to two categories. The first category contains entrepreneurs stating growth as a manifest and valued goal, and a second category of entrepreneurs with other goals than growth.

**Data Analysis**

Discriminant analysis was used to discriminate or separate growth oriented from non growth oriented entrepreneurs as clearly as possible based on differences in job interest and values. The basis for including a variable in the discriminant function was its ability to contribute to a better classification rule. There are several ways of interpreting the dis-
criminant function coefficients. In this paper the decision rule was based on a combination of the magnitude of the standardized coefficients and the pooled within-group correlation. In a perfect world where the independent variables are uncorrelated, the two selection criteria would yield the same coefficients. However, this was not the case here. Values were correlated with each other, and this affected the magnitudes and signs of the coefficients. Only a combined statistical rule could therefore yield a satisfying basis of interpretation. Since two-group discriminant analysis is analogous to multiple regression (in which the dependent variable is either 1 or 0, depending on the group to which a case belongs), explained variance ($R^2$) is also reported (Morisson, 1977; Tabachnick & Fidell, 1989).

The percentage of correctly classified cases is an index of the effectiveness of the discriminant function. When evaluating this measure, it is important to compare the observed classification rate to that expected by chance alone. In this two-group application (growth and non growth oriented) chance only, based on equal prior probabilities, will result in a classification rate of 50%.

For the best use of a discriminant function, certain assumptions must be met. The groups must be sampled from a multivariate normal population, and the population covariance matrices must be equal. Violations of the equality of the covariance matrices assumption were here measured by Box's M test. The test prime purpose is to determine if the covariance matrices are equal. A small probability might lead to the rejection of the null hypothesis that the covariance matrices are equal. Furthermore, the test is sensitive to departures from multivariate normality. If the normality assumption is violated, the test tends to label the matrices unequal (Tabachnick & Fidell, 1989). The entrepreneur's age was used as a control variable in all analyses.
Results

Interest

Table 2 displays the results from the discriminating function containing the five job interest factors. The unstandardized and standardized coefficients, and the pooled within-groups correlations are included. Here, standardized coefficients and correlations give the same information about the variables contribution to the discriminate function. This was mainly due to the factor analysis, which tries to generate uncorrelated factors.

Job interests and age effectively discriminated in 66.1% of the cases (adj. $R^2 = .08$). The factors are presented in descending order of importance, starting with the most powerful factor (market orientation), after the control variable age (i.e., younger entrepreneurs were more growth oriented). The same function without age correctly classified only 60.59% of the cases, and the explained variance dropped (adj. $R^2 = .03$). The interpretation is that growth oriented entrepreneurs were more interested in customer relations, and less interested in direct production than non-growth entrepreneurs. A positive score indicated that the entrepreneur was more interested in direct production, than in relations with customers. "Market orientation" was the outstanding most important discriminating factor between growth and non-growth oriented entrepreneurs. In second place was "Human Resources". Growth oriented entrepreneurs were more interested in personnel development and relations, in the board, and in personal development than non-growth oriented entrepreneurs. The third factor was "Supply and credits". The growth oriented entrepreneur were less interested in supplies, contacts with the suppliers, and credit management than was the non growth oriented entrepreneur. The contribution of "Strategic management" and "Financial control" was minimal, not to say non-existent. However, the tendency is worth a comment. Growth oriented entrepreneurs were more interested in strategic management and less in financial control than non growth oriented. Even if the ability to discriminate was minimal, the results were at least not counter intuitive.
Table 2
*The job interest relation to growth willingness*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unstandardized coefficient</th>
<th>Standardized coefficient</th>
<th>Correlation between the variables and the function (by size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.086</td>
<td>0.758</td>
<td>0.787</td>
</tr>
<tr>
<td>Market orientation</td>
<td>-0.613</td>
<td>-0.608</td>
<td>-0.637</td>
</tr>
<tr>
<td>Human resources</td>
<td>0.086</td>
<td>0.084</td>
<td>0.134</td>
</tr>
<tr>
<td>Supply and credits</td>
<td>-0.043</td>
<td>-0.043</td>
<td>-0.108</td>
</tr>
<tr>
<td>Strategic management</td>
<td>0.007</td>
<td>0.007</td>
<td>0.088</td>
</tr>
<tr>
<td>Financial control</td>
<td>0.007</td>
<td>0.007</td>
<td>-0.029</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Box’s M: 40.2, significance: 0.01
Percentage of "grouped" cases correctly classified: 66.1% (growth 68.5%; non growth 65.4 %) adj. R² = 0.08

In Table 3, only the entrepreneur’s age and "Market orientation " were retained. The function’s ability to classify was unchanged. There was even a small increase in the rate of correctly classified from 66.1 to 67.0. The results showed that financial control, strategic management, and human resources did not give any further valuable information to the function. The optimal function was based on differences in interest in market orientation, and the entrepreneur’s age.
Table 3

The modified interest-growth willingness model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unstandardized coefficient</th>
<th>Standardized coefficient</th>
<th>Correlation between the variables and the function (by size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.088</td>
<td>0.769</td>
<td>0.790</td>
</tr>
<tr>
<td>Market orientation</td>
<td>-0.619</td>
<td>-0.613</td>
<td>-0.619</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.060</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Box’s M: 8.19, significance: 0.045  
Percentage of "grouped" cases correctly classified: 67.0% (growth 68.5%; non growth 66.5 %) adj. $R^2 = 0.09$

To conclude, both functions performed slightly better than chance, and the most discriminating interest was "Market orientation" (i.e., if the entrepreneur enjoyed direct production or customer relations). However, the classification rate would probably drop if the model was applied on a different sample. A problem was the violation of the assumptions in both models. The small probabilities suggest that the covariance matrices were unequal. This could lead to a more poor performance of the discriminant function (i.e., a higher misclassification rate). The inference is usually robust, but classification is not because cases tend to be overclassified into groups with greater dispersion. The conclusion is that interference is reliable, but the actual classification rate may change.

Values

Table 4 displays the results from a discriminant function based on values. A major problem in this analysis was the multicollinearity of the independent variables. The reason is that the values are close in terms of contents, but they still give different sorts of information. This is in line with Schwartz’ theory of the relations among the motivational types of values and the bipolar value dimensions. The practical implication was that multicollinieraty affected the magnitudes and signs of the coefficients. The selection of variables was therefore based on prior theory and the effect on the classification rate of an extra variable.
The value function classification rate was 67.38% (adj. $R^2 = .07$) when all ten values and "Age" were included. The relation between values and growth willingness was rather weak. An important part of the variance was explained by age. An analysis performed without age correctly classified 60.52% of the cases (adj. $R^2 = 0.04$). The most important value variable was achievement. Growth oriented entrepreneurs valued personal success more than non-growth entrepreneurs. Growth oriented entrepreneurs emphasized the demonstration of competence to obtain social approval. Growth oriented entrepreneurs were not bound by tradition to the same extent as were non growth oriented. Furthermore, growth oriented entrepreneurs had a higher need for variety and stimulation in order to maintain an optimal level of activation. They did not value the preservation and enhancement of the welfare of people. They also valued power more than non growth entrepreneurs, and security was less valued. The following values (hedonism, self-direction, conformity, and universalism) gave a small contribution and were also difficult to interpret. Growth oriented entrepreneurs valued hedonism less, self direction more, conformity less, and universalism more than non growth oriented entrepreneurs. The directions of the relations were not counter intuitive.
Table 4

Values and growth willingness model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unstandardized coefficient</th>
<th>Standardized coefficient</th>
<th>Correlation between the variables and the function (by size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.088</td>
<td>0.786</td>
<td>0.771</td>
</tr>
<tr>
<td>Achievement</td>
<td>0.081</td>
<td>0.341</td>
<td>0.323</td>
</tr>
<tr>
<td>Tradition</td>
<td>-0.37</td>
<td>-0.275</td>
<td>-0.290</td>
</tr>
<tr>
<td>Stimulation</td>
<td>0.030</td>
<td>0.126</td>
<td>0.213</td>
</tr>
<tr>
<td>Benevolence</td>
<td>-0.072</td>
<td>-0.477</td>
<td>-0.211</td>
</tr>
<tr>
<td>Power</td>
<td>0.033</td>
<td>0.212</td>
<td>0.196</td>
</tr>
<tr>
<td>Security</td>
<td>-0.023</td>
<td>-0.146</td>
<td>-0.115</td>
</tr>
<tr>
<td>Hedonism</td>
<td>-0.097</td>
<td>-0.282</td>
<td>-0.097</td>
</tr>
<tr>
<td>Self direction</td>
<td>-0.019</td>
<td>-0.086</td>
<td>0.074</td>
</tr>
<tr>
<td>Conformity</td>
<td>0.058</td>
<td>0.229</td>
<td>-0.015</td>
</tr>
<tr>
<td>Universalism</td>
<td>0.054</td>
<td>0.504</td>
<td>0.002</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.408</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Box’s M: 63.70, significance: 0.721
Percentage of ”grouped” cases correctly classified: 67.38% (growth 62.5%; non growth 68.9 %) adj. $R^2 = 0.07$

Table 5 displays the results of a modified value function. The remaining variables were achievement and age. The other value types were eliminated and they did not have an severe impact on the function’s classification rate. The estimation of a single variable’s contribution to the function was problematic. Due to the high multicollinieraty, the magnitude of the impact of a variable was unstable. Stimulation, benevolence, hedonism, conformity, and universalism were ranked differently depending on if standardized coefficients or correlations were used to assess the importance of a single variable. For example, stimulation was correlated with achievement, and benevolence was correlated with tradition. This made it difficult to find one optimal function. Several combinations of variables yielded similar classification rates, and gave possible solutions. The function presented in Table 5 was, however, the simplest with only two independent variables.
Table 5
*The modified values and growth willingness model*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unstandardized coefficient</th>
<th>Standardized coefficient</th>
<th>Correlation between the variables and the function (by size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.103</td>
<td>0.918</td>
<td>0.936</td>
</tr>
<tr>
<td>Achievement</td>
<td>0.083</td>
<td>0.351</td>
<td>0.398</td>
</tr>
<tr>
<td>Constant</td>
<td>-6.423</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Box’s M: 2.73, significance: 0.442
Percentage of "grouped" cases correctly classified: 61.97% (growth 64.3%; non growth 61.2 %) adj. R² = 0.07

The problem of the value model was multicollinearity, which affected the stability of the coefficients. The problem lay in the data and not in the model, i.e., these were important contributing variables but the actual magnitude of the coefficients was difficult to measure, because many of the variables gave more or less redundant information. On the other hand, the assumptions for discriminant analysis seemed to be fulfilled here (Box’s M; p = 0.442). The classification must therefore be seen as more robust than in the interest case.

*The Combined Model*

Table 6 displays the final combined model of value and interest, or the preference model. The only remaining interest factor was market orientation, but it was also the most important of the included independent variables. The included value variables were benevolence and universalism. The classification rate of the preference model was 67.4% (adj. R² = .10), which was a minimal increase compared to the previous models. A function containing age, market orientation, and the achievement value discriminated 66.52% of the cases correctly. (adj. R² = .09). This function performed somewhat worse than when only age and interest was included, and was statistically unstable compared to the chosen function in Table 6.
In the theoretical discussion, I argued that values and interest formed the preferences used to make choices, therefore I also tried to find interactions between value and interest variable. It was supposed that a preference variable was a product of job interests and values. Stated differently, a variable measuring what an entrepreneur perceived as both interesting and valuable should predict better than a variable only measuring interest or value. However, I did not find that interaction variables added significantly to the model. Therefore, a simple additive model was retained.

Table 6
*The combined interest and value model*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unstandardized coefficient</th>
<th>Standardized coefficient</th>
<th>Correlation between the variables and the function (by size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.082</td>
<td>0.714</td>
<td>0.702</td>
</tr>
<tr>
<td>Market orientation</td>
<td>-0.607</td>
<td>-0.610</td>
<td>-0.588</td>
</tr>
<tr>
<td>Benevolence</td>
<td>-0.086</td>
<td>-0.536</td>
<td>-0.222</td>
</tr>
<tr>
<td>Universalism</td>
<td>0.051</td>
<td>0.456</td>
<td>0.047</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.719</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Box’s M: 15.10, significance: 0.145
Percentage of "grouped" cases correctly classified: 67.41% (growth 62.3%; non growth 69.0 %) adj. $R^2 = 0.10$

The strength of this model was not an increase in explained variance and classification correctness, but that it compared to the early ones met the assumptions for discriminant analysis. The multicollinearity problem was not as important as in the previous value model where the included variables were ranked differently. Both the standardized variable and correlation now ranked the variable in the same order. This was only a small increase from the previous models due to the combination of job interest and motivational value types.

The final results from of this section were that interests and values had an impact on growth willingness, and that it was possible to discriminate the two categories based on these independent variables. The present model
did perform better than chance (67.4% classification rate compared to 50%) and was statistically more robust than previous models. However, the influence of values and interest was rather small, especially for values.

Discussion

Interests and values can partly explain why some entrepreneurs chose to grow their enterprises and others do not. However, the effect was not impressive. The important contribution to research on entrepreneurial behavior was that choice in motivation was not only a process determined by cognitive representation of reality, but also of the affective value given this representation. Entrepreneurs are not only more or less able information processors; they are emotional people and this has an effect on their motivation and subsequently on their behavior. The effects of values and interests were strongly mediated by the age of the entrepreneur. Younger entrepreneurs were more growth oriented than older entrepreneurs.

The most important interest factor was market orientation. Growth oriented entrepreneurs were more interested in customer relations than in the direct production. Growth is then not in conflict with what the entrepreneurs find interesting or enjoy as a work task. On the contrary, growth means an increase in customer relations, and growth is therefore favored. Non growth oriented entrepreneurs were apparently not interested in growth, because it will not have a positive effect on what they enjoy most, i.e., working in the direct production. Growth would mean an increased management load and less time for practical production work. Growth is therefore not a favored choice. Summing up, it is important to note that the concept of job interest seems to be important to growth willingness, and should not be overlooked in the future, especially since it is closely connected to concepts such as enjoyment, commitment, and creativity. Concepts that are central to the understanding of entrepreneurial behavior.

In the value only model, achievement was the only significant variable beside age. Relating to Schwartz’ bipolar dimension the growth oriented entrepreneurs were looking for self-enhancement and were open to
change. Growth oriented entrepreneurs were in a sense more egois-
tic/individualistic than non growth oriented entrepreneurs. Growth was a
favored alternative, because the process of developing a business was
seen as a possibility to achieve personal success through the demonstra-
tion of competence. However, in the combined model, achievement was
not included. Benevolence and universalism proved to be somewhat more
important. Growth oriented entrepreneurs did not especially value preser-
vation and enhancement of welfare of people with whom one is in fre-
quently contact. On the other hand, they were open minded and valued tol-
erance, understanding of all people and for nature. Apparently, they val-
ued competition in the immediate surroundings, but were also eager to
understand and protect people.

The results from the preference model indicated that the subject of
growth as business goal was far more complex than a linear relation be-
tween values, job interests, and growth willingness. Values and interest
could only explain a minor part of variance. The use of interaction vari-
ables did not increase the classification rate. A normal additive model
was equally good. The decision to expand the venture is dependent on
more variables than job interests and values. An example is the relation
between intrinsic and extrinsic motivation. It is possible that the different
groups value intrinsic and extrinsic motivation differently, e.g., the ex-
trinsic motivation is more important for growth oriented entrepreneurs
and vice versa. Furthermore, the perception of the actual situation may
influence the growth decision. Further research should therefore be di-
rected to measure a wider range of different variables as situation char-
acteristics, extrinsic motivators, and attitudes to growth. To conclude, the
main result is that the affective representation of reality plays an impor-
tant role, but it is only one of several factors affecting entrepreneurial
growth willingness.
References


APPENDIX

Values

A total of 56 values aimed at capturing the ten motivational value types analyzed in this paper were included in the questionnaire. A few values were not used in the scale due to low intercorrelation. For the complete list of values, see Schwartz (1992).

**Power** (theoretical range = (-5) - 35; Cronbach’s Alpha = 0.71)
1. Social power (control over others, dominance)
2. Wealth (material possessions, money)
3. Social recognition (respect, approval by others)
4. Authority (the right to lead and command)
5. Preserving my public image (protecting ”my face”)

**Achievement** (theoretical range = (-4) - 28; Cronbach’s Alpha = 0.73)
1. Successful (achieving goals)
2. Intelligent (logical, thinking)
3. Capable (competent, effective, efficient)
4. Ambitious (hardworking, aspiring)

**Hedonism** (theoretical range = (-2) -14; Cronbach’s Alpha = 0.60)
1. Enjoying life (enjoying food, sex, leisure, etc.)
2. Pleasure (gratification of desires)

**Stimulation** (theoretical range = (-3) -21; Cronbach’s Alpha = 0.78)
1. An exciting life (stimulating experiences)
2. A varied life (filled with challenge, novelty, and change)
3. Daring (seeking adventure, risk)

**Self-direction** (theoretical range = (-5) -35; Cronbach’s Alpha = 0.70)
1. Curious (interested in everything, exploring)
2. Choosing own goals (selecting own purposes)
3. Creativity (uniqueness, imagination)
4. Self-respect (belief in one’s worth)
5. Freedom (freedom of action and thought)

<table>
<thead>
<tr>
<th>Universalism (theoretical range = (-9) - 63; Cronbach’s Alpha = 0.78)</th>
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</thead>
<tbody>
<tr>
<td>1. Equality (equal opportunity for all)</td>
</tr>
<tr>
<td>2. Inner harmony (at peace with myself)</td>
</tr>
<tr>
<td>3. A world at peace (free of war and conflicts)</td>
</tr>
<tr>
<td>4. Unity with nature (fitting into nature)</td>
</tr>
<tr>
<td>5. Wisdom (a mature understanding of life)</td>
</tr>
<tr>
<td>6. A world of beauty (beauty of nature and of the arts)</td>
</tr>
<tr>
<td>7. Social justice (correcting injustice, care of the weak)</td>
</tr>
<tr>
<td>8. Broad-minded (tolerant to different ideas and beliefs)</td>
</tr>
<tr>
<td>9. Protecting the environment (preserving nature)</td>
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<thead>
<tr>
<th>Tradition (theoretical range = (-6) - 42; Cronbach’s Alpha = 0.69)</th>
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<tbody>
<tr>
<td>1. Respect for tradition (preservation of time-honored customs)</td>
</tr>
<tr>
<td>2. Detachement (from worldly concerns)</td>
</tr>
<tr>
<td>3. Moderate (avoiding extremes of feeling and action)</td>
</tr>
<tr>
<td>4. Humble (modest, self-effacing)</td>
</tr>
<tr>
<td>5. Accepting my portion of life (submitting to life’s circumstances)</td>
</tr>
<tr>
<td>6. Devout (holding to religious faith and belief)</td>
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<thead>
<tr>
<th>Benevolence (theoretical range = (-7) - 49; Cronbach’s Alpha = 0.79)</th>
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</thead>
<tbody>
<tr>
<td>1. Mature love (deep emotional and spiritual intimacy)</td>
</tr>
<tr>
<td>2. True friendship (close, supportive friends)</td>
</tr>
<tr>
<td>3. Loyal (faithful to my friends, group)</td>
</tr>
<tr>
<td>4. Honest (genuine, sincere)</td>
</tr>
<tr>
<td>5. Helpful (working for the welfare of others)</td>
</tr>
<tr>
<td>6. Responsible (dependable, reliable)</td>
</tr>
<tr>
<td>7. Forgiving (willing to pardon others)</td>
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<thead>
<tr>
<th>Conformity (theoretical range = (-3) - 21; Cronbach’s Alpha = 0.65)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Politeness (courtesy, good manners)</td>
</tr>
<tr>
<td>2. Self-discipline (self-restraint, resistance to temptation)</td>
</tr>
<tr>
<td>3. Honoring of parents and elders (showing respect)</td>
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<thead>
<tr>
<th>Security (theoretical range = (-6) - 42; Cronbach’s Alpha = 0.72)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sense of belonging (feeling that others care about me)</td>
</tr>
</tbody>
</table>
2. Social order (stability of society)
3. National security (protection of my nation from enemies)
4. Reciprocation of favors (avoidance of indebtedness)
5. Family security (safety of loved ones)
6. Clean (neat, tidy)

Interest factors

- Input: 18 variables
- Criteria: Eigen value > 1.0
- Kaiser-Meyer-Olkin-test = 0.739
- Bartlett test of Sphericity = 1255.85, significance = 0.000
- Cumulative explained variance, 5 factors = 60.0%

Factor 1: Supply and credits (eigen value = 4.44, explained variance = 24.6 %)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factor loading</th>
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<tbody>
<tr>
<td>Supply</td>
<td>0.768</td>
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<tr>
<td>Contacts with the suppliers</td>
<td>0.762</td>
</tr>
<tr>
<td>Credit judgment</td>
<td>0.641</td>
</tr>
<tr>
<td>To calculate offers</td>
<td>0.631</td>
</tr>
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</table>

Factor 2: Strategic management (eigen value = 2.06, explained variance = 11.4 %)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factor loading</th>
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<tbody>
<tr>
<td>Development of new products and services</td>
<td>0.771</td>
</tr>
<tr>
<td>Strategies for the future</td>
<td>0.766</td>
</tr>
<tr>
<td>Marketing plans</td>
<td>0.578</td>
</tr>
</tbody>
</table>
Factor 3: Financial control (eigen value = 1.68, explained variance = 9.3 %)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factor loading</th>
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<tbody>
<tr>
<td>Budgeting</td>
<td>-0.733</td>
</tr>
<tr>
<td>Financial results</td>
<td>-0.722</td>
</tr>
<tr>
<td>Financing</td>
<td>-0.617</td>
</tr>
<tr>
<td>Bookkeeping</td>
<td>-0.606</td>
</tr>
</tbody>
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Factor 4: Market orientation (eigen value = 1.42, explained variance = 7.9 %)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factor loading</th>
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</thead>
<tbody>
<tr>
<td>Sales</td>
<td>-0.744</td>
</tr>
<tr>
<td>Contacts with customers</td>
<td>-0.667</td>
</tr>
<tr>
<td>The direct production</td>
<td>0.389</td>
</tr>
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</table>

Factor 5: Human resources (eigen value = 1.20, explained variance = 6.7 %)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of the personnel</td>
<td>-0.813</td>
</tr>
<tr>
<td>Contacts with the personnel</td>
<td>-0.795</td>
</tr>
<tr>
<td>Personal development</td>
<td>-0.675</td>
</tr>
<tr>
<td>Board</td>
<td>-0.569</td>
</tr>
</tbody>
</table>
Study 3:
THE DETERMINING FACTORS OF THE ENTREPRENEURS’ FORECASTS OF THEIR BUSINESS DEVELOPMENT: AN ATTRIBUTION THEORY PERSPECTIVE

Frédéric Delmar
&
Anita Lignell Du Rietz
The Determining Factors of the Entrepreneurs' Forecasts of Their Business Development: An Attribution Theory Perspective

Frédéric Delmar and Anita Lignell Du Rietz
Stockholm School of Economics

Abstract
The purpose of this paper is to analyze the psychological factors that affect small business managers' ability to predict their future performance. A theory of motivation and emotion is proposed in which causal attribution plays a central role. It is assumed that the perceived causes of success and failure affect motivated behavior.

Results from this study are exploratory, but indicate that the successful and failing small business managers differed in their ability to predict performance. This was mainly due to changes in the situation and not to personality, since these differences decreased when the general economy improved. Independent of small business managers' level of success, they were unable to predict negative outcomes. Results also show that failing small business managers attributed their situation to external causes (i.e., not depending on their behavior). It is argued that this incapacity to accurately assess future performance is not an information processing flaw but in part a valuable human resource.

Introduction
A common problem for actors dealing with small business and business venturing is the reliability of forecasts made by the entrepreneur. The topic is of special interest because it is often one of the few information sources available to the concerned economic agents (e.g., bankers, venture capitalist, consultants). In this paper we will focus on the entrepreneur’s ability to forecast the development of his or her business. The

3 The survey was financed by the Stockholm Handicraft Association, an association for small business in handicraft and service.
starting point in this paper is that in an economic crisis, successful and failing entrepreneurs differ in their ability to predict future outcomes. Successful entrepreneurs are able to accurately evaluate future performance, while failing entrepreneurs are not able to accurately forecast their future performance. The purpose of this paper is to suggest some psychological factors affecting entrepreneurs’ forecasting reliability. More precisely, we will try to explain why differences in construed causes for perceived success or failure affect the entrepreneurs' ability to predict performance, i.e., how do success and failure affect the goal expectancies of entrepreneurs and how performance predictions change with the business fluctuations.

Following this introduction we will discuss the central concept of performance prediction and related concepts. In part three, the theoretical frame of reference is presented. We consider performance prediction to be an attribution problem, i.e., how the entrepreneur explains his or her present situation and how this affects expectations. This part is then followed by a presentation of our method and results. A conclusion and discussion section finishes this paper.

**Concepts Related to Performance Predictions**

The prediction of performance is the estimation of how well one expects to do in a future task. For any given performance prediction, the criterion outcome is the person’s subsequent level of performance on the task. Henry (1994) argues that performance predictions differ from most predictive judgments and decisions investigated in the past in that the criterion is to a certain extent under the individual’s control.

Performance predictions are conceptually distinct from (a) self-set goals and (b) self efficacy judgments, behavioral self-predictions, and intentions. Goals represent the intended level of performance the individual is striving for, and they have as a consequence motivating properties. Performance predictions are supposed to represent the accurate level of performance and are assumed not to have motivating properties. The individual’s belief about how well he or she can do is represented by self-efficacy judgments. Behavioral self-predictions and intentions relate to
upcoming behavior instead of the outcome of those behaviors (Henry, 1994).

These conceptual distinctions between different types of performance related statements are of theoretical importance, but in everyday usage they are difficult to distinguish from one another. In other words, it can be difficult to differentiate a realistic performance prediction from intentions or goals. This is especially true in achievement contexts where the actors are emotionally and often financially attached to the outcome of the task. If we want to understand and use data from performance predictions, it is therefore relevant to try to understand how and why these actors perceive their environment the way they do and how perception will affect the expectancies about the future. Only then can we accurately assess and use performance predictions.

**Attribution of Success and Failure**

Small business management is an achievement context where the entrepreneur has to achieve certain goals to survive. Why entrepreneurs choose to act in a specific way and why they choose certain goals instead of others are choices that from a psychological point of view is depending on motivation. Motivation theories of success and failure have a long-standing tradition in entrepreneurship research (e.g., McClelland, 1961), mainly concentrating on stable entrepreneurial traits rather than trying to explain how motivation changes over time and with the perceived situation. Unfortunately, trait psychology has several shortcomings and has proved of little use to understand motivation and performance. A personality trait cannot alone explain behavior. There are typically many determinants of an action, some are located inside the person (e.g., moods, emotions, traits, attitudes); others are located in the environment (e.g., task difficulty, interpersonal relations). This complexity has to be accounted for when studying motivation. A theory that attempts to deal with this complexity is attribution theory. This approach is especially interesting considering the focus on attribution of success and failure in achievement motivation.

Attribution theory is a social psychological theory studying the causal attribution made by people in order to explain and understand their own
performance and the performance of others. The theory is not focusing on the validity of different construed causes but instead on the cognitive processes involved in attribution. The primary concern is the perception of causality, or the perceived reasons of the outcome of a particular event. Attribution theory can therefore be seen as a cognitive choice theory. Theories in this paradigm focus on cognitive processes involved in decision making and choice. The theoretical roots are to be found in Expectancy x Value theories, which assume that expectancies of future events direct motivated behavior and that we try to maximize or satisfy positive outcomes. Weiner (1991) points out that attribution theory goes one step further in assuming that there is a second motive force known as mastery behavior or competence seeking. The two fundamental principals of action or motivated behavior are (a) hedonism (pleasure-pain), and (b) the understanding of the environment and of oneself.

Attribution phenomena influence behavior through their effects on expectancies. Emphasis is also placed on the diversity of affective states stemming from distinct attribution patterns. The original model focuses on the causal explanation persons make about past behavior. People are supposed to explain their behavior in terms of four causal categories: effort, ability, task difficulty, and luck. The four categories are then distinguished along two dimensions of control and stability. Internal control explanations are represented by effort and ability attributions, and external control explanations are represented by task difficulty and luck. Effort and luck are considered as internal and external unstable causes, respectively. Ability is an internal stable cause, and task difficulty an external stable cause (Kanfer, 1990).

The attribution position is that the stability of a cause, rather than locus of control (cf. Rotter, 1966) determines shifts in expectancies. Failure attributed to unstable causes (i.e., effort and bad luck) has been shown to be positively correlated with higher expectations for subsequent performance. On the other hand, attributions to stable causes (i.e., ability and task difficulty) following failure are associated with lower expectations for future performance. The alleged reason is that when prior failure is seen as due to unstable causes, it will be viewed as easier to overcome in the future than failure due to stable causes, and thus likely to have a less de-
pressing effect on anticipation of future performance. When encountering task success, attributions to stable causes enhance future performance expectancies; attributions to unstable causes tend to lower performance expectancies. The reason is that prior success perceived as due to stable causes is viewed as having a greater possibility of being repeated than success due to unstable causes. Stable factors are perceived as more probable to continue in the future than unstable ones. To summarize: the attribution position can account for the observed typical and atypical shifts in chance as well as in skill settings.

Weiner (1985) has further expanded the concepts of attribution by incorporating emotion and motivation, and has revised the dimensional structure underlying causal explanation (Kanfer, 1990). The basic model has two dimensions: stability (stable-unstable) and locus (internal-external). The locus dimension caused, however, some problems since a cause might be internal yet uncontrollable, such as musical aptitude. For example, if a music student attributes failure to poor aptitude, then the performance is perceived as determined by skill and ability. According to Rotter (1966), this indicates that the outcome is perceived by the student as subject to internal control. Yet a genetically determined aptitude will not be perceived as controllable by a failing music student. As a consequence, confusion is evident in the Rotter one-dimensional taxonomy. Locus and control, and not locus of control, describe causal perception. The basic locus dimension is divided into the controllability dimension and the locus of causality dimension. Weiner has, further, linked value to the affect elicited following a goal-directed activity. Expectancy and affect are presumed to determine action. Weiner states that the affect/emotion of pride and feelings of self-esteem are associated with the locus dimension of causality. Anger, gratitude, guilt, pity, and shame are related to the controllability dimension. Feelings of hopelessness (hopefulness) are connected with causal stability.

Andersson (1991) and White (1991) criticized the attribution-model by questioning the existence of causal categories and dimensions, and especially the stability dimension. White found that people have difficulties to distinguish causes as internal or external and that they prefer to reason in terms of intentional and conscious causes. Anderson found that people
typically think in categorical terms and these categories have inherent characteristics as, e.g., stable/unstable, or controllable/uncontrollable. Categories are more important than dimensional thinking because less cognitive effort and time are needed. Therefore, people think in categories when trying to understand everyday life. Dimensional thinking is only applied in difficult or unusual situations when cognitive demands are higher. The most important dimensions are locus of causality and controllability, and not stability. This does not mean that the attribution model is inadequate, it only means that people in general think in categories, and if needed the ascribed cause is further analyzed as, e.g., internal/external or controllable/uncontrollable. What Anderson is actually stating is that in well-known situations we use categorical thinking, and in new unknown situations we go one step further in trying to fit a perceived cause in different dimensions. These findings have been confirmed in later research where attribution is studied in dynamic settings (Thomas & Mathieu, 1994).

To conclude, attribution theory is robust, and the theory can probably be applied to explain behavior in business environment. Based on this review, the following research propositions can be stated. When failing or successful small business managers attribute the business failure or success to unstable, uncontrollable and external causes they will probably alter their goal expectancies and they will predict a different outcome than the present. On the other hand, if successful or failing small business managers attribute the business success or failure to stable, controllable and internal causes they will expect an outcome in the same direction in the future.

Method

The Sample

Statistics Sweden is the official authority providing the most complete data base of Swedish firms and companies. From this data base a population has been created, consisting of all firms having between one to five employees in the local community of Stockholm. During the first half of the 90's the population counted approximately 17,000 firms.
A telephone survey was performed in September 1992, 1993, 1994 and 1995. A stratified random sample of about 450 firms was drawn from the population, a procedure repeated every year. That is, a new sample was drawn every year. Approximately one hundred firms were not included in the sample because they did not fit the definition (e.g., the firm had more than five employees, the firm was no longer independent). From those left about 300 participated in the survey and the rest refused for one reason or another. The mean response rate was 81% with a standard deviation of 5%. The respondent was the owner of the company or the managing director (often the same person). Demoskop, a Swedish market research company performed the survey.

Every firm was classified with a SNI code; a Swedish code standard based on the second revision of SITC system (the UN statistical classification). For the purposes of this paper the firms were further classified in three different broad industries:

1. Production: including manufacturing, construction, mining, electricity, gas and water service.
2. Commerce; including wholesale and retail trade, restaurants and hotels, transport, storage and communication.
3. Services; including financing, insurance, real estate and business services, cultural services and domestic services.

**Data on Profitability**

All firms were classified into two classes according to how the respondent perceived the profitability at time of the inquiry. The respondent was asked to estimate the actual situation of the firm with a four point Likert scale (The present profitability is very good- We are running at a loss). The respondents who had marked the firm as having very good or satisfying profitability formed group A. The rest, those who had marked less satisfying profitability or "we are running at a loss" constituted group B. Group A increased from 160 firms 1992 to 161 firms 1993, 184 firms 1994 and 1995 to 206 firms. Group B decreased from 144 firms 1992 to 138 1993, 114 firms 1994 and 1995 to 105 firms. The number of non-profitable firms diminished during the studied period, indicating a posi-
tive economic development. As background variables we used the size of the firm, the industry branch and starting year of the firm for the two classes respectively.

Data on Actual and Expected Performance

The respondents were asked how they perceived the development of the enterprise during the last twelve months and to predict the development during the twelve forthcoming months. These forecasts were compared with the corresponding outcome perceived at the next survey. The surveys consisted exclusively of self-report data and not financial records. We are here dealing with how the perception of causality affects the goal expectancies, and not on the validity of these causes. The perception by the respondent was therefore the focus, and financial records were not always available. Anyway self-report data on performance have been shown to have good validity (see Chandlers & Hanks, 1993).

The respondents also had to forecast the economic development/performance of the country, of the industry branch and their own business enterprise. The surveys consisted of a five point Likert scale (improved strongly-deteriorated rapidly). Small business performance was measured with different variables that were combined into a "Small Business Performance Index":

1. Demand: defined as the expected number of orders, commissions and assignments.
This is an anticipatory variable whose expected future constellation forms the basis of business plans. From the surveys of Anderson and Strigel (1981) we know that the proportion of surprising changes in demand is comparatively high at the beginning of the adjustment process to a change in the business cycle.

2. Production: defined as the firm’s expected turnover or sales with adjustment for the inflation rate. It is an intermediate variable, showing the existing trade-off between the demand and supply forces within the operating enterprise. Analyses show that production forecasts depend primarily on the previous expected trend in demand (orders) and the previous or planned trend in production.
3. Employment: defined as the expected amount of working hours with ordinary and extra hired staff as well as services bought from outside the firm. This is an instrumental variable, whose future values are planned by the owner of the firm, and it is often lagged compared to general economic development. It is the last variable to follow changes in the general economy.

Net values, or net tendencies, were formed to assess how group A and B answered. A net tendency is the difference between the weight proportions of firms reporting an improvement or a deterioration for the variable in question. Net tendencies indicate the direction and strength of the change occurred or planned. It is the method recommended by OECD to measure changes in a business cycle with qualitative indicators (Leyland, 1977).

Data on Attribution

In 1995 we were able to test our hypotheses that the entrepreneurs’ attribution processes determined the performance prediction. Attribution theory is based on three central dimensions of (1) locus (i.e., internal or external to the individual), (2) control (i.e., can the cause be controlled or not), and (3) stability (i.e., how stable is the cause over time).

Respondents were first asked to state the most important cause to their present situation. Since we were working with small firms, it was assumed that causes related to the firm were labeled internal (e.g., quality, prices, business concept). Causes related to the environment were labeled as external (e.g., economic situation, taxes, interest rates, competition). The respondents were asked if they could possibly change their performance in the future and how long it would take. These two questions that were related to locus and control formed an indication of stability. That is, if an entrepreneur perceived a cause as being under his or her control and changeable, then the cause is not stable over time.
Analysis

The null hypothesis has been formulated as follows: means on prediction from the two profitability groups (group A the profitable firms and group B, firms running at a loss) would not differ as long as they belong to the same subpopulation. The analysis was limited to data from only four consecutive time periods. In order to test the research question we have used an ordinary t-test, and if not stated otherwise the differences between the groups are significant at least at the 10% level.

Results

The two groups have been tested against background variables as: the business age, size and industry. The differences in age were not significant. The industry variable gave significant values ($p$ varying between 0.01 and 0.025). Firms from group A were over-represented in services and there were significantly more firms from group B in commerce and in manufacturing. The business size did not yield any significantly differences. To conclude, the more profitable small firms were more frequent in the service industry in relation to the less profitable firms.

Bearing this in mind, we concentrated first on differences in prediction between the firm and the economic development. The purpose was to assess the relation between firms expectancies and expectancies for the external environment, and how this relation affected prediction. Secondly we focused on the prediction and differences in the two groups. The purpose was to assess how differences in perceived performance affected future performance, and what the outcome was. Thirdly, differences in causal attribution between the two were examined. The purpose was to examined if there was any differences in attributed causes between the two groups.

Differences in Country, Industry, and Firm Predictions

Entrepreneurs base their future strategy on the firms actual outcome and expectancies for the firm and its environment. External factors therefore play a vital role, such as expected economic growth in the industry and in the whole economy. The reluctance to support firm expansion cannot only be explained by an unfavorable development if the entrepreneurs
lack confidence in the future economic and political development. However, Nerb & Strigel (1978) showed from 1 300 responses by small business enterprises in various countries that business owner-managers passing a favorable judgment on the general business climate in their country also were more favorable regarding the future development of their own business. How does the anticipated development outside the business influence the two different groups in our sample? Net tendencies are shown in figure 1:

Figure 1. The predicted economic development of Sweden, the industry and the firm for the period of 1992 to 1994 measured in net values. The figure shows the prediction of the development made by group A (successful) and group B (failure)

There was a difference in level of optimism between the groups, where group A was more optimistic than group B, i.e., the average net value was higher for group A than for group B. Furthermore, the two groups showed different patterns over time. Group A apparently judged the firm differently from the industry and country development. Except for 1992, group A was relatively less optimistic about the development of the firm compared to the industry and country.
If group A judged the development for the country, industry, and firm with different weights, Group B on the other hand saw the development of the industry and the economic development as parallel. The development of the industry and the economic development followed the same tendency, and the curves soared upward to drop back in 1995. Except for 1993, group B expected the firm to perform better than the rest of the economy. To sum up, the figure indicates that group B was more optimistic for their firm than the general economy, and that they perceived the general economic development in the same way as the industry development. Contrary to group A that predicted the categories differently, group B probably used the same cues to predict the development of the three categories with only a difference in degree. Differently stated, group B assumed that the three categories would follow the same development, but with a difference in degree.

In brief, there was a difference in optimism between group A and B concerning the firm’s development in relation to the industry and the country. Group A had a higher level of optimism than group B, but group A was more pessimistic about the firm’s development compared to the industry and country. Group B was always more optimistic about the firm’s future than the future of the country and industry. This pattern was reinforced when studying the extremely successful and failing members of the sample. This was probably due to a difference in the perception of the situation. Members of group B being in a perceived failure or loss situation had to protect their self-esteem by stating that they could turn around the situation into a success. Group A, on the contrary, was from the beginning in a more positive situation; a relative improvement in performance was comparatively more difficult to achieve than going from failure to success and was furthermore threatened by the uncertainty of the country’s development. As a consequence, Group A was more pessimistic, concerning future demand, in relation to earlier outcomes.

**Differences in Performance Predictions**

The major difference between the two groups was the perception of profitability, where A was profitable and B not profitable. We have seen that this perception affected the prediction of the economic development, but
how can this difference in performance perception affect the ability to predict the future performance of the firm? We are here focusing on three different performance measures; demand, production, and employment. These performance indicators are important to study separately, because they are \textit{a priori} more or less sensible to the different phases of business fluctuations.

The development for 1992 to 1995 is shown in figure 2. It is important to remember that during the period investigated, the Swedish economy recovered from an important economic recession. The responses mirrored that development. The tendency to be noticed from the figures was the differences in optimism between the two groups.
Figure 2. Differences in actual and predicted performance for the period 1992-96, predictions and actual outcomes are shown for demand, production, and employment. The solid paths represent the changes in performance (net values). The dashed arrows represent the performance prediction made by the groups.

In this sample, there were no significant differences between the three performance variables as supposed by Anderson & Strigel (1981). This was probably due to the short period studied. We did however find interesting differences in performance prediction between the two groups.
Group A was, in relation to the outcome, less optimistic than group B and even pessimistic concerning the future performance of the firm. Group B was on the contrary always overoptimistic about the future performance compared to the actual outcome for the group. Focusing on a single year the interpretation would be that group B’s overoptimism was one of the reason they were performing poorer than group A. Group A was more realistic about its possibilities and was acting in accordance with them. One reason was that it was relatively more difficult to rapidly improve the performance of a business which was already successful as compared to when it was failing. This effect created a cognitive resistance to overoptimism for group A. Group B’s overoptimism would instead yield a behavior not in accordance with the environment, and as a consequence poorer performance in relation to the prediction. The difference in performance could thus be ascribed to the entrepreneur’s personality (i.e., the trait of overoptimism) and not to the situation. Focusing on the development over time we had to reconsider the individual trait explanation. As the economy improved, the number of small business manager/owners performing poorly diminished and the predictions of group A and B was almost the same for 1995 and for 1996. The tendency was a rapprochement between the two groups, when the general economy turned up. The conclusion was that the perceived situation, affected the future goal setting rather than the individual’s personality. This is in line with attribution theory.

However, the net tendencies only reveal the direction of the change. When we analyzed the percentage of firms having an expansive development or a decreasing development an interesting pattern appeared in the aggregated index for the three indicators (measured as mean values for four years). In this index there was a significant difference between the two groups, both in the anticipated changes and actual changes. The forecasting performance seemed to be best in group A and in the subgroup making increases. All other groups seemed to fail the anticipation test. The expanding firms in group A could better anticipate the future, and the rest of the firms were less able. In order to examine the firms that had reported a decreasing development, we divided the group into two parts; those who had marked a slow deterioration and those who had reported a rapid deterioration. The firms in group B could not at all antici-
pate rapid deterioration and they had problems to anticipate a slow deterioration as well. Firms in group A performed better, although they missed the slow deterioration. The conclusion was that a positive outcome was more easily predicted, and that the sample was more or less incapable to predict a negative outcome. This was especially true for group B that was in a failure situation.

To sum up the results, Group A and B differed in ranking the firm’s, the industry’s, and country’s anticipated development. Group B was more optimistic about the firm’s development than that of the industry and the country. This was perhaps because that the small business managers when in a loss situation needed to protect their self-esteem by assuming their ability to perform better in the future. Concentrating on the difference between predicted performance and actual performance, group A was more able to predict than B, which was mainly overoptimistic. This was mainly due to the failure situation of group B, because when the situation was ameliorated, the differences in prediction ability shrank.

**Differences in Perceived Causes**

We have seen that the groups differed in their performance predictions. According to the stated hypothesis these differences can be explained by how they perceived their present situation. In other words, group A ought to perceive the causes of their present situation as more stable, more controllable, and internal than group B.

However, we did not find any difference in controllability, where both groups were positive (81 %) and answered that they could ameliorate the firm’s performance in the future, and in less than two years. The results were unchanged when the extreme groups (extremely successful or failing) were analyzed. The difference between the two groups was insignificant. Apparently, both groups seemed to believe in their own capability to improve their present situation.

On the other hand, there were significant differences between the groups when analyzing the most important cause to their present situation. In group B, 82% believed that the present situation was due to external causes, compared to 45% for group A. The difference was significant at
Group B attributed the present failure to external causes rather than to internal causes. Group A had a more balanced judgment; both internal and external causes were used to explain the situation.

To sum up, the only significant difference between the two groups concerned the attribution of external and internal causes. Both groups believed they could change their present situation. This could either be done by changing their own strategies or by adapting to the perceived causes. It seems that the locus dimension was the most important dimension for entrepreneurs, and that stability and controllability had little impact on performance prediction. These results support the results from Anderson (1991) that people prefer to think in categories rather than in dimensions.

Discussion

In this paper, we have chosen to try to explain the performance prediction in success or failure by applying attribution theory. The results indicate that the reliability of entrepreneurs' forecast ability was more easily explained by examining the perception of the present situation, rather than examining differences in personality. Entrepreneurs perceiving themselves as successful were more accurate in their predictions than entrepreneurs perceiving themselves as failing. We have seen that goal expectancies were dictated by the perception of causal structure and that it was closely connected to the concepts of pride, self-esteem, and hopefulness. Thereby confirming the stated research propositions. Furthermore the entrepreneurs had difficulties in predicting negative outcomes. It was also concluded that entrepreneurs in a loss situation attributed their situation to external rather than to internal causes. We did not find any support for the hypothesis that other dimensions were used. Apparently, categorical thinking was more important than dimensional thinking in this case.

Small business managers in a failure situation predicted a better performance for their firms than for the rest of the economy. This behavior was probably associated to the protection of self-esteem. Basically, the small business manager had to believe in his or her ability to change the situation from failure to success. The failure situation resulted in an incapability to predict future performance. Group B was constantly overoptimistic; because they attributed failure to external causes (i.e., the general
economic development) and at the same time believed that they could ameliorate their performance, they predicted a different outcome than the present. Successful small business managers expected the same outcome in the future, because they attributed their success to controllable causes. These differences in attribution were in some degree magnified during the recession period, because failure could more easily be attributed to the economic situation in the industry and the country. This cue was the most easily available and least threatening to the self-esteem of the entrepreneur. On the other hand, when successful and while the rest of the economy was failing, the entrepreneur could only attribute his or her success to factors controllable by him or herself.

A problem for both groups was the prediction of negative outcomes. Independent of the perception of success or failure, the small business managers showed an inability to predict negative outcomes. Successful entrepreneurs expected success, because they attributed the present situation to stable and controllable factors. Unsuccessful entrepreneurs attributed their present situation to unstable and uncontrollable causes, and therefore they expected a different (more positive) outcome. Apparently they were overoptimistic and had difficulties in accurately perceive a negative future. These excessively positive self-evaluations, exaggerated perceptions of mastery and control, and unrealistic optimism are, however, characteristics of normal human behavior. Moreover these illusions promote among other things the ability to engage in productive and creative work. These strategies are in general successful, because both cognitive processing mechanisms and the social world impose filters on incoming information that distort it in a positive direction. Negative information can be isolated and represented in as unthreatening a manner as possible. Thus positive illusions are needed to generate the mental energy needed to confront the demands of the real world. We need these positive illusions in order to motivate ourselves in our everyday life. In this sense, the capacity to develop and maintain positive illusions may be conceived as a valuable human resource rather than an error-prone processing system to be corrected (Taylor & Brown, 1988). This overoptimism is however useful to motivate behavior in difficult situations, and is therefore in most cases a valuable resource. People interested in using information from small business managers and entrepreneurs should be aware of
these problems concerning performance prediction reliability. Those problems are especially reinforced in an economic recession. Business cycle analysis based on this sort of data could be improved if respondents perceiving themselves as failing were not given the same weight in the analysis as those perceiving themselves as successful.

This study was based on relatively small samples from a specific population in the greater Stockholm area. It is therefore problematic to generalize beyond this population, but there is no indication that the results are unique to this population. A more serious problem is the measurement of the attribution dimension. We were here obliged to minimize the complexity and the numbers of questions because this was a telephone survey. It is possible that a more validated and longer instrument would more accurately tap the attribution process made by entrepreneurs. This has to be weighted against the possibility of a smaller response rate. One strength of the used method is the high response rate. Furthermore, we have not been able to observe a complete business cycle, and it is difficult to exactly understand how the attribution changes over time. Another problem that is more related to actual performance, is that we do not follow the same sample over time. It is therefore impossible to investigate how the attribution process affects individual firms. Hence, we are only able to draw conclusion about the population and not the individual level. Nevertheless, the results are important because they show the impact of the situation on entrepreneurial behavior. It is rare to find research about entrepreneurship and small business development that uses both longitudinal data and a psychological frame of reference.

For a better understanding of how entrepreneurs make their predictions and how these predictions affect the firms' performance, further research will be needed in three areas. Firstly, we need to more precisely assess the attribution process by using validated instruments to measure categories and dimensions used by entrepreneurs. Secondly, we have to follow the population through a complete business cycle in order to see how the differences between the two groups change. Thirdly, the same sample must be followed during several years to assess the importance of attribution judgment on performance. That is, can we explain the rates of success and failure by analyzing the entrepreneurs’ attribution processes?
References


APPENDIX

Differences in actual and predicted performance for the period 1992-96 and attribution

Table 1
*Differences in actual and predicted performance for the period 1992-96, predictions and actual outcomes are shown for demand*

<table>
<thead>
<tr>
<th></th>
<th>Group A</th>
<th>Group B</th>
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<tbody>
<tr>
<td>Actual outcome 1992</td>
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<td>-66</td>
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<tr>
<td>Future performance 1992</td>
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<td>-25</td>
</tr>
<tr>
<td>Future performance 1993</td>
<td>46</td>
<td>25</td>
</tr>
<tr>
<td>Actual outcome 1994</td>
<td>52</td>
<td>8</td>
</tr>
<tr>
<td>Future performance 1994</td>
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<td>46</td>
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<tr>
<td>Future performance 1995</td>
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<td>39</td>
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Table 2
*Differences in actual and predicted performance for the period 1992-96, predictions and actual outcomes are shown for turnover*

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<td>Future performance 1994</td>
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<tr>
<td>Future performance 1995</td>
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<td>41</td>
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Table 3
Differences in actual and predicted performance for the period 1992-96, predictions and actual outcomes are shown for worked hours

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</thead>
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<tr>
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<td>5</td>
</tr>
<tr>
<td>Future performance 1995</td>
<td>25</td>
<td>23</td>
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Table 4
Attribution, do you think you can ameliorate the profitability in the future

<table>
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<th>Group B</th>
</tr>
</thead>
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<td>Yes</td>
<td>80%</td>
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<tr>
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<td>7%</td>
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<tr>
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<td>4%</td>
<td>7%</td>
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Table 5
Attribution, is it external or internal factors which are responsible for your actual situation?

<table>
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<th>Group B</th>
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<tbody>
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<td>External</td>
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<tr>
<td>Internal</td>
<td>41%</td>
<td>16%</td>
</tr>
<tr>
<td>Don’t know</td>
<td>14%</td>
<td>2%</td>
</tr>
</tbody>
</table>
Study 4:

THE IMPACT OF INTELLECTUAL ABILITY AND MOTIVATION ON VENTURE PERFORMANCE

Frédéric Delmar
The Impact of Intellectual Ability and Motivation on Venture Performance

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Abstract

This study focuses on the impact of individual differences in intellectual ability and motivation on venture performance. Intellectual ability of entrepreneurs was tested by an intelligence test taken earlier during the enlistment test of the national service in Sweden. The proposed model took into account the mutual influence between the environment and the entrepreneurs. Performance was measured as business efficiency and ability to grow.

The findings suggest that intellectual ability as measured by IQ has little impact on business performance, but the mean of intelligence was above the population mean. However, ability measures related to the understanding of task requirements were positively related to performance. The entrepreneurs' persistence and job interests discriminated between better and poorer performance. The most important environment variable was the market structure.

Introduction

This study concentrates on the impact of individual differences in intellectual ability and motivation of the entrepreneur on venture performance. One of the most traditional questions in this field of research revolves around explaining why the entrepreneurs' firms differ on specific venture performance dimensions or why performance changes from time to time. One approach is to try to explain these differences in performance by focusing on individual differences between entrepreneurs in traits and motives. Another approach is to try to explain performance as a result of the situation, where the individual has little or no room to make a

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4 An earlier version of this paper has been published in the IAREP conference proceedings 1995, Frontiers in Economic Psychology, pp. 146-164.
difference. The purpose of this paper is to propose a model that takes into consideration both the determinants of individual differences and of the situation in firm performance and to report the results of a test of the model. The proposed model is grounded in previous theory and research in psychology and entrepreneurship.

The proposed model is based on an interactionist perspective, i.e., venture performance is assumed to have a causal effect upon one another between the entrepreneur and the environment. It further assumes that business performance is multidimensional (i.e., both growth and efficiency are needed to assess the business performance) and that performance can be explained in terms of basic dimensions such as intellectual ability, motivation, and environmental characteristics.

The Determinants of Human Performance

Individual differences in work performance vary with declarative knowledge, procedural knowledge and motivation (Campbell, 1990). Declarative knowledge is knowledge about facts. It represents the understanding of the requirements for a given task. Examples of declarative knowledge are facts, values, goals, and self-knowledge. Procedural knowledge and skill are achieved when declarative knowledge, i.e., to know what to do, is successfully combined with how to do it. Examples of procedural knowledge are cognitive and social abilities and perception. Motivation is another determinant of performance. Motivation is the combined effect of three choice behaviors: (a) the choice to direct the strain in a specific direction, (b) the choice of increasing the level of strain, and (c) the choice of maintaining the strain level.

Recent research in psychology, as exemplified by Project A (U.S. Army selection and classification project) has shown that cognitive ability is the best predictor of job performance (Hunter & Hunter, 1984; McCloy, Campbell, & Cudeck, 1994, McHenry, Hough, Toquam, Hanson, & Ashworth, 1990; Ree, Earles, & Teachout, 1994). Furthermore, the prediction of job performance is improved by adding non-cognitive predictors as interest and personality to a cognitive test. Vocational and job interest has been less attended to than personality. It is a predictor closely related to intrinsic motivation (Dawis, 1991), and refers to what the indi-
vidual likes and dislikes. Thus, recent psychological research confirms that intellectual ability is the most important determinant of job performance. However the picture is not as conclusive when leadership and performance are considered.

The results from leadership research are interesting to consider, because the entrepreneur is among other things a leader. The relation between intellectual abilities and leadership performance is consistently low (Bass, 1990; Fiedler, 1995). This does not mean that it does not matter if leaders are bright or not, only that there is not a straightforward relation. Some possible explanations are given by Bass, who indicates that (a) highly intelligent persons may suffer from self-preoccupation, (b) their abilities make it difficult to communicate with others, and (c) only those who already have above average intelligence are likely to achieve top management positions and therefore intelligence tests cannot discriminate poorer from better performance at the top of the organization. The latter reason is probably not valid for entrepreneurs. The core of most definitions of entrepreneurs is self-employment, but how does intellectual ability relate to entrepreneurial performance?

The question is still unanswered. Even if entrepreneurial personality has been much researched, little or no attention has been given intellectual ability as measured by IQ. An exception is de Wit and van Winden’s (1989) study on the relationship between self-employment and intellectual ability showing that high IQ increased the probability to become self-employed. The entrepreneurship research interest in performance has mainly focused on individual background and environmentally related variables.

**Entrepreneurship and Venture Performance**

Little attention has been given to individual differences in entrepreneurship since the late eighties. Research had earlier focused on entrepreneurial traits such as need for achievement, locus of control, and risk propensity. The approach was to discriminate between entrepreneurs and other groups of the general population. The results were reasonably consistent in some respects (i.e., entrepreneurs are more achievement oriented and internally oriented than the rest of the population), but these traits could
not explain more than a minor share of entrepreneurial behavior and differences in performance. Interest has therefore turned from trait psychology to explain the entrepreneurial process by including more situation related variables and going back to more easily measured factors.

Performance has been studied either as the ability to grow or to survive. Some of the most recurrent factors which positively affect growth are: the numbers of partners (Barkham, 1994; Cooper, Gimeno-Gascon, & Woo, 1994), education (Davidsson, 1989; Robinsson & Sexton, 1994), entrepreneurial, managerial, or industry experience (Barkham, 1994; Box, Watts, & Hisrich, 1994; Cooper et al., 1994; Davidsson, 1989; Robinsson & Sexton, 1994; Siegel, Siegel, & MacMillan, 1993), modes of entry such as creation instead of heritage and buyout, and the stage in the venture's life cycle (Davidsson, 1989; Dodge & Robbins, 1992; Ming-Hone Tsai, MacMillan, & Low, 1991). However, growth and survival are not necessarily caused by the same factors (Delmar, 1993). The probability of survival is positively affected by having self-employed parents (Cooper et al., 1994), relatively slow growth (Delmar, 1993; Laitinen, 1992), and the mode of entry into the market (buying and heritage instead of creating) (Chaganti & Schneer, 1994).

To sum up, venture performance has been mainly measured as (a) the ability to run the business effectively, and (b) the ability to expand it. Furthermore, different factors, both individual and situation related, affect the efficiency and growth of the venture. The conclusion is that the role of an entrepreneur's performance can only be assessed, if differences in the situation are taken into account, since entrepreneurial performance and the changes in the environment affect venture performance. Thus, a purpose of this study was to try to explain some of the factors determining both growth and survival by modeling both environmental and entrepreneurial characteristics.
Method

The Sample

The sample was taken from the Statistics Sweden register of all Swedish companies. The sample is restricted to independent enterprises between 5 and 49 employees in both the manufacturing and service industry. The 1 to 5 employees class was not included because it contains a large share of part time enterprises. Firms above 50 employees were not included, because the actual effect of the entrepreneur's behavior on the business probably diminishes with an increasing number of employees.

Of the 730 contacted entrepreneurs, 259 (35%) completed both a telephone interview and a follow-up mail questionnaire. Of the respondents, 105 were male and born in 1951 or later; 50% of these gave me their permission to retrieve the results of the intelligence test they performed during conscription to national service. Of the 53 positive responses, 45 were usable for this study. Due to missing values the used sample in the analysis is somewhat smaller. Only the cases where data on IQ were available are used in the present paper. The small sample is problematic (e.g., problems estimating the coefficients, generality), but the possibility to use an IQ-test made before the choice of becoming an entrepreneur is a rare opportunity.

Measures of Performance

As mentioned earlier, performance was measured as either the business efficiency (i.e., return on assets and investment, debt-equity ratio) or growth (i.e., numbers of employees and size of turnover). Most of the studies measure performance as growth. The reasons are (a) the difficulty to access the financial reports of small and newly founded enterprises, and (b) the questionable value of financial ratios as indicators of effectiveness in small and new enterprises (Ang, 1991). Most performance measures are therefore self-report data from the interviewed entrepreneur. Information about growth is more easily accessible and reliable than measures on efficiency. The result is that most of the performance research in new and small enterprises is based on the measurement of growth. However, different factors affect growth and efficiency, and per-
formance is therefore multidimensional. It would be wrong to only focus on one performance measure. Even if the validity of financial ratios can be questioned, it would be a pity not to use the possibility we have in Sweden to collect the official annual reports. In this paper, I have therefore chosen to measure efficiency as well as growth.

Efficiency was measured with the risk buffer and the debt-equity ratio. The risk buffer is the difference between return on assets and return on debt. A large risk buffer means an ability to generate capital both as a function of successful operational and financial management. It is therefore a general indicator of business performance. The debt-equity ratio informs us about the long term financial situation of the business. A high debt-equity ratio means that the firm is highly indebted, and probably will have financial problems if the return on assets does not exceed return on debt. A high debt-equity ratio is therefore an indicator of financial risk. Both were computed as the average of years 1992 and 1993. In order to reduce the skewness of the distribution, the logarithm of debt-equity ratio was used. A problem was that these measures have not been calculated for every case, due to missing financial reports.

Growth was measured as the change in percentage in numbers of employees and turnover over the last three years. Contrary to the efficiency measures, these measures were based on questionnaire data. Both growth ratios were logarithmized to reduce the skewness of the distribution.

Measures on Individual Differences and Environment

The explanatory variables were either related to the entrepreneur or to the environment. The variables related to the entrepreneur used here were measures of decision styles, intellectual ability, and motivation. Decision styles were seen as separate from intellectual ability (even if they are actually part of the abilities defining human performance) because of the supposed importance of decision making ability in economics and in the management literature.

Decision styles are measured with a questionnaire designed by Mann. It is based on the Janis and Mann’s (1977) conflict theory of decision making, and it measures the tendency to use different patterns of decision
making. The questionnaire consists of six scales measuring six decisional coping patterns. The coping patterns are defined and presented below with the Cronbach’s coefficient alpha for this study in parentheses:

**Vigilance** is the tendency to carefully search for information, to consider many alternatives and without bias, and to evaluate alternatives carefully before making a choice (Cronbach’s Alpha = 0.49).

**Hypervigilance** is the tendency to impulsively make decisions and to search for quick, easy solutions to problems (Cronbach’s Alpha = 0.59).

**Defensive avoidance** is the tendency to try to avoid or escape decision making. Rationalization, buck passing, and procrastination are three types of defensive avoidance (Cronbach’s Alpha = 0.65).

**Rationalization** is the tendency to avoid the reality of the decisions. This is achieved by concentrating only on the positive alternatives of the choice or ignoring or denying unpleasant aspects of the decision (Cronbach’s Alpha = 0.43).

**Buck passing** is the tendency to leave the hard decisions to others, to avoid taking responsibility and to blame others when a wrong decision is made (Cronbach’s Alpha = 0.61).

**Procrastination** is the tendency to put off making decisions by considering other things or by considering the decision for too long (Cronbach’s Alpha = 0.69).

A problem is the low reliability for rationalization and vigilance (< 0.50). Peterson (1994) has in a meta-analysis of Cronbach’s coefficient alpha reviewed the recommended reliability levels. All reviewed articles recommend levels above 0.50 for basic and preliminary research. Both vigilance and rationalization have reliability levels below the recommended levels, and are therefore not used. It should be noted that satisfactory levels are 0.70 and above for behavioral research. The measurement of decision style is therefore problematic, and if included in any of the models interpretation should be critical, and possibly dropped in a final analysis.

**Intellectual ability** was measured by a range of variables. The *a priori* most interesting factor is the cognitive ability of the entrepreneurs as measured in the enlistment tests of the national service in Sweden (which
is compulsory for all males 18 years old). The tests include four psychological tests measuring verbal ability, inductive-logical ability, technical comprehension, and spatial ability. The four tests are then combined into a composite measure (IQ score) using a stanine scale. The mean for the population is 5 (stand.dev. 2); for the current sample it was 6.7 (stand.dev. 1.7). The tests are normally taken at the age of 18 or 19 years. Further data on entrepreneurial, management, and industry experience were used. Data on general educational level, and education in business administration were also available. Thus, also considering data on decision styles, data on both procedural and declarative knowledge have been gathered.

Motivation was measured as expressed by job interests, need for achievement, and persistence as measured by the number of hours worked per week. Job interest was chosen because of its ability to predict performance. Need for Achievement has a long standing tradition in entrepreneurship research (McClelland, 1961), but it is also a variable used by McCloy et al. (1994) along with interest when confirming their model of human performance. Need for achievement was measured with two different scales. The first scales measures achievement as meeting internal standards of excellence (Cronbach’s Alpha = 0.78). The second one measures achievement as the need for personal success through the demonstration of competence according to social standards (Cronbach’s Alpha = 0.73). McClelland’s definition is more closely related to first scale (Schwartz, 1992). A high score indicates a high need for achievement.

No validated and carefully developed measurement instrument was available for the measurement of job interests. Instead I had to construct my own instrument. A set of 18 variables was used to measure interest. The respondent was asked to mark on a five point Likert scale how interested he or she was in a certain work task (e.g., marketing, personal development). By means of exploratory factor analysis (Kim & Mueller, 1978) the set of variables was reduced to five underlying factors. The factors were extracted by principal component analysis. The clearest structure was achieved by an oblique rotation. The factor scores were standardized (mean = 0 and standard deviation = 1) and represent the entrepreneur’s estimated score on the factor. A positive factor score value indicates that
the entrepreneur's interest in a factor was above average. A negative value means that the entrepreneur's interest was below average. The interpretation of the five identified interest factors is shown in Table 1.

Table 1
Interpretation of the factor analysis
(Kaiser-Meyer-Olkin test = 0.739, Bartlett test of sphericity = 1255.85, cumulative explained variance 5 factors = 60.0%)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Interpretation</th>
<th>Score above average</th>
<th>Score below average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Supply and credits</td>
<td>The entrepreneur is more interested in supplies, contacts with the suppliers, and the credit management of the customers</td>
<td>The entrepreneur is less interested in supplies, contacts with the suppliers, and the credit management of the customers</td>
</tr>
<tr>
<td>2</td>
<td>Strategic management</td>
<td>The entrepreneur is more interested in innovation, planning for the future of the business and marketing plans</td>
<td>The entrepreneur is less interested in innovation, planning for the future of the business and marketing plans</td>
</tr>
<tr>
<td>3</td>
<td>Financial control</td>
<td>The entrepreneur is more interested in budgeting, financing, and bookkeeping</td>
<td>The entrepreneur is less interested in budgeting, financing, and bookkeeping</td>
</tr>
<tr>
<td>4</td>
<td>Market orientation</td>
<td>The entrepreneur is more interested in direct production, and less interested in customer relations</td>
<td>The entrepreneur is less interested in direct production, and more interested in customer relations</td>
</tr>
<tr>
<td>5</td>
<td>Human resources</td>
<td>The entrepreneur is more interested in personnel development and relation, in the board, and personal development</td>
<td>The entrepreneur is less interested in personnel development and relation, in the board, and personal development</td>
</tr>
</tbody>
</table>

The environment related variables were all based on self-report data. They were actually a mix of individual related factors as age and number of worked hours per week, and more orthodox environment measures as competition and the amount of turnover generated by the three largest customers (customer's concentration). Some variables related to the individual were included here, because they did not fit the model for human performance where motivation and ability are the core determinants.
variables included were: present competitive position, the intensity of the competition, customer's concentration, the employees attitudes to changes and novelties, their commitment to business, ability to innovate, work climate, start-up year, number of founders, and the birth year of the entrepreneur.

**Analysis Method**

Multiple regression analysis was used to analyze the data. Given the small number of cases, special attention was given to test the assumptions for multiple regression and cleaning the data set. The data were checked for outliers, multicollinearity, linearity, normality and heteroscedasticity. Backwards elimination was used.

The analysis was made in two stages. First, each variable category (e.g., decision styles) was examined separately to find the best predictors of this group. In the second stage, all variables were analyzed together in order to maximize the fit of the model. This procedure was repeated for all four dependent performance variables. The control variables used were the mode of entry and the industry.

The best equation was chosen on the basis of goodness of fit (adjusted $R^2$) and the F-test to assess the linear relationship between the dependent variable and the entire set of independent variables, but also on how well it fitted the theoretical frame of reference.

**Results**

**The Separate Models**

Table 2 displays the results of regression analyses for the four performance measures for each of the four different variable categories. The regression coefficients, the beta coefficients, the adjusted $R^2$ and F-values are included.

Decision styles had by themselves little or no ability to predict business performance. The explained variance was very low ranging between 0.02 and 0.17, and the effect was relatively small. None of the functions were
significant at the $p<0.05$. However, most problematic was that the results were counter intuitive. Vigilance (i.e., the tendency to carefully search for information) was expected to be positively related with performance, and the other coping patterns were expected to be negatively related. Rational information processing had apparently not the positive impact that I expected. This result will be further commented upon later in the paper.

As with decision styles, the intellectual ability functions showed very low explained variance (adj. $R^2$ ranging from 0.04 to 0.13), and with only one function significant at $p<0.05$ (risk buffer). Furthermore, intellectual ability as measured by IQ was not included in any of the functions. The included variables were related to experience and education. These findings suggest that declarative knowledge (knowledge about task requirements) had more impact on performance than procedural knowledge.

The motivation functions were able to explain more variance than ability and decision styles, with explained variance varying between 0.12 and 0.20. Only the function where motivation was related to debt-equity was insignificant. Need of achievement measured as the need for personal success through the demonstration of competence according to social standards was included in all functions except the debt-equity function. Apparently, the last words on need for achievement and entrepreneurship have not yet been said. Interest was also an important factor, where entrepreneurs less interested in supplies and credit management were more
Table 2
Regression Analysis Results (the beta coefficient in parenthesis) (table is continued on the next page)

<table>
<thead>
<tr>
<th>Risk buffer</th>
<th>Decision styles</th>
<th>Intellectual abilities</th>
<th>Motivation</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Constant 10.8</td>
<td>Created -6.01</td>
<td>Constant 21.65</td>
<td>Constant -73.2</td>
</tr>
<tr>
<td></td>
<td>Buyout 9.01 (.409)</td>
<td>Education -5.97 (-.268)</td>
<td>Nach -.922 (-.298)</td>
<td>Customers 7.56 (.580)</td>
</tr>
<tr>
<td></td>
<td>Procrast. 1.82 (.240)</td>
<td>Education 9.87 (.527)</td>
<td>Supply -4.00 (-.289)</td>
<td>Competition 5.19 (.291)</td>
</tr>
<tr>
<td></td>
<td>Vigilance - 1.46 (-.270)</td>
<td>Adj. R^2 = .13</td>
<td>Buyout 8.33 (.331)</td>
<td>Commitment -7.01 (-.317)</td>
</tr>
<tr>
<td></td>
<td>Adj. R^2 = .17</td>
<td>F = 3.44, sign. = .045</td>
<td>Adj. R^2 = .18</td>
<td>No. of founders 6.04 (.346)</td>
</tr>
<tr>
<td></td>
<td>F = 2.93, sign. = .053</td>
<td></td>
<td>F = 3.12, sign. = .043</td>
<td>Start up year .67 (.216)</td>
</tr>
<tr>
<td>Debt-equity ratio</td>
<td>Constant 1,59</td>
<td>Constant 2.19</td>
<td>Constant .28</td>
<td>Constant -1.57</td>
</tr>
<tr>
<td></td>
<td>Hypervigi. -.156 (-.340)</td>
<td>Education -.22 (-.266)</td>
<td>Fin. contr. -.19 (-.278)</td>
<td>Customers -.34 (-.571)</td>
</tr>
<tr>
<td></td>
<td>Adj. R^2 = .08</td>
<td>Industry -.34 (-.267)</td>
<td>Human res. .21 (.313)</td>
<td>Commitment -.29 (.273)</td>
</tr>
<tr>
<td></td>
<td>F = 3.67, sign. = .066</td>
<td>Adj. R^2 = .05</td>
<td>Adj. R^2 = .12</td>
<td>Start up year .03 (.188)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F = 1.70, sign. = .202</td>
<td>F = 2.28, sign. = .104</td>
<td>Adj. R^2 = .32</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F = 4.48, sign. = .007</td>
</tr>
<tr>
<td>Growth (employees)</td>
<td>Decision styles</td>
<td>Intellectual abilities</td>
<td>Motivation</td>
<td>Environment</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------</td>
<td>------------------------</td>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Constant .253</td>
<td>Constant .51</td>
<td>Constant -.91</td>
<td>Constant .07</td>
<td></td>
</tr>
<tr>
<td>Buyout -.251 (-.269)</td>
<td>Buyout -.42 (-.392)</td>
<td>Nach .02 (.147)</td>
<td>Buyout -.36 (-.407)</td>
<td></td>
</tr>
<tr>
<td>Buck passing .072 (.225)</td>
<td>Management exp. .14 (.219)</td>
<td>Supply -.19 (-.422)</td>
<td>Work climate .18 (.210)</td>
<td></td>
</tr>
<tr>
<td>Adj. R² = .09</td>
<td>Running other -.13 (-.247)</td>
<td>Created .218 (.255)</td>
<td>Competition -.07 (-.224)</td>
<td></td>
</tr>
<tr>
<td>F = 2.96, sign.= .064</td>
<td>Adj. R² = .11</td>
<td>Nr. of hours .01 (.289)</td>
<td>Adj. R² = .12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F = 2.61, sign.= .065</td>
<td>Adj. R² = .20</td>
<td>F = 2.99, sign.= .042</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adj. R² = .3, sign.= .019</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adj. R² = .16</td>
<td>F = 3.49, sign.= .026</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>F = 3.99, sign.= .014</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Growth (turnover)</th>
<th>Decision styles</th>
<th>Intellectual abilities</th>
<th>Motivation</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant .461</td>
<td>Constant -.17</td>
<td>Constant -.65</td>
<td>Constant .49</td>
<td></td>
</tr>
<tr>
<td>Rationality .071 (.202)</td>
<td>Education .19 (.271)</td>
<td>Nach .02 (.198)</td>
<td>Innovation .12 (.258)</td>
<td></td>
</tr>
<tr>
<td>Adj. R² = .02</td>
<td>Adj. R² = .04</td>
<td>Nr. of hours .01 (.189)</td>
<td>Birth year -.03 (-.236)</td>
<td></td>
</tr>
<tr>
<td>F = 1.29, sign.= .288</td>
<td>F = 1.86, sign.= .170</td>
<td>Adj. R² = .18</td>
<td>Adj. R² = .18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F = 3.49, sign.= .026</td>
<td>F = 4.00, sign.= .014</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
successful. It is also noteworthy that persistence (numbers of hours worked per week) was positively related to growth.

The environment functions were most successful in explaining risk buffer and debt-equity (the efficiency measures), but were more or less equal to the motivation functions concerning growth performance. These results showed that the growth process was intimately related to the entrepreneurs' motivation, whereas efficiency was better explained with the environmental characteristics. Most important were the variable relating to the market structure. The risk buffer was bigger and the long term financial risk smaller for firms dependent on few customers. Intense competition was related to a higher risk buffer, but at the same time had a negative effect on growth. A good work climate affected the growth positively.

To sum up, the environment functions were on average the best predictors of the business performance. However, little information was gained about the entrepreneur's role from them. Focusing on the entrepreneur, I can conclude that the intellectual ability of the entrepreneur had a small effect on performance, as measured by education and experience. Cognitive capacity as measured by the military service aptitude test did not yield any interesting results. Motivation gave little but significant addition to the functions, especially the growth functions. Job interest is a category of variables well worth investigating further. The most confusing results concern the decision style. The effect was however small and the reliability of the scales were problematic.

The Aggregate Models

We have seen that the entrepreneur per se had a small effect on the performance of the venture compared to the environmental effect. A possible conclusion would be to focus only on environmental variables. As we will see the combined aggregate model increased significantly the possibility to understand the human and environmental determinants of the business performance. Table 3 displays the results from the multiple regression where both determinants of entrepreneurial performance and the environment were included. All functions were here significant and the explained variance significantly higher. For the risk buffer and for the
debt-equity ration functions the explained variance was remarkably high (0.63 and 0.48 respectively).

Table 3

Results from the aggregated model (table is continued on the next page)⁵

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Beta coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk buffer</td>
<td>Constant</td>
<td>117.2</td>
</tr>
<tr>
<td></td>
<td>Environment Created</td>
<td>-13.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Comp. pos.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Competition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Birth year</td>
</tr>
<tr>
<td></td>
<td>Decision style</td>
<td>Hypervigilan.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nach</td>
</tr>
</tbody>
</table>

Adj. R² = .63  
F= 8.31, sign. = .000

<table>
<thead>
<tr>
<th>Debt-equity ratio</th>
<th>Constant</th>
<th>-3.82</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Environment Customers</td>
<td>-.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Founding year</td>
</tr>
<tr>
<td></td>
<td>Decision style</td>
<td>Buck passing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Int. ability</td>
</tr>
<tr>
<td></td>
<td>Industry exp.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bus. adm.</td>
<td></td>
</tr>
</tbody>
</table>

Adj. R² = .48  
F= 5.71, sign. = .002

⁵ The results from the full environment model were reanalyzed for this dissertation, because the size of business had been omitted. The business size was insignificant in predicting the risk buffer and the debt-equity ratio. However, size was significantly related to growth in nr. of employees and turnover. For Growth in employees the adj. R² increased to 0.40 with no substantial further changes in the model. For growth in turnover the adj. R² was unchanged, but IQ score became insignificant. Thus, the inclusion of size generated an equal model and therefore the original model was retained. In both cases, size was negatively related to growth, i.e., smaller business tend to grow faster than larger ones.
<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Beta coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth (employees)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-1.13</td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nr. of hours</td>
<td>.01</td>
<td>.332</td>
</tr>
<tr>
<td>Created</td>
<td>.28</td>
<td>.313</td>
</tr>
<tr>
<td>Job interest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply &amp; Credits</td>
<td>-.28</td>
<td>-.611</td>
</tr>
<tr>
<td>Decision style</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defensive</td>
<td>.14</td>
<td>.298</td>
</tr>
<tr>
<td>Int. ability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Man.exp.</td>
<td>.12</td>
<td>.199</td>
</tr>
<tr>
<td>Adj. R² = .34 F= 4.86, sign.= .002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth (turnover)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-.85</td>
<td></td>
</tr>
<tr>
<td>Job interest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply &amp; Credits</td>
<td>-.27</td>
<td>-.503</td>
</tr>
<tr>
<td>Market orientation</td>
<td>-.08</td>
<td>-.211</td>
</tr>
<tr>
<td>Int. ability</td>
<td>.12</td>
<td>.353</td>
</tr>
<tr>
<td>IQ score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competition</td>
<td>-.13</td>
<td>-.295</td>
</tr>
<tr>
<td>Nr. of hours</td>
<td>.02</td>
<td>.330</td>
</tr>
<tr>
<td>Adj. R² = .40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F = 5.82, sign.= .001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The magnitude of the risk buffer was determined by the competitive position, the mode of entry, decision styles and the achievement orientation. We can expect a higher risk buffer if the business is in a favorable competitive position and the competition is low. The creation of the business had a negative effect. This is logical, it should be easier to uphold a high risk buffer if the business is managed in a market where the business is already integrated. Hypervigilance (i.e., the tendency to impulsively make decisions and to search for quick, easy solutions to problems) and need for achievement were negatively related to the risk buffer. This means that negative decisions patterns are negatively related to the risk buffer. Furthermore, individuals high in achievement tend to lower the risk buffer, i.e., taking larger risks. Variations in risk buffer were best explained by market variables, the mode of entry, and the entrepreneur’s intellectual ability.
The debt-equity ratio was determined by environmental and ability factors. The smaller the amount of customers generating sales was, the smaller was the ratio (i.e., a small financial risk). Furthermore, a young business generated a higher financial risk. Probably because it is much more difficult to have a low financial risk in the early phases of business creation than in the later phases. Highly educated and experienced entrepreneurs lowered the long term financial risk in the firm. The only trouble is the decision style; the tendency to leave the hard decisions to others, to avoid taking responsibility and to blame others when a wrong decision is made was related to a low long term financial risk.

Growth in numbers of employees was determined by motivation, ability, and mode of entry. Persistence (numbers of hours the entrepreneur works per week), and a low interest in credits and suppliers had a positive effect on growth. Creation of the own business and management experience also had a positive effect. The only trouble was the inclusion of the defensive avoidance decision coping pattern, which was positively related to growth. It is difficult to try to understand how the tendency to avoid to make decisions is related to growth. The goodness of fit increased strongly compared to the earlier growth models.

Growth in turnover was caused by low competition. Apparently, the market has a pull effect on the business' growth. This pull opportunity was seized by the entrepreneurs who worked hard, were more intelligent, and were less interested in credits and suppliers and more oriented towards customer's relations. This was the only function where cognitive ability was included as an important variable. We also had here an increase in fit compared to earlier.

To conclude, the interaction model was much more powerful than the separate models, perhaps because performance is due to the combined effect between an entrepreneur and the environment. Motivation played a more important role in the growth functions, whereas ability and the environmentally related factors dominated the efficiency functions. Intellectual abilities, as measured by IQ, seemed to have only little effect on performance, thereby confirming the results from earlier leadership research. However, declarative knowledge (experience, education, and de-
cision styles) did in these combined models offer an important contribution to the explained variance. Growth was best explained by the direction of the entrepreneur's interest and persistence. Created ventures grown faster than other ventures but they had higher financial risk, and lower risk buffer. The variables governing growth and financial performance were not the same; growth was not necessarily the way to achieve good finances and vice versa.

Discussion and Conclusions

The combined models of the entrepreneur and of the environment yielded more interesting results than the separate models. However, cognitive capacity, as measured by IQ, did not have a significant impact on performance. This was in line with earlier research in leadership performance. However, the mean of the sample was considerably above the population mean. Considering the results from this study and de Wit and van Winden's (1989) study is seems that self-employed have a higher IQ than the population. It is however difficult to say if the result of that individuals with higher intellectual abilities are more prone to choose an entrepreneurial career, or that a floor level intelligence is needed to survive. The reason that intelligence did not have a great impact on performance, was probably that I from the beginning had a restriction of range and therefore these tests could not discriminate better from poorer performance. It can be assumed that entrepreneurship requires a floor level intelligence, which is above the population mean. Perhaps tests designed for a higher intellectual level would discriminate better.

The ability measures that best predicted performance were measures related to experience, education, and decision styles. Those variables were indicators of the entrepreneur's declarative knowledge, contrary to IQ which was a measure related to procedural knowledge. It seems that a floor level intelligence is needed to be established on the market, but that the discrimination between poor and good performance is then dependent on the knowledge about the task requirements. Since procedural knowledge was unable to predict performance due to a small variation (i.e., the entrepreneurs were more less at the same level of intelligence), the best ability predictor became declarative knowledge. Knowing what informa-
tion to search for and how to handle it, then become an important com-
parative advantage.

Decision styles were apparently somewhat important determinants of the 
entrepreneur's performance, but the results were intriguing. The vigilance 
to search carefully for information, and carefully evaluate the alternat-
tives) decision style did not have a positive impact on performance. In 
other words, rational decision making did not correlate positively with 
performance. There is number of possible explanations to this. First, the 
need to search for information can be a result of non-willingness to act, 
and therefore counterproductive to the entrepreneur's position of acting 
in order to produce results. That is, time and action are more important 
than analysis. Secondly, a large amount of information to process can 
lead to an overload of cognitive capacity. There is no reason to search for 
information if it is not possible to properly process it. Thirdly, the quality 
of the information is marginally deteriorating with the collected amount. 
After a while the gain of searching for extra information is lower than the 
cost. To conclude, rational decision making is not adaptive if the entre-
preneur wants the business to be effective and growing.

Motivation had a strong impact on performance, especially on growth, it 
was more important than intellectual abilities (decision styles included). 
Job interest is a determinant of creative and hard work, which was con-
firmed by the fact that the entrepreneur's persistence was a positive de-
terminant of performance. Interest has the ability to free and to create the 
mental energy needed to sustain growth. Interest is probably one of the 
most important motivators of the entrepreneur. The reason for this is that 
entrepreneurial performance is an action on a high level demanding great 
devotion, and one is not willing to do so if one does not feel a great inter-
est in that direction. Growth is only achieved if the entrepreneur is inter-
ested in activities that directly or indirectly affect it. Entrepreneurs' run-
ning growing enterprises, enjoy doing it, and they are therefore willing to 
work longer hours than others.

Different factors affected the efficiency and the growth of a business. The 
mode of entry, e.g., had different impact on the risk buffer and growth. 
Created enterprises were more growth-oriented than buyout and inherited
enterprises. On the other hand, the latter had a higher risk buffer. Further research on venture performance should take these results under consideration. A possibility would be to try to compare high profit/high growth ventures with low profit/low growth ventures. However, the problems of using financial ratios have to be considered. Even after this study I am not convinced that financial ratios can contribute with important information for small or newly started enterprises.

As we have seen, the modeling of entrepreneurial and venture performance is of importance, and depending on how we model the performance determinants we obtained different results. Modeling variables only related to the entrepreneurs gave poor results compared to the environment model. The combination of the categories yielded far more interesting results, and thereby reestablished the importance of the entrepreneur.

Finally, it is concluded that the results were interesting, and one is tempted to generalize them. However, the results were based on a small sample; the results should be confirmed on larger sample.
References


Study 5:

VALUES AND ENTREPRENEURSHIP

Frédéric Delmar
Values and Entrepreneurship

Frédéric Delmar
Stockholm School of Economics

Abstract
The purpose of this study is to investigate the relation between entrepre­neurship and values. Two perspectives are identified, the first dealing with individual differences in values (the individualistic perspective) and the second with regional differences (the social legitimation perspective). The paper includes both a theoretical review and empirical work based on two surveys of entrepreneurs and non-entrepreneurs.

Important differences in values between non-entrepreneurs and entrepre­neurs were found. Entrepreneurs valued personal success, independence, and stimulation, more than the rest of the population, even if those values implied accepting inequalities in society. Values had virtually no power at all to discriminate between regions high or low in new enterprises rate.

Background
The importance of values for entrepreneurship has a long standing tradi­tion as a problem in theory and research since the early work of McCle­lland (1961), who in his turn found inspiration in the works of Weber (1930) on the role of Protestant ethic to explain the rapid development of Anglo-Saxon and German cultures. McClelland’s point was that the eco­nomic growth and decline of a culture could be explained by the prevail­ing value system, especially by the role of the need for achievement mo­tive. The assumption is that psychological variables such as values interv­ene between economic stimuli and the reactions and behavior of people. As a consequence values are important determinants of behavior, and values are formed through learning and socialization by the predominant culture. Values can be said to form the "mental software" (Davidsson, 1994) shared by the people in a culture; the core of culture can therefore be said to be formed by its values.
Culture is not an easily defined concept, but there are, however, some recurrent common features when the concept is discussed. Hofstede, Neuijen, Daval Ohayv and Sanders (1990, p. 286) state that a culture:

"...is (1) holistic, (2) historically determined, (3) related to anthropological concepts, (4) socially constructed, (5) soft, and (6) difficult to change."

Furthermore, culture varies at many different levels, from the national, regional and local levels, but also at the organizational, professional, and family levels, as well as between generations. Every cultural group will respond more or less differently to economic stimuli. It is therefore valuable to differentiate between different cultural groups and, as a consequence, to identify variables able to form the basis of differentiation. The purpose of this paper is to isolate and measure quantitatively the values able to discriminate between entrepreneurs and non-entrepreneurs, on the individual level as well as on the regional level. This purpose can be achieved in two ways: first to examine the difference in values between entrepreneurs (i.e., self-employed) and the general population and second, to examine the difference in values between areas of low and high startup rates of firms.

In the first case, it is assumed that it is those individuals who have more entrepreneurial values who are more likely to behave entrepreneurially. As a contrast to this individualistic perspective, a more social perspective proposes that the prevailing values and beliefs constitute a social norm-base that more or less restricts entrepreneurial behavior regardless of the values and beliefs held by the actual business founders. From the social legitimization perspective a relationship between values and aggregate entrepreneurship does not require a corresponding relationship between values and entrepreneurial behavior on the individual level. It therefore also makes sense to study differences between low and high new firm start-up areas, because if values are of some importance to economic development, it will be shown in either or in both cases.

Following this introduction, earlier results from value research in entrepreneurship will be discussed. A first part will survey the literature con-
cerning differences between entrepreneurs and non-entrepreneurs on the individual level (the individualistic perspective), and the value differences on an aggregate level (the social legitimization perspective). In the second part, the theoretical and methodological characteristics of values are discussed. Value measurement is a well covered field in psychology, and recent research has some valuable insights to offer to entrepreneurship research. After this research review, the empirical research specific to the present paper is presented and discussed. The article is finished with a general discussion about value research in entrepreneurship.

**The Individualistic Perspective**

I will here use the term entrepreneurial characteristics instead of personality traits or values, because the entrepreneurship literature does not always differentiate between what is seen as a personality trait (a stable disposition) and what is seen as a value (a stable preference). The typical example is need for achievement and risk taking that are either referred to as values or as personality traits. Both are stable and are supposed to influence individual behavior. Personality can most easily be described as whom we are (independent of what we want to be or not). We can be neurotic, extraverted or open to experience. Values are more related to motivation and the goals of our behavior (what we would like to be). However these differences in concept are not always clear. It is difficult to determine if an entrepreneur is risk prone because that is his or her personality or that she or he prefers to live an exciting life. Nevertheless results from both personality trait research and value research are both pertinent to entrepreneurship research.

Among the most popular characteristics to be found in the literature are: 1) need for achievement; 2) internal locus of control; 3) risk taking propensity; 4) tolerance for ambiguity; 5) overoptimism; and 6) need for autonomy. The classical approach is to try to differentiate entrepreneurs from other professions based on their stable characteristics. This research has encountered several difficult theoretical as well as methodological problems (for a review of these problems see, e.g., Delmar [1994], Herron and Robinson [1993], Sexton and Bowman [1985]).
The first problem is inconsistency due to a large number and variants of traits. Furthermore researchers have not reached consensus on trait relevance, their importance, and how they vary with different situations. For example, need for achievement may be only discriminating in success-oriented cultures as the American and other similar cultures (Spence, 1985). We cannot assume it is a universal value able to discriminate entrepreneurs from others everywhere. It is therefore difficult to formulate a common frame of reference. The second problem is the assumption that the variables characterizing the entrepreneur and the environment are stable. To take an example, entrepreneurial overoptimism is better understood as an attribution process dependent on the perception of the actual situation than a stable characteristic (Delmar & Lignell Du Riez, 1995). Furthermore, the environment changes constantly and characteristics such as those reviewed here have a very small or no ability to predict entrepreneurial or business performance (Box, Watts & Hisrich, 1994; Box, White & Barr, 1993; Davidsson, 1989; Kolvereid, 1992; Miller & Toulouse, 1986). Thirdly, the theories and methods in use are, in comparison to modern personality psychology, obsolete. An individual’s personality is now measured with five basic dimensions, called the "Big Five", which are supposed to map the complete personality, and not only a single dimension (Costa & McRae, 1992; Goldberg, 1993; Hogan, 1991). Hence, when measuring personality, the measures should contain at least these five dimensions of interpersonal evaluation. The inability to handle these problems has led to a severe questioning of the use of stable characteristics to understand entrepreneurial behavior, and other perspectives have instead been favored in hope of more fruitful results. One of these perspectives deals with value measurement; not the mere measurement of a single or a couple of characteristics or values, but of comprehensive value systems as those proposed by Hofstede (1980) and Rokeach (1973).

McGrath, MacMillan and Scheinberg (1992a) tried to discriminate between entrepreneurs and non-entrepreneurs using Hofstede’s four dimensional value system (Power distance, Individualism, Uncertainty avoidance, and Masculinity) on large samples from eight countries. Using discriminant analysis, they were able to classify 73.96% of the entrepreneurs and 67.68% of the non-entrepreneurs correctly. This is an impressive
result considering earlier research. However, there were some methodo-
logical problems. The discriminant function was based on 25 variables
from the initial set of 83, and no attempt was apparently done to relate
the set to the indexes representing the Hofstede dimensions. Hence, con-
clusions are drawn on sets of variables that were arbitrary in relation to
the four dimensions. It is therefore difficult to exactly assess the amount
of variance explained by these value systems. Still, it seems that entre-
preneurs from different cultures share certain values that differentiate
them from non-entrepreneurs. Another attempt to map the entrepreneurial
values was made by Fagenson (1993), but this time using Rokeach value
system of instrumental and terminal values. Unfortunately, the study only
reports mean differences and significance tests, and therefore no infor-
mation is given on the size of the effect of values on actual behavior.
However, the results from the two studies, despite the fact they were us-
ing different instruments, lead to somewhat similar conclusions. Entre-
preneurs value individualism and freedom more (i.e., the possibility to
make a difference for oneself) than the general public or managers, even
if those values imply some inequalities in society. To accomplish these
end states, they value ambition, capability, and uncertainty more than
other groups. Apparently, value research reaches the same conclusion
about entrepreneurs as trait research.

To sum up, typical research on the individual level shows some consist-
tent results, but the effect on behavior is small when investigated. We
have also witnessed a shift from personality terminology to value termi-
nology (i.e., from describing what an entrepreneur is to what an entrepre-
neur prefers). Values are assumed to be more promising than personality,
when it comes to predicting behavior. However, we have already seen
that it is difficult to separate these concepts practically, and as we will see
the value concept and the personality concept share common problems
when it comes to predicting entrepreneurial performance. They may theo-
retically be two separate concepts, but empirically they seem to generate
the same results.

The Social Legitimization Perspective
In this section, work is discussed where values are primarily used to dif-
ferentiate between geographical areas with different levels of entrepre-
neurship. The supposed important contribution of values to entrepre-
neurship and economic development has been stressed by several authors as
Weber (1930) and McClelland (1961), just to mention the earliest at-
ttempts. Davidsson (1995a) has in a review of the value literature iden-
tified two perspectives regarding the importance of values for entrepre-
nearship. The first perspective assumes that it is those individuals who
have more entrepreneurial values that are more likely to behave entrepre-
nearially. This assumption is commented on in the previous section. As a
contrast to this individualistic perspective, a more social perspective pro-
poses that the prevailing values and beliefs constitute a social norm-base
that more or less restricts entrepreneurial behavior, regardless of the val-
ues and beliefs held by the actual business founders. From the social le-
gitimiziation perspective a relationship between values and aggregate en-
trepreneurship does not require a corresponding relationship between
values and entrepreneurial behavior on the individual level. This ap-
proach resembles the culture perspective which is one of the perspectives
suggested by McGrath, MacMillan, Yang and Tsai (1992b). Culture is
seen as a stable phenomenon, leading to differences in social and eco-
nomic outcome between different regions. These values are deeply en-
trenched, rendering the social outcomes impermeable to attempts to
change them. Hence, little or no room is given for individual action. The
individualistic perspective supports the importance of individual action
and downplays the inertia created by culture. Social outcomes are here
assumed to be more susceptible to economical and societal intervention.
Independent of which perspective is favored, it is a fact that there is a
regional variation in entrepreneurship, and that some of that variance can
probably be explained by differences in culture.

Shane (1992) has examined the relation between culture and inventive-
ness in 33 countries. The analysis is based on correlations between the
per-capita rates of invention and the power distance and individualism
indices from Hofstede's value system. The results were quite strong with
correlations ranging from 0.38 to 0.65. Shane found that individualistic
societies invent more than collective ones. Shane argues that individual-
istic societies invent more because they value freedom more, and free-
don is a necessity for creativity. Furthermore individualistic societies do
not stress loyalty, and are more prone to recognize individual achieve-
ment more than collective societies. Apparently, values can explain variance in inventiveness. However, according to the work of Davidsson (1995a; 1995b; 1992), the impact of values is more questionable. Davidsson has studied cultural differences between low-start up and high start up regions in Sweden. He used an entrepreneurship value index composed of several classical entrepreneurship values such as need for autonomy, need for achievement, and acceptance of capitalism. The effect of values was small (measured as differences in means) and problematic. In these series of studies, it was impossible to assess what values were of importance. There were differences between regions, but they changed from time to time. To be more precise, the entrepreneurship value scale discriminated between different regions, but the separate components did not. That is, a single value does not predict behavior because specific actions are rarely the result of a single motive. The scale total is therefore considerably more valid than are any individual subscales. Furthermore cultural values were more correlated with structural determinants than with start-up levels. This means that values cannot significantly add to explained variance when predicting entrepreneurship. Thus, we should be careful when interpreting studies where structural and culture variables are not studied together (Davidsson, 1995b).

The research done on an aggregated level is less numerous compared to that carried out within the individualistic perspective. It is a consequence of the prevailing focus on the entrepreneurial individual as the agent of change. The social legitimization perspective stresses that entrepreneurship is a process integrated in a social setting where the structural factors (economic and demographic variables) as well as general culture are important determinants. However, the importance of cultural values as predictors is small. Still, cultural values seem to be able to explain some aspects of the entrepreneurial process. To conclude, values have little predictive efficiency. Why this is so, is further commented on in the next section.

Values and Behavior

If values are supposed to be the core of culture, and culture is supposed to be an important determinant of economic development, it is interesting to
ask what is a value, how does it work, and what are its effects on behavior if any?

The conceptual definition used in the present paper is the following: value is a judgment, or evaluation made of abstract objects or end states of human existence (e.g., equality, freedom, achievement, tradition). Values are the criteria people use to select and justify actions and to evaluate people (including the self) and events. Such evaluation is made on the basis of the relative importance of things to the person. Values refer to what the person finds important or unimportant and they are relatively enduring over time (Dawis, 1991; Eagly & Chaiken, 1993; Schwartz, 1992; Sjöberg, 1993). Values differ from attitudes, even if they are closely related. The term attitude is defined as the valuation of a concept or an object, i.e., to which extent the object or the concept is judged as good or bad in a general, global meaning (e.g., attitudes to a political party, offshore oil drilling, or pollution). Attitudes change more easily than values over time. The object or concept to be valued is either general or specific, but usually it is rather specific (Eagly & Chaiken, 1993; Sjöberg, 1993). To conclude, values and attitudes are the same sort of concept with a difference in the abstraction of the judged object and the stability of this judgment over time.

My definition of value as an evaluation presumes that value is an evaluative state intervening between certain classes of stimuli and certain classes of responses. Therefore, values account for the covariation between stimuli denoting the value object (the entity or thing to be evaluated) and the evaluative responses to these stimuli. These responses can be classified into three categories; cognitive responses (beliefs, opinions, information), affective responses (emotions, feelings, and moods), and behavioral responses (intentions). The cognitive types of evaluative responses are thoughts or ideas about the attitude object; what is often called beliefs about the value object. Beliefs are understood as the linkages or associations, established by people between the value object and various attributes. The attributes that are associated with the value object express positive or negative evaluation. For example, some people believe that entrepreneurs are evil capitalists who should be controlled by
the state. Other people think that entrepreneurship is an expression of freedom and independence.

The predictive validity of values and attitudes has been much debated, i.e., the relationship between attitudes and overt behavior. It was found that the relation was much lower than expected, even inexistent. However, recent research has been able to establish when attitudes have predictive power (Bagozzi & Warshaw, 1992; Kim & Hunter, 1993; Sjöberg, 1993). A substantial relation between attitude and behavior can only be found with attitudes which are proximal to the dependent variable, i.e., attributes that are closely related in their contents. Distal variables with very different contents are rarely strongly related to the dependent variable, and they almost never add anything beyond a model based on proximal variables and demographics. Values are by definition distal variables, and they do not correlate highly with behavior. Furthermore, the relation may be even further reduced if the behavior is not entirely under the person’s volitional control, i.e., behaviors that require resources, the cooperation of others, and skills. The actor may not be able to perform such behaviors, despite his or her intentions to do so (Kim & Hunter, 1993). Thus, we can conclude that relevant attitudes can strongly predict volitional behavior. Values, on the other hand, are distal and thereby lack predictive power.

The value approach can also be criticized on a theoretical level. The approach is derived from expectancy-value theories and assumes that human behavior is determined by the need to achieve abstract goals specific to the cherished value. However, expectancy-value theories have been largely criticized for assuming the power of such ultimate goals of behavior. There is an implicit assumption that individuals maximize their hedonic pursuits by selecting those activities which have the highest likelihood of reaching the most valued goal. Humans are here assumed to have rational powers, and they are assumed to possess knowledge of (a) all alternatives, (b) the likelihoods of attaining these personal choices, (c) complete capability of assigning each goal a value, and (d) the capacity not only to merge expectancy and value into a single numerical figure, but to compare this figure with all others. Then humans, according to the model, selfishly select a goal that will produce the "highest" expected
pleasure (Weiner, 1992). Because human motivation is much more complex this approach fails.

To sum up, we can only expect values to contribute modestly to the explanation of entrepreneurial behavior. Firstly, values are too distal to actual behavior. Secondly, values have their greatest impact on volitional behavior, and a large part of entrepreneurial behavior is dependent on resources, the cooperation of others, and skill. Thirdly, humans do not act in accordance with the assumptions made by expectancy-value theories. We are not rational in that sense. However, given these drawbacks, research in values and their impact on behavior is still going on. One of the most recent and interesting contribution is Schwartz' (1992) work on universal values.

**Universal Values**

The contribution of Schwartz' work (Schwartz, 1992; Schwartz & Bilsky, 1990) is to empirically, as well as theoretically, identify the content, comprehensiveness, equivalence of meaning, and structure of values. By identifying the substantive content of values it is possible; to recognize all types of values and to form priorities independent of the culture; to determine the nature of content; and to find an universal set of motivational types. By comprehensiveness is meant the ability to map all the types of values to which individuals are likely to ascribe at least moderate importance as a criteria of evaluation. Comprehensiveness is important because we want to be able to account for all possible important values to a cultural group. Another methodological point is the possibility to assume equivalence of meaning, i.e., that values are similar or have the same meaning in different groups in a cross cultural study. If equivalence cannot be assumed then it is impossible to compare different groups. Finally, the value structure, i.e., the relations among single values, may reveal a meaningful structure which enables us to understand the conflicts and compatibilities among values.

According to Schwartz, there is a value structure that is universal in its content. Schwartz has distinguished 10 types of values that are likely to be recognized within and across cultures and used to form value priorities that guide us in our behavior. The 10 motivational types of values are:
Self-Direction. The goal of this value type is the possibility to choose, create, and explore independently.

Stimulation. This is the need for variety and stimulation. The aim is to maintain an optimal level of activation.

Hedonism. The pleasure of satisfying one's needs. It is the pleasure or sensuous gratification for oneself.

Achievement. The need for personal success through the demonstration of competence according to social standards. This differs from McClelland's view of achievement motivation to meet internal standards of excellence. McClelland's definition is more closely related to self-direction values.

Power. Power values emphasize the attainment or preservation of a dominant position within a general system. Achievement values on the contrary focus on the active demonstration of competence in concrete interaction.

Security. Safety, harmony, and stability of society, relationships, and of self are the motivational goals of this value type.

Conformity. The restrainement of actions, inclinations, and impulses likely to upset or harm others and to violate social expectations or norms.

Tradition. The respect, commitment, and acceptance of the customs and ideas that culture or religion imposes on the individual.

Benevolence. The motivational goal is enhancement and preservation of the welfare of people with whom one is in frequent personal contact.

Universalism. The goal of universalism is understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.
The values represent all aspects of the content domain, and therefore fill almost evenly the geometrical space formed to represent the intercorrelations among them. This means that the value types can be ordered on a bipolar value dimension (Self-transcendence vs. Self-enhancement and Openness to change vs. Conservation). Conformity, tradition and security are grouped in the conservation dimension. Universalism and benevolence are grouped in the self-transcendence dimension. Openness to change is represented by self-direction and stimulation. Achievement and power are found in the self-enhancement dimensions. Hedonism is stuck in the middle between openness to change and self-enhancement.

In brief, Schwartz argues that motivational differences between value types can be seen as continuous rather than discrete. For practical reasons (i.e., to examine differences in value priorities and to relate specific priorities to other variables) it is better to see them as discrete categories, but the precise locations of the partition lines are arbitrary, i.e., it is difficult to decide where one type of motivation ends and where another begins. The theory of value structure can be an important contribution to entrepreneurship research, since it gives us the possibility to form hypotheses about how the whole integrated system of value priorities relates to background, attitude, and behavior variables. These could all be central aspects for research dealing with the behavior of the entrepreneur.

Method

The Sample

The sample in this study was a combination of two survey samples gathered at different points in time and with different aims. The first survey was directed to a group of small business managers-owners in Sweden, and was supposed to measure and assess determinants of business growth and entrepreneurship. The second sample was aimed to assess determinants of environmentally responsible behavior and was directed Swedish citizens aged 18-65 years (Andersson, 1994). The reason that I have chosen to merge the two samples was that they represent both the general population and the small business owner-manager. Furthermore, the combination of the two samples gave me a large sample of 1234 of both
entrepreneurs and non-entrepreneurs where the two groups are well-represented. This large sample made it possible to cross-validate the results. A problem is that they were not taken at the same point of time and for the same reasons. It is possible that results may be influenced because small business management and the environmental problem highlighted different concerns. However, values are a distal and stable and the respondents were asked about their values in general. I have judged this problem to be minimal.

The first sample was taken from the Statistics Sweden register of all Swedish companies. The sample was restricted to independent firms between 5 and 49 employees in both the manufacturing and service industry. The 1 to 5 employees class was not included because it contains a large share of part time firms. Firms above 50 employees were not included, since the actual effect of the entrepreneur’s behavior on the business probably diminishes with an increasing number of employees. Of the 730 contacted entrepreneurs, 259 (35%) completed both a telephone interview and a follow-up mail questionnaire. The Schwartz value questionnaire was included in the mail questionnaire. The survey was conducted in October and November of 1994. The average age for the sample was 47.6 years and 5.4% were female.

The second survey was conducted in November 1993. The questionnaire was sent to a random sample of 1,500 Swedish citizens aged 18-65 years. Of the contacted individuals, 975 (65%) responded to the survey (Andersson, 1994). The analysis of the subjects’ socio-demographic characteristics showed that 47% were female, and the average age was 39.7 years. On the whole, the subjects were representative of the Swedish population in the same age interval.

Data on Values

The instrument is a Swedish version of Schwartz’ (1992) instrument. The instrument contains 56 values. According to the definition of values as guiding principles in the individual’s life, the survey asks the respondents to rate each value “as a guiding principle in my life”, using the following nine point scale: of supreme importance (7), very important (6), (unlabeled; 5, 4), Important (3), (unlabeled, 2, 1), not important (0), op-
posed to my values (-1). Rating is employed instead of ranking so that the information-processing capacities are not over taxed. Rating also gives the possibility to measure "negative" values.

The reliability of the scales was tested with Cronbach’s alpha. The alpha coefficient for the ten scales varied between 0.80 and 0.58, which can be considered above average for value scales (Peterson, 1994). Further details on instrument and the scales are given in the appendix 1.

Data on Regional Differences in New Firm Formation

Data on new firm formation were gathered from Statistics Sweden (1995). These data were based on a survey directed to newly founded firms in 1993 and -94. The survey was send to a random sample of 14 000 firms from a total population of 57 400, taken from Statistics Sweden’s Central Register of Enterprises and Establishments. The response rate was 86 %. Only personal enterprises, limited companies and trading companies were covered. Enterprises related to agriculture, forestry, fishing and real estate were excluded, as were unincorporated associations and foundations.

The new firm rate was measured as the mean for 1993-94 based on the number of newly founded enterprises per 1000 inhabitants (aged between 16-64 years) in each of Sweden’s 24 regions. The highest new firm rates were found in Sweden’s three largest cities with surroundings (Stockholm, Gothenburg, and Malmö). The lowest new firm rates were found in the Northern and central regions (Norr- and Västerbotten, Västernorrland, and Värmland), but also in the south of Sweden (Blekinge and Skaraborg). Table 1 displays the new firm formation for the concerned areas for 1993-94.
Table 1

*New firm formation per 1000 inhabitants (aged 16-64 years)*

<table>
<thead>
<tr>
<th>New enterprises</th>
<th>Stockholm</th>
<th>Gothenburg and Bohus</th>
<th>Malmö</th>
<th>Blekinge</th>
<th>Skara-borg</th>
<th>Värmland</th>
<th>Väster-norrland</th>
<th>Väster-botten</th>
<th>Norrbotten</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>6.3</td>
<td>4.3</td>
<td>4.8</td>
<td>2.9</td>
<td>2.9</td>
<td>2.9</td>
<td>3.3</td>
<td>2.9</td>
<td>2.7</td>
</tr>
<tr>
<td>1994</td>
<td>11.2</td>
<td>7.9</td>
<td>7.4</td>
<td>4.7</td>
<td>4.7</td>
<td>4.9</td>
<td>4.8</td>
<td>4.3</td>
<td>4.8</td>
</tr>
<tr>
<td>Mean</td>
<td>8.75</td>
<td>6.1</td>
<td>6.1</td>
<td>3.8</td>
<td>3.8</td>
<td>3.9</td>
<td>4.1</td>
<td>3.6</td>
<td>3.8</td>
</tr>
</tbody>
</table>


**Analysis**

Discriminant analysis was used to discriminate the different groups as much as possible based on differences in values. There are several ways of interpreting the discriminant function coefficients. In this paper the decision rule is based on a combination of the magnitude of the standardized coefficients and the pooled within-group correlation. In a perfect world where the independent variables are uncorrelated, the two selection criteria would yield the same coefficients. However, this is not the case here. Values are correlated with each other, and this has affected the magnitudes and signs of the coefficients. Only a combined statistical rule can therefore yield a satisfying basis of interpretation.

The percentage of correctly classified cases is an index of the effectiveness of the discriminant function. When evaluating this measure, it is important to compare the observed classification rate to that expected by chance alone. In this two-group application (e.g., self-employed and non self-employed) chance, based on equal prior probabilities, will result in a classification rate of 50%. Since two-group discriminant analysis is analogous to multiple regression (in which the dependent variable is either 1 or 0, depending on the group to which a case belong), explained variance ($R^2$) is also reported (Morisson, 1977; Pedhazur, 1982).

For the most efficient use of a discriminant function, certain assumptions must be met. The groups must be sampled from a multivariate normal population, and the population covariance matrices must be equal. Viola-
tions of the equality of the covariance matrices assumption are here measured by Box's M test. The test's prime purpose is to determine if the covariance matrices are equal. A small probability might lead to the rejection of the null hypothesis that the covariance matrices are equal. Furthermore, the test is sensitive to departures from multivariate normality. If the normality assumption is violated, the test tends to label the matrices unequal (Morrisson, 1977; Tabachnick & Fidell, 1989).

Two analyses were performed. The purpose of the first analysis was to test value differences between entrepreneurs and non-entrepreneurs. In this analysis, I had a fairly large sample to work on (N= 1234), and was able to estimate the degree of shrinkage of the function. According to Pedhazur (1982), the best method to estimate the degree of shrinkage is to perform a cross-validation. This is done using two samples. For the first sample the discriminant function is calculated. The discriminant function is then applied to the discriminant variables of the second sample, thus yielding a classification for each subject. The first sample is referred to as the screening sample, and the second as the calibration sample. The difference in correctly classified subjects, or the explained variance of the screening sample and of the calibration sample, are estimates of the amount of shrinkage. If the shrinkage is small, the discriminant function obtained in the screening sample may be used for further predictions. However, Pedhazur recommends, that after deciding if the shrinkage is small, to combine the two samples and use the discriminant function for the combined sample in future predictions.

In the second analysis, I wanted to test if differences in new firm formation between Swedish regions were due to differences in values. To maximize the differences, I have chosen to only use the region with the highest respectively the lowest rates of new firm formation. Only a restricted part of the sample is used, i.e., only respondents living in the concerned areas, and even if the sample is somewhat smaller (N= 608), I have chosen to perform a cross validation. The thumb of rule is that cross-validation is a valuable procedure for samples where N> 500.

Furthermore age and gender are used as control variables. According to Schwartz (1992), we can expect that values changes with age and gender.
Only the final discriminant functions based on the complete sample are presented.

Results

Differences at the Individual Level

The results from the discriminant analysis are displayed in Table 2. The unstandardized and standardized coefficients, and the pooled within-groups correlations are included. Here, standardized coefficients and correlations did not give the same information about the variables’ contribution to the discriminant function. This is due to the high correlation between the included values. Moreover, the small probability \((p=0.00)\) suggests that the covariance matrices are unequal. This could lead to a poorer performance of the discriminant function (i.e., a higher misclassification rate). The inference is usually robust, but not classification, since cases tend to be classified too often into groups with greater dispersion. On the other hand, the test is very sensitive to the sample size.

Table 2  
Values and entrepreneurs

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unstandardized coefficient</th>
<th>Standardized coefficient</th>
<th>Correlation between the variables and the function (by size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>-1.042</td>
<td>-0.462</td>
<td>-0.624</td>
</tr>
<tr>
<td>Age</td>
<td>0.048</td>
<td>0.583</td>
<td>0.439</td>
</tr>
<tr>
<td>Universalism</td>
<td>-0.061</td>
<td>-0.553</td>
<td>-0.378</td>
</tr>
<tr>
<td>Achievement</td>
<td>0.069</td>
<td>0.321</td>
<td>0.353</td>
</tr>
<tr>
<td>Stimulation</td>
<td>0.037</td>
<td>0.160</td>
<td>0.285</td>
</tr>
<tr>
<td>Self-direction</td>
<td>0.063</td>
<td>0.302</td>
<td>-0.185</td>
</tr>
<tr>
<td>Security</td>
<td>-0.035</td>
<td>-0.216</td>
<td>-0.146</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.169</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Box’s M: 276.17, significance: 0.000
Percent of "grouped" cases correctly classified: 76.17% (Self-employed 82%; others 74%)
Adj. \(R^2=0.30\)
The stability of the function was assessed through cross-validation. Furthermore, cases with missing values were excluded from the analysis. The effective sample was N= 1071. The percentage of correctly classified cases varied between the screening and calibration sample with 3% and the explained variance between 0.29 and 0.31, indicating a stable discriminant function. Furthermore, it was concluded that the high correct classification rate (76% correctly classified) indicated that there were substantial differences between individuals who choose to become self-employed and those who do not. These differences were strongly influenced by age and gender, where older and male respondents were more likely to be self-employed. An analysis performed without age and gender correctly classified 72%, but the explained variance diminished to 0.17, a difference of 0.12. The correct classification rate was somewhat higher than the one reported by McGrath et al. (1992a) when using Hofstede's index. The overall impression from the results was that they did not contradict earlier research.

Figure 1. Differences in values between entrepreneurs and non-entrepreneurs

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6 The model was tested on the male population only. The correct classification rate diminished somewhat to 72.3% (adj. $R^2 = .26$). All variables were in the confidence interval, except for self-direction.
Figure 1 shows the differences in values between the two groups. Achievement, stimulation, and self-direction were closely related to higher order dimensions such as openness to change and self-enhancement, whereas security and universalism, which had the highest correlation, were related to conservatism and self-transcendence respectively. According to the results, self-employed respondents valued universalism less (i.e., they did not value the understanding, appreciation, tolerance, and protection for the welfare of all people and for nature), but they valued change and self-enhancement. It is interesting to note that both achievement measures were included in the final function. This indicates that McClelland's definition relating to internal sets of performance standard is too narrow, and that self-employed persons have more complex achievement patterns. Security was negatively related to self-employment, which is probably best understood from a risk perspective. The entrepreneurs or self-employed are not attracted to risk as earlier theories suggest, they only accept it. They value security less, because it is contradictory to change and self-enhancement. This is an important distinction. Entrepreneurs are not attracted by risky situations. They have to accept them because they value changes and self-enhancement higher than security. Overall, these results were in the same directions as those found by Fagenson (1993) and McGrath et al. (1992a), where entrepreneurs valued ambition, capabilities, and individualism more than the general public, even if those values implied some inequalities in society.

To sum up, the discriminant function, in spite of the assumptions, was shown to be stable in the cross-validation. The explained variance was moderate and the classification rate was somewhat higher than earlier studies. The included values confirmed earlier research, but at the same time underlined the importance of testing a whole value system, and not only separate values.

**Differences at the Regional Level**

The results in the first analysis were encouraging, indicating a substantive difference in values between entrepreneurs and non-entrepreneurs. However, the difference in values between regions with a low rate in new enterprises and regions with a high rate in new enterprises was very small, and it was difficult to find one best function. Therefore two func-
tion are discussed, that both satisfied the assumptions and yielded similar results\(^7\). As in the first analysis, cases with missing values were excluded from analysis. The effective sample was N= 585.

Table 3

*Values and regional differences*

**Function 1**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unstandardized coefficient</th>
<th>Standardized coefficient</th>
<th>Correlation between the variables and the function (by size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tradition</td>
<td>-0.141</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Constant</td>
<td>2.326</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Box’s M: 2.07, significance: 0.15
Percent of ”grouped” cases correctly classified: 57.93% (Low 57%; high 58%)
Adj. R\(^2\)=0.02

**Function 2**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Unstandardized coefficient</th>
<th>Standardized coefficient</th>
<th>Correlation between the variables and the function (by size)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universalism</td>
<td>-0.107</td>
<td>-0.979</td>
<td>-0.576</td>
</tr>
<tr>
<td>Self-direction</td>
<td>0.187</td>
<td>0.911</td>
<td>0.479</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.175</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Box’s M: 5.58, significance: 0.14
Percent of ”grouped” cases correctly classified: 57.46% (Low 60%; high 56%)
Adj. R\(^2\)=0.03

\(^7\) A stepwise regression analysis was performed on all regions. The analysis yielded three significant variables: Tradition, Universalism, and Self-direction. The explained variance was very low (R\(^2\) = 0.02)
Both functions showed an extremely low ability to discriminate between the two groups. The two functions were only able to correctly classify 57% of the cases and the explained variance was at its best 0.03. The shrinkage was small with classification rates varying between 57% and 60% for function 1, and between 58% and 59% for function 2. Reusing the discriminant function modeled in the first analysis yielded a classification rate of 58% (maximum 62%), but the explained variance remained extremely low (adj. $R^2 = 0.03$). Value differences between entrepreneurs and non-entrepreneurs may be applicable to the regional level. Nevertheless, these findings confirmed earlier research made by Davidsson (1992; 1995a; 1995b), underlining that the differences are small between regions and that it is difficult to assess what values are of importance.

According to function 1, tradition (the respect, commitment, and acceptance of the customs and ideas that culture or religion imposes on the individual) was less valued in regions with higher start-up frequencies. Tradition is closely connected to the higher dimension of conservation, and directly opposed to change which is an important value for entrepreneurs. In function 2, universalism was less valued and self direction (to choose, create, and explore independently) was more valued by people in regions with a high rate of new enterprises. These results can be compared to Davidsson and Delmar (1992) who found that people in regions with high start up rate valued change significantly more than regions low in start up rate. Regions where the inhabitants valued change more than tradition and care, tended to create more enterprises, even if the difference was very small.

To conclude, values had little ability to discriminate between regions with different start-up rates, even when the most extreme regions were chosen for the analysis. The cross-validation showed that these results were stable, and considering earlier research the results were to be expected.

Discussion

The purpose of this work was to assess the importance of values in the entrepreneurial process both from an individualistic perspective (i.e., are there differences between entrepreneurs and non-entrepreneurs?) and a
social legitimization perspective (i.e., are some regions more entrepre-
neurial because the culture value actions related to entrepreneurship more
than other regions?). On the individual level, we have seen than values
had a moderately good ability to discriminate between entrepreneurs and
non-entrepreneurs. The correct classification rate was high and cross-
validation showed that the model was stable, and 17 % of the variance
was explained when only values were used. It was found that entrepre-
neurs valued personal success, independence, and stimulation more than
the rest of the population, even if it meant accepting inequalities in soci-
exty. The results are easily incorporated with earlier findings. The results
from the socialization perspective were less encouraging. Values had
virtually no ability at all to discriminate between regions high and low in
new enterprises’ rate. It was difficult to find a single function, and there­
fore two functions were presented. In the first function, tradition was able
to discriminate somewhat between the two regions. In the second func­
tion self-direction and universalism were included. Hence, there were
some significant value differences between region, but they were very
small. Regions high in new enterprise rate were more open to change and
valued traditions less than regions low in new enterprise rate. Both the
contents and the strength of the function are in line with earlier research.
However, it is important to note that an alternative interpretation is that
the regional differences tested are more attributable to differences be­
tween cultures in large cities and rural areas than differences in new en­
terprise rates. The conclusion is that entrepreneurs and non-entrepreneurs
had different value systems and that these results were stable across
studies and the use of slightly different value systems. The idea of social
legitimization where values are an important explanation to differences in
start-up rate received poor support.

Compared to earlier research, we have seen that the use of value systems
(comprehensive systems covering all the types of values) instead of sin­
gle values are slightly more able to give stable and interesting results.
This is at least true from the individual perspective. The impact of values
is perhaps somewhat more important at the individual level. But we still
do not know how important values are compared to other determinants of
behavior (e.g., ability, emotions, task characteristics) when it comes to
the choice of being an entrepreneur or not.
Values did not differentiate between different regions. Several possible explanations due to design and method are possible. The study was conducted on Swedish regions. It is possible that Swedish culture is too homogenous, and choosing more regions or countries where differences can be expected to be larger will perhaps yield better results. But more important is that values are more correlated with other structural variables than with the new firm rate (Davidsson, 1995a). As we have seen, cities are more entrepreneurial than rural regions. It is probable that a study trying to separate the effect of structure and values will find better results. Stated differently, it is a covariance problem, and the variance from structure must be controlled to correctly assess the importance of values. On the other hand it is also possible that the used value system in this work is too distal and abstract, and consequently did not accurately tap information about regional differences in attitudes to self-employment and new business formation. Attitude scales more closely related to the topic of new firm formation will probably yield better results, if the social legitimization perspective has some explanatory value to the entrepreneurship problem. Recent research in psychology (Greenwald & Banaji, 1995) has shown that social cognition is influenced not only by attitudes, but also by self-esteem and stereotypes. Furthermore, social cognition is both implicit and explicit. This means that not only general attitudes to new firm formation have to be investigated, but also how self-esteem and stereotypes about entrepreneurs are in accordance with each other. Furthermore, questionnaires only tap explicit social cognition, and other indirect measures are needed to assess the role of implicit cognition (e.g., projective measures as once used by McClelland [1961]).

To conclude, we have seen that values had a moderate discriminating power at the individual level but not at the regional level, and that the important values were stable over different studies and value systems. Further research must therefore now be directed to determining the importance of values compared to other behavioral determinants in the choice process of being an entrepreneur, and how they affect entrepreneurial performance should be studied as well. Concerning the social legitimization perspective much more work is needed to first find a satisfying way of measuring culture and then trying to separate the effects of struc-
ture and culture. I have here suggested that the measurement of culture should be more focused on attitudes, self-esteem and stereotypes connected to entrepreneurship and entrepreneurs.
References


APPENDIX

Values

A total of 56 values aimed at capturing the ten motivational value types analyzed in this paper were included in the questionnaire. A few values were not used in the scale due to low intercorrelation. For the complete list of values, see Schwartz (1992).

Power (theoretical range = (-5) - 35; Cronbach’s Alpha = 0.71)
1. Social power (control over others, dominance)
2. Wealth (material possessions, money)
3. Social recognition (respect, approval by others)
4. Authority (the right to lead and command)
5. Preserving my public image (protecting ”my face”)

Achievement (theoretical range = (-5) - 35; Cronbach’s Alpha = 0.77)
1. Successful (achieving goals)
2. Intelligent (logical, thinking)
3. Capable (competent, effective, efficient)
4. Ambitious (hardworking, aspiring)
5. Influential (having an impact on people and events)

Hedonism (theoretical range = (-2) -14; Cronbach’s Alpha = 0.58)
1. Enjoying life (enjoying food, sex, leisure, etc.)
2. Pleasure (gratification of desires)

Stimulation (theoretical range = (-3) -21; Cronbach’s Alpha = 0.76)
1. An exciting life (stimulating experiences)
2. A varied life (filled with challenge, novelty, and change)
3. Daring (seeking adventure, risk)

Self-direction (theoretical range = (-5) -35; Cronbach’s Alpha = 0.70)
1. Curious (interested in everything, exploring)
2. Choosing own goals (selecting own purposes)
3. Creativity (uniqueness, imagination)
4. Self-respect (belief in one’s worth)
5. Freedom (freedom of action and thought)

**Universalism** (theoretical range = (-9) - 63; Cronbach’s Alpha = 0.80)

1. Equality (equal opportunity for all)
2. Inner harmony (at peace with myself)
3. A world at peace (free of war and conflicts)
4. Unity with nature (fitting into nature)
5. Wisdom (a mature understanding of life)
6. A world of beauty (beauty of nature and of the arts)
7. Social justice (correcting injustice, care of the weak)
8. Broad-minded (tolerant to different ideas and beliefs)
9. Protecting the environment (preserving nature)

**Tradition** (theoretical range = (-6) - 42; Cronbach’s Alpha = 0.62)

1. Respect for tradition (preservation of time-honored customs)
2. Detachment (from worldly concerns)
3. Moderate (avoiding extremes of feeling and action)
4. Humble (modest, self-effacing)
5. Accepting my portion of life (submitting to life’s circumstances)
6. Devout (holding to religious faith and belief)

**Benevolence** (theoretical range = (-9) - 63; Cronbach’s Alpha = 0.76)

1. A spiritual life (emphasis on spiritual not material matters)
2. Meaning of life (a purpose in life)
3. Mature love (deep emotional and spiritual intimacy)
4. True friendship (close, supportive friends)
5. Loyal (faithful to my friends, group)
6. Honest (genuine, sincere)
7. Helpful (working for the welfare of others)
8. Responsible (dependable, reliable)
9. Forgiving (willing to pardon others)

**Conformity** (theoretical range = (-4) - 28; Cronbach’s Alpha = 0.75)

1. Politeness (courtesy, good manners)
2. Self-discipline (self-restraint, resistance to temptation)
3. Honoring of parents and elders (showing respect)
4. Obedient (dutiful, meeting obligations)
<table>
<thead>
<tr>
<th>Security (theoretical range = (-7) - 49; Cronbach’s Alpha = 0.66)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sense of belonging (feeling that others care about me)</td>
</tr>
<tr>
<td>2. Social order (stability of society)</td>
</tr>
<tr>
<td>3. National security (protection of my nation from enemies)</td>
</tr>
<tr>
<td>4. Reciprocation of favors (avoidance of indebtedness)</td>
</tr>
<tr>
<td>5. Family security (safety of loved ones)</td>
</tr>
<tr>
<td>6. Clean (neat, tidy)</td>
</tr>
<tr>
<td>7. Healthy (not being sick physically or mentally)</td>
</tr>
</tbody>
</table>
Study 6:

DETERMINANTS OF GROWTH MOTIVATION: A STRUCTURAL EQUATION MODEL OF ENTREPRENEURIAL BEHAVIOR

Frédéric Delmar
Determinants of Growth Motivation: A Structural Equation Model of Entrepreneurial Behavior

Frédéric Delmar
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Abstract
This study focuses on the impact of individual differences in intellectual ability and motivation on venture performance. The proposed model takes into account the interaction between the environment and the entrepreneur’s motivation and ability. The model also differentiates between entrepreneurial and business performance. Business performance was measured as business efficiency (risk buffer) and previous growth, entrepreneurial performance as growth motivation. Both multiple regression and structural equation modeling were used to test the model.

Analyses of the data provided weak support for the business performance models, but strong support for the entrepreneurial performance model. Findings suggested an important interaction between self-determination, job interests and ability. Furthermore, these characteristics had an indirect effect on growth motivation. It was concluded that motivation, and not ability, is the most important determinant of individual differences in performance.

Introduction
One of the most traditional questions in entrepreneurship research revolves around explaining why entrepreneurs’ firms differ on a specific venture performance dimension or why performance changes from time to time. One approach is to try to explain these differences in performance by focusing on individual differences in traits and motives. Another approach is to try to explain performance as a result of the situation, where the individual has little or no room to make a difference. Few studies have jointly examined a wide array of both individually and situation related variables to estimate their separate contributions to prediction and explanation of performance. The approach adopted in this
investigation is therefore to propose and test a model that takes into consideration both the determinants of individual differences and of the situation in firm performance. The proposed model is grounded in previous theory and research in psychology and entrepreneurship.

The proposed model is based on an interactionist perspective, i.e., venture performance is assumed to be based on the mutual influence between the entrepreneur and the environment. It further assumes that business performance is multidimensional (i.e., both growth and efficiency are needed to assess the business performance) and that performance can be explained in terms of basic dimensions such as intellectual ability, motivation, and environmental characteristics. Furthermore, it is assumed that entrepreneurial performance and business performance can be differentiated. Stated differently, an entrepreneur can perform well, because business performance depends on others factors than the entrepreneur. The main focus of this work is on explaining how the behavior of the entrepreneur affects performance. Environmentally related variables (task characteristics) are here seen as control variables and are not the primary objects of research (Ruist, 1990). The first purpose is to examine how three domains of variables (motivation, ability, and task characteristics) can predict and explain entrepreneurial performance, i.e., future growth or growth motivation. The second purpose of the current study is to examine how these three domains of variables can predict and explain business performance, i.e., previous growth and efficiency. Since explanation is a central aspect of this investigation, structural equation modeling, also known as causal modeling, will be used, in conjunction with multiple regression.

The organization of the study is as follows: Firstly, the model on which this work is based is presented. It is a framework based on psychological performance theory. Determinants of performance and their relations are reviewed. Secondly, this introduction and theoretical review is followed by a method discussion where structural equation modeling is presented. In the next section, I present the results from the data analyses. Finally, the results are discussed in the concluding section.
A Model of Entrepreneurial Behavior and Performance

There are four major concepts in this model: business performance, entrepreneurial performance, the individual (motivation and ability), and the environment. The model is shown in figure 1.

1- Business performance is determined by the response of the environment (i.e., market) to the actions of the entrepreneurs. Differently stated, the business will perform well if there is a demand for the products or services offered by the business. Therefore, business performance is depending on entrepreneurial performance (arrow a) and the action of both the internal (e.g., the personnel’s reaction to different decisions) and external environment (e.g., changes in customer relations) (arrow b). In this model, entrepreneurial performance is distinct from business performance. An entrepreneur can be performing highly, but his or her business performs poorly because of unforeseen events or events not controllable by the entrepreneur. For example, an entrepreneur may wish to expand his or her business, but the competition is too intensive. Differently stated, an entrepreneur can never control all factors determining business performance, and therefore it is more logical to define entrepreneurial performance as the specific tasks that can be or should be controlled. Business performance is here either measured as the ability to survive or to grow. Growth is also the result of entrepreneurial performance. Sur-
vival is *per se* not sufficient as an entrepreneurship indicator, but it is an indicator of durability on the market.

2- *Entrepreneurial performance* or behavior is defined by the actions taken by the entrepreneur to reach desired goals. Entrepreneurial performance is restricted to tasks that are or can be under the control of the entrepreneur, such as the role of the board, organization, decision making, and goals and strategies. The basic argument is that an understanding of entrepreneurial behavior is better understood by examining behaviors that are under the control of the entrepreneur. Only when we understand the determinants of entrepreneurial performance can we link entrepreneurial behavior to business performance. Differently stated, we have to know what an entrepreneurs does and why, and how these actions affect business performance. Entrepreneurial performance is determined by the environment (arrow c) and the individual’s capacity and will (i.e., ability and motivation) (arrow d) to deal with the environment (organizational design and context). The entrepreneur is assumed to act on the environment in accordance with his or her goals. The actual performance of the entrepreneur is difficult to measure and is often confounded with the business performance in empirical tests, but it is important to note that the two are not always the same.

3- The *environment* is divided into the internal organization and the surrounding context. The organizational design is the product at time period $t_0$ of the entrepreneur’s interpretation of the environmental threats and possibilities at time period $t_0$. In other words, the entrepreneur creates an organization that he or she thinks will be most effective in the present context to achieve the goal or goals of the venture. This organization will be more or less effective. The organization and the context represent the environment on which the entrepreneur acts. The model is of course static, and in a dynamic model it could be assumed that the entrepreneur also affects and changes the environment in the next time period $t_2$.

4- *The individual* is defined by the entrepreneur’s dispositions, i.e., ability and motivation. The entrepreneur’s actions are based on his or her individual dispositions and the characteristics of the environment (arrow e). Differences in entrepreneurial performance due to the individual vary
with the ability and motivation. The concept of ability is based on proce-
dural and cognitive knowledge. Declarative knowledge is knowledge
about facts (e.g., facts, values, goals, and self-knowledge). It represents
the understanding and requirements for a given task. Procedural knowl-
dge and skills (e.g., social and cognitive abilities, and perception) are
achieved when they are successfully combined with knowledge of how to
do it.

Motivation is a direct determinant of performance. Motivation is a com-
bined effect of three choices: (a) the choice to direct the strain in some
direction, (b) the choice of increasing the level of strain, and (c) the
choice of maintaining the strain level. In other words, the direction, the
extensiveness, and the time for a certain behavior are the basis of moti-
vation. This is a cognitive definition of motivation. A more general de-
inition of motivation is given by Kanfer (1991). She defines motivation
as:

"... intra- and interindividual variability in behavior not due solely to in-
dividual differences in ability or to overwhelming environmental de-
mands that coerce or force action." (p. 78)

The model is based on certain assumptions from psychological perform-
ance theory. Firstly, entrepreneurial performance arises only when there
is a choice of acting with a certain intensity and during a certain time.
Motivation is therefore a determinant of performance. Performance is not
possible without a minimum level of talent being met and therefore there
is a complex interaction between procedural knowledge and motivation.
The greater the talent, the greater the tendency to choose to perform, but
talent per se has no relation to the choice of strain level. Secondly, de-
clarative knowledge is necessary for procedural knowledge. This means
that when one performs a task, one has to know what to do. This distinc-
tion is important, because performance can deteriorate because proce-
dural knowledge has never been developed or because declarative knowl-
dge has never been acquired or is obsolete. More simply stated, the per-
formance model indicates that to perform a task an entrepreneur must (a)
possess the prerequisite knowledge, (b) master the prerequisite skills, and
then (c) actually choose to work on the job tasks for some period of time at some level of effort (McCloy, Campbell, & Cudeck, 1994).

Recent research in psychology, as exemplified by Project A (U.S. Army selection and classification project) has shown that cognitive ability is the best predictor of job performance (McCloy, Campbell, & Cudeck, 1994; McHenry, Hough, Toquam, Hanson, & Ashworth, 1990; Hunter & Hunter, 1984; Ree, Earles, & Teachout, 1994). Furthermore, the prediction of job performance is improved by adding non-cognitive predictors as interest and personality to a cognitive test. Vocational and job interest has been less attended to than personality. It is a predictor closely related to intrinsic motivation (Dawis, 1991), and refers to what the individual likes and dislikes. Thus, recent psychological research agrees that intellectual ability is the most important determinant of job performance. However the picture is not as conclusive when leadership and performance are considered.

The results from leadership research are interesting to consider, because the entrepreneur is among other things a leader. The relation between intellectual abilities and leadership performance is consistently low (Bass, 1990; Fiedler, 1995). This does not mean that it does not matter if leaders are bright or not, only that there is not a straight forward relation. Bass indicates that (a) highly intelligent persons may suffer from self-preoccupation, (b) their abilities make it difficult to communicate with others, and (c) only those who already have above average intelligence are likely to achieve top management positions and therefore intelligence tests cannot discriminate poorer from better performance at the top of the organization (Bass, 1990). This may be true, but examining the results from the Project A, we can conclude that intellectual ability has a high predictive power when the performance criterion is well defined (e.g., solving a math problem, assembling a complicated machine) but diminishes when performance becomes dependent of some sort of social interaction. That is, when performance becomes dependent on interactions with others, the predictive ability of intellectual ability diminishes drastically. Possible explanations are that (a) leadership is a complex performance where several goals must be achieved and there are several ways to achieve them, and (b) performance is no longer only dependent on the
leader, but on how the leader is perceived by others (e.g., the leader may make sound decision, but he or she is not perceived as creditable). Nevertheless, we do not know how intellectual ability relates to entrepreneurial performance.

The question is still unanswered. Even if entrepreneurial personality has been much researched, little or no attention has been given intellectual ability as measured by IQ. An exception is de Wit & van Widen’s (1989) study on the relation between self-employment and intellectual ability showing that high IQ increased the probability to become self-employed. Entrepreneurship research’s interest in performance has concentrated on individual background and environmentally related variables.

To sum up, this section shows two things. Firstly, that business performance as an indicator of entrepreneurial performance is contaminated; more variables than the individual and the error term control the variance in measures of business performance even in small enterprises that are the unit of analysis in most entrepreneurship studies (Davidsson, 1989). That is, performance is here seen in two stages. The first stage is the entrepreneurial performance that is determined by how the individual chooses to act. The second stage is the business performance which is a product of entrepreneurial performance and the environmental characteristics. Here, the number of variables determining performance is much larger and therefore the relative impact of the individual on the venture performance is reduced. Secondly, this section shows the interconnectedness between the individual and the environment, and on the individual level the association between motivation and ability. To be able to understand entrepreneurial performance we must therefore penetrate more deeply the roles of motivation and ability, and how they are affected by the situation.

Layout of Research Design

A problem with this study is that with cross-sectional data the model as a whole cannot be tested directly. While some objective data that may explain performance were available, ex ante data on motivation and perception variables were lacking. Growth and financial performance data concern the 1992-94 period, whereas growth motivation and perception
data were collected at one point in time, viz., October-November 1994. Therefore partial analyses are presented. First an attempt is made to explain previous growth by differences in stable and distal data in the relevant time period. The subjective part of the model is thus left out. In the following analysis the effects of proximal variables were tested on growth motivation. Although the relation between growth motivation and subsequent real growth cannot be tested directly, the results of the partial analyses have implications for that relationship.

Method

The Sample

The sample was taken from the Statistics Sweden register of all Swedish companies. The sample is restricted to independent business enterprises between 5 and 49 employees in both the manufacturing and service industry. The 1 to 5 employees class was not included because it contains a large share of part time firms. Firms above 50 employees were not included, since the actual effect of the entrepreneur's behavior on the business probably diminishes with an increasing number of employees.

Of the 730 contacted entrepreneurs, 259 (35%) completed both a telephone interview and a follow-up mail questionnaire. The response frequency cannot be considered low compared with published research, and considering the size of the questionnaire (over 260 questions). Furthermore, it is not critical, because inference on statistical grounds to a larger and well defined population is not the prime purpose of this study.

Measures of Performance

Performance was measured as either the business efficiency (i.e., return on assets and investment, debt-equity ratio) or growth (i.e., numbers of employees and size of turnover). Most studies measure performance as growth. The reasons are (a) the difficulty to access the financial reports of small and newly founded businesses, and (b) the questionable value of financial ratios as indicators of effectiveness in small and new businesses (Ang, 1991). Most performance measures are therefore self-report data from the interviewed entrepreneurs. Information about growth is more
easily accessible and reliable than measures of efficiency. The result is that most of the performance research in new and small businesses is based on the measurement of growth. However, different factors affect growth and efficiency, and performance is therefore multidimensional. It would therefore be wrong to only focus on one performance measure. Even if the validity of financial ratios can be questioned, it would be a pity not to use the possibility we have in Sweden to collect the official annual reports. In this paper, I have therefore chosen to measure efficiency as well as growth.

Efficiency was measured with the risk buffer. It is the difference between return on assets and return on debt. A large risk buffer means an ability to generate capital as a function of both successful operational and financial management. It is therefore a general indicator of business performance. The ratio was computed as the average of the years 1992 and 1993. A problem was that these measures have not been calculated for every case, due to missing financial reports.

Growth was measured with a composite measure of the change in percentage in numbers of employees and turnover over the last three years (for growth motivation optimal size in five years). Contrary to the efficiency measures, these measures were based on questionnaire data. Both growth ratios were logarithmized to reduce the skewness of the distribution. The Cronbach's Alpha for the growth indicator was 0.83 for previous growth and 0.84 for growth motivation.

Measures of Individual Differences and Task Characteristics
The explanatory variables are either related to the entrepreneur or to the environment. The variables related to the entrepreneur were grouped in three broad categories: ability (decision styles, education and experience), motivation (job interests, values, self-determination, attitudes), and individual background (sex, age, entrepreneurs in the family). Task characteristics were divided into two groups of variables. The first dealt with variables related to the characteristics of the firm (e.g., personnel, board), and the second group dealt with the external environment (e.g., competition, industry).
Individual Background

The individual background was measured with indicators such as sex, age, and if the entrepreneurs had parents or close family who have been or are business manager-owners. Sex and family relationship were measured with dummy variables.

Ability

Decision styles were seen as separate from intellectual ability (even if they are actually part of the abilities defining human performance) because of the supposed importance of decision making ability in economics and in the management literature.

Decision styles were measured with a questionnaire designed by Mann. It is based on the Janis and Mann's (1977) conflict theory of decision making, and it measures the tendency to use different patterns of decision making. The questionnaire consists of six scales measuring six decisional coping patterns. The coping patterns are defined and presented below with Cronbach’s coefficient alpha for this study in parentheses:

Vigilance is the tendency to carefully search for information, to consider many alternatives without bias, and to evaluate alternatives carefully before making a choice (Cronbach’s alpha = 0.49).

Hypervigilance is the tendency to impulsively make decisions and to search for quick, easy solutions to problems (Cronbach’s alpha = 0.59).

Defensive avoidance is the tendency to try to avoid or escape decision making. Rationalization, buck passing, and procrastination are three types of defensive avoidance (Cronbach’s alpha = 0.65).

Rationalization is the tendency to avoid the reality of the decisions. This is achieved by concentrating only on the positive alternatives of the choice or ignoring or denying unpleasant aspects of the decision (Cronbach’s alpha = 0.43).

Buck passing is the tendency to leave the hard decisions to others, to avoid taking responsibility and to blame others when a wrong decision is made (Cronbach’s alpha = 0.61).
Procrastination is the tendency to put off making decisions by considering other things or by considering the decision for too long (Cronbach’s alpha = 0.69).

Peterson (1994) has in a meta-analysis of Cronbach’s coefficient alpha reviewed the recommended reliability levels. All reviewed articles recommended levels above 0.5 for basic and preliminary research. Both vigilance and rationalization have reliability levels below the recommended levels, and are therefore not used. It should be noted that satisfactory levels are 0.70 and above for behavioral research. The measurement of decision style is therefore problematic, and should be developed if it is to be used for prediction for smaller groups or individuals. It is, however, judged that these scales have satisfactory reliability levels for predictions in this case with a sample larger than 200.

*Intellectual ability* was measured by a range of variables such as entrepreneurial, management, and industry experience, educational level, and education in business administration. Thus, also considering data on decision styles, data on both procedural and declarative knowledge have been obtained. Decision styles were here seen as representatives of procedural knowledge whereas education and experience were seen as indicators of declarative knowledge. It should be noted that these variables were rough indicators of intellectual ability, but good tests of intellectual ability (i.e., IQ) are time consuming and not developed for use in mail surveys.

*Motivation*

*Job interest.* No validated and carefully developed measurement instrument was available for the measurement of interest. Instead I had to construct my own instrument. A set of 18 variables was used to measure interest. The respondent was asked to mark on a five point Likert scale how interested he or she was in a certain work task (e.g., marketing, personal development). By means of exploratory factor analysis (Kim & Mueller, 1978) the set of variables was reduced to five underlying factors. The factors were extracted by principal component analysis. The clearest structure was achieved by an oblique rotation. The factor scores are standardized and represent the entrepreneur’s estimated score on the factor. A
positive factor score value indicates that the entrepreneur’s interest in a factor is above average. A negative value means that the entrepreneur's interest is below average. The interpretation of the five identified interest factors is shown in Table 1.

Table 1
Interpretation of the factor analysis
(Kaiser-Meyer-Olkin test = 0.739, Bartlett test of sphericity= 1255.85, cumulative explained variance with 5 factors = 60.0%)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Interpretation</th>
<th>Score above average</th>
<th>Score below average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Supply and credits</td>
<td>The entrepreneur is more interested in supplies, contacts with the suppliers, and the credit management of the customers</td>
<td>The entrepreneur is less interested in supplies, contacts with the suppliers, and the credit management of the customers</td>
</tr>
<tr>
<td>2</td>
<td>Strategic management</td>
<td>The entrepreneur is more interested in innovation, planning for the future of the business and marketing plans</td>
<td>The entrepreneur is less interested in innovation, planning for the future of the business and marketing plans</td>
</tr>
<tr>
<td>3</td>
<td>Financial control</td>
<td>The entrepreneur is more interested in budgeting, financing, and bookkeeping</td>
<td>The entrepreneur is less interested in budgeting, financing, and bookkeeping</td>
</tr>
<tr>
<td>4</td>
<td>Market orientation</td>
<td>The entrepreneur is more interested in direct production, and less interested in customer relations</td>
<td>The entrepreneur is less interested in direct production, and more interested in customer relations</td>
</tr>
<tr>
<td>5</td>
<td>Human resources</td>
<td>The entrepreneur is more interested in personnel development and relation, in the board, and personal development</td>
<td>The entrepreneur is less interested in personnel development and relation, in the board, and personal development</td>
</tr>
</tbody>
</table>

Values were measured with Schwartz’ value instrument translated into Swedish by Daun (Verkasalo, Daun, & Niit, 1994). According to Schwartz (1992) there is a value structure that is universal in its content.
Schwartz has distinguished 10 types of values that are likely to be recognized within and across cultures and used to form value priorities that guide us in our behavior. The 10 motivational types of values are:

**Self-Direction.** The goal of this value type is the possibility to choose, create, and explore independently (Cronbach’s alpha = 0.70).

**Stimulation.** This is the need of variety and stimulation to maintain an optimal level of activation (Cronbach’s alpha = 0.76).

**Hedonism.** The pleasure of satisfying one’s needs, it is the pleasure or sensuous gratification for oneself (Cronbach’s alpha = 0.58).

**Achievement.** The need for personal success through the demonstration of competence according to social standards. This differs from McClelland’s view of achievement motivation to meet internal standards of excellence. McClelland’s definition is more closely related to self-direction values (Cronbach’s alpha = 0.77).

**Power.** Power values emphasize the attainment or preservation of a dominant position within a general system. Achievement values on the contrary focus on the active demonstration of competence in concrete interaction (Cronbach’s alpha = 0.71).

**Security.** Safety, harmony, and stability of society, relationships, and of self are the motivational goals of this value type (Cronbach’s alpha = 0.66).

**Conformity.** The restrainement of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms (Cronbach’s alpha = 0.75).

**Tradition.** The respect, commitment, and acceptance of the customs and ideas that one’s culture or religion impose on the individual (Cronbach’s alpha = 0.62).
Benevolence. The motivational goal is enhancement and preservation of the welfare of people with whom one is in frequent personal contact (Cronbach’s alpha = 0.76).

Universalism. The goal of universalism is understanding, appreciation, tolerance, and protection for the welfare of all people and for nature (Cronbach’s alpha = 0.80).

The instrument contains 56 value items. According to the definition of values as guiding principles in the individual’s life, the survey asks the respondents to rate each value "as a guiding principle in my life", using the following nine point scale: of supreme importance (7), very important (6), (unlabeled; 5, 4), Important (3), (unlabeled, 2, 1), not important (0), opposed to my values (-1). Rating is employed instead of ranking so that the information processing capacities are not over taxed. Rating also gives the possibility to measure "negative" values.

Self-determination or causality orientation was measured by an instrument developed by Deci and Ryan (1987). The instrument measures three causality orientations that are personality characteristics, and are supposed to influence intrinsic motivation (interest and enjoyment in a task). Autonomy orientation (Cronbach’s alpha = 0.77) refers to the degree to which inputs are perceived as autonomy supportive and is related to intrinsic motivation. Control orientation (Cronbach’s alpha = 0.65) refers to the degree to which inputs are perceived as controlling and is related to extrinsic motivation. A third orientation, the impersonal orientation (Cronbach’s alpha = 0.68), refers to the tendency to experience oneself as being unable or incapable to attain desired outcomes.

Attitudes to growth and beliefs about the future (opportunities) were measured with ten respectively eight questions on a five point Likert scale. Most of these questions have been used earlier by Davidsson (1989). They were however supplemented with questions concerning leadership and enjoyment. These questions were only used when analyzing growth motivation. Contrary to previous measures, attitudes are assumed to be proximal and relatively unstable over time.
Task Characteristics

The task characteristics variables were almost all based on self-report data. The purpose of measuring these variables was to use them as control variables, and they were not the primary objects of this research. However, task characteristics have an important impact on performance and therefore substantial work has been done to measure a large array of possible determinants of performance. The task characteristics were divided in two sub groups; external environment and firm related variables.

External environment: these variables related to the differences in industry, market structure, geographic location, and competitive intensity. Competitive intensity and customer concentration (the amount of turnover generated by the three largest customers) were the only self-report measure in this group.

Firm related variables: were based on self-report data from the telephone survey. The questions covered a wide area of subjects such as: personnel, board, short and long term planning, cooperation, use of external competence, the role of the auditor, business size and age, and number of associates.

Every one of the covered topics is of course complex, and should ideally be measured with advanced instruments. However, since they were not my primary focus, simple measures were used instead.

Analysis

Data were analyzed using both multiple regression and structural equation modeling (also known as causal modeling). These different methods were chosen, because they answer different questions. Multiple regression assumes that all independent variables are not heavily correlated with each other and therefore contribute uniquely to the explained variance. Structural equation models on the contrary can test a complex model (i.e., the variation in the dependent variable is caused by a complex set of independent variables that both correlate with the dependent and other independent variables) on empirical data. Another difference between the two methods is that structural equation models use latent
variables when estimating the model compared to multiple regression that only uses manifest variables. A more detailed discussion will follow under the structural equation model section (Ruist, 1990; Pedhazur, 1982).

Structural equation models have some relative strengths compared to multiple regression (i.e., complex model testing and the use of latent variables). However, some shortcomings of the structural equation model approach must be mentioned. Structural equation models are complex to understand, and there is no simple straightforward way to test the fit of the model (Brannick, 1995). The advantage of multiple regression is its relative simplicity and focus on explained variance in the dependent variable. It is a widely used method and the use of multiple regression made it possible to compare my results with earlier research. Thus, I have here used multiple regression to build models that maximize the explained variance and enabled comparison, whereas structural equation modeling was used to test the hypothesized performance model.

Multiple regression
Multiple regression is used to analyze the variability of a dependent variable by resorting to information available on several independent variables. Multiple regression analyses enable us to analyze the collective and separate effects of two or more independent variables on the dependent variable (Pedhazur, 1982). Special attention was given to test the assumptions for multiple regression and cleaning the data set. The data were checked for outliers, multicollinearity, linearity, normality and heteroscedasticity (Berry, 1993; Fox, 1991). No severe problems were found.

However, it should be noted that the majority of the independent variables did not fulfill the assumptions made about the measurement levels. Most variables were measured with ordinal or nominal scale. Nominal scale variables were transformed into dummy variables, whereas ordinal scale variables were used as they were. The use of ordinal scale variables in regression analysis is a point of controversy (Ruist, 1993; Srinivasan & Basu, 1989; Michell, 1989). The basic problem with ordinal scale variables is that it is problematic to assume equal distances between different
values (e.g., we do not know if the distance between very good and good is equal to the distance between good and poor). Distance refers to the difference in amount of the property that is measured. If the distance between the different values is unequal, the estimation of the regression coefficient is biased. This problem is somewhat minimized by pooling combinations of variables into instruments. However, some unique ordinal scale variables were used in the analyses. These variables were related to the task characteristics and attitudes. If such a variable is found to be significant, a cautious interpretation is to be followed.

Backwards elimination was used to estimate the models. The backward solution starts out with the squared multiple correlation of all independent variables with the dependent variable. The independent variables are deleted one at the time, and the loss in explained variance ($R^2$) due to the deletion of the variable is studied. The loss in explained variance that occurs as a result of the deletion of a variable was assessed against two criteria of theoretical meaning and significance. Only variables that were theoretically meaningful and significant at the ten percent level or lower were retained in the final models.

**Structural Equation Modeling**

**Background**

A principal goal of experimentation is to provide a basis for inferring causation. Among the tools to achieve this goal are control and manipulation of independent variables, random assignment to experimental treatments, and appropriate methods of data analysis. Causal inferences are difficult to support without true experimentation. However, behavioral and social scientists often make such inferences in the context of nonexperimental and quasi-experimental research. A variety of sophisticated methods of multivariate data analysis have been developed and used in these situations, a special category is covariance structure modeling (Breckler, 1990).

Structural equation modeling is used to test whether a hypothesized causal structure is consistent or not with the data. It is a method that
merges the logic of factor analysis or principal component analysis, multiple regression, and path analysis within a single framework. The possibility to test a causal structure has made structural equation modeling increasingly popular in the behavioral sciences, but severe criticisms have been directed against these methods. Critics argue that you cannot prove, but only infer causality. Differently stated, causality is an assumption of structural equation modeling and not a consequence. Another more practical problem is the determination of how well a model reproduces data or fits the data (Fornell & Larcker, 1981). Multiple tests are available, but they are extremely sensitive to sample size and are often thumb rule based. Thirdly, it is not possible to find one best model, but there can be several models generating the same result (this is a problem shared with most multivariate techniques), and therefore the choice of a model is subjective. Fourth, it is problematic to use the same set of data to both modify and evaluate a model. Modifications can be made on several levels (i.e., changing factor loadings or changing path coefficients), and this leads to an extreme data fitting. It is therefore no guarantee that the process model modification results in the population model. Finally, the invention of latent variables to explain an observed pattern of correlations does not guarantee that the invented latent variable really exists (Breckler, 1990; Brannick, 1995). In other words, the researcher can create latent variables that are the results a sample randomness, and cannot be found in the population.

Nevertheless, the gains of structural equation modeling are important. They can test complex models. Secondly, they provide means for accounting for biasing effects of random measurement error. Thirdly, researchers can avoid restrictive assumptions about unmeasured variables (i.e., the distribution of residuals) (Kelloway, 1995; Williams, 1995). To sum up this discussion, the researcher when applying structural equation modeling must base his or her work on a theoretically well supported model and be careful to account for how the final model was obtained. In the next section, I will discuss my choice of estimation method.

**PLS (Partial Least Square)**

A fundamental distinction can be made between the use of structural equation modeling for prediction versus theory testing and development.
This distinction is made on the basis of the underlying model and the choice of estimation method. This choice is made between a full-information model (maximum likelihood or general least square) estimation approach in conjunction with the common factor model and a partial least square (PLS) estimation in conjunction with the principal component model (Anderson & Gerbing, 1988).

The most popular estimation method is LISREL which is a full information model based on a maximum likelihood estimation. I have however chosen to use a PLS estimation, mainly because LISREL demands large samples (at least 200 and preferably over 500), multivariate normality, and interval scaling to be able to make unbiased estimations. PLS is better suited for smaller samples, but is more oriented towards prediction and application compared to LISREL which is used for theory testing and development (Anderson & Gerbing, 1988; Fornell & Bookstein, 1982).

PLS has several relative strengths for application and prediction. The PLS approach assumes that all observed measure variance is useful variance to be explained. Stated differently, no random error variance or measure specific variance (i.e., unique variance) is assumed under a principal component model. That is, PLS is distribution free and independence free (i.e., no assumption is made about the independence of residuals) compared to LISREL which demands strong distribution assumptions. Parameters are estimated so as to maximize the variance explained in either as a set of latent variables (formative mode) or a set of observed measures (reflective mode). LISREL, on the other hand, tries to explain the covariances between the model’s manifest variables. Fit is evaluated on the basis of the percentage of explained variance ($R^2$) in the specific regressions and with the size of path-coefficients, weights from formative indicators, loadings to reflective indicators and residuals. It offers the advantage of precise definition of component scores, because PLS estimates the latent variables as exact linear combinations of observed measures. This precise definition in combination with explaining a large percentage of the variance is useful in accurately predicting individuals’ standings on the components.
However, there are some drawbacks of PLS. Firstly, because it is a limited information estimation method; PLS parameters are not as efficient as full-information estimates. Jackknife and bootstrap procedures are needed to obtain estimates of the standard errors of the parameters. No overall test model is available. Finally, PLS estimates will be asymptotically correct only under the joint conditions of consistency (increasing sample size) and consistency at large (the number of indicators per latent variable becomes large). In other words, PLS estimations are consistent, i.e., they come closer to the real values, as the sample and the numbers of indicators of latent variables increase. In practice, the correlations of the observed manifest measures with their respective latent variables will tend to be overestimated, whereas the correlations between the latent variables will tend to be underestimated (Anderson & Gerbing, 1988; Wahlund, 1991).

LISREL and PLS can be seen as a complementary choice depending on the research purpose: LISREL for theory testing, and PLS for application and prediction. In other words, PLS is primarily intended for causal-predictive analysis in situations of high complexity and does not demand a large amount of theoretical information. LISREL, on the other hand, emphasizes the transition from exploratory to confirmatory analysis, and is therefore theory oriented (Anderson & Gerbing, 1988; Bookstein, 1982; Fornell & Bookstein, 1982; Wahlund, 1991; Wold, 1982). Because of the relatively small sample, PLS being distribution free, the complexity of research area, and the lack of a strong theory, it was felt that PLS was a better option than LISREL.

**Estimating the Structural Equation Model**

The estimation of the structure model is an interaction between the logic of theory and the empirical facts, and I will first concentrate on the theoretical demands that have been made on the model.

A good theoretical model is the base on which causal relations can be hypothesized. The problem is that the theoretical information about the relation between different determinants is quite low. Empirical entrepreneurship research has been more interested in prediction, than in explaining the entrepreneurial process. As a consequence, there is a sub-
stantial amount of different predictors, but little information about their causal relations. To guide model building, variables have been divided in two categories: distal variables and proximal variables. Distal refers to measures that are general and are generally seen to represent trait constructs. Examples of distal measures are values, job interests, ability, and the external environment. They are variables that are stable over time, and are relatively difficult to change. Proximal variables refer to measures that are more task-specific and are associated with a particular situational context. Examples of proximal variables are attitudes and opportunity recognition. Considering the relative stability of different variables, it was assumed that distal variables influence proximal variables. In order words, distal variables (e.g., values) are assumed to cause variation in performance directly or indirectly via more proximal variables (e.g., attitudes). A proximal variable can only cause variation in the dependent variable directly or via another proximal variable. Once the structural equation model was specified, the relationships between the latent and the manifest variables are decided.

Structural equation models are made of two parts: the external and the inner model (the structural equation model). The external model is composed of the manifest variables, i.e., the measured variables, and the inner model is the structural equation model composed of latent variables. It is the relations between the latent variables that is the primary focus. However, these relations are determined by the relations between the individual latent variables and their corresponding manifest variables. In PLS, latent variables are formed either from formative or reflective indicators. The choice between reflective and formative indicators is primarily a theoretical one, and it has important consequences for the final results. Reflective indicators are chosen if it is believed that manifest variables are reflections of a latent variable. Personality is a typical example where reflective indicators are chosen, because it is assumed that an individual's personality will cause variation in the manifest variables. Formative indicators, on the other hand, form the variation in the latent variables. For example, the variation in a latent variable called "external environment" is assumed to be the results of the variation of several different variables (e.g., competition, geographic location, industry), and they are not necessarily highly correlated. Depending on whether formative or reflective
indicators are chosen, PLS will work differently. PLS will try to optimize the explained variance for latent variables with formative indicators, whereas factor loadings are maximized when reflective indicators are used. The choice between reflective and formative variable has therefore consequences for the final results. However the choice cannot be purely theory driven. If the number of indicators is large and formative, PLS can generate factor loadings above one, which is an impossible result. This problem can be solved by eliminating the problematic manifest variables or by changing from formative to reflective indicators (Anderson & Gerbing, 1988; Wahlund, 1991).

The initial model was modified based on data. After having tested a first model, the path coefficients (comparable to beta coefficients in regression analysis) were examined. Small path coefficients were eliminated, if they did not contribute to the explained variance or were not theoretically interesting. New paths were added after the examination of inner residual covariance (PSI) matrix. The PSI matrix displays the relations that are not accounted for by the tested model. Based on factor loadings, insignificant manifest variables were eliminated. The goal of the estimation procedure was to obtain a model satisfying the following conditions. First, the model should have a high explained variance, indicating that most of the relevant paths are included. Secondly, the model must be simple, i.e., a minimum of latent variables and paths. Thirdly, the model should be theoretically sound.

Results
The presentation of the results from this study has been divided in two sections, as follows: (a) the results from the multiple regression analyses; and (b) the results form the structural equation modeling. In each section, the three different performance measures are dealt with separately.

Multiple Regression
Variance partitioning was used to study the relative importance of variables. In other words, variables partitioning was used to estimate the importance of a single variable or a group of variables in the model. It is important to warn against an overinterpretation of this method. Variance
partitioning was used to control for a variable(s) while studying the effect of another variable(s). The results from such an analysis are model dependent, and may not be seen as a way of assessing the relative importance of the variable(s) for the predictor (Pedhazur, 1982).

Predictions for individual differences in performance were quite poor, but for growth motivation it was very good. Less than twenty percent of variance was explained in the previous growth and risk buffer models. Results from the analyses are displayed in table 1.

*Risk buffer.* The risk buffer model had the poorest fit of all models with only 10% of variance explained. This is low, even when compared to earlier studies of financial performance. Results were probably influenced by the studied period (1992-93). This period was characterized by the worst recession Sweden has known since the 1930's. It is possible, that during such extremes conditions, financial performance is the result of great random changes, instead of more systematic and predictable patterns as during more moderate time periods. Nevertheless, results are interesting to comment. Three different groups of variables were significantly related to risk buffer: (a) job interests, (b) values, and (c) the task characteristics. Ability variables were not significantly related to the predictor. High performance was achieved when the entrepreneur was interested in market relations, and valued security, but not conformity. Interests explained 0.02 of the variance, and interests and values together explained 0.03 of total variance. Thus, task characteristics explained 0.07 of variance. In this model, individually related variables accounted for 30% of the explained variance. When the analysis was repeated using mean values instead of pairwise deletion of missing values, the explained variance of the total model dropped to 0.09.
Table 2

*Backward Multiple Regression Results* (*p* < 0.1 **p* < 0.05 ***p* < 0.01)

<table>
<thead>
<tr>
<th>The prediction model</th>
<th>Variables</th>
<th>Coefficient</th>
<th>Beta coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk buffer</td>
<td>Constant</td>
<td>-27.80</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Individual</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Int. market orientation **</td>
<td>-2.309</td>
<td>-0.132</td>
</tr>
<tr>
<td></td>
<td>Int. human resources *</td>
<td>-2.557</td>
<td>-0.146</td>
</tr>
<tr>
<td></td>
<td>Conformity **</td>
<td>-0.765</td>
<td>-0.174</td>
</tr>
<tr>
<td></td>
<td>Security **</td>
<td>0.451</td>
<td>0.164</td>
</tr>
<tr>
<td></td>
<td><em>Environment</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low tech *</td>
<td>-5.612</td>
<td>-0.141</td>
</tr>
<tr>
<td></td>
<td>Customer concentration *</td>
<td>2.266</td>
<td>0.143</td>
</tr>
<tr>
<td></td>
<td>Innovation *</td>
<td>1.941</td>
<td>0.125</td>
</tr>
<tr>
<td></td>
<td>Work climate *</td>
<td>5.948</td>
<td>0.173</td>
</tr>
<tr>
<td>Adj. R² = .10, F=</td>
<td><strong>4.03</strong>*, N= 212</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous growth</td>
<td>Constant</td>
<td>-1.470</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Individual</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Int. supply and credits *</td>
<td>-0.095</td>
<td>-0.127</td>
</tr>
<tr>
<td></td>
<td>Int. human resources **</td>
<td>-0.142</td>
<td>-0.190</td>
</tr>
<tr>
<td></td>
<td>Universalism **</td>
<td>0.014</td>
<td>0.172</td>
</tr>
<tr>
<td></td>
<td>Autonomy ***</td>
<td>0.017</td>
<td>0.204</td>
</tr>
<tr>
<td></td>
<td>Birth year ***</td>
<td>0.014</td>
<td>0.182</td>
</tr>
<tr>
<td></td>
<td><em>Environment</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Customer concentra. ***</td>
<td>0.121</td>
<td>0.180</td>
</tr>
<tr>
<td></td>
<td>Export **</td>
<td>0.005</td>
<td>0.157</td>
</tr>
<tr>
<td>Adj. R² = .16, F=</td>
<td><strong>7.31</strong>*, N= 225</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth motivation</td>
<td>Constant</td>
<td>0.850</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Individual</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Int. financial control ***</td>
<td>0.112</td>
<td>0.139</td>
</tr>
<tr>
<td></td>
<td>Int. human resources ***</td>
<td>-0.144</td>
<td>-0.180</td>
</tr>
<tr>
<td></td>
<td>Att. workload ***</td>
<td>0.112</td>
<td>0.137</td>
</tr>
<tr>
<td></td>
<td>Att. survival ***</td>
<td>0.076</td>
<td>0.105</td>
</tr>
<tr>
<td></td>
<td>Tradition **</td>
<td>-0.011</td>
<td>-0.107</td>
</tr>
<tr>
<td></td>
<td>Benevolence **</td>
<td>0.014</td>
<td>0.118</td>
</tr>
<tr>
<td></td>
<td>Security **</td>
<td>0.013</td>
<td>0.106</td>
</tr>
<tr>
<td></td>
<td>Hypervigilance ***</td>
<td>-0.102</td>
<td>-0.200</td>
</tr>
<tr>
<td></td>
<td><em>Ent. performance</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nr. of prof. board men. ***</td>
<td>0.110</td>
<td>0.116</td>
</tr>
<tr>
<td></td>
<td>Use of auditor ***</td>
<td>-0.117</td>
<td>-0.122</td>
</tr>
<tr>
<td></td>
<td>Imp. of auditor ***</td>
<td>0.124</td>
<td>0.108</td>
</tr>
<tr>
<td></td>
<td>Previous growth ***</td>
<td>0.502</td>
<td>0.465</td>
</tr>
<tr>
<td>Adj. R² = .76, F=</td>
<td><strong>48.00</strong>*, N= 203</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Size of bus. ***</td>
<td>0.004</td>
<td>0.504</td>
</tr>
<tr>
<td></td>
<td>Business age ***</td>
<td>0.010</td>
<td>0.112</td>
</tr>
</tbody>
</table>

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Previous growth. Even this model had a low predictive power (adj. $R^2 = 0.16$), but it is a more normal result compared to the earlier research than in the previous case. As in the risk buffer model, it was motivational variables and not ability variables that significantly predicted growth. Job interests, values, and autonomy orientation together explained 0.09 of the variance. Interests alone explained 0.05 of the variance. Job interests were here also the most important of the individually related variables. Individually related variables accounted for 56% of the explained variance. The results indicated that younger entrepreneurs who were less interested in credit and supply management achieved higher growth. They were also autonomy oriented and valued universalism.

Growth motivation. This model had a very high explained variance considering it is based on cross sectional data. This strong result is highly dependent of previous growth as a predictor. Entrepreneurs who had a high previous growth will also expect a high future growth. The model was tested with a split-half procedure (sub samples were taken to test the stability of the model), and the explained variance varied between 0.76 and 0.82. When previous growth is excluded, the explained variance dropped to 0.58, which is still a good model of growth motivation. When previous growth was excluded, the results indicated the same, i.e., entrepreneurs active in younger and larger firms are more growth oriented. These firms were characterized by higher number of board members recruited outside the firm, and little confidence was given to the auditor. Differently stated, growth oriented entrepreneurs had more confidence in work done by the board, than in the advice given by the auditor. Motivational factors related to job interests, values, and attitudes to growth are significantly related to the dependent variable. However, the only ability indicator found to be significant was the decision style of hypervigilance, which was negatively related. Eliminating all variables related to the entrepreneur the model still explained 0.65 of the variance (if previous growth was deleted the model dropped to 0.35, which is a relatively larger drop). Interests and attitudes to growth were the most important individually related variables. Entrepreneurs who felt that growth would diminish their work load and increase the chances for survival were more growth oriented. Interest in finance and bookkeeping also resulted in a
higher growth motivation. Considering these results, growth motivation was mainly depending on task characteristics and not on individual differences. However, it could be argued that the board composition and the trust in the auditor are the results of earlier made choices.

To sum up, the results gave very poor to poor support for the hypothesized performance model for two out of three models. However, job interests were significantly related to all dependent variables, especially interest in human resources that was negatively associated. That is, entrepreneurs less interested in personnel and personal development performed better. An explanation is that many of the business managers-owners do not want to grow, because they want to keep an informal and familiar atmosphere in the business (cf. Davidsson, 1989). Values were also significantly related to performance, but not the traditional achievement value. Quite on the contrary, values as benevolence and universalism were positively associated to performance. Conformity and tradition values were negatively related to performance. Benevolence and universalism, as well as tradition and conformity are very close to each other in terms of contents. The well performing entrepreneurs value welfare, are broad minded, and do not conform to old patterns. Ability, as measured here, had little or no relation to performance, and motivation was completely dominant as representative of individual differences. It should be noted that ability is not satisfactorily measured, and better measures could alter the results. Task characteristics are of course important, but different variables influenced performance except for customer concentration. Entrepreneurs who had chosen to concentrate on few customers also performed better.

**Structural Equation Model**

The model reported here had a lower explained variance than when regression analysis was used. The major reason was that paths not considered as theoretically relevant were excluded. For example, external environment was significantly related in the model to the background of the entrepreneur, to self-determination and to ability. These paths were excluded, because they could not be appropriately explained. It is possible to argue that being in an international market or being in a specific industry were the results of earlier choices. However, to keep the model
more simple such an assumption was not made here. It is assumed that entrepreneurial background, self-determination and ability are stable characteristics and therefore not under the influence of environmental changes. Another way of augmenting the explained variance in the dependent variable is to assume that the latent exploratory variables are uncorrelated with each other. However, the purpose here is to examine if there is an underlying structural pattern, and trying to describe the complexity of entrepreneurial behavior.

Because of the shrinkage in explained variance and the low explained variance in the regression analysis, it was judged of no interest to estimate structural equation models for risk buffer and previous growth. Consequently, only growth motivation is modeled.

This model had a substantially lower explained variance ($R^2 = .52$) compared to the regression analysis ($R^2 = .76$). This could be compared with Davidsson (1989), who did also model growth motivation with PLS. He was able to explain 44 percent of the variance. However, the two studies cannot be compared in all respects. Davidsson (1989) used a sample containing smaller firms, and data were gathered during an economic boom.

Except for the attitude variable and growth motivation, all latent variables were based on formative indicators. Formative indicators are assumed to form the variation in the latent variables. It was assumed to be theoretically correct to use this sort of indicators, because most manifest variables had already been submitted to factor analysis, were part of instruments, or single variables. Therefore, the correlations between the included manifest variables were not substantial; a strong correlation between the manifest variables is assumed when reflective indicators are used. It should, however, be mentioned that the growth motivation model was tested with reflective instead of formative indicators. The model with reflective factors yielded a somewhat higher explained variance for the latent variables (e.g., $R^2$ for growth motivation was .53 for the reflective model). The models were more or less equivalent, but the formative model was assumed to be more theoretically correct.
The model is composed of nine latent variables (see figure 2). Entrepreneurial background, interest, ability, perceived opportunity, and attitudes represent the individual related variables. The background variables described the personal background of the entrepreneur with variables such as age, sex, and if the entrepreneur had close family who had been entrepreneurs. Self-determination was composed of the autonomy and impersonal orientation scales. The job interests and ability variables were composed of manifest variables related to these variables and do not need any special explanation. Perceived opportunity is a proximal variable supposed to be closely related to attitudes. The difference is that opportunity was composed of questions regarding the future of the market and the competition, whereas attitudes concerned the firm's and the entrepreneur's situation. The variable was assumed to reflect expectations about the future. Opportunity was not heavily related to either entrepreneurial performance or growth motivation, but was kept because in earlier studies it has been an important variable and added significantly to the explained variance (Davidsson, 1989). Entrepreneurial performance was supposed to represent the action taken by the entrepreneur to form the development of the enterprise. The latent variable was composed of manifest variables such as use of financial data, board composition, mode of entry, if the entrepreneur managed other enterprises or not, and previous growth. In other words, this variable represented choice or results of choices taken earlier by the entrepreneur, and could therefore be seen as reflecting some sort of accumulated or previous entrepreneurial performance or behavior. Previous growth is an important manifest variable, and when the model was rerun without the variable the explained variance in growth motivation dropped from 52% to 46%. The environment variable was formed from variables such as industry, relations to customers, organizational climate, competition, and start-up year. The variable represented the task characteristics. Further details about the composition of the different variables are given in the appendix.

According to these results, the most important variable was entrepreneurial performance followed by the environment and the entrepreneur's background. Both background and environment had a direct as well as an indirect effect on growth. Entrepreneurial performance was explained by attitudes, self-determination, ability, and opportunity. Both self-
determination and opportunity were problematic because the signs were not the same for growth motivation and previous entrepreneurial performance. The problems related to opportunity and to self-determination are dealt more closely with in the concluding section. Job interests were not directly related to performance, but indirectly via ability and opportunity. Job interests were affected by self-determination and background. Relationships without controversy, as self-determination which is a concept close to interests, and interests are assumed to be the results of early experiences. There was a moderate relationship between interests and ability, and ability was related to background and self-determination.

Decision styles and values were not included. They did not add significantly to the model or were situated far back in the causality chain. The interpretation of the variables was therefore to be regarded as too insecure, and they were therefore dropped from the analyses. The two variable groups had in common that they were stable and distal, so it was expected that they would have a small direct effect. However, the indirect effects were not especially large either.
Figure 2. PLS derived path model for growth motivation as dependent variable (R^2: Growth motivation = 0.52; Previous ent. performance = .23; Attitudes= 0.07; Opportunity = 0.33; Ability = 0.23; Job interests = 0.18, N = 237)
To conclude, the structural equation model gave some support to the hypothesized performance model. All relations were confirmed, except for the relation between environment and entrepreneurial performance. Furthermore, the direct relations between self-determination and growth motivation, and between background and growth motivation were not anticipated. The environment affected business performance directly and the proximal individual variables (attitudes and opportunity). The more distal variables were not, or not strongly, related to the environment, which was expected. The relation between entrepreneurial performance and growth motivation was substantial. There was a clear and important relation between ability and motivation (job interests and motivation) confirming the basic assumption of the performance model. That is, to perform a task an entrepreneur must (a) possess the prerequisite knowledge, (b) master the prerequisite skills, and then (c) actually choose to work on the job tasks for some period of time at some level of effort.

Discussion

Data were analyzed using two different methods, and it is therefore natural that results differed with the two methods. Multiple regression assumes direct effects and that the dependent variables are only moderately correlated with each other. Furthermore, only manifest variables are used. Structuring modeling allows us the use of latent variables and intercorrelated independent variables, and consequently to test the entrepreneurial and business performance model.

The models explaining risk buffer and previous growth could only explain a minor share of variance. This in spite of the large number of different variables collected and analyzed. The individual difference model presented in this paper only received poor to moderate support from data when trying to explain business performance while the models explaining growth motivation received substantial support. These large differences can be partially explained by the fact that the studied time period took place during a deep recession. It is possible that these unique circumstances had an important effect on the results. Furthermore, it is possible that a number of important independent variables were omitted or badly measured. Variables such as strategy, number and sort of crises encoun-
tered, or other important changes in the organization (e.g., new important customers or suppliers) could be added to augment the explained variance. Furthermore, better measures of intellectual ability designed for entrepreneurs, and better measures of task characteristics (firm and external environment), and previous actions would perhaps enhance the explained variance. Proximal variables, such as attitudes and opportunity, were important contributions in explaining growth motivation, but were omitted in the performance models. It therefore seems the use of more proximal measures could lead to a better explanation of business performance.

Another problem is the choice of the dependent variable. It is difficult to link individual differences directly to business performance. Individual differences in entrepreneurship should be linked to performance in entrepreneurship. Stated differently, more work must be done on defining the dependent variables. Linking individual differences in entrepreneurship directly to venture performance signifies that an important amount of uncontrolled variables is introduced. Thus entrepreneurial performance should be separated from business performance. It is only when we know what determines entrepreneurial performance that we can assess the importance of the entrepreneur to business performance. Until then, we will be fumbling in the dark without any kind of systematic research agenda, and the findings will be accordingly. Indicators of entrepreneurial performance are for example goal setting and formulation, commitment, strategy formulation, growth motivation, creativity, innovation capacity and motivation, and creation of ventures. It is believed the important differences in explained variance between the models support this separation between entrepreneurial and business performance, especially if research focuses on entrepreneurial behavior.

The results from the multiple regression analyses indicated that motivation was the most important variable for individual performance. Ability and decision making had little or no influence on performance. Of the motivation indicators, job interests were most important, followed by values. Attitudes were only used to predict growth motivation, and were as important as interests. Self-determination, which is a personality characteristic, only contributed significantly to explaining previous growth. In
the growth motivation model, previous growth was the most important factor determining motivation. This is in line with attribution theory, stating that if individuals attribute success to stable, controllable and internal causes they will expect an outcome in the same direction in the future (Anderson, 1991; Weiner, 1985).

The structural equation modeling gave different results and gave support to the entrepreneurial performance model. Values and decision styles were eliminated completely from the model. This was an empirical result. The actual structure of the model was the result of judgments based on theoretical and empirical considerations. The only major difference, compared to the hypothesized model, is that no support was found for a direct relationship between the environment and entrepreneurial performance. The role of ability was more clear in this model than in the regression models, because indirect paths are allowed. Ability was seen as an important variable with important indirect rather than direct effects on performance. Overall the individually related variables had important indirect effects. Job interest is a new concept in entrepreneurship research, and has in this research turned out to be an important determinant of performance, and should be further elaborated in future research. Clearly, enjoying oneself is an important determinant of entrepreneurship (cf. Brytting, 1991). Now that we have clear results, it is logical to state that an entrepreneur would not expand his or her business if he or she did not believe he or she would enjoy the consequences of that choice.

The role of opportunity recognition and self-determination need to be further commented upon, because the signs shifted depending on whether they were related to growth motivation or to previous entrepreneurial performance, to entrepreneurial performance, and positively related to growth motivation. The role of opportunity can be seen as the result of a marginal effect due to the entrepreneur’s perception of the situation. It has been shown that entrepreneurs perceiving themselves as successful are less overoptimistic than entrepreneurs perceiving themselves as failing. This relationship would explain the change in sign, because failing entrepreneurs will tend to judge future opportunities higher than successful entrepreneurs (Delmar & Lignell Du Rietz, 1995). Self-determination is composed of two manifest variables, autonomy and impersonal orien-
tation. Autonomy orientation refers to the degree to which inputs are perceived as autonomy supportive and is related to intrinsic motivation. The impersonal orientation refers to the tendency to experience oneself as being incompetent to attain desired outcomes. This change in sign was interpreted as the motivation of expanding the enterprise being closely connected to intrinsic motivation, but that expansion can only be achieved successfully with the help of others.

The results indicated that motivation factors such as interests, self-determination and attitudes, and not ability, are the most important determinants of performance. This is a result that is in accordance with leadership research and some entrepreneurship research (Davidsson, 1989; Miner, Smith, & Bracker, 1994; Miner, Smith, & Bracker, 1992; Miner, 1990). It seems that the predictive power of ability tests diminishes with the increasing complexity of the task being studied and with social interaction. A possible reason is that the handling of a complex system is more will demanding than cognitive resource demanding. The entrepreneurial task is ill-defined in the sense that there are multiple goals and multiple ways to reach them. The entrepreneur must therefore have both the motivation to seek and learn, and the commitment to achieve his or her goals. If the task of entrepreneurship is defined in this way, the entrepreneurship problem is one of motivation and not primarily of ability. Differences in ability would only be relevant if there was only one best option and one best way to reach it. Another possibility is that the development of an organization is both stressful and time consuming. It would therefore be more important to solve a problem directly, rather than to find a best solution. The marginal gain of finding a best solution is smaller than the marginal gain of finding a satisfying solution and then move on. If this is the case, the use of decision rules, and not ability, would make a difference in performance. However, the results from this study indicate that they are not important discriminators. Another more methodological reason is that intellectual ability was not adequately measured. The use of ability tests and questionnaires about decision rules designed for entrepreneurs may give other results. Furthermore, social perception and interaction also seem to be important determinants of performance in complex settings, testing for the role of social perception of entrepreneurship may therefore yield interesting results.
Focusing on the structural equation model, I have argued that interests influence ability, or more exactly the level of education and experience, because abilities are developed in the directions dictated by one's interests. However, the reverse relationship is also possible, i.e., experience and education influence job interests. Earlier education and experience may have exposed the entrepreneur to an environment leading to the development of specific interests. In that case, the role of education and experience is greater than the model suggests. If this is the case, ability becomes a more distal variable than interests, and job interests are still a better predictor of performance than ability. It is not because relatively speaking motivation is more important, but because experience and ability form interest patterns leading to higher performance.

The important role of previous growth in both the PLS-model and the multiple equation model has to be commented. It has been argued that entrepreneurs who have experienced growth were more likely to continue in the same direction. Thus, past behavior would repeat itself. However, the high statistical association between previous growth and growth motivation is ambiguous, because they could represent the influence of many other factors that were present at both occasions when the measures were assessed but were not taken into account by the entrepreneurial and business performance model. For example, moral obligations or the role of social perception were not accounted for. Moreover, growth motivation and previous growth may share the same error variance, as a similar response format was used for the two measures (Ajzen, 1991).

Most of the drawbacks of this study have already being mentioned, such as its being relatively time dependent, most causal relations can be challenged, and there are variables omitted or badly measured. However, this is a problem common to most entrepreneurship research. A large array of different factors affects the entrepreneurial process, and these factors are difficult to measure with single indicators, and at the same time entrepreneurs are extremely busy and reluctant to answer lengthy questionnaires. There is a trade-off between a satisfactory response rate and information. The sample is still too small (N = 259) for doing cross validations and testing the models with LISREL. A larger sample is needed to confirm
these results. On the other hand, many of the findings are confirmed by other studies both from psychology and research on entrepreneurship. Another problem is to translate the growth motivation model into action. Even if growth motivation is a good indicator of action, the two are not the same.

To sum up, future research on the psychology of the entrepreneur should abandon attempts to link entrepreneurial characteristics directly to business performance, and instead focus on entrepreneurial performance. This change in focus will probably lead to better understanding of the psychology of the entrepreneur. Furthermore, more research needs to be done using modern psychology findings. Job interests and Miner’s task motivation theory are examples of modern psychology research applied to the entrepreneurship problem. Other dimensions that seem promising and interesting are goal formulation and commitment. Furthermore, more work has to be done on assessing the role of ability and entrepreneurship. This and other research indicate that ability is relatively unimportant for business performance. This is somewhat paradoxical and may be due to the fact that we have yet not fully understood or learned to measure what abilities determine successful entrepreneurship behavior. Finally, larger samples are needed to satisfactorily use structural equation models and make cross validations.
References


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Appendix

Tables 2 to 10

The composition of each latent variable with manifest variables, hypothesized direction of the relationship, weights, and loading patterns

<table>
<thead>
<tr>
<th>LV: Background</th>
<th>Hypothesized Dir.</th>
<th>LV Weights</th>
<th>LV Loading Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>-</td>
<td>-.48</td>
<td>-.45</td>
</tr>
<tr>
<td>Birth year of entrepreneur</td>
<td>+</td>
<td>.81</td>
<td>.85</td>
</tr>
<tr>
<td>Close</td>
<td>+</td>
<td>.24</td>
<td>.41</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LV: Environment</th>
<th>Hypothesized Dir.</th>
<th>LV Weights</th>
<th>LV Loading Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer, turn over</td>
<td>-</td>
<td>-.26</td>
<td>-.32</td>
</tr>
<tr>
<td>Export</td>
<td>+</td>
<td>.41</td>
<td>.50</td>
</tr>
<tr>
<td>Low technology</td>
<td>-</td>
<td>-.23</td>
<td>-.18</td>
</tr>
<tr>
<td>Prof. service</td>
<td>+</td>
<td>-.30</td>
<td>-.31</td>
</tr>
<tr>
<td>Competition</td>
<td>-</td>
<td>-.10</td>
<td>-.26</td>
</tr>
<tr>
<td>Comp. position</td>
<td>+</td>
<td>.57</td>
<td>.70</td>
</tr>
<tr>
<td>Suppliers</td>
<td>+</td>
<td>.28</td>
<td>.21</td>
</tr>
<tr>
<td>News &amp; Changes</td>
<td>+</td>
<td>.19</td>
<td>.30</td>
</tr>
<tr>
<td>Founders</td>
<td>+</td>
<td>-.13</td>
<td>-.24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LV: Self-determination</th>
<th>Hypothesized Dir.</th>
<th>LV Weights</th>
<th>LV Loading Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomy</td>
<td>+</td>
<td>.69</td>
<td>.84</td>
</tr>
<tr>
<td>Impersonal</td>
<td>-</td>
<td>-.57</td>
<td>-.75</td>
</tr>
<tr>
<td>LV: Job interests</td>
<td>Hypothesized Dir.</td>
<td>LV Weights</td>
<td>LV Loading Pattern</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------</td>
<td>------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Supply &amp; credits</td>
<td>-</td>
<td>-.51</td>
<td>-.34</td>
</tr>
<tr>
<td>Strategic management</td>
<td>+</td>
<td>.46</td>
<td>.62</td>
</tr>
<tr>
<td>Market orientation</td>
<td>-</td>
<td>-.41</td>
<td>-.48</td>
</tr>
<tr>
<td>Human resources</td>
<td>+</td>
<td>.27</td>
<td>.38</td>
</tr>
<tr>
<td>Often interesting</td>
<td>+</td>
<td>.20</td>
<td>.40</td>
</tr>
<tr>
<td>Interest increase</td>
<td>+</td>
<td>.30</td>
<td>.55</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LV: Ability</th>
<th>Hypothesized Dir.</th>
<th>LV Weights</th>
<th>LV Loading Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrepreneurial exp</td>
<td>+</td>
<td>.37</td>
<td>.49</td>
</tr>
<tr>
<td>Management exp.</td>
<td>+</td>
<td>.04</td>
<td>.21</td>
</tr>
<tr>
<td>Education</td>
<td>+</td>
<td>.57</td>
<td>.79</td>
</tr>
<tr>
<td>Business adm.</td>
<td>+</td>
<td>.47</td>
<td>.77</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>LV: Opportunity</th>
<th>Hypothesized Dir.</th>
<th>LV Weights</th>
<th>LV Loading Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry dev.</td>
<td>+</td>
<td>-.16</td>
<td>-.36</td>
</tr>
<tr>
<td>Future for firm</td>
<td>+</td>
<td>.69</td>
<td>.84</td>
</tr>
<tr>
<td>Finance</td>
<td>+</td>
<td>.21</td>
<td>.44</td>
</tr>
<tr>
<td>Labor</td>
<td>+</td>
<td>.14</td>
<td>.23</td>
</tr>
<tr>
<td>Competence</td>
<td>+</td>
<td>.32</td>
<td>.54</td>
</tr>
<tr>
<td>Qualified help</td>
<td>+</td>
<td>.16</td>
<td>.42</td>
</tr>
<tr>
<td>LV: Attitudes</td>
<td>Hypothesized Dir.</td>
<td>LV Weights</td>
<td>LV Loading Pattern</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------</td>
<td>------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Work load</td>
<td>+</td>
<td>.16</td>
<td>.59</td>
</tr>
<tr>
<td>Work share</td>
<td>+</td>
<td>.18</td>
<td>.64</td>
</tr>
<tr>
<td>Employee well being</td>
<td>+</td>
<td>.22</td>
<td>.73</td>
</tr>
<tr>
<td>Pay-off</td>
<td>+</td>
<td>.09</td>
<td>.33</td>
</tr>
<tr>
<td>Control</td>
<td>+</td>
<td>.08</td>
<td>.53</td>
</tr>
<tr>
<td>Independence</td>
<td>+</td>
<td>.16</td>
<td>.45</td>
</tr>
<tr>
<td>Survival</td>
<td>+</td>
<td>.23</td>
<td>.70</td>
</tr>
<tr>
<td>Quality</td>
<td>+</td>
<td>.14</td>
<td>.61</td>
</tr>
<tr>
<td>Fun</td>
<td>+</td>
<td>.22</td>
<td>.70</td>
</tr>
<tr>
<td>Leadership</td>
<td>+</td>
<td>.14</td>
<td>.62</td>
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</table>

<table>
<thead>
<tr>
<th>LV: Ent. performance</th>
<th>Hypothesized Dir.</th>
<th>LV Weights</th>
<th>LV Loading Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manage others</td>
<td>-</td>
<td>.11</td>
<td>.25</td>
</tr>
<tr>
<td>Buyout</td>
<td>-</td>
<td>-.04</td>
<td>-.19</td>
</tr>
<tr>
<td>Outside board memb.</td>
<td>+</td>
<td>.06</td>
<td>.18</td>
</tr>
<tr>
<td>Internal systems</td>
<td>+</td>
<td>.25</td>
<td>.28</td>
</tr>
<tr>
<td>Previous growth</td>
<td>+</td>
<td>.92</td>
<td>.96</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LV: Growth motives</th>
<th>Hypothesized Dir.</th>
<th>LV Weights</th>
<th>LV Loading Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turnover</td>
<td>+</td>
<td>.61</td>
<td>.75</td>
</tr>
<tr>
<td>Employee</td>
<td>+</td>
<td>.67</td>
<td>.80</td>
</tr>
</tbody>
</table>
Table 11

*PSI, Inner Residual Covariance*

<table>
<thead>
<tr>
<th>Backgr.</th>
<th>1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environ.</td>
<td>.07</td>
</tr>
<tr>
<td>Self-dete.</td>
<td>-.21</td>
</tr>
<tr>
<td>Interests</td>
<td>.03</td>
</tr>
<tr>
<td>Ability</td>
<td>.13</td>
</tr>
<tr>
<td>Opportun</td>
<td>.01</td>
</tr>
<tr>
<td>Attitudes</td>
<td>-.02</td>
</tr>
<tr>
<td>Ent.perf.</td>
<td>.04</td>
</tr>
<tr>
<td>Growth</td>
<td>.04</td>
</tr>
</tbody>
</table>

Backgr. | Environ. | Self-dete. | Interests | Ability | Opportun | Attitude | Ent.perf. | Growth |
---------|----------|------------|-----------|---------|----------|----------|----------|--------|
Backgr.  | 1.00     | 1.00       | .98       | .82     | .77      | .67      | .77      | .48    |
Environ. | .07      | .07        | .02       | .02     | .02      | .02      | .02      | .02    |
Self-dete.| -.21     | -.21       | -.02      | -.02    | -.02     | -.02     | -.02     | -.02   |
Interests | .03      | .03        | .03       | .03     | .03      | .03      | .03      | .03    |
Opportun | .01      | .01        | .01       | .01     | .01      | .01      | .01      | .01    |
Attitudes| -.02     | -.02       | -.02      | -.02    | -.02     | -.02     | -.02     | -.02   |
Ent.perf. | .04      | .04        | .04       | .04     | .04      | .04      | .04      | .04    |
Growth  | .04      | .04        | .04       | .04     | .04      | .04      | .04      | .04    |
Table 12

*Latent Variables Correlations*

<table>
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**Table 13**

Reduced Path Coefficients
Charpentier, C., Ekonomisk styrning av statliga affärsverk.
Eliasson, M., Julander, C-R., Productivity in Swedish Grocery Retailing. - changes over time and a causal model.
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