

RISK PERCEPTION OR SELF PERCEPTION: WHAT CAUSES PEOPLE TO START A VENTURE? FROM INFORMATION PROCESSING TO EXPERIENCE.

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In cognitive entrepreneurship research one main question is: Do entrepreneurs think differently than others in various ways? Especially in the area of risk perception cognition is thought of as information processing. In later streams of cognitive science it has developed from a state where cognition is seen as information processing to a state where cognition is mainly seen as an effective act, where experiences play an important role. We use risk perception as an indicator for information processing and self perception as an indicator for past experience. We found that past experience explains starting a real venture whereas risk information processing explains starting a case study venture.

Risk Perception or Self Perception: What Causes People to Start a Venture? From Information Processing to Experience.

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Abstract

In cognitive entrepreneurship research one main question is: Do entrepreneurs think differently than others in various ways? Especially in the area of risk perception cognition is thought of as information processing. In later streams of cognitive science it has developed from a state where cognition is seen as information processing to a state where cognition is mainly seen as an effective act, where experiences play an important role. We use risk perception as an indicator for information processing and self perception as an indicator for past experience. We found that past experience explains starting a **real** venture whereas risk information processing explains starting a **case study** venture.

Introduction

„Are the cognitions of entrepreneurs different from those of other business professionals? In other words, do they think differently in various ways, both with respect the content of their thoughts (e.g. Mitchell, Smith, Morse, Seawright, Pedreo, & McKenzie, 2002) and the process they employ? (E.g. Baron, 2000)” (Baron & Ward 2000: 554). According to Baron and Ward (2004) this is one of the questions in the research of entrepreneurial cognition which has received the greatest attention. If entrepreneurs think different do cognitive biases play a role in the thinking of entrepreneurs? (E.g. Simon et. al. 2000) Cognitive biases are well established as reasons for people’s decision to start ventures, despite the high risk involved. More specifically researchers have argued that people start ventures because “they do not **perceive** the risks involved, and not because they knowingly accept high levels of risks.” (Simon et. al. 2000: 114) If people do not perceive risk appropriately they don’t need to have a high risk propensity or a great willingness to take risk knowingly. Risk perception seems therefore to be a crucial factor explaining individual’s decision to start a company. The measurement of risk perception seems well developed and applying it one can find whether a person perceives the risk involved in a decision as low, medium or high. Researchers typically described the decision situation in a laboratory setting in which other variables can be controlled and more important: The decision situation is the same for all subjects and so their evaluation can be compared easily (Johnson 1990, Krueger & Brazeal 1994, Shrader & Simon 1997). Further it is argued that cases capture much of the complexity of making actual business decisions (Manimala 1992).

The research result seems therefore convincing (Simon et. al. 2000: 125): “Specifically, the study found that individuals who perceive lower levels of risk were more likely to decide to form a venture,…” And the authors continue: ”This result helps unravel the riddle posed by past findings. Entrepreneurs do not need a greater willingness to take risk if they do not

perceive the riskiness of their acts.” (p. 126) Applying the same method we reproduced these results (Simon, M. et al.2000) using a sample of 223 business students and 60 (real) entrepreneurs: People who perceive a low risk in the decision situation are more likely to start the venture and vice versa. The venture used in this laboratory setting was described in a twelve page Harvard Business School case study (Clarke 1988) about a revolutionary new product, contact lenses for chickens. The subjects had to decide whether they would introduce these contact lenses or not. So the participants had to decide about a case study situation and not about their own real business and they had not to bear any consequences if they fail and could not gain anything if they succeeded. Therefore we want to figure out whether the results derived from the case study decision would also explain the willingness to start a real venture. In our sample of 283 we had not only 60 entrepreneurs who had already started their venture, but also 11 students who also had started their business, and we had additional 60 who had referred the intention to start their own venture in the near future, and we had 152 left not willing to start their own business at all. Surprisingly we found that the risk perception, as derived from the case study, did not explain, not even correlate with, the willingness to start a “real” venture. In addition we found that the people with a high willingness to start a real venture had a lot of experience (~5-15 years) within the area of their business. On the other hand, no participants of the studies had any experience in the business and technology of contact lenses, especially contact lenses for chickens. Our main focus is to use real experience as an explaining factor for people’s willingness to start a venture. In researching whether new information or past experience plays a major role for entrepreneurial decision, Parker found that entrepreneurs (and others) “give much greater weight to past experience than to new information, when updating their expectations.” (Parker, 2004: 12) Given this result, we had to find indicators for measuring past experience.

We used self perception theory (Bem, 1972) as one indicator for former experiences. According to Bem the self-perception theory refers to one's own behavior and therefore to own experiences (Bem 1972). As an other indicator for past experiences we used Locus of Control (Rotter, 1966, 1975) "Those who experience having control over occurrences have an internal Locus of Control and will be referred to as internal". (Hansemark, 2003: 302)

Distinguishing the cognitive view from the experience view may be summarized with the risk of oversimplification as it is shown in figure 1 and 2:

FIGURE 1 ABOUT HERE

FIGURE 2 ABOUT HERE

The cognitive approach and risk-perception

Using Risk-Perception as an explaining variable for starting a business Simon et. al. argued: "people start ventures because they do not **perceive** the risk involved, and not because they knowingly accept high levels of risk." (Simon et al. 2000: 114) But here the question is: Who does perceive the risk involved which means the risk "as it is"? If some of the 223 Master of Business Administration students perceive lower levels of risk and some other perceive medium and higher levels of risk, what does it tell us? It only tells us that different students perceive the risk differently. Perceiving the risk of the case study is one way to perceive the case study as a whole. And even if the risk perception is correlated with their decision to start the case study venture this is only an other way of perceiving the case study as a whole why should subjects perceive the case study inconsistently? If the students think the venture is reasonable to be started than the theory of cognitive dissonance can also explain that these students perceive lower levels of risk. Putting it this way the decision is the cause and the risk perception is the result! Some students perceive the case study differently than others on an individual level. Also some entrepreneurs may perceive the risk described in the case study

differently than other entrepreneurs. But does the group of entrepreneurs perceive the risk differently than the group of non-entrepreneurial students? Statistically speaking, is there a significant difference between entrepreneurs and non-entrepreneurs in their risk perception?

H1: Entrepreneurs (people who are starting their first venture) **do not** perceive risk (as described in a case study) differently compared to MBA students (people who have not started a venture).

It could be argued that there might be no difference in risk perception between entrepreneurs and students because they may perceive the risk with the same cognitive biases. If so the question is: Who are the people who perceive the risk without a bias or perceive the risk in the right way? And more important: How can we know that these people perceive the risk in the right way? These questions challenge the assumption that risk is an ontological entity which can be described without cognitive or other biases. The assumption that risk is an ontological entity is often made in using cognitive psychology especially in the research of cognitive biases in the entrepreneurial cognition domain. "The study's findings tentatively suggest that individuals start ventures because they do not perceive the risks involved,.." (Simon et al. 2000: 114.) So the risk is out there in the venture independent from the observer. The same authors argue: "Cognitive biases are common types of mental shortcuts used to make judgments" (Simon et al. 2000: 113.) To describe a cognitive process as a cognitive bias or even as a mental shortcut, the describer must know the cognitive process without a bias. But how can he or she know that his or her cognitive process is without bias? This is only possible, if the describer thinks that there is an ontological reality (risk) out there and that he or she knows it without any mental shortcuts. But cognition theory has developed further and now is aware of the difficulties of describing the ontological world independently from an observer. That does not mean that we couldn't measure risk-perception and figure out differences between different individuals. It only means that even researchers are risk

perceivers and that they do not know whether they perceive the risk as it is if they assume that there is an “ontological” risk. Cognitive science as described by Varela has developed from a state of the cognitivist paradigm where cognition has been mainly seen as information processing to a state where cognition is mainly seen as an effective act, which is processed by a structural coupling between the individual and its environment and where experiences play an important role. (Varela 1988)

Information versus Experience

Together with Parker we believe that there is an overestimation of the information processing in using cognitive psychology as it is used in several studies in the entrepreneurial cognition domain (e.g. Simon et al. 2000, Sitkin and Weingart 1995). But there are also other streams in cognitive science which focus on the integration of the information processing and the human experience. In their book, Varela et al. wrote: “This book begins and ends with the conviction that the new science of mind (cognitive science) need to enlarge their horizon to encompass both lived human experience and the possibilities for transformation inherent in human experience. Ordinary, everyday experience, on the other hand, must enlarge its horizon to benefit from the insights and analyses that are distinctly wrought by the science of mind. It is this possibility for circulation between the science of mind (cognitive science) and human experience that we explore in this book.” (Varela et al. 1991: XV) Exactly this question of the relationship between information and experience was addressed by Simon C. Parker with an interesting result: „Of greater importance, however, is that this regression output implies that on average entrepreneurs adjust their expectations of unobserved productivity in the light of new information by around 16 per cent ($=1-0.84$). Furthermore, this parameter is significantly different from both 0 and 100 per cent: its 95 per cent confidence interval is [11.5, 20.5] per cent. The statistical significance of λ suggests that entrepreneurs *do* exploit new information, but that they give much greater weight to past experience than to new information when

updating their expectations.“ (Parker 2004: 16) “For brevity, we refer to their joint impact on the entrepreneur's venture as ‘unobserved productivity’.” (Parker 2004: 16). Also Perlitz and Löbler used the idea of different experiences in explaining risk attitudes. (Perlitz & Löbler, 1995) If entrepreneurs (and others) do give much greater weight to past experience than to new information than we should try to find more about the differences between the experiences of entrepreneurs and others. According to the theory of self-perception (Bem 1972) and to Locus of Control Theory (Rotter 1966) both theories can be used as an indicator of past experiences. For our research the first of two postulates of the self perception theory is important. “Individuals come to ‘know’ their own attitudes, emotions, and other internal states partially by inferring them from observations of their own overt behavior and/or the circumstances in which this behavior occurs.” (Bem 1972: 5) In observing her own behavior and/or the circumstances an individual observes the consequences of her own experiences.

Verheul et. al. (2004), for example, used self-perception theory in explaining gender differences and entrepreneurship. Hansemark (2003) used locus of control as a predictor for business start-ups. The locus of control theory is well known in entrepreneurial research (for an overview see: Hansemark 2003, Jennings & Zeithaml 1983) and Rotter’s I-E-scale has widely been used. It was shown that the I-E-scale has had great explanatory power in different research questions (Hansemark 2003, Jennings & Zeithaml 1983). Recently, Hansemark (2003) pointed out that some of the studies have been focusing on established entrepreneurs and that the I-E-scale could lose its explanatory power because the locus of control is a learned characteristic, so it can change over time and be developed. If then a person establishes and develops an internal locus of control during her entrepreneurial career she could have had an external locus of control before starting the career. We avoid the problem of established entrepreneurs by only analyzing first time entrepreneurs. Simultaneously Hansemark’s hint supports the idea that locus of control refers to past experience. It is

therefore reasonable to assume that these characteristics will change with the change of social context brought about by former activity and therefore learned by experience. (Hansemark 2003) According to these former research (e.g. Ahmed 1985, Begley & Boyd 1987, Mescon & Monanari 1981, Durand & Shea 1974) our hypotheses are:

H2: Internal Locus of Control is associated with a high willingness to start a “real” venture.

H3: The extend to which an individual perceives herself as prepared to start a business is associated with the willingness to start a “real” venture.

Because we think that former experiences play an important role for starting a real venture, and because none of the participants in the study has experiences with contact lenses (for chicken), we do neither expect a correlation between internal locus of control and risk perception, nor do we expect a correlation between self perception and risk perception. So we expect that neither internal locus of control nor self perception does explain starting a case study venture. And furthermore we do not even expect a correlation between risk perception and the willingness to start a real business.

H4: Risk perception explains the willingness to start a case study venture but not the willingness to start a “real” venture

H5: Internal Locus of Control and Self-Perception does not explain risk-perception.

Methods

Design

Our survey captured the subjects' risk perception, decision to start a case study venture (following Simon et al. 2000), and in addition locus of control, self perception and willingness to start a real venture. The questionnaire as well as the case study was translated into German.

We informed the subjects that there was no one correct answer, and that responses were confidential and not for the purpose of evaluation. We also told the subjects not to discuss the case or surveys with others, a message that was repeated in the written instructions accompanying the survey.

The case study we used is a twelve-page Harvard Business School Case (Clarke 1988) and describes a revolutionary new product, contact lenses for chickens. The case is based on a situation, where the persons think about introducing contact lenses for chickens which are able to lower the chicken's natural tendency to fight and some other negative issues related to chicken farming. The case not only describes the venture's proposed product and market, it also provides the subjects with encouraging and discouraging information regarding the venture's potential. "The case's length, ambiguity and complexity allowed subjects to use a variety of approaches to determine whether or not to start the venture." (Simon et al. 2000: 120)

Subjects

Our sample consisted of three different kinds of subjects: Firstly 223 students of Business Administration at Leipzig University, secondly 60 real entrepreneurs and thirdly from the 223 students of Business Administration 11 who have already started their own venture. Out of the 223 business students 60 indicated a high willingness to start a venture in the near future. Like in the study of Simon et al. (2000), the students came from many different backgrounds,

some of them had work experience or have done another educational training before and they differ in their major and study level. The mean age of the subjects was 26.8 years (SD=7.6) and the sample consisted of 48% females and 52% males.

The sample of the 60 entrepreneurs was taken from several start-up seminars to identify entrepreneurs according to the recommended criteria: Firstly (Begley & Boyd 1987, Cooper et.al. 1988, Miner et.al 1989) respondents have to be the founder of the identified firm, and secondly subjects have to be currently involved in the start-up-process. This was operationalized by requiring subjects to have started their venture within the last year. (Busenitz and Barney, 1997) Furthermore it is the first start-up for all entrepreneurs.

Measures

To assure comparability with the survey of Simon et al. (2000), we used the same questions for risk-perception, illusion of control and starting a case study venture. In addition we extended the questionnaire with questions about self-perception, locus of control and another question about starting a real venture. The questionnaire can be found in Appendix A.

Decision to Start a Venture

The Decision to start a case study venture was operationalized by two questions. (see questions 1 & 2 of the questionnaire in appendix A) In addition we asked whether the subjects already started their business or not (see Appendix A

Risk Perception

Risk perception was measured by the mean of eight items as used in earlier surveys (Simon et. al. 2000, Nutt 1986 1993, Thomas & McDaniel 1990), see questions 3.1-3.8) with a Cronbach's alpha of 0.89. A factor analysis proved that risk perception was unidimensional measured.

Illusion of Control

Illusion of control measures the tendency of the respondents to believe he or she can control or at least influence outcomes they can clearly not. According to past management literature on illusion of control (e.g., Duhaime and Schwenk 1985, Schwenk 1986, Simon et al. 2000), this study focuses on business events that entrepreneurs often, mistakenly, think they can control or predict. In this case it is the prediction of market entry of competitors and market demand for the product. Like Simon et al. (2000) we used the mean value of three items ($\alpha = 0.66$) to measure the subject's illusion of control, whereas he took two from Langer and Roth (1975) and added one by himself. (see Appendix A)

Locus of Control

Locus of control refers to the extent to which individuals believe that they can control events that affect them. It can be divided into two separate sources of control: internal and external. “‘Internals’ believe that they can determine their own fate within limits, while ‘externals’ believe outside forces determine their fate.” (Jennings 1983, p.417) For measuring Locus of control Rotter's I-E scale was used. The scale consists of 29 paired statements and the respondents were asked to decide which of each statement they agree most to. Only 23 out of the 29 pairs ($\alpha = 0.78$) are used for scoring, 6 are dummy pairs. “... much research has shown that locus of control is a stable, individual difference which has been shown not to vary across situation” (Carpenter 1997: 190).

Self Perception

Self-Perception is the way in which a person perceives her own abilities and tendencies. All choices, aspirations, efforts and perseverance in the face of setbacks of a person are influenced by the self-perception of the persons own capabilities (Boyd 1991). “If a certain behavior is perceived to be beyond the ability of a person, he or she will not act, even if there is a perceived demand for that behavior.” (Boyd and Vozikis 1994: 66). We used three questions ($\alpha = 0.62$) to measure the self-perception of the subjects. The first question was

adopted from previous research on self-image (Verheul 2004). We asked if the person would call themselves an entrepreneur on a seven score Likert-scale. Two questions were added about the perception of the subject's fear of failing, his knowledge, abilities and experience, taken from the GEM Consortium as cited in Köllinger et. al. (2004) adult population survey questionnaire. With a factor analysis we proved that the measure was unidimensional.

Analysis and Results

We used the following methods to test our hypotheses

H1: Entrepreneurs (people who are starting their first venture) **do not** perceive risk (as described in a case study) differently compared to MBA students (people who have not started a venture).

To test hypothesis 1 we used t-test to compare the means of the two groups and the Kolmogorov-Smirnoff-test to figure out whether the frequencies on the seven score Likert-scale are equally distributed between the two groups. Even in the case where the means could be exactly the same, the variance or the skewness could be different in both subsamples. Using a Kolmogorov-Smirnoff-test it is assured that we used the whole information of the data representing the risk perception. The measurement of risk perception was hereby calculated in two different ways. One was the mean over the different items, and the other was the factor scores, derived from a factor analysis over the eight items.

TABLE 1 ABOUT HERE

Table 1 summarizes the results. The t-test for example showed, that the differences between risk perception of entrepreneurs measured by means was 4.26 and the risk perception of non-entrepreneurs was 4.04. This difference is not even significant on the 10%-level. The t-test using factor scores and the Kolmogorov-Smirnoff-tests showed similar results. No differences were significant. So there is no reason to reject hypothesis 1. People who are starting a venture do not perceive risk as described in a case study differently compared to people who

have not started a business. The level of risk perception is not an indicator distinguishing entrepreneurs from students.

H2: Internal Locus of Control is associated with a high willingness to start a “real” venture

H3: The extent to which an individual perceives him- or herself as an entrepreneur is associated with the willingness to start a “real” venture.

H4: Risk perception explains the willingness to start a case study venture but not the willingness to start a “real” venture

H5: Internal Locus of Control and Self-Perception does not explain risk-perception.

To test our hypotheses 2-4 we used two different approaches. Firstly we reproduced the results of the regressions done by Simon et al. This was done because (consistent with Simon) we used means in the regression analysis to represent the constructs of risk perception, self perception and starting the case study venture. Secondly we estimated a confirmatory model using partial least squares (PLS) estimates, because all of the mentioned constructs were measured by more than one item/variable. Using a stepwise regression for both independent variables (starting a case study venture and starting a real venture) table 2 shows that for the first stepwise regression (starting a case study venture) the variable flexibility, optimism, locus of control and self perception were excluded, whereas in the second stepwise regression (starting a real venture) the variables flexibility, optimism, illusion of control and risk perception were excluded.

TABLE 2 ABOUT HERE

Model 1 reproduces the results of Simon et al. (2000) and supports H4. The lower the value for risk perception and the higher the value for illusion of control, the higher is the willingness to start a case study venture. We have to mention, that the illusion of control and risk perception do correlate negatively on a significance level of $p < 0.005$, which will be no problem at the PLS analysis. Model 2 shows that the willingness to start a real venture is not

influenced by the risk perception, the illusion of control, flexibility and optimism. The explaining variables for starting a real venture are self perception and locus of control. So the measurement of risk perception within a case study is questioned as a predictor for starting a real venture.

Model 3 confirms hypothesis H5, which means that the variables indicating former experiences do not predict the cognitive perception of risk as described in the case study and confirms the results found by Simon et al. (2000) that the illusion of control has a small, but significant influence on risk perception.

Since we used means for representing the construct in the regression analysis, we now want to test our hypotheses H2-H4 using a conformational model. Because the used data are not normally distributed for most of the variables we did not use LISREL, but instead PLS, because the latter is more robust against not normally distributed variables (Chin 2003, Fornell & Cha 1994) Figures 3 and 4 show the results of this analysis.

FIGURE 3 ABOUT HERE

FIGURE 4 ABOUT HERE

In figure 3 and 4 the significant constructs are linked with a solid line, the non-significant constructs are linked with a dotted line. Also the path coefficients and the t-values (in parentheses) of the coefficients are given. The t-values were generated by the bootstrapping procedure of PLS-Graph with a resample size of 200 (Tenenhaus et. al. 2005, Yeo & Grace 2004, Chin et. al. 2003) Looking at the path coefficients we see that the relative impact of the risk perception is much higher than the impact of the illusion of control but there is also an impact of Illusion of Control on risk perception.

As expected, a low risk perception is associated with a high willingness to start a case study business. Illusion of control is associated positively with the decision to start and negatively with the risk perception. This totally confirms the results of Simon et al. (2000).

Simultaneously, the path coefficients for self perception and locus of control are very small, indicating that their impact is negligible. The R²-value indicates that the model explains 62 percent of the variance.

Looking at figure 4, we see an inverse pattern. Whereas the path coefficients of risk perception and illusion of control are relatively low, the path coefficients of self perception and locus of control are relatively high. Supporting our hypotheses that risk perception does not explain the willingness to start a real business whereas the two measurements of former experience, self perception and locus of control, showed a high explanatory power. In addition the signs of the path coefficients of risk perception and illusion of control are reverse. This would indicate an inversion of the hypothesis that a low risk perception is associated with a high willingness to start a venture and that a high illusion of control is associated with a high willingness to start a venture. We do not give any further interpretations, because the path coefficients are not significant.

With a R² of 0.43 we have found two important factors explaining the willingness to start a real venture. But even together they do not explain as much as risk perception and illusion of control explains the willingness to start the case study business. The path coefficient for self perception is higher compared to the path coefficient for locus of control, indicating that the self perception has a higher influence on decision making. The path coefficient of locus of control is negative, because a low value on the I-E-scale represents an internal locus of control.

The main result is, that risk perception and illusion of control do not explain the willingness to start a **real** venture and locus of control and self perception do not explain not even correlate with the decision to start the **case study** business. This gives hint that perhaps real life experiences are good predictors for real life decisions whereas cognitive processes seem

to be more important for processing information and therefore for decisions in a controlled setting such as classrooms.

Discussion

Starting with the question whether entrepreneurs think different we confirmed former research with a sample of entrepreneurs and students and supported the hypothesis that risk perception does explain the willingness to start a case study venture. We also confirmed that the illusion of control plays a moderating role between risk perception and starting a case study business. More challenging was the finding that in our study risk perception as measured in former studies (Simon et. al. 2000) did not explain the willingness to start a real venture. According to our general hypothesis, which was already mentioned by Parker (2004), that former experiences are more important for the willingness to start a real venture than cognitive processes. Furthermore, according to our results, former experiences seem not to explain cognitive styles or biases. The variables illusion of control and risk perception at the one hand and self perception and locus of control at the other hand did not correlate significantly, which means that former experience and cognitive processes are different concepts. To reflect former experience we used the locus of control theory and the theory of self perception. Both constructs explain strongly the willingness to start a real venture. Therefore it seems that entrepreneurs tend to use past experiences more than new information in the decision process. But why do entrepreneurs give such a small weight to new information compared to past experience?

The only way (new) information has a chance to be processed by the brain is going there via the senses. If we look closer to the pathways from our senses to the brain we find for example that for the visual pathway (see figure 5): “It is evident that 80 percent of what any LGN (lateral geniculate nucleus, the authors) cell listens to comes not from the retina but from the dense interconnectedness of other regions of the brain.” (Varela 1993: 95)

FIGURE 5 ABOUT HERE

If we take the dense interconnectedness of other regions of the brain as a representation of former experience we are not surprised that information plays such a subordinated role in decision making. By the way, the 20 % coming from the retina are very close to the 16 % mentioned by Parker (2004). We don't believe that this is accidentally.

Practitioners are typically aware of the high value of the experience for real life decisions. Scholars often argue that they want to prepare the students for the "real world". But how can we prepare young people for a world that they can not experience in the classroom? Löbler (2005) therefore suggests ten principles for a more experience based learning for entrepreneurship students, based on a constructivist pedagogic paradigm.

Limitation and future research

With this article we focused more on experience than on information processing as predictor for starting a venture. We showed that risk perception and illusion of control are good predictors in a controlled setting like a case study, but they do not work properly in a real life setting. A better predictor for real life setting in our study was experiences and connected predictors. Varela et al. (1993) and Parker(2004) show that new information only have a subordinate role on decision making. With the predictors locus of control and self perception we could explain about 40 percent of the willingness to start a real venture. Future research should examine further predictors for experience and the connectedness to other people and their influence on starting a real venture.

Although this research looked close to the decision to start a real venture, we did not analyze any success variables and it is well known that not all start-ups are successful. Hansemark (2003) and Brockhaus (1980) showed that the locus of control on the I-E-scale is still an item of discussion for long term predictions.

At the beginning of our article we argued that the concept of risk as an “ontological” entity could be questioned from a more constructivist perspective. So further research has to explore whether the idea of an “ontological” risk has to be reevaluated in the light of the new development of cognitive sciences.

APPENDIX A

Decision to Start a Case Study Venture

Respondents had to decide whether the decision-maker in the case, Daniel Garrison, should quit his job to start a venture. The respondents were told that they should put themselves in exactly the same situation as Daniel Garrison and determine what they would do. Responses to each of the two questions below ranged on a 1-7 agreement scale.

Question 1. Should ODI go ahead and introduce the contact lens?

Question 2. Assume that all the principals of ODI had the choice of liquidating the venture for a modest profit; what should ODI do?

Risk Perception

To measure the risk perception we used the eight items below. Respondents were asked about their perceptions of the level of risk associated with bringing the new product to market and starting ODI. Again, we used a 1-7 agreement scale.

Question 3. I believe that ...

... [3.1] the probability of ODI's contact lens introduction doing poorly is very high.

... [3.2] the amount ODI could lose by introducing the lens is substantial.

... [3.3] there is great uncertainty when predicting how well ODI will do with their contact lens introduction.

... [3.4] the overall riskiness of ODI's contact lens introduction is high.

... [3.5] overall I would label the option of introducing the contact lenses as something negative.

... [3.6] I would label introducing the contact lenses as a potential loss.

... [3.7] introducing the contact lenses will have negative ramifications for ODI's future.

... [3.8] there is a high probability of ODI losing a great deal by introducing the contact lenses.

Illusion of control

Respondents were asked how well they might perform on different tasks related to the introduction of ODI's contact lenses. Subjects reported their responses to the three questions on a scale ranging from 1 to 7.

Question 4. I could ...

- ... [4.1] accurately predict total market demand for the contact lenses.
- ... [4.2] accurately predict when larger competitors would enter the market.
- ... [4.3] succeed at making this venture a success, even though many other managers would fail.

Self Perception

To get an idea about the self perception of the subjects they had to rate themselves on three items, on a 1-7 scale.

- [5.1] I would call myself an entrepreneur
- [5.2] I have the knowledge, skill and experience required to start a new business.
- [5.3] Fear of failure would prevent me from starting a new business

Locus of Control

To get the information about the Locus of Control we used Rotter's I-E-scale. The respondents had to decide which of the two meanings they agree more too. The 29 paired choices were labelled as Question 6.1 to 6.29.

- 1a Children get into trouble because their parents punish them too much.
- 1b The trouble with most children nowadays is that their parents are too easy with them.
- 2a Many of the unhappy things in people's lives are partly due to bad Luck.
- 2b People's misfortunes result from the mistakes they make.
- 3a One of the major reasons why we have wars is because people don't take enough interest in politics
- 3b There will always be wars, no matter how hard people try to prevent them.
- 4a In the long run people get the respect they deserve in this world.
- 4b Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
- 5a The idea that teachers are unfair to students is nonsense.
- 5b Most students don't realize the extent to which their grades are influenced by accidental happenings.
- 6a Without the right breaks one cannot be an effective leader.
- 6b Capable people fail to become leaders have not taken advantage of their opportunities.
- 7a No matter how hard you try some people just don't like you.
- 7b People who can't get others to like them don't understand how to get along with others.
- 8a Heredity plays the major role in determining one's personality
- 8b It is one's experiences in life which determine what they're like.
- 9a I have often found that what is going to happen will happen.
- 9b Trusting to fate has never turned out as well for me as making a decision to take a definite course of action
- 10a In the case of the well prepared student there is rarely if ever such a thing as an unfair test.
- 10b Many times exam questions tend to be so unrelated to course work that studying is really useless.

- 11a Becoming a success is a matter of hard work, luck has little or nothing to do with it.
11b Getting a good job depends mainly on being in the right place at the right time.
- 12a The average citizen can have an influence in government decisions.
12b This world is run by the few people in power, and there is not much the little guy can do about it.
- 13a When I make plans, I am almost certain that I can make them work.
13b It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
- 14a. There are certain people who are just no good.
14b. There is some good in everybody.
- 15a. In my case getting what I want has little or nothing to do with luck.
15b. Many times we might just as well decide what to do by flipping a coin.
- 16a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
16b. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.
- 17a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand nor control
17b By taking an active part in political and social affairs the people can control world events.
- 18a Most people don't realize the extent to which their lives are controlled by accidental happenings
18b There really is no such thing as "luck."
- 19a One should always be willing to admit mistakes.
19b It is usually best to cover up one's mistakes.
- 20a It is hard to know whether or not a person really likes you.
20b How many friends you have depends upon how nice a person you are.
- 21a In the long run the bad things that happen to us are balanced by the good ones.
21b Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
- 22a With enough effort we can wipe out political corruption.
22b It is difficult for people to have much control over the things politicians do in office.
- 23a Sometimes I can't understand how teachers arrive at the grades they give.
23b There is a direct connection between how hard I study and the grades I get.
- 24a A good leader expects people to decide for themselves what they should do.
24b A good leader makes it clear to everybody what their jobs are.
- 25a Many times I feel that I have little influence over the things that happen to me.
25b It is impossible for me to believe that chance or luck plays an important role in my life.
- 26a People are lonely because they don't try to be friendly.
26b There's not much use in trying too hard to please people, if they like you, they like you.
- 27a There is too much emphasis on athletics in high school.
27b Team Sports are an excellent way to build character.
- 28a What happens to me is my own doing.
28b Sometimes I feel that I don't have enough control over the direction my life is taking.
- 29a Most of the time I can't understand why politicians behave the way they do.
29b In the long run the people are responsible for bad government on a nation as well as on a local level.

Flexibility

Flexibility was measured using the 10 items below on the 1-7 scale

- For most questions there is just one right answer once a person is able to get all the facts.
- People would be a lot better off if they would just forget about words like probably, approximately, and perhaps.
- I don't like things to be uncertain and unpredictable.
- I like to have a place for everything and everything in its place.
- I set a high standard for myself, and I feel others should do the same.
- I do not always tell the truth.
- I think that I am more strict about right and wrong than most other people.
- Once I have my mind made up, I seldom change it.
- I am in favour of very strict enforcement of all laws.
- Most of the arguments I get into are over matters of principle.

Optimism

Four items were used to measure optimism.

- I feel the economy will expand next year.
- I usually expect improvement in my life
- I usually expect improvement in the economy.
- I feel my performance will improve next year. *Items with an asterisk are reverse scored.

Decision to Start a Real Venture

Question 9: Respondents had to decide between the following 3 choices:

- I already started my business.
- I am going to start an own business.
- I am not going to start an own business.

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	t-Test	Kolmogorov-Smirnoff-Test
Mean score	Not significant	Not significant
Factor score	Not significant	Not significant

Table 1: Differences of risk perception between entrepreneurs and non-entrepreneurs.

	Model 1		Model 2		Model 3				
	Case Study		Real Venture		Risk Perception				
	Indicator	B	(R²)	Indicator	B	(R²)	Indicator	B	(R²)
Included	Risk Perception	-0.738**	(0.576) ^a	Self Perception	0.544**	(0.382) ^a	Illusion of Control	-0.166*	(0.027) ^a
	Illusion of Control	0.117**	(0.014) ^a	Locus of Control	-0.230**	(0.048) ^a			
Excluded (not significant)	Flexibility			Flexibility			Flexibility		
	Optimism			Optimism			Optimism		
	Locus of Control			Risk Perception			Locus of Control		
	Self Perception			Illusion of Control			Self Perception		

Table 2: Results of regressions, explaining the willingness to start a case study venture, the willingness to start a real venture and the risk perception.

a) Indicates the explained variance by variable; **) p< 0.01; *) p<0.05

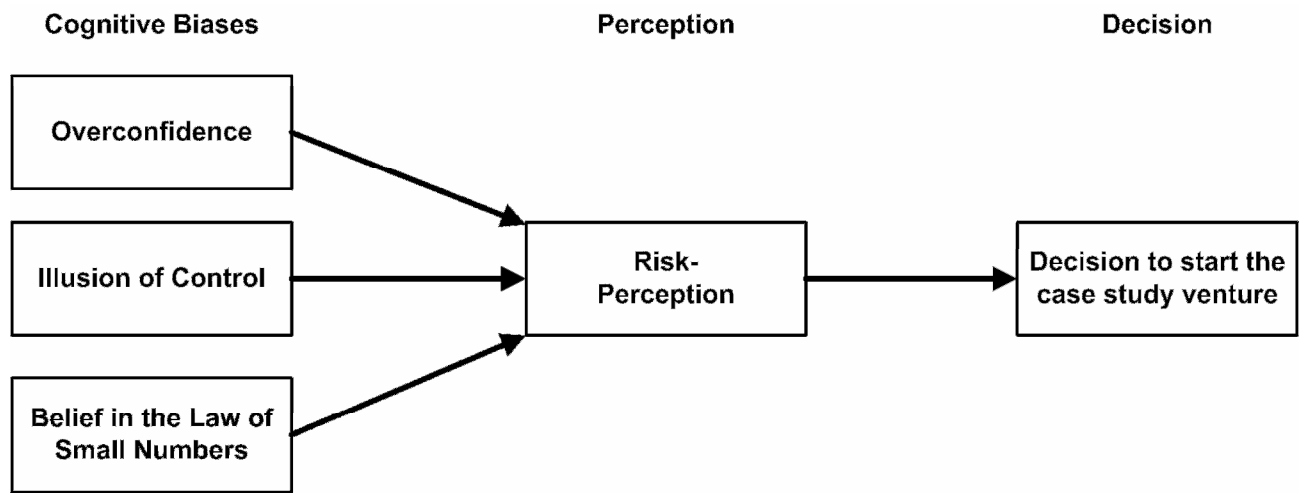


Figure 1: Cognitive Biases

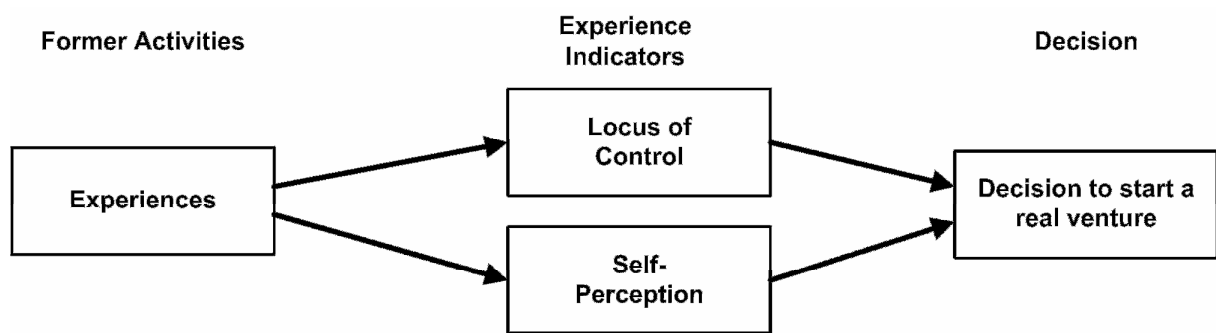
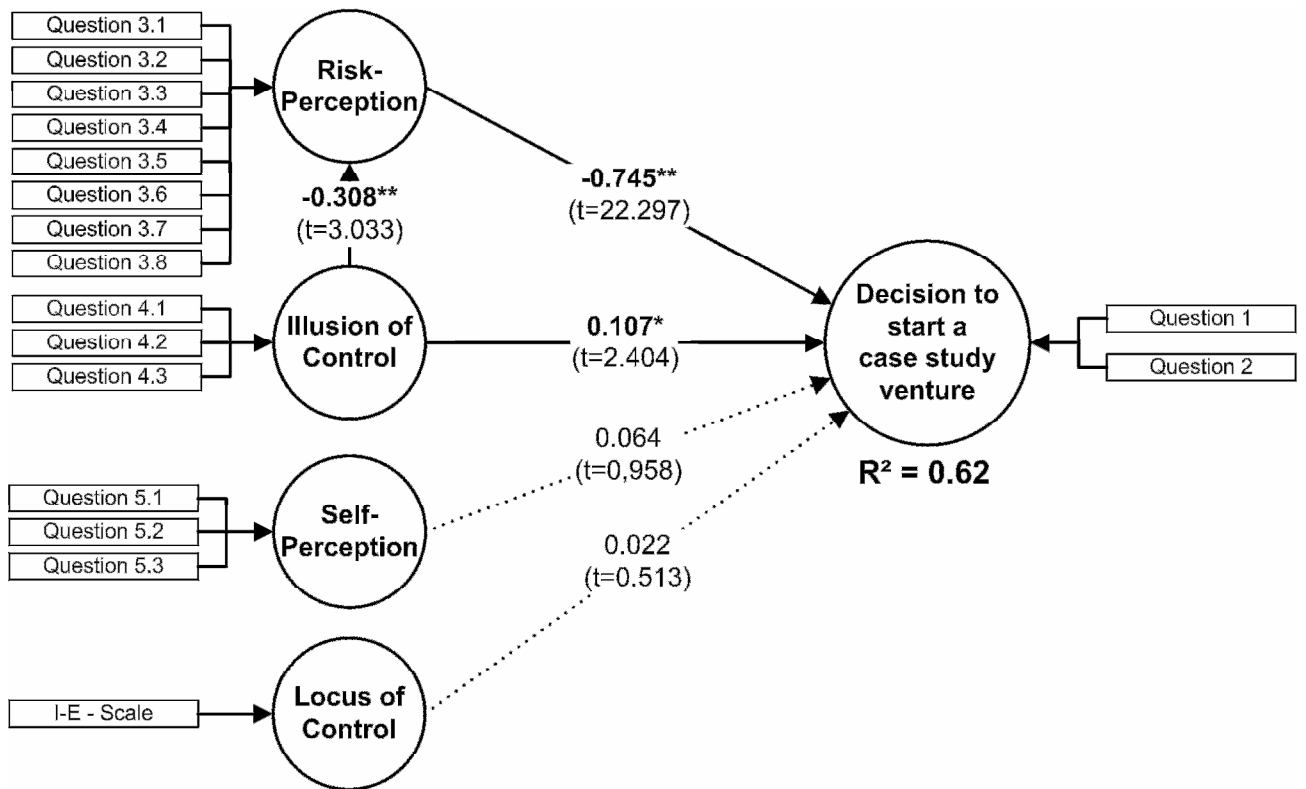
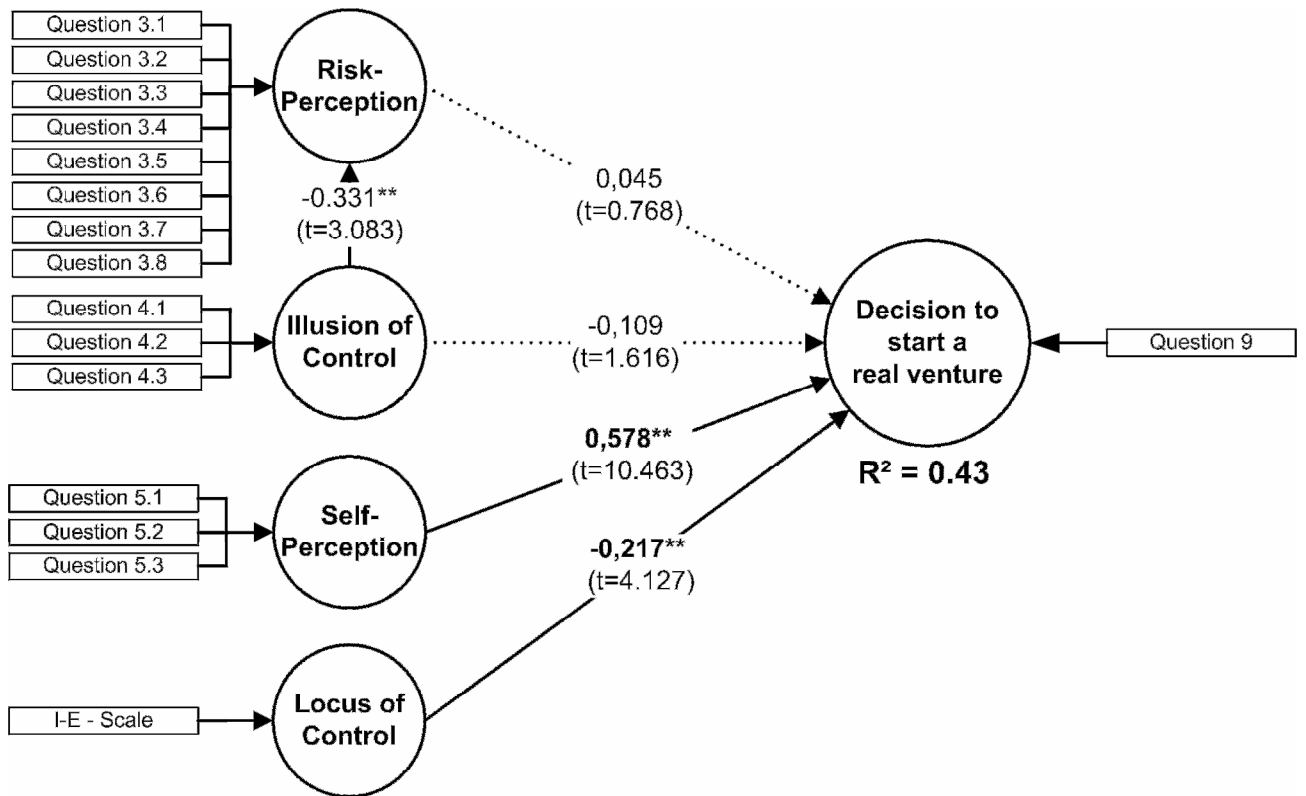


Figure 2: Experience

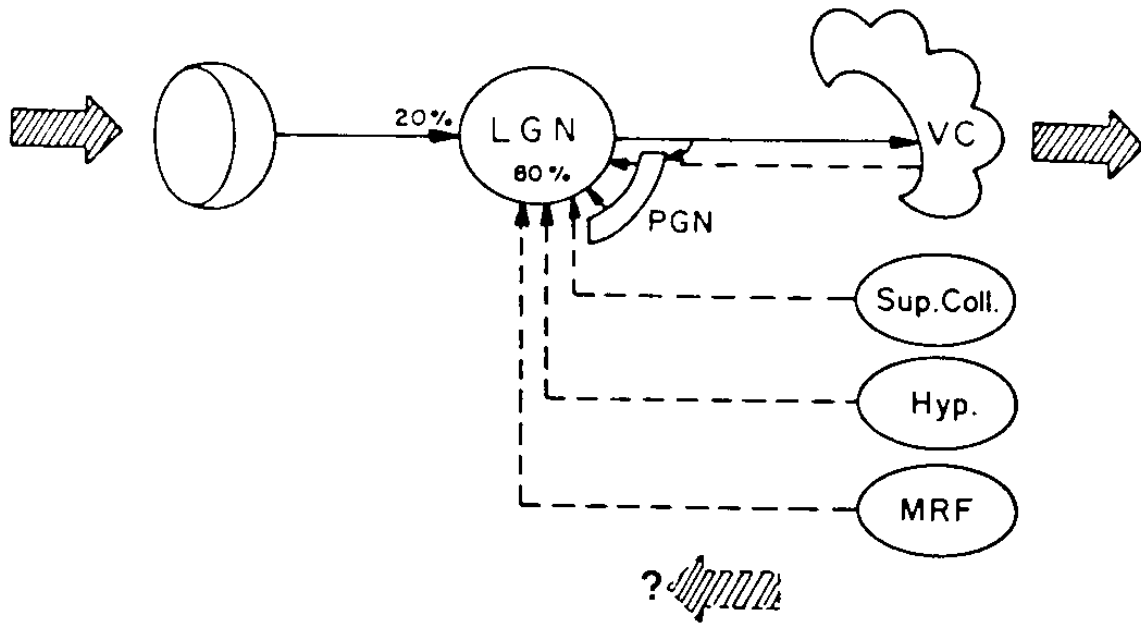


Significances: * $p < 0.05$; ** $p < 0.01$.

Figure 3: Cognitive Bias Model



Significances: * $p < 0.05$; ** $p < 0.01$.
 Figure 4: Experience Model



LGN - lateral geniculate nucleus, VC - Visual Cortex, Sup.Coll. - superior colliculus,
 PGN - posterior geniculate nucleus, Hyp. - hippocampus, MRF - mesencephalic reticular formation
 Figure 5: Connections in a visual pathway at the thalamic level.