Entrepreneurial Mindsets: Theoretical Foundations and Empirical Properties of a Mindset Scale

John-Erik Mathisen[a] and Jan Ketil Arnulf[b]
BI Norwegian Business School Oslo Norway, N-0484 Oslo
[a] john-erik.mathisen@bi.no [b] jan.k.arnulf@bi.no

Abstract

This study builds on research on mindsets from laboratory research to develop and test a measurement scale for entrepreneurial mindsets. A three-dimensional scale was constructed measuring elaborating mindsets, implemental mindsets, and compulsiveness about business ideas. EFA and CFA support the claim that these three latent variables may be reliably measured. Using two samples of altogether 608 business students enrolled in entrepreneurship and normal business classes, we were able to demonstrate that elaborating mindsets are antecedent to implemental mindsets. Finally, compulsive mindsets about entrepreneurial activities were mediated by implemental mindsets. We argue that compulsivity is part of the notable impression entrepreneurs make on others, and that this is caused by mindsets instead of personality. A discriminant analysis with the big five personality factors supports this as neuroticism is not correlated with entrepreneurial compulsiveness. Other traits are related to mindsets in ways predicted by existing research.

Introduction

Schumpeter argued that entrepreneurs by introducing new combinations of means of production break with traditions and social norms, and thereby appear somehow special [1]. They may also give an impression on others that they are odd, intense, and narrow-minded. Entrepreneurs operate in an uncertain environment recognized by rapid change across several critical variables [2], but despite – or maybe because of – the uncertain environment, there has been considerable research interest in personality traits as explanation for successful entrepreneurial activities [3]. Still, personality has not been shown to explain entrepreneurship substantially [4].The best case for personality as explanatory value emerged in a recent meta-analysis which found that Big Five personality traits explained 13% of the variance in entrepreneurial intention and 10 % of the variance in entrepreneurial performance [5]. The widespread assumption that entrepreneurship activities and success are rooted in individual factors may not be as weak as the research on personality suggests. Our contribution is to show how the concept of mindsets is better suited than personality traits to capture properties of individuals that characterize them across situations and explains entrepreneurial activities in a substantial way. Personality traits are by definition assumed to be invariant, requiring high test- retest reliability and inter-rater reliability. Such methodological requirements leave personal dispositions of very general dimensions [6]. Given the volatility of entrepreneurial business environment and the assumed stability of personality traits, a more perception based explanation of entrepreneurs could expand our understanding of the entrepreneurial process [7]. Certain aspects of entrepreneurs' cognition may cause them to act differently from other people [8], e.g., perceived change in the entrepreneurial business environment has been

shown to incite entrepreneurs to search for new opportunities [2]. Earlier publications have called for research on the interaction between the external and internal environment in how entrepreneurs conceive adaptable strategies [9]. Mindsets appear to be a promising construct in this respect. Mindsets may be described as malleable strategies that evolve and change in concert with the individual's interaction and experience with their environment [10]. Previous research has conceptualized entrepreneurial mindsets as one single dimension, applying demographic data [11] or qualitative data [12]. More than a century of laboratory research in psychology has shown that forming mindsets is a process ranging from consciously accepting a task to automatic election of the task to perceived situational cues [13, 14]. Our research question is if it possible to create a survey of entrepreneurial mindsets based on experimental research that will show acceptable psychometric properties and explain entrepreneurial activities over and above common personality trait measurements.

To our knowledge, no one has developed a scale quantitatively measuring the intensity of unique mindsets associated with different stage in the process of becoming engaged in entrepreneurial activities. Such a scale may offer opportunity to measure entrepreneurial mindsets more systematically and to explore a broader content of entrepreneurial mindsets. Additionally, this conceptualization may be used to explain how entrepreneurial mindsets develop in teaching and practice, and to increase our understanding of the relationship between entrepreneurial mindsets and entrepreneurial activities. Drawing on experimental research on mindsets, we attempt at constructing a survey-based approach that may be less obtrusive than laboratory experiments but still apply this knowledge on actual real-life entrepreneurial activities.

Theory

The term "entrepreneurship" appears to be hard to define in a precise and unambiguous manner [15]. Increasingly, researchers have turned to opportunity recognition as a core activity in the entrepreneurial process [16]. Some researchers have also defined entrepreneurship as a pattern recognition activity [17] and found mindset or mental frames as key features in the opportunity recognition process [18].

Mindsets are conceived as "distinct cognitive operations that facilitate problem-solving" [14]. The concept of mind-set goes back to the Würzburg School of psychological research which was founded by Oswald Külpe in the end of the 19th century. Their research showed that subjects would single out the features related to their tasks, and unimportant features were rejected from attention. For example with the task of observe the number of letter, the subjects may be totally unable to report on color and may deny that color has been experienced at all. This is the original meaning of the term "mindset", the brain is "set" to perceive the world according to predefined criteria.

A substantial part of the research on mindsets has been concerned with how these become automatic and non-conscious. It was shown that tasks would gradually disappear from consciousness in subjects who participated in reaction studies. With increased practice, the task kept being completed even if there was no awareness of it. The waiting period for the stimuli to appear was also reported by the subjects as becoming impalpable and subjects had no phenomenological awareness of inner speech at the time of study. Külpe's student Asch argued that the original purpose is forgotten and appearance of the stimulus automatically activated the prescribed conduct [13]. In this way, mindsets are conceived as automated processing of stimuli, a product of experience in the form of repeated exposure to tasks [13].

The mind is set to respond in a certain manner to particular aspects of stimulation. In turn stimulus presentation release the automatic process comprising the set [19]. The object of a mindset is therefore a type of pattern recognition, reminiscent of the concept “stimulus” in behavioristic terminology [20]. The difference is however that the concept “mindset” not only describes a response to a given stimulus, but a sensitivity to environmental patterns that imposes percepts on stimuli with a considerable cognitive effort

Combining the Würzburg tradition with Kurt Lewins distinction between goal setting and goal striving, Gollwitzer (1990) argues that goal oriented behavior is made up of different phases labeled deliberating, planning, acting, and evaluating. Each phase is characterized by a task that has to be solved, and the over-all success of an activity will be dependent on the success of any one of these phases. Becoming engaged in each of the tasks produces a mind-set that facilitates task completion. We chose to identify the various phases with three distinctly different measures of mindsets called “elaborating” (deliberating and planning), “implementing” (acting and evaluating) mindsets, and compulsiveness about business ideas. The point is that like all mindsets, these may become automated and happen without awareness, but they will be concerned with distinctly different phases of the entrepreneurial process. In relation to the initial, deliberating phase, elaborating mindsets should develop. This is the goal setting phase and give answer to the “why” questions [21], e.g., why should I become engage in entrepreneurial activities? When an elaborating mindset is created, people consider the desirability and feasibility of a goal. Desirability of the outcome is determined by reflecting on its expected value. Feasibility is determined by consider whether the outcome implied by a given wish can be obtained by own activities and whether the situational context is facilitating or impending. Hence, an open-mindedness toward processing of incoming and stored information may be beneficial. Phenomenologically, the elaborate mindset it is characterized by a fluid state (Gollwitzer, 1990), such as “should I, or should I not become engaged in entrepreneurial activities?”

Implemental mindsets are closer to action and should develop during the planning phase. Implemental mindsets are made up of thoughts about how, as in “how can I become engaged in entrepreneurial activities?” Implemental mindsets tend to focus on the specifics of where, when, and how to implement a plan, transforming a whish into intention. In contrast to the elaborating mindsets, the implemental mindsets will give rise to closed-mindedness towards incoming and stored information, emphasizing only information relevant for goal achievement. Phenomenologically, this state is characterized by a feeling of determination to fulfill ones whish (Gollwitzer, 1990): “I’m determined to become engaged in entrepreneurial activities, when I perceive an opportunity the strategy for goal attainment will be released”. Results from a meta-analysis indicate that forming implemental mindsets enhance the accessibility of specific opportunities as well as automated goal directed behavior over and beyond barely forming an intention to act. [22]

A central feature of the mindsets in experimental settings is their tendency to become automatic and wane from awareness. While the behavior itself may be perceived by the individual and the environment, it may not be felt to be voluntary [23]. This is called compulsiveness in psychology, a word with clinical connotations such as in the word “obsessive-compulsive disorder”. Automatic behaviors of high frequency are, however, quite common and not restricted to clinical phenomena if the thoughts are not in themselves disturbing. One example is falling in love where it is found that infatuated couples suffer from compulsiveness about their loved one [24]. Other constructs of abnormalities like delusions are also shown to be normally distributed in the population [25]. A meta-analysis found that

mindsets could resemble trait like individual characteristic [26]. It has also been observed that activation of implemental mindsets appears to remove the influence of personality on behavior[27]. The frequency with which a given behavior is repeated has been called "response strength" [20]. We believe that automated entrepreneurial mindsets with high degree of response strength are the most likely candidate for the somewhat obsessed, single-minded appearance of many successful entrepreneurs that appears to the environment as personality traits [consider the case of Steve Jobs, 28].

For measurement purposes, one may ask what delineates a "mindset" – what is, logically speaking, the "set" of situations subsumed in a mindset, and how are different mindsets separated? This question is not only of theoretical, but also of practical importance to the usefulness of the mindset concepts. Mindsets may have different objects – in our case entrepreneurial actions – but the mindsets still differ in terms of the activities they arouse. To demonstrate the existence and usefulness of our three-component operationalization of a mindset survey, we need at least to show that the three defining types of mindsets (elaborating, implementing, and compulsiveness) are methodologically discernible [29]. Thus hypothesis 1: *Elaborating-, implemental entrepreneurial mindsets and compulsiveness about business ideas will be discernible as stable, statistically independent variables in how subjects think about entrepreneurial activities.*

Based on the works of Gollwitzer [14], we argue that the development of mindsets go from elaborating to implementing and become compulsive as a function of repeated action. To the extent that personality is related to compulsivity, the influence should be stronger on elaborating than on implementing mindsets, leading us to hypothesis 2: *The three different mindsets will be related so that the relationship between elaborating mindsets and compulsiveness concerning business ideas will be fully mediated by implemental mindsets*

There may be many links between personality and mindsets, since personality may exert influence on several steps in the process of developing the mindsets. But if the compulsiveness of entrepreneurs is due to personality, one would expect a correlation between neuroticism and compulsiveness. If we are right in the present argumentation, there is no such connection since the compulsion is developed along with the entrepreneurial mindset. Instead, personality should be most strongly related to the first phase of the development of mindsets, i.e., elaborating mindsets, and the mutual influence of the five factors should be according to the findings of Zhao and colleagues [5]. Hypothesis 3: N*euroticism is not related to compulsiveness about business ideas. And h*ypothesis 4: *Openness to experience, extraversion and conscientiousness are positively correlated with elaborating mindsets, whereas agreeableness is negatively correlated with elaborating mindsets.*

Method

We developed a total of 24 items to measure the three entrepreneurial mindsets. We followed the clinical tradition to measure the intensity and frequency of mindsets. To capture the content of the different mindsets we followed the tradition of elaborating and implemental mindsets and asked the students of their thoughts regarding the desirability and feasibility of becoming engaged in entrepreneurial activities, and their thoughts about how, where, and when to fulfill their wishes to become engaged in entrepreneurial activities. Accordingly, our measurement instrument was developed to measure student's intensity of elaborating- and implemental mindsets and compulsiveness about business ideas. The subject were asked how

often they had experienced the stated thoughts or equivalents thoughts during the last week, and responded on a five point Likert scale ranging from 1 (not at all) to 5 (all the time). The list of items used after an deleting items that fail to meet our criteria are present in table 1. To measure personality we used the 60-item version of the NEO [30]. Previous research has found work experience to be related to entrepreneurial intention, mediated by subject's entrepreneurial self-efficacy (Zhao et al., 2005). Prior research has also found gender to be significantly related to intention to become engaged in entrepreneurial activities, such that men more than women were more likely to intend to become engaged in those activities (Zhao et al., 2005). Accordingly, we treaded work experience and gender as control variables.

Sample

Data from two samples was collected to examine the three entrepreneurial mindsets. Both samples consisted of students at the Norwegian Business School in Oslo Norway. The first sample consisted of 285 students. 129 (45.3%) of the students reported to have entrepreneurship or innovation as their major education, the rest of the 285 (156) students reported to be enrolled in non-entrepreneurial education. Their mean age was 22 years and 44,9 % were women. Their mean length of work experience was 4,8 years. The second sample consisted of 323 students, 21 (6,5%) of the students reported to have entrepreneurship or innovation as their major, the rest of the 323 (302) students reported to be enrolled in non-entrepreneurial education. Their mean age was 21,8 years and 48 % were women. Their mean length of work experience was 3,9 years. All the data was collected by questionnaire completed in class. The response rate was 85% for both samples.

Results

We used the first sample (N=285) to conduct an exploratory factor analysis. The list of items used after an explorative analysis, and deleting items that fail to load above 0,5 on the intended factor and cross loading above 0,35, are present in table 1. The means, standard deviations, reliability coefficients, and intercorrelations among the included variables can be read from table 2 below.

Table 2: Means (M), Standard Deviation (SD), Reliability Coefficients and Intercorrelations among Study 1 Variables.

	M	SD	1	2	3	4	5
1. Gender	0.55	0,5					
2.Work experience	4.84	3.58	.00				
3. Elaborating	2.81	0.73	,17**	.08	(.80)		
4. Implemental	2.88	1.07	.32**	.13**	.53**	(.92)	
5. Compulsiveness	2.09	0.86	.35**	.16**	.45**	.71**	(.88)

Note. N = 285. Reliability (∝) estimates are listed on the diagonal. * $p < .05$. ** $p < .01$.

Table 1: Exploratory factor analysis of the three dimensional mindset scales

Items		Factor 1 Elaborating mindset	Factor 2 Implemental mindset	Factor 3 Compul-siveness
Ela 1	I'm considering both positive and negative aspect of become engaged in entrepreneurial activities	,69		
Ela 2	I'm consider whether I have the time to become engaged in entrepreneurial activities	,76		
Ela 3	I'm considering whether I have the opportunity financially to become engaged in entrepreneurial activities	,79		
Ela 4	I consider whether the timing to become engaged in entrepreneurial activities is right	,73		
Ela 5	I'm looking for both positive and negative information about becoming engaged in entrepreneurial activities	,68		
Im 1	When I think of business ideas, I'm determined to become engaged in entrepreneurial activities		,85	
Im 2	I have decided to become engaged in entrepreneurial activities		,87	
Im 3	I have a plan/strategy for how to become engaged in entrepreneurial activities		,87	
Im 4	I have a plan/strategy for when to become engaged in entrepreneurial activities		,83	
Im 5	When I perceive an opportunity I will size up the opportunity and become engaged in entrepreneurial activities		,74	
Com 1	My friends and acquaintances have stated that I may appear to be excessively interested in business ideas			,56
Com 2	In conversations with others I become distracted by business ideas that pop up which I cannot talk about right then			,62
Com 3	I find it hard to control my own thoughts about business ideas			,90
Com 4	My thoughts about business ideas interferes with other areas of my life			,76
ALPHAS		,80	,92	,88

Extraction method: Principal component analysis. Rotation method: Promax with Kaiser Normalization.
Rotation converged in 6 iterations

The obtained model was tested in a new dataset by confirmatory factor analysis in Lisrel 8.8, using the second sample (N=323). The variables were treated as ordinal, the polychoric correlations and asymptotic covariance matrix was calculated, and the method of estimation was robust maximum likelihood (RML). The results showed that all items loaded on their intended factor above the recommended minimum of .50. The fit indices suggest that the model fitted the data well: RMSEA = 0,53. The normed chi-square (χ^2/df) also is within the recommended range between 1.0 and 5.0 (Schumaker & Lomax, 1998). These results support hypotheses 1; the three different mindsets show up as distinct latent variables in the measurement model. To test hypothesis 2, we merged the two datasets. The average of factor loadings for item on the three factors was calculated. To tests for the meditational influence of implemental mindsets on the relationship between elaborating mindset and compulsiveness about business ideas the criteria of Baron and Kenny [31] were applied. Results of regression analyses are shown in table 3.

Table 3: The mediating influence of implemental mindset on the relationship between elaborating mindset and compulsiveness about business ideas

	Step 1	Step 2	Step 3
	Compulsiveness	Implemental mindset	Compulsiveness
1. Gender	.43**	.57**	.15**
2. Work Experience	.05*	.05**	.02*
3. Elaborating	.47**	.66**	.18**
4. Implemental	----	----	.43**
R^2	.32	.39	.51
F	95.22	127.69	156,32
ΔR^2	----	----	,19**

Note. N = 323. * $p < .05$. ** $p < .01$.

Step 1 shows that elaborating mindsets were significantly related to compulsiveness about business ideas (β= .47, p< ,001). In step 2 it was found that elaborating mindsets were significantly related to implemental mindset (β= .47, p< ,001). In step 3, results indicated that implemental mindsets were significantly related to compulsiveness about business ideas when controlled for elaborating mindset (β= .43, p< ,001). By including implemental mindsets as a mediator, the influence of elaborating mindset on compulsiveness about business ideas was significantly reduced from β= .47 to β= .18 (p< .001). The mediation relationship appears to be stronger related to compulsiveness about business idea than the direct influence of elaborating mindset. This finding indicates that most students' entrepreneurial mindsets develop from elaborating to implemental to compulsiveness about business ideas.

The relationship between personality traits and entrepreneurial mindsets

The hypothesized relationships between personality factors and the three mindsets (Hypotheses 3-4) were tested in sample 2 (N=323), by regression analysis in SPSS. The means, standard deviations, reliability coefficients, and correlation among the variables included in this analysis are shown in table 4 below. The results of the regression analyses are shown in table 5

Table 4: Means (M), Standard Deviation (SD), Reliability Coefficients and Intercorrelations among variables used to study the relationship between personality and mindsets.

	M	SD	1	2	3	4	5	6	7	8	9	10
1. Gender	0.52	0,5										
2. Work Experience	3.89	2.98	-.10									
3. Neuroticism	2.58	0.62	-29**	-.05	(.84)							
4. Extraversion	3.78	0.51	-.15**	.23**	.25**	(.81)						
5. Openness	3.35	0.55	-16**	.17**	.12*	.17**	(.78)					
6. Agreeableness	3.43	0.49	-.36**	.07	-.034	.15**	.06	(.73)				
7.Conscientiousness	3.71	0.53	-,09	.11*	-.29*	.29**	.06	.23**	(.82)			
8. Elaborating	2.59	0.80	,14**	.20**	-.05	.16**	.18**	-.17**	.07	(.83)		
9. Implemental	2.38	0.99	.20**	.27**	-.13*	.17**	.20**	-.18**	.17**	.61**	(.92)	
10.Compulsiveness	1.81	0.75	.16**	.22**	-.08	.20**	.23**	-.15**	.15**	.57**	.65**	(.84)

Note. N = 323. Reliability (∝) estimates are listed on the diagonal. * *p* < .05. ***p* < .01.

Analysis 1 in table 5 below shows the model for the relationship between Big Five Personality factors and the intensity of elaborating mindset (R^2=0,14, F=7,05, p<0,001). Extroversion and openness were found to be significantly related to the intensity of subjects' elaborating mindsets (β=,21, p<0,05, β=,23, p<0,05 respectively),Agreeableness was found to be negatively related to the intensity of elaborating mindsets (β= -,26, p<0,05). Consciousness was not found to be significantly related to elaborating mindsets (β=,09, p>0,05, these results partly supports hypothesis 4. Analysis 3 in table 5 shows the model for the relationship between Big Five Personality factors and compulsiveness about business ideas (R^2=0,22, F=12,86, p< ,001). In support of hypothesis 3 results showed that Neuroticism was not significantly related to compulsiveness about business ideas (β= -,045, p>0,05).

Table 5: The relationship between Big Five personality factors and entrepreneurial mindsets

		Analysis 1	Analysis 2	Analysis 3
		Elaborating mindset	Implemental mindset	Compulsiveness
1.	Gender	.26**	.43**	.30’’
2.	Work Experience	.05**	.08**	.40**
3.	Neuroticism	.04	.03	.05
4.	Extroversion	.21*	.18	.22*
5.	Openness	.23**	.33**	.28**
6.	Agreeableness	-.26**	-.35**	-.23**
7.	Conscientiousness	.09	.30**	.20**
R^2		.14	.22	.19
F		7.09	12.86	10.32

Note. N = 323. * $p < .05$. ** $p < .01$.

Discussion

The purpose of this study was to use the findings on mindsets from laboratory research and clinical work to develop a measurement scale for entrepreneurial mindsets. Based on available theory and research, we devised a three-dimensional scale consisting of the intensity of elaborating mindset, implemental mindset, and compulsiveness about business ideas. The three subscales seem to measure reliably different intensities in the types of mindsets related to entrepreneurship and business ideas. The important part in this study is not necessarily the content of the mindsets as much as the distinction between the different types. Data suggest that entrepreneurial mindsets develop sequentially Elaborating mindsets are seen as a necessary initial step towards entrepreneurial activities, since this is a phase where the would-be entrepreneur considers arguments for and against embarking on entrepreneurial activities. We believe this phase is particularly important in initial learning activities such as in formal education, a kind of open-minded reflective thinking [32]. In contrast, implementing mindsets are characteristic of the more closed type of narrow-mindedness related the planning of specific actions. These mindsets may be less easily influenced by formal teaching methods, since they are easily automatized and related to practice – more like a type of tacit knowledge [33]. Finally, compulsiveness is a sign that mindsets are not only automatized, but intense and becoming a strong characteristic of the person having the mindset [26].

To a minor degree, there may be a direct relationship between elaborating mindsets and compulsiveness. A compulsive relationship to elaborating mindsets would support the distinction between a process oriented versus an outcome oriented approach towards entrepreneurial activities [34]. Being process oriented will help people develop implemental entrepreneurial mindsets that let them react swiftly and effortlessly to perceived business opportunities [22]. People who apparently can not control frequent thoughts about business ideas but lack a strategy for how to become engaged in entrepreneurial activities are obsessed with the outcome instead of the necessary steps to get there. At any rate, our study seems to support our claim that entrepreneurial mindsets are more strongly related to work experiences and learning activities than to stable personality traits. This does not mean that personality is unimportant. Four of the factors in big five personality inventory (openness, extroversion, consciousness, and agreeableness) relate to the three different entrepreneurial mindsets in a predicted manner, consistent with previous research. Particularly interesting is the fact that openness to experience is a factor that explains most of the variance in entrepreneurial intention, emphasizing the role of innovative thinking. Also in line with previous research, agreeableness appears to be consistent and significant negative related to the three different mindsets [5]. Entrepreneurs have always had a reputation for odd behaviors, not being like everyone else [35] . We think strong, automatic compulsions to become engage in

entrepreneurial activities, particularly the close-minded determination associated with implementing mindsets, are observable for people around the entrepreneur and used as perceptual foundations for the attribution of “specialness”. Our data do indeed support this existence of driven, repetitive thought patterns in people with strong implemental mindsets. By creating and empirically testing a compulsiveness scale in an entrepreneurial setting, we have put entrepreneurs back into the context of their daily operations, showing that they are a product of daily activities rather than driven by some abnormal characteristics. In fact, neuroticism was the only personality trait that did not correlate systematically with mindsets, nor with compulsiveness. Compulsiveness, usually assumed to be a psychological disorder, may actually still turn out to be an asset in an entrepreneurial context.

References

1. Schumpeter, J.A., *The theory of economic development : an inquiry into profits, capital, credit, interest, and the business cycle*. Social science classics series1983, New Brunswick, N.J.: Transaction Books. lxiv, 255 p.
2. Stewart, W.H., R.C. May, and A. Kalia, *Environmental Perceptions and Scanning in the United States and India: Convergence in Entrepreneurial Information Seeking?* Entrepreneurship: Theory & Practice, 2008. **32**(1): p. 83-106.
3. Begley, T.M. and D.P. Boyd, *Psychological characteristics associated with performence in entrepreneurial firms and smaller businesses.* Journal of Business Venturing, 1987. **2**(1): p. 79-93.
4. Baum, J.R. and E.A. Locke, *The relationship of entrepreneurial traits, skills, and motivation to subsequent venture growth.* Journal of applied psychology, 2004. **89**(4): p. 587-598.
5. Zhao, H., S.E. Seibert, and G.T. Lumpkin, *The Relationship of Personality to Entrepreneurial Intentions and Performance: A Meta-Analytic Review.* Journal of Management, 2010. **36**(2): p. 381-404.
6. Chia, R. and R. Holt, *The Nature of Knowledge in Business Schools.* Academy of Management Learning & Education, 2008. **7**(4): p. 471-486.
7. Krueger, N.F., M.D. Reilly, and A.L. Carsrud, *Competing models of entrepreneurial intentions.* Journal of Business Venturing, 2000. **15**(5-6): p. 411-432.
8. Baron, R.A., *The cognitive perspective: a valuable tool for answering entrepreneurship's basic "why" questions.* Journal of Business Venturing, 2004. **19**(2): p. 221-239.
9. Yang, S.-J., S. and Y. Chandra, *Agent Based Simulation in Entrepreneurial Research*, in *Academy of Management* 2009: Chicago.
10. Axelrod, R.M. and M.D. Cohen, *Harnessing complexity : organizational implications of a scientific frontier*1999, New York: Free Press. XVIII, 184 s.
11. Sarasvathy, D.K., H.A. Simon, and L. Lave, *Perceiving and managing business risks: differences between entrepreneurs and bankers.* Journal of Economic Behavior & Organization, 1998. **33**: p. 207-225.
12. Navis, C., *Old Mindset and New Opportunities: How founders' Prior Experience Affect New Venture Survival*, in *Academy of Management* 2009: Chicago.
13. Humphrey, G., *Thinking; an introduction to its experimental psychology*. Methuen's Manuals of modern psychology1951, London,: Methuen. xi, 331 p.
14. Gollwitzer, P.M., *Action phases and mind-sets*, in *The handbook of motivation and cognition: Foundations of social behavior*, E.T.H.R.M. Sorrentino, Editor 1990, New York: Guilford Press. p. 53-92.

15. Sorenson, O. and T.E. Stuart, *Entrepreneurship: A Field of Dreams?* Academy of Management Annals, 2008. **2**: p. 517-543.
16. Short, J.C., et al., *The Concept of "Opportunity" in Entrepreneurship Research: Past Accomplishments and Future Challenges.* Journal of Management, 2010. **36**(1): p. 40-65.
17. Baron, R.A. and M.D. Ensley, *Opportunity recognition as the detection of meaningful patterns: Evidence from comparisons of novice and experienced entrepreneurs.* Management Science, 2006. **52**(9): p. 1331-1344.
18. Munoz, C.A., S. Mosey, and M. Binks, *Developing Opportunity-Identification Capabilities in the Classroom: Visual Evidence for Changing Mental Frames.* Academy of Management Learning & Education, 2011. **10**(2): p. 277-295.
19. Cohen-Kdoshay, O. and N. Meiran, *The representation of instructions in working memory leads to autonomous response activation: evidence from the first trials in the flanker paradigm.* Q J Exp Psychol (Colchester), 2007. **60**(8): p. 1140-54.
20. Skinner, B.F., *Reflections on behaviorism and society*1978, Englewood Cliffs, N.J.: Prentice-Hall
21. Freitas, A.L., P. Gollwitzer, and Y. Trope, *The influence of abstract and concrete mindsets on anticipating and guiding others' self-regulatory efforts.* Journal of Experimental Social Psychology, 2004. **40**(6): p. 739-752.
22. Gollwitzer, P.M. and P. Sheeran, *Implementation intentions and goal achievement: A meta-analysis of effects and processes.* Advances in Experimental Social Psychology, Vol 38, 2006. **38**: p. 69-119.
23. Parks-Stamm, E.J., G. Oettingen, and P.M. Gollwitzer, *Making sense of one's actions in an explanatory vacuum: The interpretation of nonconscious goal striving.* Journal of Experimental Social Psychology, 2010. **46**(3): p. 531-542.
24. Marazziti, D., et al., *Alteration of the platelet serotonin transporter in romantic love.* Psychological Medicine, 1999. **29**(3): p. 741-745.
25. Peters, E., et al., *Measuring delusional ideation: The 21-item Peters et al. delusions inventory (PDI).* Schizophrenia Bulletin, 2004. **30**(4): p. 1005-1022.
26. Payne, S.C., S.S. Youngcourt, and J.M. Beaubien, *A meta-analytic examination of the goal orientation nomological net.* Journal of Applied Psychology, 2007. **92**(1): p. 128-50.
27. Fiske, S.T., et al., *Handbook of social psychology*, 2010, Wiley: Hoboken, N.J.
28. Isaacson, W., *Steve Jobs*2011, London: Little, Brown.
29. Nunally, J.C. and I.H. Bernstein, *Psychometric theory*1994, Boston: McGraw Hill. 316-318.
30. Costa, P.T., Jr. and R.R. McCrae, *Four ways five factors are basic.* Personality and individual differences, 1992. **13**: p. 653-665.
31. Baron, R.M. and D.A. Kenny, *The Moderator Mediator Variable Distinction in Social Psychological-Research - Conceptual, Strategic, and Statistical Considerations.* Journal of Personality and Social Psychology, 1986. **51**(6): p. 1173-1182.
32. Dewey, J., *Experience and nature*1958, New York: Dover.
33. Polanyi, M., *Knowing and Being*1969, London: Routledge & Kegan Paul.
34. Watkins-Mathys, L., *Developing Student-led Entrepreneurship Learning: the South-East England Collaborative Model.*, 2011, Bucks New University: https://docs.google.com/viewer?a=v&q=cache:KiJozuI_sCEJ:
35. Baum, J.R. and E.A. Locke, *The relationship of entrepreneurial traits, skill, and motivation to subsequent venture growth.* Journal of Applied Psychology, 2004. **89**(4): p. 587-598.