The identification of Investment Opportunity ad seed-stage by Business Angels.

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Researchs on judgment and decision-making have a long tradition in several academic fields (management, psychology, politics and others). Decision-making ability still remains critical because of the ambiguity, the uncertainty and the complexity which characterize its context (Inbar, Cone, and Gilovich 2010). In entrepreneurship, judgment at individual level is the main topic of inquiry (Shepherd, Williams, and Patzelt 2015). Entrepreneurship is crucial in our economies. In fact, the seed-stage financing decision by Business Angels (BAs) can determine entrepreneurial firm or startup success (Mason 2010). Angel financing at seed-stage is recognized as more important than formal venture capital but angel market remains inefficient with an unexploited potential.

Many authors have tried to solve this inefficiency by studying the selection or screening stage of the BAs decision process. From a demand side perspective, they handled the project readiness in order to attract financing at seed-stage (Sudek 2006). The angels decision criteria are : the trustworthiness and the enthusiasm of the entrepreneur(s), the management team characteristics, the potential exit route, the barrier for entry for competitors ; ROI and patent, the entrepreneur social and intellectual capital, the nature of the industry, the stage of the idea development and the openness of the team for mentoring (Baum, and Silverman 2004; Becker-Blease, and Sohl 2007; Ludvigsen 2009; Maxwell, Jeffrey, and Lévesque 2011; Petty, and Gruber 2011; Zutshi, and Tan 1999). From a supply side, the aim was to help policy makers in efficient targeting by categorizing informal investor. BAs are rich people in middle age, they have an entrepreneurial experience and in most cases, they have sold their firm with large margin (Redis, Certhoux, and Pare 2013 ; Maula, Autio, and Arenius 2005; Burke, Stel, Hartog, and Ichou 2014). They have also a good personal network and their investment propensity depends on macroeconomics factors as growth rate, entrepreneurial activity level, interest rate and institutional context (Clercq, Meuleman, and Wright 2012; Ding, Sun, and Au 2014). In a project-investor node perspective, BAs were described as heuristics users (under a stimulus-response paradigm) to simplify opportunity assessment when attempting to select investments (Chen, Xin, and Kotha 2009). There are « elimination by aspects » heuristic (Maxwell, Jeffrey, and Lévesque

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2011) and visual heuristic (Latham, and Tello 2014; Chan, and Park 2014). Although these perspectives are useful, we think that they oversimplify the selection and evaluation process. The first view lists objective criteria that are less reliable to actual informal capital investing (Kirsch, Goldfarb, and Gera 2009). The supply side attempted to delineate investor candidates in order to target them with policies but variations between countries have undermined this option. The third perspective is the most promising one but it has been too limited to heuristic approach under a stimulus-reaction framework. It also has been too partial by only studying the presentation stage. To our knowledge, the mental process is less studied in spite of the call to focus more on investors cognitive capacities (Miloud, Aspelund, and Cabrol 2012 ; Smith, Mason, and Harrison 2010). Little is known about the actual project evaluation process at early-stage. We postulated that a focus on the psycho-cognitive aspects of the opportunity recognition by BAs, will offer more insight on the actual process involved. To our knowledge, the key question remains to identify not only the factors actually facilitating investment opportunity recognition but also the mental process involved in this task. To further understand this issue, our research questions are the following : what is the BA cognitive strategy during the recognition process ? Which factors, with a subjective meaning, are actually driving the investment opportunity recognition at seed-stage ? In this paper, we consider project selection and evaluation (two activities linked inextricably) as an investment opportunity recognition process. When considering a business idea, BAs have to make sense of the project potential and to subjectively decide if there is an investment opportunity or not. Sensemaking is largely studied at organizational level but individual interpretation ability remains poorly understood (Crossan, Lane, and White 1999 ; Grégoire, Barr, and Shepherd 2010 ; Dimov 2007). Thus, the present work aims to reduce this gap in the literature. We assume that BAs use a particular mental process which to interpret project's potential.

Investment Opportunity Recognition in a Psychology-Cognitive View

In this paper, we define investment opportunity recognition in accordance with Grégoire, Barr, and Shepherd (2010). It integrates : an objective dimension because the entrepreneur business idea is a reality independent from the investor ; a subjective dimension because the outcome of the process is an *ex ante* belief based on the idiosyncratic mental representation of the investor. With two psychological frameworks (pattern recognition theory and structural alignment theory), we analyse the cognitive structure and content in the interpretation of complex situations (Wood, and williams 2014). Investment opportunity recognition is considered as a complex task because of the uncertainty which characterizes startup at early-stage.

Interpretation of investment opportunity follows a pattern recognition process. Indeed actors rely on schemas or cognitive structures in their attempt to sense the environment (Allard-Poesi 1998). By interacting with their context, actors automatically recognize patterns or tend to rebuild the situation by proactively chunking pieces of information in order to create new knowledge (Pretz 2008). According to Dane and Pratt (2007) and Weaver and Stewart (2012), sensemaking is the result of an associative mechanism between environmental cues and prototypes stored in memory. Mental structures modulate perception and interpretation in complex contexts (Hodgkinson, Langan-Fox, and Sadler-Smith 2008). They are composed of interrelated concepts which influence sense and action at an individual level (Vaghely, and Julien 2010 ; Valliere 2013). "Schema are dynamics evolving mental models that represent individual's beliefs and knowledge about how the physical and social world work" (Gaglio, and Katz 2001). Thus, by anchoring on this literature and considering project evaluation at the early-stage as uncertain task, we postulate that the investment opportunity recognition depends on a mental representation possessed by BA.

Pattern recognition theory distinguishes between two forms of mental representation : prototypes and exemplars (Baron 2006 ; Baron, and Ensley 2006). Whereas prototypes are idealized representations of a typical member of a category, exemplars are specific examples of situations encountered by individual (Chea 2008). Prototypes and exemplars are both necessary for a good pattern recognition (Woiceshyn 2009; Ward 2004) during decision-making. Pattern recognition underlies expert intuition. However, most often in complex situations, no direct matching exists between a mental representation and environmental cues. Then, an unconscious creative process is engaged to rebuild the situation. Actors try to proactively give sense or to interpret the new situation (Coget, Haag, and Bonnefous 2009; Daft, and Weick 1984; Hélène 2013). Pattern recognition theory fails in describing the main structure of interpretation process. We use structural alignment theory (Gentner 1983). We assume that the proactive constructive intuitive process is similar to an analogy process based on structural alignment. Three arguments can justify this claim : 1) structural alignment is a cognitive process without conscious (Gentner, and Smith 2012; Dunbar 2000) like intuitive judgment ; 2) like intuition, structural alignment is experiential as it results in the transfer of a known case to an unknown situation (Gavetti, and Rivkin 2005) ; 3) intuiting and analogy are system 1 components as described by the dual processing theory (Hodgkinson, Langan-Fox, and Sadler-Smith 2008). Thus we can fruitfully bring together pattern recognition and structural alignment to better respond to the « how » question of BA opportunity identification.

Structural alignment focuses on the complex situations interpretation by highlighting the form of individual reasoning (Gentner, and Kurtz 2006 ; Mason 2004). By comparing two situations, actors establish structural similarities in order to make reliable inferences about the unknown. The theory distinguishes two types of similarities : the superficial similarities and the relational one. The firsts concern the commons physical attributes between two objects ; the seconds emphasize similarities based on the hidden functionality of the objects and the relations between superficial attributes (Grégoire, Barr, and Shepherd 2010). The superficial attributes are important because they facilitate memory accessibility. The structural relations represent the cognitive map during a sensemaking process and without them superficial attributes loose sense (Gentner 1983). There are two types of relations. « First order relation » describes a component functionality in a situation and can relate two superficial attributes (Gentner, and Gunn 2001). They help explain the « how » and the aims. « Higher order relations » are more used in the subjective interpretation of complex situations (Grégoire, Barr, and Shepherd 2010; Grégoire, and Shepherd 2012). « Higher order relations » are more crucial in the interpretation (Keane, Ledgeway, and Duff 1994). Structural alignment has another advantage : the identification of differences between two cases (Gentner, and Gunn 2001; Gentner, and Smith 2012). We are able to detect differences easier when two situations are structurally aligned (Mason 2004). While interpreting situations, actors initiate a re-representation of observed facts and rewrite situations in their own language (Gentner, and Krutz 2006). It is almost the case when the situations to be compared are less superficially similar. They semantically analyse divergent arguments inside similar structural relations in order to build an holistic image. This process is part of a sensemaking (Weick, Sutcliffe, and Obstfeld 2005) or an intuiting ability (Crossan, Lane, and White 1999). We conceptualize that the BAs investment decision at seed-stage is then a process of intuiting. Based on this review, we conclude that prototype theory and structural alignment framework are complementary in attempting to better understand the actual process of the investment opportunity recognition by BAs at an early-stage. We make two principal propositions for our empirical test :

Proposition 1 : *BAs in the investment opportunity recognition, structurally aligned their prototype on the project characteristics ; they are able to detect risk involved in the idea because of the substantial use of higher order relations.*

Proposition 2 : *Compared to other actors in the idea intrepretation, BAs will use less superficial attributes and first order relations.*

Methodology, Results and Discussion.

Adopting a qualitative approach, we exploit field observations to test our two research propositions. We have observed interactions between BAs and entrepreneurs during the project evaluation process. Raw data were collected through field notes, interviews and secondary data. These data have been content analysed and inter-raters agreement with an independant coder is conform with norm (Krippendorf 2004). We have compared the congitive strategy of BAs and entrepreneurs.

The analyses show that the BA possesses a mental prototype of « investment opportunity » and that he employs a specific cognitive strategy. Our data confirm the two research propositions. First, the « Technology » aspects interpretation is not substantially different between BAs and entrepreneurs. The « Market » and « Entrepreneur » factors are the most relevant aspects to consider for investment opportunity recognition. The senses our BAs have given to these factors are different from what the entrepreneurs think. Second, the reasoning structure of the BA is substantially different from the entrepreneur thinking schema. While the BAs devote relative efforts in using « higher order relations », the entrepreneur strategy is dominated by « first order relations ». We conclude that entrepreneurs are more in the description of an idea and the BAs are in the sensemaking or the interpreting of the opportunity. The superficial features are present in the strategy of the two actors, although in a small proportion. The actors need them to retrieve their memories. We also affirm that BAs use « first order relations » for the retrieving purpose. Investment opportunity recognition is then different from entrepreneurial opportunity recognition. This paper improves our knowledge of what is subjectively considered as an investment opportunity by BAs. It also describes the actual process underlying this decision. We can advise organizations which aimed to make project attractive for investors and policy makers in stimulating entrepreneurial informal finance market. Our results can help BAs to better understand their own decision process. In addition we contribute to improve understanding of decision making in uncertainty. Interpreting ability is the managerial skill to have at an individual level (Castaneda, and Rios 2008; Dimov 2007). Our results can also be related to recent analysis in entrepreneurial cognition (Grégoire, Barr, and Shepherd 2010; Grégoire, and Shepherd 2012).

Even if the interpretation of our study is limited due to the small number of cases considered, we assumed that our results can be the basis of further researches. In fact, we invite researchers to more use psychology framework. The unknown future prediction ability should interest more analysts of decision-making process.

References

Allard-Poesi F. (1998). ‘Representations and Influence Processes in Groups: Towards a Socio-Cognitive Perspective on Cognition in Organization,’ *Scandinavian Journal of Management*,14 (4), 395‑420.

Baron, Robert A. (2006). ‘Opportunity Recognition as Pattern Recognition: How Entrepreneurs “Connect the Dots” to Identify New Business Opportunities,’ *Academy of Management Perspectives*, 20 (1), 104‑19.

Baron, Robert A., and Michael D. Ensley (2006). ‘Opportunity Recognition as the Detection of Meaningful Patterns: Evidence from Comparisons of Novice and Experienced Entrepreneurs,’ *Management Science*, 52 (9), 1331‑1344.

Baum, Joel A. C., and Brian S. Silverman (2004). 'Picking Winners or Building Them? Alliance, Intellectual, and Human Capital as Selection Criteria in Venture Financing and Performance of Biotechnology Startups,' *Journal of Business Venturing*, 19 (3), 411‑36.

Becker-Blease, John R., and Jeffrey E. Sohl (2007). 'Do Women-Owned Businesses Have Equal Access to Angel Capital?,' *Journal of business Venturing*, 22 (4), 503‑21.

Burke A., Stel A.V., Hartog C. and Ichou A (2014). 'What Determines the Level of Informal Venture Finance Investment? Market Clearing Forces and Gender Effects,' *Small Business Econmics*, 42 (3), 467-484.

Castaneda, Delio I., and Manuel F. Rios (2008). 'From Individual Learning to Organizational Learning,' *The Electronic Journal of Knowledge Management*, 5 (4), 363‑372.

Chan C.S.R., and H.D. Park (2014). 'How images and color in business plans influence venture investment screening decisions,' *Journal of business Venturing*, In press.

Chea, Ashford C. (2008). 'Entrepreneurial Venture Creation: The Application of Pattern Identification Theory to the Entrepreneurial Opportunity-Identification Process,' *International Journal of Business and Management*, 3 (2), P37.

Chen, Xiao- Pin, Xin Yao, and Suresh Kotha (2009). 'Entrepreneur Passion and Preparedness in Business Plan Presentation: A Persuasion Analysis of Venture Capitalists' Decision,' *Academy of Management Journal*, 52 (1), 199‑214.

Clercq, Dirk De, Miguel Meuleman, and Mike Wright (2012). 'A Cross-Country Investigation of Micro-Angel Investment Activity: The Roles of New Business Opportunities and Institutions,' *International Business Review*, 21 (2), 117‑129.

Coget, Jean-Francois, Christophe Haag, and Annabel-Mauve Bonnefous (2009). 'Le Rôle de l'Emotion dans la Prise de Décision Intuitive : Zoom sur les Réalisateurs-Décideurs en Période de Tournage,' *M@n@gement*, 12 (2), 118‑141.

Crossan, Mary M., Henry W. Lane, and Roderick E. White (1999). 'An Organizational Learning Framework: From Intuition to Institution,' *Academy of Management Review*, 24 (3), 522‑537.

Dane, Erik, and Michael G. Pratt (2007). 'Exploring Intuition and Its Role in Managerial Decision Making,' *The Academy of Management Review*, 32 (1), 33‑54.

Daft, Richard L., and Karl E. Weick (1984). 'Toward a Model of Organizations as Interpretation Systems,' *The Academy of Management Review*, 9 (2), 284‑295.

Dimov, Dimo (2007). 'From Opportunity Insight to Opportunity Intention: The Importance of Person-Situation Learning Match,' *Entrepreneurship Theory and Practice*, 31 (4), 561‑583.

Ding, Zhujun, Sunny Li Sun, and Kevin Au (2014). 'Angel Investors' Selection Criteria: A Comparative Institutional Perspective,' *Asia Pacific Journal of Management*, 31 (3), 705‑731.

Dunbar, Kevin (2000). 'How Scientists Think in the Real World: Implications for Science Education,' *Journal of Applied Developmental Psychology*, 21 (1), 49‑58.

Gaglio C. M., and J.A. Katz (2001). 'The Psychological Basis of Opportunity Identification: Entrepreneurial Alertness,' *Small Business Economics*, 16 (2), 95‑111.

Gavetti, Giovanni, and Jan W. Rivkin (2005). 'How Strategists Really Think : Tapping the Power of Analogy,' *Harvard Business Review*, avril.

Gentner, Dedre (1983). 'Structure-Mapping: A Theoretical Framework for Analogy,' *Cognitive Science*, 7 (2), 155‑170.

Gentner, Dedre, and Virginia Gunn (2001). 'Structural Alignment Facilitates the Noticing of Differences,' *Memory & Cognition*, 29 (4), 565‑77.

Gentner, Dedre and Kurt J. Kenneth (2006). 'Relations, Objects and the Composition of Analogy,' *Cognition Science, 30*, 609-642.

Gentner, Dedre, and Linsey Smith (2012). '*Analogical reasoning,'* In *Encyclopedia of human behavior*. Oxford, UK. <http://groups.psych.northwestern.edu/gentner/papers/gentnerSmith_2012.pdf>. Accessed on 11-11-2014, 12:31:54.

Grégoire, Denis A., Pamela S. Barr, and Dean A. Shepherd (2010). 'Cognitive Processes of Opportunity Recognition: The Role of Structural Alignment,' *Organization Science*, 21 (2), 413‑431.

Grégoire, Denis A., and Dean A. Shepherd (2012). 'Technology-Market Combinations and the Identification of Entrepreneurial Opportunities: An Investigation of the Opportunity-Individual Nexus,' *Academy of Management Journal*, 55 (4), 753‑785.

Hélène, Laurence (2013). 'Les Représentations des Créateurs d'Entreprise Peuvent-Elles Contribuer à l'Amélioration des Pratiques d'Accompagnement ? Eléments pour une Perspective Sociocognitive des Processus de Création,' *Communication n°12 au 8eme congrès AEI*, octobre.

Hodgkinson G. P., Langan-fox J., and E. Sadler-smith (2008). 'Intuition: A Fundamental Bridging Construct in the Behavioural Sciences,' *British Journal of Psychology*, 99 (1), 1‑27.

Inbar, Yoel, Jeremy Cone, and Thomas Gilovich (2010). 'People's Intuitions About Intuitive Insight and Intuitive Choice,' *Journal of Personality and Social Psychology*, 99 (2), 232‑247.

Keane, Mark T., Tim Ledgeway, and Stuart Duff (1994). 'Constraints on Analogical Mapping: A Comparison of Three Models,' *Cognitive Science*, 18 (3), 387‑438.

Kirsch D., Goldfarb B. and A. Gera (2009). 'Form or Substance: the Role of Business Plans in Venture Capital Decision Making,' *Strategic Management Journal*, 30, 487-515.

Krippendorff, K. (2004). *Content Analysis: An Introduction to Its Methodology*, 2nd edition. Thousand Oaks, CA: Sage.

Latham S., and F.S. Tello (2014), 'Examining Entrepreneurs' Presentation Effectiveness in Generating Stakeholder Interest: Observations From the Medical Device Industry,' *Journal of Small Business Management*, DOI: 10.1111/jsbm.12132.

Ludvigsen, Joel (2009). 'Decision time in Belgium: an Experiment as to How Business Angels Evaluate Investment Opportunities,' *CEB Working Paper N° 09/037*, septembre.

Mason, Colin (2010). 'Entrepreneurial Finance in a Regional Economy,' *Venture Capital*, 12 (3), 167‑172.

Mason, Lucia (2004). 'Fostering Understanding by Structural Alignment as a Route to Analogical Learning,' *Instructional Science*, 32 (4), 293‑318.

Maula, Markku, Erkko Autio, and Pia Arenius (2005). 'What Drives Micro-Angel Investments?,' *Small Business Economics*, 25, 459‑475.

Maxwell, Andrew L., Scott A. Jeffrey, and Moren Lévesque (2011). 'Business Angel Early Stage Decision Making,' *Journal of Business Venturing*, 26 (2), 212‑225.

Miloud, Tarek, Arild Aspelund, and Mathieu Cabrol (2012). 'Startup Caluation by Venture Capitalists: an Empirical Study,' *Venture Capital*, 14 (2-3), 151‑174.

Mitteness, Cheryl, Richard Sudek, and Melissa S. Cardon (2012). 'Angel Investor Characteristics that Determine Whether Perceived Passion Leads to Higher Evaluations of Funding Potentiel,' *Journal of Business Venturing*, 27 (5), 592‑606.

Petty, Jeffrey S., and Marc Gruber (2011). '"In Pursuit of the Real Deal": A Longitudinal Study of VC Decision Making,' *Journal of Business Venturing*, 26 (2), 172‑188.

Pretz, J.E. (2008). 'Intuition versus Analysis: Strategy and Expérience in Complexe Everyday Problem Solving,' *Memory & Cognition*, 36 (3), 554-566.

Redis, Jean, Gilles Certhoux, and Jean Louis Pare (2013). 'Les Déterminants de La Stratégie d'Investissement des Business Angels : le Cas de la France,' *Communication n°27 au 8eme congrès AEI*, octobre.

Shepherd D., Williams T. A., and H. Patzelt (2015). 'Thinking about Entrepreneurial Decision Making: Review and Research Agenda,' *Journal of Management*, 41 (1), 11-46.

Smith, Donald J., Colin M. Mason, and Richard T. Harrison (2010). 'Angel Investment Decision Making as a Learning Process,' *Working Paper 10-05, University of Strathclyde, Scotland UK*, novembre.

Sudek, Richard (2006). 'Angel Ivestment Criteria,' *Journal of Small Business Strategy*, 17 (2 Fall/Winter), 89‑103.

Vaghely I. P., and P-A. Julien (2010). ' Are Opportunities Recognized or Constructed? An Information Perspective on Entrepreneurial Opportunity Identification,' *Journal of Business Venturing*, 25 (1), 73‑86.

Valliere D. (2013). 'Towards a Schematic Theory of Entrepreneurial Alertness,' *Journal of Business Venturing*, 28 (3), 430‑42.

Ward, Thomas B. (2004). 'Cognition, creativity, and entrepreneurship,' *Journal of Business Venturing*, 19 (2), 173‑188.

Weaver E. A., T.R. Stewart (2012). 'Dimensions of Judgment: Factor Analysis of Individual Differences,' *Journal of Behavioral Decision Making*, 25 (4), 402‑413.

Weick, Karl E., Kathleen M. Sutcliffe, and David Obstfeld (2005). 'Organizing and the Process of Sensemaking,' *Organization Science*, 16 (4), 409‑421.

Wood M.S., and D.W. Williams (2014). 'Opportunity Evaluation as Rule-Based Decision Making,' *Journal of Management Studies*, 51 (4), 573-601.

Woiceshyn, Jaana (2009). 'Lessons from "Good Minds": How CEOs Use Intuition, Analysis and Guiding Principles to Make Strategic Decisions,' *Long Range Planning* 42 (3), 298‑319.

Zutshi, Ravinder K., and Wee Liang Tan (1999). 'Singapore Venture Capitalists (VCs) Investment Evaluation Criteria: A Re-Examination,' *Small Business Economics*, 13 (1),9.