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Heterogeneity among entrepreneurs: a focus on entrepreneur's cognitive process and a research agenda¹

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1. Introduction/Objectives

There has always been an interest in the behavioral entrepreneurship literature dedicated to study the differences between entrepreneurs and non-entrepreneurs². This literature, has mainly focused on how cognitive bias explain entrepreneurial entry (see Astebro *et al.*, 2014 for a review). Nevertheless, there is an important literature underlying traits or socioeconomic differences among entrepreneurs, such as gender differences, social capital, network, cross-country differences effect etc. (Chowdhury, Terjesen and Audretsch, 2015 ; Estrin, Mickiewicz and Stephan, 2013 ; Micozzi and Lucarelli, 2016). Following this approach an emerging

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² See for example Busenitz and Barney (1994).

literature has emerged, which focuses on how heterogeneity among entrepreneurs in terms of cognitive bias might affect firm's outcome (Adomdza *et al.*, 2016 ; Betzer *et al.*, 2017 ; Koellinger *et al.*, 2007). This growing literature shows that entrepreneur's biases could impact the firm's willingness to grow, the mode of growth, their type and amount of funding, their investment, the innovative process etc.

In that sense, we propose a literature review to investigate how different decisions and different firms' results arise from entrepreneur's cognitive biases. So, the aim of this paper is to discuss heterogeneity among entrepreneurs based on their cognitive process rather than other entrepreneurial characteristics. We believe this topic has not been properly explored but that cognitive process is an important source of heterogeneity among entrepreneurs. Several articles have shown how entrepreneurs' cognitive factors impact decisions and outcomes, generating different results. Our proposal is to analyze them and classify the main impacts observed in the literature so far.

Thus, each topic of this research includes (1) which are the cognitive factors that affect entrepreneurs; (2) how these factors manifest themselves in entrepreneurs - for example, the overconfidence bias that can manifest itself in 3 different ways according to the literature (Hamelin and Pfiffelmann, 2018); (3) what are their impact on entrepreneurial decisions – which could be innovative decisions, growth decisions, funding decisions, or any other firm changes decisions; (4) the firm's outcomes affect by those biases described in the literature; (5) a research agenda for each topic.

This is the first time a paper is devoted to understanding the entrepreneurial heterogeneity in terms of cognitive biases. We believe that this literature review will provide a contribution to management scholars interested in understanding the effects of entrepreneurs' cognitive processes. This review might be a way to shed some light in literature gaps and provide a better understanding of this topic in the entrepreneurship literature.

2. Literature Review

The starting point for this research is the Shepherd et al., (2015) review and research agenda on entrepreneurial decision-making process. One of the most important contributions of their paper is the categorization of the entrepreneurship main articles into significant

decision-making topics³. By doing this, the author explicit entrepreneurial decision-making process, serving as good guide for posterior researches⁴. Our work tries to go beyond this research by bridging the entrepreneurial decisions with the results of the firms, explaining how the cognitive process works on this bridge.

Cognitive processes are not a new topic in entrepreneurship literature. After some important articles on the topic (Baron, 1998 ; Busenitz and Barney, 1994 ; Simon *et al.*, 2000), interest in this area has increased greatly. The early studies were more concerned with the different ways of thinking between entrepreneurs and non-entrepreneurs (Busenitz, 1999 ; Busenitz and Barney, 1994 ; Mitchell *et al.*, 2002). And today, given the advancement of the literature, researchers are also interested in understanding the different ways of thinking among the entrepreneurs themselves (Ayala and Manzano, 2014 ; Baron *et al.*, 2011 ; Betzer *et al.*, 2017 ; Hmieleski and Baron, 2009).

In addition, literature reviews are important part of the entrepreneurial literature. Many researchers have separated the studies on entrepreneur behavior into different categories or created an agenda for the future or both⁵. Other reviews were made in order to organize some cognitive concepts. One example of this type of literature development is seen in Hamelin and Pfiffelmann (2018), in which the authors disentangles optimism from overconfidence bias concepts, a common mistake seen in many studies such as in the seminal paper of Cooper *et al.* (1988). Thus, literature reviews in entrepreneurship had as objective to provide knowledge base on a given topic, to eliminate gaps in the literature or to eliminate conflicts, to identify where greater focus of researchers is needed, etc. Among these types of literature review, our review focuses on categorizing emerging studies into behavioral entrepreneurship contributing to the topic of decision-making process and cognitive bias.

3. Methodology

This literature review relies on two similar methods. First, as already said in previous sections, the starting point of this research is the Shepherd *et al.*, (2015) review. However, in addition to the concepts seen in the paper, we also began our review looking at the table of articles used by the authors to make their literature review. We believe that some of the articles

³ The topics are: opportunity assessment decisions, entrepreneurial entry decisions, decisions about exploiting opportunities, entrepreneurial exit decisions, heuristics and biases in the decision-making context, characteristics of the entrepreneurial decision maker and environment as decision context.

⁴ See for example (Baldacchino *et al.*, 2015 ; Zhang et Cueto, 2017).

⁵ See for example Baum *et al.*, 2014.

in their review are important to make this present paper. In that sense, we first rely on their table of articles included in review about decision-making process to create our article database. Articles that are not related to the theme of heterogeneity among entrepreneurs will not be part of our review

In addition, as other important literature reviews on the topic of behavioral entrepreneurship (Astebro *et al.*, 2014 ; Grégoire *et al.*, 2011 ; Hamelin and Pfiffelmann, 2018 ; Shepherd *et al.*, 2015), we will also use the method of criterion sampling (Patton, 1990). That is, the search for articles will be based on Boolean keyword searches in journals of impact in entrepreneurship that are not mentioned by Shepherd et al. (2015) review.

So, we will make a search on the main online database that contains some of the top journals that publish articles on the topic until 2019. These are: JSTOR, EBSCO, Wiley, ScienceDirect and also Google Scholar. This last database is important to prevent important articles not listed in the previous databases from being out of the review. The first filter we used in the search in each database was to use the root word "entrepreneur*" followed by the logical operator "and" and one of the following two words: "bias*" and "heuristic*". Thus, articles should have in any part of the text at least one word formed by the root "entrepreneur" and the root "bias", or the root "entrepreneur" and "heuristic".

The first search should bring thousands of results, mostly unrelated to the search. The word "bias" refers not only to cognitive bias, but also to terms of methodology as sample bias for example. But filtering by the term "cognitive bias" may omit in searching for articles on bias names like "hindsight bias" for example. The second filter we will use should look for one of the following words: cognit*, self, over*, optim*, behav*, commit*, fallacy, decision, hindsight. We believe that doing this way, we will capture most of the articles that are related to our review.

Finally, we will have a few dozen articles that may be related to the review. Finally, they will be read and analyzed if they correspond to the research objective: to understand the heterogeneity of the entrepreneurs in term of cognitive process. It is worth mentioning that theoretical studies or whose topic is motivation, or self-efficacy, affection or that consider entrepreneurs homogeneously will be discarded from that review.

4. Expected Results

We hope that with this literature review there will be a greater understanding on the topic of heterogeneity among entrepreneurs. Several articles that relate cognitive biases to entrepreneurial decisions and firm's outcomes will be analyzed and the relationship among them will be categorized in several different topics. Each topic refers to a different cognitive factor, followed by subtopics with different entrepreneurial effects caused by this factor.

For illustration purposes, we will briefly discuss a common bias in this short paper version. Overconfidence is one of the most studied biases in the literature. Although there is some confusion about this bias in the literature since it is often used in reference to optimism, whereas they are not synonyms. Besides, this bias can manifest itself on the entrepreneur in three forms: overprecision (or miscalibration), overplacement (or better-than-average) and overestimation. All these forms of overconfidence have been used in the entrepreneurial literature to understand some firm's results. For example, McCarthy *et al.* (1993) shows that overplacement affects firm's performance in terms of growth and revenue. That is, due to excessive growth, overconfidence negatively impacts the firm's profitability. In another study relating overconfidence and entrepreneurial financial decisions, Adomdza *et al.* (2016) tried to see if miscalibration impacted the entrepreneurs' funding decisions in terms of weak-tie and close-tie. Surprisingly, in this case, overconfident entrepreneurs didn't show any preference in terms of funding. But in the same study, they found that planning fallacy (a possible consequence of optimism) could cause heterogeneity in terms of funding since it positively affects strong-tie funding and negatively affect weak-tie funding.

The overconfidence bias is just one example of the most common biases studied in this review, and the discussion above is far from ending. But our brief example already shows how performance and financial decisions are affected by some cognitive factors, leading to a heterogeneity among entrepreneurs. In the example above, overconfidence could be a possible explanation why some entrepreneurs choose to grow, and others don't. We expect that our review shows other articles that can corroborate with this result or present another result. Lastly, we expect to find other cognitive factors such as framing, preference for skewness, representativeness, availability, anchoring etc. affecting firm's results and explaining the entrepreneurial heterogeneity.

5. Discussion

The literature has already shown that entrepreneurs are heterogeneous individuals due to several observed characteristics, such as the entrepreneur's culture or gender. But literature

has never taken much into account the heterogeneity among entrepreneurs caused by the way entrepreneurs think and decide. This present research wants to show that the cognitive process of the entrepreneur also helps to understand why some firms fail and others succeed.

In the same way, the literature has already shown that many studies have analyzed how cognitive factors explain results observed in firms. We intend to position our literature review as a way of organizing this sparse set of studies in order to facilitate further researches on the subject.

We hope that this work will guide future research on the subject in order to increase this literature. Making it clear where the gaps are in this literature, where there are contradictory results between different articles and where are the research opportunities to be explored.

6. Implications and Limits

The main implication of this paper is its contribution for the behavioral entrepreneurship, with a focus on entrepreneurs' heterogeneity. It is expected that some minor mistakes in the literature will be corrected when dealing with entrepreneurship cognitive biases. There are some evidences, pointed out by some reviews in previous literatures, that some concepts are mistakenly used interchangeably. Working to make the concepts clearer and less noisy is a good way to improve the literature.

This present work is also filling a gap in the entrepreneurial heterogeneity literature. The literature has never given due attention to the study of cognitive processes to explain the heterogeneity of entrepreneurs, despite the great growth of these studies. So, we believe this literature review comes on time with the increase in number of entrepreneurial cognitive processes studies.

This literature review also implies in a research agenda for future studies. Organizing the existing literature and analyzing its trajectory over time makes it easier to find its research gaps. Therefore, the research agenda enables and helps the literature to continue.

The main limitation seen so far to create this research is to draw strong conclusions from the literature review. In other words, many cognitive biases have many different effects on financial decisions and on firms' outcomes. In this sense, some cognitive biases seem in the review have ambiguous effects on firms' outcomes, making them inconclusive in some cases. Even though, this does not diminish the importance of the work since its main objective is to fill a gap in entrepreneurial heterogeneity literature and set a research agenda for the future.

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