EFFECTUAL AND CAUSAL ENTREPRENEURS ARE BIASED DIFFERENTLY

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Abstract
Entrepreneurship literature has described two contrasting sets of heuristics used by entrepreneurs to create ventures. These heuristics, based on the psychological theory, are likely to have the byproduct of biases, which entrepreneurs are highly susceptible to. We theoretically reason and empirically tested in 123 nascent entrepreneurs that the heuristics of effectuation and causation have contrasting relationships with the biases of overconfidence and illusion of control. The results showed that entrepreneurs are far from being homogeneously biased for overconfidence or illusion of control. Instead, entrepreneurs using more the heuristic rules of effectuation have lower overconfidence and higher illusion of control, while those using causal rule have higher overconfidence and lower illusion of control. Understanding the relationships between the heuristics in effectuation theory and entrepreneurial biases is a critical step for both theoretical development and partitioning communities.
THE MEGA-HEURISTICS OF EFFECTUATION, CAUSATION, AND ADVICE SEEKING AND THEIR ACCOMPANYING BIASES OF OVERCONFIDENCE AND ILLUSION OF CONTROL

ABSTRACT

The theory of effectuation and causation has described sets of practical heuristics entrepreneurs use to create ventures. These different heuristics, based on the psychological theory of heuristics and bias, are likely to have accompanied biases, which entrepreneurs are known to be highly susceptible to.

In this paper, we theoretically reason and empirically uncover that the mega heuristics of new venture creation: effectuation and causation, and internal and external advice seeking in addition, have important by-product of the biases of overconfidence and illusion of control. Tested in 104 nascent entrepreneurs, we find surprisingly that many of the relationships proposed are empirically proved but in opposite directions. These findings have important implications for further theory development to the entrepreneurial heuristics and bias, effectuation, and advice seeking literature.
INTRODUCTION

Entrepreneurs exhibit great heterogeneity in their approach to create ventures (Gartner, 1985). The various approaches entrepreneurs use in new venture creation include: effectuation, causation; and external and internal advice seeking. The causation and effectuation approaches consist of integrated sets of observed heuristics entrepreneurs use (Read and Sarasvathy, 2005; Wiltbank et al., 2006). Different approaches to advice seeking frame and shape venture strategies, and thereby influencing organizational outcomes (Alexiev et al., 2010; Bonaccio and Dalal, 2006).

The approaches to new venture creation either include or can redesign the heuristics (simple rule of thumb) of entrepreneurs (Haynie and Shepherd, 2009). Heuristics are typically studied together with their by-product of bias, known as the heuristics and bias research program in psychology and behavioral economics (Tversky and Kahneman, 1974; Wilcox, 2011).

However, there is a dearth of studies on how the new venture creation approaches of entrepreneurs affect how biased they are. Such questions deserve theoretical development and empirical examination, because 1) the actual approaches to new venture creation and the heuristics involved is key in unraveling the entrepreneurship phenomena, 2) entrepreneurs are highly susceptible to biases (c.f., Busenitz and Barney, 1997; Forbes, 2005; Simon et al., 2000), and 3) heuristics and biases are tightly coupled theoretically in their origin in psychology.

We seek to address this issue by empirically examining how entrepreneurs who follow the new venture creation approaches of effectuation, causation, and internal and external advice seeking may be susceptible to biases. We develop theoretical reasoning between the
new venture approaches and the biases of overconfidence and illusion of control and tested them empirically in nascent entrepreneurs.

Connecting new venture creation approaches with biases enhances the understanding of actual entrepreneurial processes. The approaches of effectuation, causation, internal and external advice seeking are found to have important and unexpected relationships with biases empirically. Empirical results from nascent entrepreneurs show patterns against the theoretical reasoning and empirical findings in general strategy literature. For example, in strategy literature internal (external) advice seeking is reasoned and found to increase (decrease) overconfidence and surprisingly nascent entrepreneurs experience the opposite effect. The relationships between effectuation/causation and illusion of control are also counterintuitive and against the previous proposals in effectuation literature (Kraaijenbrink, 2010; Ye et al., 2008).

In summary, this article puts forward the idea that the new venture creation approaches bring forth or down the biases the entrepreneurs have in interesting manners – which open ample avenues for further theoretical development and empirical examining in entrepreneurship research.

THEORETICAL BACKGROUND AND DEVELOPMENT

Effectuation/Causation

The theory of effectuation is arguably the most important emerging theory in entrepreneurship (Fisher, 2012). Entrepreneurs who follow effectuation take goals as ever changing over time in new ventures. Rather than setting and exploiting goals, the effectual approach emphasizes the control over the available set of means, and effectual entrepreneurs starting with who they are, what they know, and whom they know to found ventures (Fisher, 2012; Wiltbank et al., 2006).
On contrary, causation describes an approach in which entrepreneurs set a goal and then choose a means to achieve that goal (Sarasvathy, 2001). Causal entrepreneurs recognize, identify and evaluate opportunities, set an opportunity as the goal, and make a plan and subsequently acquire resources to exploit the opportunity (Fisher, 2012).

The principles that characterize both effectuation and causation approaches are listed in Table 1.

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The principles in both causal and effectual approaches are heuristics that entrepreneurs use in their actual decision making processes (Read and Sarasvathy, 2005). In fact, effectuation was initially proposed as an integrated set of observed heuristics used by experts entrepreneurs (Sarasvathy and Kotha 2001). For instance, the affordable loss principle and the principle of controlling the means are useful rule-of-thumb decision strategies not based on exhaustive-search or classical epistemic rationality (Baron, 2007; Tversky and Kahneman, 1974). In a similar manner, causation involves a set of heuristics (Wiltbank et al., 2006). Together, the two sets of heuristics characterized effectuation and causation form two commonly-found yet contrasting approaches of founding new ventures (Read and Sarasvathy, 2005).

Heuristics are strategies using readily accessible, though loosely applicable, information to problem solving, when the exhaustive search is impractical. The effect of the heuristics is known as bias (Baron, 2007; Tversky and Kahneman, 1974; Wilcox, 2011).
Heuristics and biases occur in entrepreneurship due to many reasons, including, but not limited to, high uncertainty, information overload and velocity, the lack of historical information and organizational routines, high time pressures, etc. (Baron, 2004; Busenitz and Barney, 1997; Hayward et al., 2006; Holcomb et al., 2009; Simon et al., 2000). The study of entrepreneurial bias is a very important area in entrepreneurship (Krueger, 2005; Schade and Koellinger, 2007; Zhang et al., 2014).

Surprisingly to date, how effectuation and causation, as sets of heuristics, lead to entrepreneurial biases have not been studied much - only two conference papers have touched upon this issue conceptually.

Ye et al. (2008) conceptualized the relationships between effectuation and the degrees of threat biases, over-trust bias and illusion of control of entrepreneurs. Kraaijenbrink (2010) proposed that effectuation and causation to be associated with different types of biases, and he aggregated the biases into ‘effectuation-type biases’ and ‘causation-type biases’. For example, the author suggested that entrepreneurs particularly susceptible to an illusion of control, anchoring bias, loss aversion, herd behavior, and/or availability bias use an effectuation approach more often than a causation approach (Kraaijenbrink, 2010). While both articles recognize the new venture approaches could be associated with different types of bias, they did not pick out, either through specific theoretical reasoning or empirical tests, the particular entrepreneurial bias that accompany effectuation and causation, as pointed out by the authors themselves.

The most studied biases in entrepreneurship are overconfidence and illusion of control (Zhang et al., 2014). Overconfidence describes the overestimation of one’s own ability to affect the expected outcomes of task execution relative to others (Busenitz, 1999; Gudmundsson and Lechner, 2013). Illusion of control refers to the fact that an individual
overemphasizes how much her/his skill may improve performance in situations where chance is the most responsible for the outcome (Langer, 1975).

Now we will elaborate how overconfidence and illusion of control accompany effectuation and causation specifically.

**Hypotheses Development**

Effectuation is characterized by a constant experimentation and feedback from external sources (Chandler et al., 2011; Sarasvathy, 2001). As part of the experimentation, the need for flexibility is essential (Sarasvathy, 2001) to take advantage of these new opportunities that could arise (Chandler et al., 2011).

Due to the experimentation and the flexibility associated with effectuation, entrepreneurs face different opportunities, decision frames, and business models using a diverse set of assumptions, and as a result, their confidence levels about their actual abilities and knowledge can be better calibrated. Entrepreneurs might discover that their abilities and background are not as essential or useful as they thought to solve specific encounters before getting exposed to such diversity.

The effectual approach also lead to more concrete and tangible evidences, and allow entrepreneurs to better acknowledge their business environment, and therefore making the environment more familiar and less complex, factors that have been identified as antecedents of overconfidence in entrepreneurial decision-making (Hayward et al., 2006; Zacharakis and Shepherd, 2001; Zhang et al., 2014). The more concrete and tangible evidences also allow entrepreneurs to calibrate more accurately their expectancies with the outcomes of their ventures, lowering their possibility of overconfidence.

**Hypothesis 1a: Higher level of effectuation would lead to less overconfidence**
First, effectuation is not focused on prediction but instead on control. Effectual entrepreneurs always work with things that they can control (Sarasvathy, 2001).

Second, entrepreneurs following effectuation approaches conduct experimentation whose risks are well-controlled (Sarasvathy, 2001).

Third, following the heuristics of affordable loss, effectual entrepreneurs are less likely to approach uncontrollable projects and instead pursue those they can afford to lose (Chandler et al., 2011). This heuristic limits the chances that entrepreneurs may be out of control.

Taking together, the emphasis on control, the well-controlled experimentation, and affordable loss heuristics in the effectuation approach can lead entrepreneurs to believe they have good control of the tasks as well as the eventual outcomes of their ventures, thus higher levels of illusion of control.

Hypothesis 1b: Higher level of effectuation would lead to more illusion of control.

Entrepreneurs following causation approach engage in the forecasting, analysis and selection of long run opportunities, as well as designing and planning of business strategies (Chandler et al., 2011). Finer business plans show more elaborate scenarios and contingency planning, which render decision makers more confident about their abilities to meet plans regardless of whether the planning and strategies help them to actually complete tasks (Buehler et al., 1997). Also Hayward et al. (2006) proposed that business planning by entrepreneurs intensifies the positive relationship between the environmental complexity and entrepreneurs’ overconfidence. This can be due to the fact that forecasting, planning, and strategy formulation, unlike experimentation, do not produce evidence for entrepreneurs to calibrate their confidence upon.
Considering this logic, we claim entrepreneurs who follow causation approach experience higher levels of confidence.

**Hypothesis 1c: Higher level of causation would lead to more overconfidence.**

Entrepreneurs using an effectuation approach use experimentation to resolve firm specific uncertainty between firm actions and firm outcomes better than those following causation. When entrepreneurs know what specific firms actions lead to what specific outcomes, they may have a sense of control on their new ventures. Causal entrepreneurs who are less ‘doers’ than ‘planners’, and while detailed plans on paper can inflate the sense of overconfidence, they do not give people a strong sense that they are in control of the ventures.

Because causation does not involve regular trial-and-error but rather the prediction of an uncertain future based on pre-existing knowledge, it can be harder for entrepreneurs following this approach to feel the progresses of new ventures. The progresses of new ventures increase the illusion of control of the entrepreneurs (De Carolis et al., 2009).

**Hypothesis 1d: Higher level of causation would lead to less illusion of control.**

Note that in our study, we follow the heuristics and bias research program in psychology, taking effectuation and causation as sets of heuristics (rule of thumb) and study biases as their by-product.

However this does not rule out the fact that some preexisting biases in individual entrepreneurs can affect their approaches of founding new ventures. In Kraaijenbrink (2010), he proposed the relationships in both directions. Still in effectuation literature, the general approach is to take effectuation and causation as entrepreneurial expertise and
approaches, and it is interesting to examine whether these expertise and approaches produce the by-product of biases.

**Advice Seeking**

The approaches of new venture creation not only depend on the entrepreneurs but also get heavily influenced by people surrounding the entrepreneurs, such as mentors, partners, VCs, other entrepreneurs, their families and friends, etc. (Franke et al., 2008; Robinson and Stubberud, 2009; Vissa and Chacar, 2009).

Advice seeking is a top management team function. It (re)frames and (re)shapes firm strategies, and different approaches to advice seeking are known to influence organizational outcomes (Alexiev et al., 2010; Bonaccio and Dalal, 2006). Strategy literature has shown that external and internal advice seeking provide knowledge and new perspectives that could change the status quo and therefore are important determinants of a firm’s exploratory innovation (Alexiev et al., 2010; Jansen et al., 2006). Internal advice seeking as well as advice seeking from executives in similar firms increase comfort as decision makers’ believes are less likely to be challenged (McDonald and Westphal, 2003).

Advice seeking involves task-related information exchange, which improve the likelihood of accurate decisions (Bonaccio and Dalal, 2006; Mcdonald and Westphal, 2003). Additionally, advise seeking could suggest decision makers fresh alternatives and new views that might have not been contemplated earlier (Alexiev et al., 2010).

Because of these properties, advice-seeking can serve to debiase management decisions in established organizations (Meissner and Marburg, 2013). External advice seeking decreases the level of illusion of control, and internal advice seeking increases the illusion of control of top managers (Meissner and Marburg, 2013).
For entrepreneurs, advice seeking supports them with information and social capital from their networks (De Carolis and Saparito, 2006). The information from advice seeking is critical for creating or recognizing entrepreneurial opportunities (Klotz et al., 2014; Ozgen and Baron, 2007; Shane and Venkataraman, 2000) and the progresses of new ventures (De Carolis et al., 2009).

The social capital helps the entrepreneurs to be able to receive support for their new venture creation (Liao and Welsch, 2005). Social capital is known to impact entrepreneurial biases (De Carolis et al., 2009; De Carolis and Saparito, 2006). The characteristics of the social capital of the entrepreneurs, such as 1) the trust they have in their social networks, 2) the shared codes and languages with others in the networks, as well as 3) the structural holes and 4) ties in the social networks could impact the biases of overconfidence and illusion of control (De Carolis and Saparito, 2006).

To date, no studies have examined the relationship between the approaches of advice seeking and biases in new venture creation. Below we build theoretical reasoning on why external and internal advice seeking can influence the degrees of biases of nascent entrepreneurs.

**Hypotheses Development**

External advice seeking increases new knowledge on environmental changes and opportunities and provides new perspectives challenging existing points of view (Alexiev et al., 2010; McDonald et al., 2008). When entrepreneurs seek for advice from experts, venture capitalists and other entrepreneurs, they get new knowledge and perspectives about the environment they are involved in as well as their ventures. The new knowledge and perspective may let them feel that they are not as prepared, leading to less overconfidence.
With new knowledge and perspectives, the environments become more familiar and less hostile for the entrepreneurs, and more familiar and less hostile environments reduce the overconfidence of entrepreneurs (Hayward et al., 2006; Simon and Shrader, 2012; Zacharakis and Shepherd, 2001).

**Hypothesis 2a: External advice seeking has a negative impact on overconfidence of entrepreneurs.**

External advice reduces the perceived control over decisions (Meissner and Marburg, 2013). External advice equip entrepreneurs with new information and perspectives about both the environments and their ventures (Durand, 2003), which may make the entrepreneurs feel that they no longer control the new venture creation as they used to believe before asking for advice.

We contemplate that external advice seeking would enable entrepreneurs to calibrate using multiple perspectives their sense of control and how much their skills can help them to control the results.

**Hypothesis 2b: External advice seeking has a negative impact on illusion of control of entrepreneurs.**

Internal advice from co-workers and personnel inside the ventures are known to lead to greater confidence of the capabilities in established firms (Meissner and Marburg, 2013). Internal information in companies tend to have similar viewpoints and may be biased by not only neglecting outside information, but also discounting minority opinions from company insiders (Meissner and Marburg, 2013; Phillips, 2003).

As a consequence, the approach of using internal advice would not question but instead reinforce the existing knowledge and perspectives of the decision makers. Entrepreneurs face
high levels of uncertainty in new venture decisions (Keh et al., 2002; Simon et al., 2000), so for them approaching internal source for advice can increase comfort as their beliefs are less likely to be challenged (Mcdonald and Westphal, 2003), increasing their levels of confidence. Meanwhile, the entrepreneurs can feel their environments remain unfamiliar and hostile, which increase the level of overconfidence (Simon and Shrader, 2012; Zacharakis and Shepherd, 2001).

Thus we argue that entrepreneurs who employ internal advice seeking approach are more overconfidence.

*Hypothesis 2c: Internal advice seeking has a positive impact on overconfidence of entrepreneurs.*

Internal advice seeking utilizes internal information and perspectives within a firm, and may cause an overreliance on internal information and under utilization of important external information (Alexiev et al., 2010). This approach increases the sense of certainty, and increases the perception of control for the decision makers (Meissner and Marburg, 2013).

We argue similarly that relying on internal advice would make entrepreneurs believe that they can control the outcomes of their decisions, increasing the illusion of control.

*Hypothesis 2d: Internal advice seeking has a positive impact on illusion of control of entrepreneurs.*

**METHODS**

**Sample and Data Collection**

We tested the model using a sample of entrepreneurs in ASECH (Association of Chilean Entrepreneurs). ASECH organizes stage 0 program in which experienced
entrepreneurs transfer and share knowledge to nascent entrepreneurs during seven weeks. The nascent entrepreneurs in the stage 0 program are just starting to develop business ideas or ventures.

All the entrepreneurs enrolled in stage 0 courses from October to December 2013 were included in the sample. The initial targeted sample size was approximately 200 nascent entrepreneurs from three different cities, Santiago, Rancagua and Valparaíso. They received printed surveys in the first week of the stage 0 program. The questionnaire gathered data on the entrepreneur’s experience levels, his or her decision-making processes and cognitive processes. We received 131 responses (65.5% of 200). Discarding incomplete surveys, our final data set consists of 95 responses for the model regarding overconfidence (47.5% of 200) and 104 responses for illusion of control (52% of 200).

The mean age of the sample is 33.2 years (s.d. 8.7); 43.5% are male and 56.5% female; and they have started in average 1.7 start-ups (s.d. 1.37). Regarding the level of education, 5.3% have only finished high school, 16.8% got technical degrees, 55.7% finished undergraduate studies, 18.3% achieved graduate degrees (masters or Phds.) and 3.8% are in the process of doing their undergraduate studies (neither completed or dropped out).

**Measures**

**Independent Variables**

*Effectuation and Causation*: These constructs were measured using Chandler’s et al. (2011), on a 5-point Likert scale. Effectuation was measured through three sub dimensions (experimentation, flexibility and affordable loss) in eleven items ($\alpha=0.93$). Entrepreneurs were asked to answer based on the start-up phase of their venture and indicate the degrees to which they agree or disagree with each of the statements. For example, one item states:
“We experimented with different products and/or business models.” Causation was measured with seven items in the same procedure as effectuation (α=0.91). For example, one item states: “We developed a strategy to best take advantage of resources and capabilities”.

**External and Internal Advice Seeking:** These constructs were measured with the 7-point Likert scales from Alexiev et al. (2010). Each measure has 3 items (α=0.92 and α=0.96). Respondents rated, for instance, the “frequency of external/internal advice seeking” as well as the “degree to which external/internal advice is sought regarding the current” and “future strategy” of the organization.

**Dependent Variables**

*Illusion of Control:* This construct was measured based on Langer (1975) and Meissner and Wulf (2013). Participants were asked to decide in a hypothetical investment scenario of US$70,000 in stock options. The questionnaire provided two investment alternatives: (1) Buying a portfolio of three stocks that are selected by an investment consultant and (2) purchasing a portfolio of three stocks selected by the decision maker himself in a situation that cannot be influenced by individual ability. A tendency towards self-selecting the portfolio indicates an illusion of control bias, because the decision maker has the illusion to believe that he or she can impact the performance of the portfolio. From our sample, 40% presents higher levels of illusion of control and 31% moderate levels.

*Overconfidence:* This construct was measured based on Simon and Shrader (2012). It is a well-established format in entrepreneurial studies to measure overconfidence (Busenitz and Barney, 1997; Keh et al., 2002; Russo and Schoemaker, 1992; Simon et al., 2000). It contains 7 general knowledge questions related to entrepreneurship, technology and economy. For each question, the participants had two alternatives to choose from, and they
had to choose one of the two as well as report the confidence level of their choice, between 50 and 100% (50% if they just guessed with any idea 100% if they are completely sure). Overconfidence is derived by subtracting the percentage of correct answers from the average percentage of confidence. The higher the difference, the more overconfident an entrepreneur is. From our data, we found that 86% of our sample was overconfident, consistent with previous findings that nascent entrepreneurs are overconfident (Forbes, 2005; Koellinger et al., 2007).

Control Variables

Control variables include: age, sex, level of education, number of start-ups that the entrepreneurs have been involved before the stage 0 program, including the ideas or ventures that they are developing at the moment, the phase of the start-up (Baron and Shane, 2007; Gielnik et al., 2014). Lastly, we control for risk propensity, a common control variable in numerous entrepreneurial bias research (Keh et al., 2002; Simon et al., 2000).

RESULTS

Descriptive Statistics

Table 2 presents the descriptive statistics for all the variables (mean and standard deviation) and the correlations among them.

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Multiple Regression

We performed two regression models to test our hypotheses. The first model considers the effect of causation, effectuation and advice seeking on overconfidence, testing
Hypotheses 1a, 1c, 2a and 2c. The second model takes into account the effect on illusion of control, testing Hypotheses 1b, 1d, 2b and 2d. In order to verify the assumptions of multiple regression, we conducted a robust regression to analyze the presence of heteroscedasticity and outliers in the sample. The standard errors for both models in the normal regression and robust regression are similar, indicating that heteroscedasticity is not an issue in our model. In Table 3 we show the results for the robust regression as we detected outliers in both models, which could have distorted the least squares estimation in the regression model (Verardi and Croux, 2008). Given our relatively small sample of nascent entrepreneurs, we chose $p < 0.10$ as the level of significance, as in similar studies on entrepreneurial biases (Simon and Shrader, 2012).

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Analyzing Model 1, we found significant support for Hypothesis 1a, which means that higher level of effectuation leads to less overconfidence. Hypothesis 1c was not supported, regarding causation increasing the level of overconfidence. We uncovered that external advice seeking is positively related to overconfidence ($p < 0.01$) and internal advice seeking negatively related to the bias ($p < 0.05$), which is opposite to what Hypothesis 2a and 2c predict. From our data, we discovered that from external sources, 52.7% of our total sample had higher preferences for asking family and 58.8% friends, while 79.4% other entrepreneurs, 48.1% mentors, 27.5% academics and 17.6% venture capitalists. Regarding internal advice seeking, 66.4% highly preferred advice from partners, 35.9% from high ranked employees and 25.2% from low ranked employees.
We found partial evidence regarding the fact that the phase of the start-up is positively related to overconfidence ($p < 0.1$), as well as partial evidence that risk propensity was negatively correlated ($p < 0.1$). Concerning the control variables, we removed gender and level of study, because they are not significant and the removal of them improves the adjusted $R^2$.

As shown in Table 3, we found that Hypothesis 2b and 2d are not supported, which means that the relationships between external/internal advice seeking and illusion of control are not significant in an entrepreneurial setting. We discovered a positive significant relationship between causation and illusion of control, opposite to what Hypothesis 1d predicts. We found partial support ($p < 0.1$) for the relationship between effectuation and illusion of control (H1d), however in the opposite direction as predicted, which means that effectuation approach would lead to less illusion of control.

Regarding the control variables, we did not find any of them to affect significantly the model. Level of study and phase of the start-up are not correlated with the dependent variables at all, and without them, the adjusted $R^2$ increases, so we removed those two.

**DISCUSSIONS**

Our study investigated the effect of advice seeking and effectuation/causation on illusion of control and overconfidence.

We observed that effectuation leads entrepreneurs to decrease their levels of overconfidence as we expected. We identified several unexpected relationships (affecting the biases in the opposite directions) in our findings that we will discuss now.

We did not find support to the relationship between causation and overconfidence, and the results between effectuation/causation and illusion of control are totally unexpected.
We uncovered a relationship between causation and the illusion of control to be positive and the relationship between effectuation and the illusion of control to be negative—the opposite directions as we hypothesized. We argued that entrepreneurs following an effectuation approach will like to focus on what they can control and likely have an increased sense of control, similarly as proposed in previous literature (Kraaijenbrink, 2010; Ye et al., 2008). However, even effectual entrepreneurs tend to focus on control, and they likely have more control of their new ventures, they may not have an increased sense of feeling that they are in control. Rather it is the causal entrepreneurs who emphasize less control may have an inflated sense of feeling that they are in control.

Future research could try to untangle the ‘actual control’ versus the sense of feeling in control, which may be key to further understand the new venture creation.

Unexpectedly, we found that in entrepreneurship context external advice seeking is positively related to overconfidence and internal advice seeking is negatively related to the bias, which are the opposite as past findings of advice seeking and overconfidence (Alexiev et al., 2010; Meissner and Marburg, 2013; Sieck and Arkes, 2005).

One possible explanation rests on the differences in advice seeking between entrepreneurial and large organization settings. Entrepreneurs seek external advice often from people who they trust such as friends and family (Klotz et al., 2014) and people who like their ideas (such as other similar entrepreneurs and mentors who support them). These people tend to share common languages and codes, which increase their confidence levels (De Carolis and Saparito, 2006). Family is known to be a provider of emotional and moral support/encouragement (McKeever, 2005) and its feedback, likewise friends advice, is unlikely to be as useful as those from more professional sources (Robinson and
The positive feedback leads to higher entrepreneurial expectancies, increasing overconfidence (Gatewood et al., 2002).

Internal advice seeking can differ a lot between those in new ventures and those in established firms as well. In new ventures, entrepreneurs seek advice from partners or early employees. Partners are often asked to join an entrepreneurship because they provide diverse and complementary backgrounds, capabilities, resources, and viewpoints. They cover important functions in new enterprises. They also usually have stake (stocks or options) in the company. In addition, dominating viewpoints may have yet to emerge and there is a lack of established hierarchy in a startup. These make the partners and early stage employees to be more responsible, honest, forthright, and perhaps critical about expressing their concerns in the startup settings.

On top of that, there could be many internal functions that are yet to be setup (properly) in a startup, and internal advice seeking may reveal or even is intended to solve these critical issues. Internal advice seeking could often reveal the hash reality inside a startup, and therefore lowers overconfidence. Future research should measure the main sources of external and internal advice seeking, in order to verify these possible explanations.

Seeking advice from this group of people can be very different from top management teams in a large established companies seeking advice from their managers deep in the hierarchy. Internal advice seeking in entrepreneurship therefore appears to be a uniquely different phenomenon from that in established firms.

The relationships between external and internal advice seeking and illusion of control are not significant in our small sample of nascent entrepreneurs. We built on Meissner and Marburg (2013), who found that external advice seeking leads to a decrease of illusion of
control in top managers of large organizations, as they perceive a reduced control over the
decision because of the new information and perspectives from the external sources,
meanwhile internal advice seeking intensifies this bias, as internal information might be
biased not only by overlooking outside information, but also by disregarding minority
opinions from firm insiders. Even though we used the same measures as Meissner and
Marburg (2013), our results do not conclude whether advice seeking is associated with
illusion of control in entrepreneurship. We performed an independent regression only
considering external and internal advice seeking, and we still found that internal advice
seeking was not significant and external advice seeking only partially significant (see Table
3). Possibly as the new venture context is very uncertain (Baron, 1998; Simon et al., 2000),
the advice does not change much the sense of control. The level of uncertainty is still high
independently of the advice and information received, thus the sense of control could be in
generally unrelated.

Still, there is a need to breakdown the types of advice seeking in entrepreneurship
beyond external and internal as in the strategy literature. The breakdown could be on the
role of the persons (mentors, family, friends, customers, suppliers, VCs, partners, early
stage employees, etc.) and the type of advices entrepreneurs seek (investment, operation,
marketing, technology, collaboration, etc.). This breakdown enables more delayed analysis
on entrepreneurial advice seeking.

Contributions

We contribute to the effort of analyzing new venture creation approaches as set of
heuristics and analyze them using the lens of heuristics and bias research program from
behavioral economics. Specifically, this study adds to the identification of antecedents
of entrepreneurial bias, a burgeoning stream of literature (Zhang et al., 2014). Effectuation, causation and advice seeking have intricate connections with many antecedents of entrepreneurial biases identified to date, such as social capital (De Carolis et al., 2009; De Carolis and Saparito, 2006), experience (Hayward et al., 2006; Koellinger et al., 2007; Shepherd et al., 2003) and familiarity, complexity and hostility of environments (Hayward et al., 2006; Simon and Shrader, 2012; Zacharakis and Shepherd, 2001). Understanding the heuristics and biases in entrepreneurship is important for both descriptive science and possible prescriptive science (the possibility of debiasing).

Taking effectuation and causations as heuristics and following the theory of heuristics and biases research program in behavioral economics allow us to examine the bias accompanying the sets of heuristics. We identified the relationships between effectuation and causation with overconfidence and illusion of control, the most notably entrepreneurial biases. In addition, our work is the first to take the relationships between effectuation and entrepreneurial bias to an empirical level, advancing the previous conceptual works (Dew and Sarasvathy, 2002; Kraaijenbrink, 2010; Ye et al., 2008). In the process, we found many unexpected findings, e.g. the proposed negative relationship between causation and illusion of control (Kraaijenbrink, 2010). We confirm that the new venture creation approaches have interesting relations with the biases the entrepreneurs have.

Finally, we encountered surprising results in entrepreneurial advice seeking, getting empirical results on the opposite directions to the previous results in large organizations (Meissner and Marburg, 2013). This provides evidence that entrepreneurial advice seeking is different from advice seeking in established firms as in general strategy literature. We analyze the possible explanation of the unexpected results and proposed a breakdown of advice seeking based on entrepreneurship phenomena.
Limitations and Future Considerations

We completed our study with rigor and care, however it has limitations. The cross-sectional design of the current study constrains our ability to make causal inferences empirically. Additionally, another limitation of our study is common method variance. We utilized several design solutions, such as careful wording of the questions, collection of the data during a three month period for different classes and cities and diverse response formats for different variables, as suggested by Pace (2009) to minimize problems that might arise from common method variance or the use of subjective measures. However, the use of longitudinal studies and more experimental settings, and the incorporation of appropriate marker and instrumental variables could help address this issue (Podsakoff et al., 2012).

CONCLUSIONS

Our findings prove that nascent entrepreneurs using different new venture creation approaches tend to have overconfidence and illusion of control differently. Specifically, we uncover that effectual processes lead to less overconfidence and causal processes increase the illusion of control, while external and internal advice seeking affect overconfidence in an unexpected manner, on contrary to findings on managers in large organizations.

The surprising results surface not only from studying advice seeking on biases formation in an entrepreneurial context, which has not been done before, this study also helps to polish the understanding of effectuation and causation principles as a set of heuristics and unveils their associated bias. In doing so we hope to contribute to the knowledge for both researchers and practitioners on how new venture creation processes and practices may lead to specific biases in the entrepreneurs’ decision-making.
REFERENCES


### Table 1: Principles that differentiate causation and effectuation -adapted from Dew et al. (2009) and Chandler et al. (2011) who developed based on Sarasvathy (2001).

<table>
<thead>
<tr>
<th>Issue</th>
<th>Causal Approach</th>
<th>Effectual Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>View of the future</td>
<td>Predictive, the future is framed as a continuation of the past, thus accurate prediction is relevant.</td>
<td>The future is unpredictable; therefore prediction is neither easy nor useful.</td>
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<tr>
<td>Basis for taking action</td>
<td>Goal-oriented. Goals determine actions and events in the venture.</td>
<td>Means-oriented, goals are changing all the time, thus actions are based on given means.</td>
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<tr>
<td>Predisposition toward risk and resources</td>
<td>Expected return. Entrepreneurs pursue the (risk-adjusted) maximum opportunity and raise required resources to do so.</td>
<td>Affordable loss, entrepreneurs follow opportunities without investing more resources that they can afford to lose.</td>
</tr>
<tr>
<td>Attitude toward outsiders</td>
<td>Competitive analysis of the market.</td>
<td>Partnership to create new markets.</td>
</tr>
<tr>
<td>Attitudes toward unexpected contingencies</td>
<td>Avoiding. Focus on accurate and careful prediction and planning.</td>
<td>Leveraging. Imaginative re-thinking of possibilities and continual transformations of targets.</td>
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</tbody>
</table>
Table 2. Descriptive statistics and variable correlations

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<tr>
<th>Variables</th>
<th>Mean</th>
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*p < 0.1; *p < 0.05; **p < 0.01; ***p < 0.001
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<tr>
<th>Variables</th>
<th>Model 1 Overconfidence (n=95)</th>
<th>Model 2 Illusion of Control (n=104)</th>
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<td>1. Gender</td>
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*p < 0.1;  **p < 0.05;  ***p < 0.01