

Causation versus effectuation
in entrepreneurial decision-
making: the impact of family
resources, family business
background and education.



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“Happiness is not something ready made. It comes from your own actions.”
– Dalai Lama.

Looking back, I am extremely grateful to have listened to their advise and I now know that happiness is not something that you can derive from things like money or material possessions. You can only be happy if you are proud of yourself and your actions and I can finally say that I'm proud of myself. If you're up there somewhere dad, I hope that you feel the same way about me.

Jolien Pot
Enschede, December 17th 2013

Summary

In recent years, entrepreneurship and entrepreneurial ventures have been the subject of many studies and theses. Entrepreneurship was seen as the way out of the financial crisis and such it seemed imperative to understand the complex concept. Despite recent efforts, our knowledge on entrepreneurship is still limited and lacks an all embracing framework especially in regards to entrepreneurial processes. Sarasvathy's effectuation theory is one of the more prominent theoretical perspectives on entrepreneurial decision-making, distinguishing two separate decision-making processes, namely causation and effectuation. Despite the growing attention to her work, it still remains largely unclear why some entrepreneurs tend to favour effectuation over causation and vice versa. The current dominant view is that entrepreneurial decision-making varies thanks to situational contexts unique to every entrepreneur. This study combined the work of four different authors, namely Gartner (1985), Bruyat and Julien (2000), Sarasvathy (2001) and Shane (2003) hoping to shed some light on the current blackbox called "situational context". After comparing all four models, it seemed likely that family resources, family business background and education played a role in whether someone favoured causation over effectuation when making entrepreneurial decisions. As such, this study set out to research what the effects of those environmental factors truly were.

Based on a thorough literature search, it was hypothesized that family resources contribute to whether someone favours one decision-making process over the other. In their 2005 research, Read and Sarasvathy posited that entrepreneurs with enough resources available tend to favour causal decision-making processes over effectual decision-making processes due to the fact that those entrepreneurs have the means necessary to chase after any goal they set. Gartner (1985), Zahra (2005), Naldi, Nordqvist, Sjoberg & Wiklund (2007), Chlosta, Patzelt, Klein & Dormann (2010), Schröder, Schmitt-Rodermund & Arnaud (2011), etc. have all claimed that having an entrepreneurial parent influences both the decisions of budding entrepreneurs and the way that they reach those decisions. It seemed likely that entrepreneurs with an entrepreneurial parent are more likely to exhibit to an affordable loss state of mind than an expected return state of mind when making business decisions, are more likely going to try their best to avoid contingencies rather than embrace them and are more likely to use competitive analysis rather than alliances when making entrepreneurial decisions. The final factor thought to influence whether an entrepreneur favours causal or effectual decision-making processes over one another was education. Dew et al. (2009) found that MBA students tended to favour causal decision-making over effectual decision-making. As such, this study set out to find whether that was truly the case.

Seventeen American student-entrepreneurs participated in this study. They were asked to solve a case covering several problems one encounters when starting a business, while using the speak aloud method. The students were then asked several questions in order to determine whether external factors such as time constraints or difficulties with the speak aloud method influenced the answers given. They were also asked to fill in a survey containing the Chandler scale (2009) and several additional questions used to determine whether the answers given when solving the case were representative. The interview was

then typed out and coded. Afterwards, the coding was compared to the coding done by another researcher and if the inter-rator reliability was higher than 65%, the coding could be used to provide support for the claims made in this research. Multiple one-sample t-tests were run to determine whether the hypotheses had to be rejected and it was found that neither family resources, nor family business background influenced whether someone tends to favour causal or effectual decision-making processes or not. Dew et al.'s 2009 conclusion, namely that MBA students tend to favour causal decision-making processes over effectual decision-making processes was supported. Last but not least, some recommendations in regards to future research were made.

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Chapter 1. Introduction.

In this chapter the focus of this thesis will be introduced (problem statement). After that, the methodology of this study will be briefly discussed as well as the purpose and the relevance of this study.

1.1 Problem statement

In this section the importance of entrepreneurship and entrepreneurial ventures, entrepreneurship itself and the assumed relationship between family and entrepreneurship and education and entrepreneurship will be discussed. The research question of this study are also introduced in this section.

1.1.1. The importance of entrepreneurship and entrepreneurial ventures.

In recent years, entrepreneurship and entrepreneurial ventures have been the subject of many studies and theses. Some authors even call it the core of the dynamics of capitalism (Baumol, 1993) and state that the entrepreneur is “the driving force of the whole market system” (Mises, 1949, p. 249). In times of economic downfall and recession, entrepreneurship is often viewed as a way out of the downwards spiral by both governments and citizens alike. To be more specific, it’s seen as a crucial phenomenon necessary in developing one’s economy and maintaining competitiveness (Schaper and Volery, 2004; Venkatachalam & Waqif, 2005). As such it should not come as a surprise that after the global recession of 2009 hit, many researchers, governments and citizens turned to entrepreneurship as a solution (Fairlie, Karlan & Zinman, 2012).

From the citizens’ perspective the lack of better employment opportunities is a very strong incentive to start a new venture. Traditionally, during an economic turndown there is a lot of slack in regional labour pools, resulting in strong competition between applicants and more beneficial employment contracts for the employer. Over time, it becomes more difficult to obtain and hold jobs. Furthermore, the value of holding a job deteriorates because the salary and benefits offered deteriorate because it’s getting easier and easier to replace one employee with another, should that employee not agree with the offered salary and benefits. Due to the increased competition and deteriorating benefits associated with holding a job, the risk perceived with starting one’s own company decreases. This decrease in risk eventually outweighs the economic turndown’s other effects, such as limited demand for products and a shortage of investors, that increase the amount of risk perceived with starting one’s own venture (Fairlie, 2013). Furthermore, starting a venture offers the individual the chance to enjoy financial independency, freedom to express one’s own creativity, the possibility of greater financial results, job enrichment and a sense of fulfillment by being able to contribute to economic development (Ahmed and Nawaz, 2010).

From a government’s point of view, it is beneficial that unemployed citizens start their own company for the government would no longer have to pay that unemployed citizen social welfare if the company makes enough to sustain that citizen. Furthermore, the

citizen would eventually start paying tax again if the company turned out to be a viable venture. So in monetary aspect, the benefits of starting a new company are twofold as far as the government is concerned.

But the aspect of self-employment is not the only way in which entrepreneurship could possibly affect economic growth. In their 2005 article on the effect of entrepreneurial activity on economic growth, van Stel, Carree and Thurik mention five different ways in which entrepreneurs could possibly affect economic growth: (1) by entering a new market, (2) by playing vital roles in the early evolution of new industries, (3) by increasing and creating new kinds of competition, (4) by enhancing the existing knowledge on what is possible and what customers prefer, and (5) by being inclined to work more and more efficiently for their pay than they would have if they weren't self-employed.

In that same article, they mention that the effect of entrepreneurship on economic growth depends on the per capita income level of the country. In order to benefit from entrepreneurial activity, a country has to have a per capital income level that is higher than 20000 dollars (van Stel, Carree and Thurik, 2005, p. 7.). As such, developed economies such as that of the Netherlands and the United States should be able to benefit from entrepreneurial activity. But in order to properly benefit from something and possibly increase the amount and success of it, one should first know a bit more about what entrepreneurial activity entails and which factors could possibly influence how an entrepreneur approaches a certain problem.

1.1.2. Entrepreneurship

Many management schools nowadays still disagree on what entrepreneurial activities entail and on what the focus should be of studies studying entrepreneurship (Sarasvathy, 2008). Initially, an entrepreneur was thought of as a creative destructor. The entrepreneur, as a creative destructor, revolutionises the economic structure from within, shaking up old monopolies that were previously established by technological or organizational paradigms and thus disruption the economic equilibrium that had been previously established (Schumpeter, 1934).

As time progressed and more research was dedicated to the subject of entrepreneurship, many different definitions arose, many different functions of entrepreneurship were posited and attention was drawn to the how and what of entrepreneurship. An entrepreneur was no longer solely seen as a creative destructor but as someone who noticed a previously unnoticed profit opportunity and tried to act on it (Kircher, 1973). The explanation given by Kircher for why someone did notice the unnoticed profit potential and someone else didn't is asymmetric knowledge. Asymmetric knowledge theories assume that not everyone has access to the same information, causing one party to have relevant information whereas the other does not. Kirzner however does not posit an explanation on the why and how of this asymmetric knowledge (Foss, Klein, Korr and Mahoney, 2008).

As the examples above illustrates, the focus of most studies in regards to

entrepreneurship, and especially entrepreneurial process models, is on “actors who do” and their motives for doing so (Moroz & Hindle, 2012, p. 782). Asymmetric knowledge theories posit that entrepreneurs set up new businesses because they noticed an unnoticed profit opportunity. Subjectivism, a philosophical perspective, however offers another explanation in order to explain why someone recognizes an opportunity whereas someone else doesn't. Subjectivism posits that individuals hold different preferences, knowledge, and expectations. As such, the contents of the human mind, and hence decision making, are not solely determined by external events such as knowledge asymmetry (Foss et al., 2008). Opportunity recognition is often used as a function in entrepreneurial process models. Entrepreneurial process models are used to try to explain the dynamic process of identifying economic opportunities and acting upon them by developing, producing and selling goods and services (OECD, 1997). Sarasvathy (2001) adds to this that opportunities cannot only be found but can also be created.

The difference in entrepreneurial processes used by entrepreneurs have also been theorized to cause the difference in whether one notices an opportunity whereas someone else does not and have been used to explain why one entrepreneur succeeded whereas another did not (Lumpkin & Dess, 1996, in Kellermans, Eddleston, Barnett & Peason, 2008).

The amount of theories and models in regards to entrepreneurial processes and entrepreneurial decision-making processes are fast and an important part of the literature on entrepreneurship. This fastness makes it difficult for both scholars and practitioners to understand. Moroz and Hindle (2012) therefore strove to find common denominators in order to further the understanding of entrepreneurial processes and decision-making. Out of the 32 models that they researched, they found that only four were simultaneously general, “all processes that are ‘entrepreneurial’ do this” (Moroz and Hindle, 2012, p. 781) and distinct, “only entrepreneurial processes do this” (Moroz and Hindle, 2012, p. 781), about entrepreneurial processes and seemed to converge on ways of conceptualizing the entrepreneurial process. Those four models were the models of Gartner (1985), Bruyat and Julien (2000), Sarasvathy (2001) and Shane (2003). Sarasvathy's framework on entrepreneurial processes will be used as the “leading” model in this study because Gartner (1985) lacks a direct link between the individual and the process, Bruyat and Julien (2000) lack an explanation on new value creation and Shane (2003) lacks an explicit distinction between entrepreneurs and non-entrepreneurs and uses tacit knowledge as an explanation.

The process approach to entrepreneurship is currently renowned for rekindling the debate on entrepreneurial processes and what they entail (Read, Song & Smit, 2009). It acknowledges that entrepreneurs face three different types of uncertainty, namely (1) Knightian uncertainty, which tells us that probability distributions and outcomes are unknown so it's impossible to calculate the profitability of one outcome occurring over another; (2) goal ambiguity, which refers to the fact that entrepreneurs have difficulty formulating goals due to the fact that they do not know where they stand and as such

aren't able to formulate a goal that they should attain in the future; and (3) isotropy, which "refers to the fact that in decisions and actions involving uncertain future consequences it is not always clear *ex ante* which pieces of information are worth paying attention to and which not" (Sarasvathy, 2008, p. 92). The process approach to entrepreneurship is founded on the presumption that people typically use two types of processes to deal with the three types of uncertainty when tackling business problems and making entrepreneurial decisions. These two separate entrepreneurial processes are called causal processes and effectual processes. The duality between those two processes leaves room for subjectivism. It emphasizes different ways of thinking. Instead of seeing competitors, one sees alliances. Or one sees contingencies as challenges that better the company instead of nuisances that need to be overcome.

The first term, causal processes, is used to describe processes that take a particular effect as given (Sarasvathy, 2001, p.245). It is based on the logic "to the extent that we can predict the future, we can control it". The past is seen as a continuation of the past (Sarasvathy, 2008a, p.6). As such, the entrepreneur bases the choices that he/she makes in regard to what to use on rational planning and selecting the means necessary to attain the future he/she prefers.

Effectual processes are based on the logic "to the extent that we can control the future, we do not need to predict it" (Sarasvathy, 2008a, p.6). Through human actions it is possible to influence the future, rendering predictions of the future absolute and unnecessary. As such, someone using effectual processes does not see the future as a merely a continuation of the past. When using effectuation processes, the entrepreneur "takes a set of means as given and focus on selecting between possible effects that can be created with that set of means." (Sarasvathy, 2001, p. 245). In a nutshell, this means that an entrepreneur tries to make the best of the resources that are at his/her disposal, and as such focuses on what he/she can bring to the world, instead of looking at what the market needs and how he/she can cater to those needs. As such, using effectuation processes, an entrepreneur could end up with "different types of firms in completely disparate industries" (Sarasvathy, 2001, p.247). In chapter 2 more attention will be paid to causal and entrepreneurial processes, their differences and how to distinguish one from another.

1.1.3. Entrepreneurship, family and education.

Many authors have argued that one's family and family business background influences entrepreneurs and the decisions that they make (Sarasvathy, 2001; Wiltbank, Dew, Read and Sarasvathy, 2006). In the field of psychology, it is mentioned that one's mental framework is influenced by one's background, experience and education (Gleitman, Gross and Reisberg, 2011). Family is one of the earliest sources to exert influence on the development of one's mental model (Gleitman, Gross and Reisberg, 2011). Values and norms are learned at a young age and what parents do and know influences the preferences, knowledge and expectations of children.

Chlosta, Patzef, Klein and Dormann (2010) found that role models of parents affect, and

can be seen as motivators for whether someone becomes self-employed for they provide an opportunity to obtain a realistic view of entrepreneurship. They also found similar affects for parental role models, paternal role models and maternal role models (Chlosta, Patzef, Klein and Dormann, 2010). This corresponds with what Dyer & Handler (1994) argued, namely that early exposure to parental role models in the family business will affect the children's attitude towards becoming self-employed (Dyer et al. 1994).

Sing and DeNoble (2003) however also stress a downside of this obtained view of entrepreneurship for they state that entrepreneurs with family members are less likely to use creative ideas when dealing with business problems for they are more likely to use what they've learned from their role model(s) when making decisions (Singh and DeNoble, 2003).

Chan Shao, when writing his master thesis, was also intrigued by this issue. In his study, which he conducted using Chinese students and entrepreneurs, he found that student entrepreneurs with self-employed parents are more likely to rely on mean-driven activities and exploit contingencies than those without entrepreneurial parents in making entrepreneurial decisions (Shao, 2012, p. 59).

Sarasvathy (2008) also mentions several ways in which the familiar background of an entrepreneur could potentially influence the decision-making processes of the entrepreneur. In the case "Curry in a Hurry", she mentions that having limited funds while growing up may spark an entrepreneur to creatively bring his/her idea to the market while using close to no resources (Sarasvathy, 2008, p. 76). As such, it is clear that family influences the entrepreneurial decisions an entrepreneur makes but it remains unclear as to how.

Another factor that could possibly influence how someone sets up a new venture is the education someone received. Students trained in economics are strongly bought into the notion of rationality, which sometimes results in a rejection of effectual logic due to cognitive limitations for they see all techniques that are not necessarily rational as "irrational" and "intuitive" (Sarasvathy, 2008, p. 213). She also posits that most students in MBA courses tend to be risk-averse and because they're likely to interpret effectuation as the need to take risk, may reject it without a second thought (Sarasvathy, 2008, p. 236). Business schools nowadays sometimes offer entrepreneurial classes, working as incubators, influencing how entrepreneurs start up their business (Sarasvathy, 2008, p.179). In their 2009 study, Dew et al. concluded that MBA students are more likely to use causal processes than effectual processes when making a complex business decision. Shao (2012) initially used education as a control variable but concluded that he could not rule out that it was a third variable. As such, it seems likely that education influences the way someone approaches a problem, but it remains unclear as to how exactly.

Nowadays, more and more business schools try to teach both causal processes and effectual processes (Sarasvathy, 2008), but the question remains whether an education on both reaches everyone. Venkataraman goes as far to question whether it's enough to just

educate MBA students and potential entrepreneurs in this aspect or that classes on entrepreneurship should also be taught in high school and grade school (Venkataraman, 2005, in Sarasvathy, 2008). As such, it seems likely that the majority of the influence that education may exert on decision-making is derived from the education that they've received in college, therefore this research will only focus on the kind of education that the participants have received in college. More on the presumed effect of education on entrepreneurial decision-making can be found in chapter two.

1.1.4. Research questions

Seeing as this study focuses on how family and educational background influences entrepreneurs in their entrepreneurial decision-making, the main research question has been formulated as "To what extent do family resources, family business background and education influence entrepreneurs in regards to their entrepreneurial decision-making?"

In order to be able to provide an answer to that question, the following sub-questions should be answered first:

- To what extent does family resources influence entrepreneurial decision-making in regards to their preference of either causal decision-making processes or effectual decision-making processes?
- To what extent does family business background influence entrepreneurial decision-making in regards to their preference of either causal decision-making processes or effectual decision-making processes?
- To what extent does education influence entrepreneurial decision-making?

In chapter two, more detailed information will be given on these sub-questions as well as the theory derived hypotheses that will be tested in this study.

1.2. Methodology

As mentioned before, the goal of the study is to investigate how family and education influence the entrepreneurial decision-making process when setting up a new venture. In order to answer the research question, data on entrepreneurial decision-making processes was gathered in the United States of America (USA). Seventeen student-entrepreneurs participated in a session in which they were asked to provide answers to a case study on setting up a coffee store, using the think aloud method. Afterwards, they were asked several questions to determine whether they had enough time for the case, whether they would do things the same if given the choice to change their choices, if they had any trouble with the method, etc. to determine whether the case itself is representative for their actions. The students were also asked to fill in a survey, which was later on used to analyze whether the case itself was representative for what they normally would have done when presented with such a problem. The study itself is exploratory in nature, for it tries to better comprehend the nature of entrepreneurial decision-making processes.

1.3. The purpose and relevance of this research.

The aim of this study is to examine the influence of family and education on entrepreneurs' preferred mode of decision-making, as well as on how they solve a business problem. By doing so, the author of this thesis hopes to contribute to the fast existing theory on entrepreneurial decision-making with the use of theory-driven hypotheses that will be empirically tested. By understanding some of the factors that influence entrepreneurial decision-making, one could potentially hope to influence entrepreneurial decision-making in such a way that the entrepreneurial venture is more likely to do economically well. Furthermore, this study is, as far as the author is aware, the first to research the influence of family resources, family business background and education on the entrepreneurial decision-making of American nascent entrepreneurs. If the results point out that family resources and or education influences entrepreneurial decision-making, further research should be done in that respect for few studies have been done on those topics.

The transcripts and coded versions of the interviews held in this study will also be used in the EPICC project (Entrepreneurial Processes in a Cultural Context). The goal of this project is to research whether and what affects national culture has on entrepreneurial processes. So far, studies have been conducted in 20 countries and that number is growing monthly!

Chapter 2. Theoretical framework

In this theoretical framework four entrepreneurial process models will be discussed resulting in the selection of the “leading” model used throughout this study. This “leading” model, Sarasvathy’s (2001) model, will then be explained more in depth, especially in regards to causal and effectual processes. A comparison between the four models can also be found in this chapter and as well as several factors thought to influence entrepreneurial decision-making that were found in multiple of the entrepreneurial processes models and combined into the factors family resources, family business background and education. The theoretic framework also contains all hypotheses posited and tested in and by this study.

2.1. Entrepreneurial processes and entrepreneurial decision-making processes.

Before one is able to determine whether entrepreneurial decision-making processes are influenced by factors as family resources, family business background and education, one should first delve deeper into what entrepreneurial decision-making is. Decision-making is “The act or process of choosing a preferred option or course of action from a set of alternatives” (Colman, 2008). Narayan and Corcoran-Perry (1997) posit that decision-making is the result of the interaction between a problem, a person that wants to solve it and the environment both reside in.

In numerous fields, including Psychology and Business, many theories have been posited on decision-making, on what it is, what influences it, decision-making strategies and at what point a decision is made. Extensive debates have been held on whether all that one does is influenced by nature, “all that has been genetically inherited” (Gleitman, Gross and Reisberg, 2011) whether all that one does is solely influenced by nurture, “all environmental factors that happened after conception, i.e. experience” (Gleitman, Gross and Reisberg, 2011) or some sort of combination of both, much is still unclear on genetics, and as such, genetic factors will not be included as influential factors in this research. Therefore a more empiricists’ standpoint is taken, meaning that in this study, people will be seen as *tabula rasae*, blank slates that will be gradually filled by experience (Locke, 1690). As such, this study pays no mind to any genetic factors that could have potentially influenced one’s decision-making, choosing to focus solely on factors in the environment that could have possibly influenced it.

However, when one is influenced by their experience and what someone is taught, then research that has been done in the past has been influenced by what was known in the past and new discoveries may have prompted different interpretations of something that was classified as something else previously. As such, it is important to look at different ways in which scientists have previously modeled entrepreneurial decision-making before choosing one way to use as a lens through which you look at what entrepreneurs do. In order to prevent a possible bias from occurring, multiple models of entrepreneurial processes will be discussed below, using Moroz and Hindle’s 2012 article.

In their research, they strove to find common denominators in 32 different models of

entrepreneurial processes in order to further the understanding of entrepreneurial processes in a useful way to both scholars and practitioners (Moroz and Hindle, 2012). Out of all 32 models, only four were simultaneously general, “all processes that are ‘entrepreneurial’ do this” (Moroz and Hindle, 2012, p. 781) and distinct, “only entrepreneurial processes do this” (Moroz and Hindle, 2012, p. 781), about entrepreneurial processes and seemed to converge on ways of conceptualizing the entrepreneurial process. Those four models were the models of Gartner (1985), Bruyat and Julien (2000), Sarasvathy (2001) and Shane (2003).

Gartner (1985) attempted to combine and organize variables used to research entrepreneurs and entrepreneurship to draw up a comprehensive framework that could be used to describe new venture creation. Previous research had often assumed that entrepreneurs and the ventures they created were much the same and Gartner felt that it was important to recognize the differences among entrepreneurs and their ventures for he thought that they could vary greatly, especially in regards to entrepreneurial firms and non-entrepreneurial firms. Two different definitions were combined in order to get a firm grasp on what new venture creating really entails, resulting in the following framework:

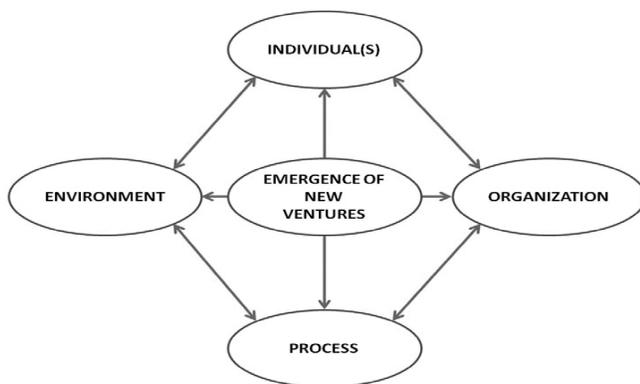


Figure 1: Gartner's static framework model of new venture emergence (Hindle & Moroz, 2012)

Gartner used previously published articles, such as Bruno & Tyebjee (1982) and Collins & Moore (1970), in order to determine factors that influence and are influenced by the emergence of new ventures. According to Gartner, individuals can have internal motivation for starting a company, such as the need for achievement and locus of control (Brockhause, 1982; in Gartner, 1985), but can also be externally motivated by the environment to start a new venture, by for instance job satisfaction (Collins and Moore, 1970; in Gartner, 1985) and living conditions (Bruno and Tyebjee, 1982; in Gartner, 1985)). The environment also influences the process by which the new venture is created.

The process by which a new venture is created was broken down to six common behaviours such as the recognizing of an opportunity, the accumulation of resources etc. The process by which an entrepreneur sets up a new venture in turn affects the characteristics of the organization itself, by choosing whether or not to include a partner

into the venture (Timmons, Smollen and Dingee, 1977; in Gartner, 1985) or the strategic choices that are viable to the company (Porter, 1980; in Gartner, 1985). The process of setting up a venture is essentially where the entrepreneurial decisions are made.

The characteristics of the organizations affects the individual in terms of sense of achievement and monetary funds available, as well as the process by limiting the strategic choices and thus options that can be used. The emergence of new ventures in turn affects the individual, the environment, the process and the organization (Gartner, 1985).

One of the limitations of Gartner's model is that it focuses on new firms and it does not matter whether or not these firms are innovative (Moroz & Hindle, 2012). Gartner himself mentions one of the biggest limitations of his framework, the fact that it "does not to answer specific questions about how new ventures are started or provide specific developmental models for new venture creation". As such, Gartner's framework will not be used as the "leading model" of this study.

Bruyat and Julien (2000) tried to propose a "new" definition of entrepreneurship based on proposals already made by researchers in the field, in particularly that of Gartner (1990). They state that "the entrepreneur is the individual responsible for the process of creating new value" (Bruyat & Julien, 2000, p. 169). They also posit that in order to be called an entrepreneur, an individual should first have created new value. The creation of value in turn puts constraints on the individual. As such, the entrepreneurial process in their model starts with I (Individual) <-> NVC (New Value Creation), meaning that an individual creates new value, but that the creation of new value in turn also affects and influences the individual.

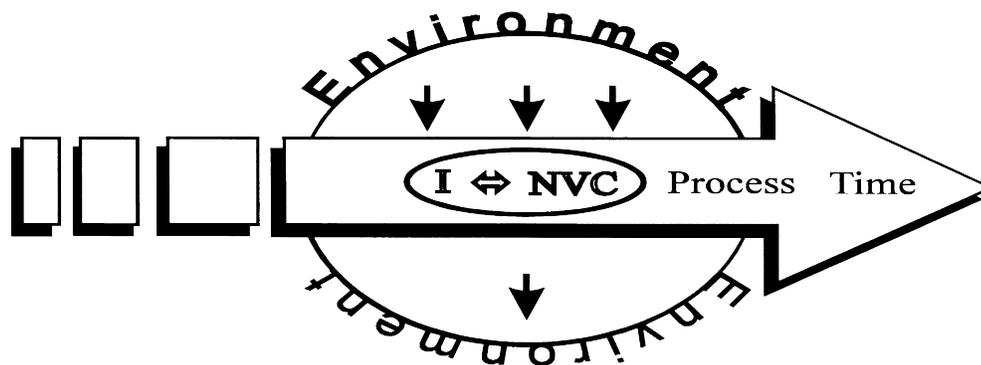


Figure 2: The entrepreneurial process (Bruyat & Julien, 2000)

Building on Gartner's work (1985) they state that the environment influences the individual and the new value creation, and the individual and new value creation in turn influence the environment. Seeing as their framework largely draws from Gartner's 1985 work, the process is still essentially where the entrepreneurial decisions are made. The main difference between Gartner (1985) and Bruyat and Julien (2000) is that "the individual and the object created are considered to be a dialogic, and become the core elements" (Bruyat & Julien, 2000, p. 170). Bruyat and Julien (2000) did introduce

temporality issues but despite this, their model shares Gartner' models' limitations for they did not include innovation in their model (Moroz & Hindle, 2012), did not specifically answer how new ventures are started and did not provide an answer on how entrepreneurs create new value. As such, this model will not be used as the "leading model" either.

Sarasvathy focused her work on the teachable and learnable aspects of entrepreneurial expertise (Moroz & Hindle, 2012). Unlike most other studies in the area of entrepreneurship that focus on finding and exploiting existing opportunities, Sarasvathy (2001) posits that opportunities can be co-created by the entrepreneur and stakeholders committed to the entrepreneurial venture (Read et al, 2009).

Like Gartner (1985), Sarasvathy discovered and acknowledged a difference between entrepreneurs and non-entrepreneurs and noticed a difference in how (potential) entrepreneurs approach a decision-making problem. She coined the two different decision-making processes "effectual decision-making processes" and "causal decision-making processes". She posits that the difference in thinking is caused by the difference between entrepreneurs and non-entrepreneurs, which is interesting for it offers an insight in how new ventures are started and why.

Although more on causal and effectual decision-making processes can be found in chapters 2.1.2. and 2.1.3., it is perhaps important to know that Sarasvathy's model also has certain limitations. Moroz and Hindle (2012) state that they had trouble with Sarasvathy's lack of clarity when she "hedged her bets" (Moroz & Hindle, 2012, p. 805). Furthermore, they state that her interpretation of causality is contradictory for she does not clearly convey that both effectual and causal logic are cognitive tools that can be used within an entrepreneur, and can co-exist, meaning that the entrepreneur can use both in the same situation in different proportions. Effectual logic also contrasts the human agency based perspectives of entrepreneurship such as used by Shane (2003) in his entrepreneurial processes framework for it downplays the importance of purposeful human action (Moroz & Hindle, 2012). Another problem with Sarasvathy's framework is that whether something is labeled as a causal or effectual process can differ based on the interpretation of the interpreter for it's not always clear whether something is one of the other.

In his 2003 article, Shane tried to create a unifying theoretical framework for studying entrepreneurship based on the link between the individual and an opportunity.

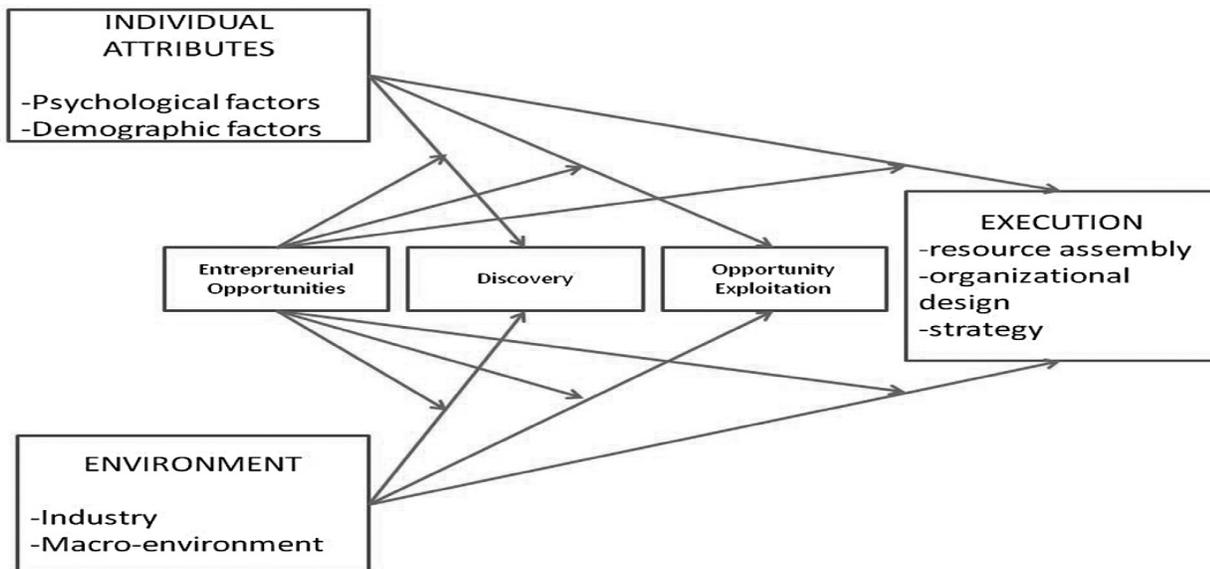


Figure 3: Shane's (2003) model of entrepreneurial processes, from Moroz and Hindle (2012)

The model shown consists of three elements, namely the individual, the environment and the entrepreneurial decision-making process. Shane's model is built on the presumption that entrepreneurial opportunities exist independently of the individuals that "notice" them. The individual is just needed to do what it takes to make it happen (Shane, 2003). With this, Shane effectively renders the objectivity/subjectivity debate moot (Moroz & Hindle, 2012).

In his model, he tried to consider the relationships between all parts, and not focus all of his attention on one of the two camps: the individual-centric and environmental-centric viewpoints. In order to do so, he posits some conditions necessary for unifying the field: "(1) the existence of profit based (objective) opportunities that may be exploited through the application of new means end relationships, (2) a variation among people in their willingness and ability to act, (3) a need to embrace uncertainty/risk bearing, (4) a requirement for purposive organizing, and (5) a requirement for some form of innovation" (Moroz & Hindle, 2012, p. 806).

Shane's model covers more than just the creation of a business. It starts out at the discovery of an opportunity. "Entrepreneurial discovery is the perception of a new means-ends framework to incorporate information, incompletely or partially neglected by prices, that has the potential to be incorporated in prices and thereby efficiently guide the resource allocation decisions of others" (Eckhardt & Shane, 2003, p.338). Whether or not the opportunity is exploited depends on the individual and the environment. The influences of the individual and the environment in turn are influenced by the entrepreneurial opportunities, that is "situations in which new goods, services, raw materials, markets and organizing methods can be introduced through the formation of new means, ends, or means-ends relationships" (Eckhardt & Shane, 2003, p. 336). The entrepreneurial opportunities, the individual and the environment all influence the

execution.

As a whole, the framework is comprehensive and Moroz and Hindle (2012) state that it is difficult to falsify the distinctiveness of the opportunity process to entrepreneurship as described by Shane, yet when it is broken down into discovery/creation, evaluation and exploitation, entrepreneurs could possibly be involved in one of the earlier stages but pass off the opportunity to another. As such, only the discovery is distinct. Another problem with Shane's framework is that he devotes little attention on opportunity evaluation (Moroz & Hindle, 2012). Shane's framework however does not explicitly mention a distinction between entrepreneurs and non-entrepreneurs and as such, what an entrepreneur learned in previous ventures could possibly be attributed to another factor such as a tacit knowledge (Eckhardt & Shane, 2003) without knowing what provided the entrepreneur with that knowledge. Shane's framework also does not explain why some opportunities are fabricated by entrepreneurs instead of just discovered (Sarasvathy, 2001).

Seeing as Gartner (1985) does differentiate between entrepreneurs and non-entrepreneurs, but lacks a direct link between the individual and the process and does not answer why a new venture is started, his model of entrepreneurial processes will not be used as the "leading model" in this research. Bruyat and Julien (2000) will also not be used as the "leading model" in this study due to their lack of explanation on new value creation. Shane's framework on entrepreneurial processes lacks an explicit distinction between entrepreneurs and non-entrepreneurs and uses tacit knowledge as an explanation, without wondering where this tacit knowledge came from. As such, Sarasvathy's framework on entrepreneurial processes will be used as the "leading" model.

2.1.1. Factors in the entrepreneurial processes models that could potentially influence entrepreneurial decision-making.

All four models on entrepreneurial processes mention entrepreneurial decision-making as a factor that influences new venture creation. Gartner (1985) and Bruyat & Julien have coined it "process" in their models. Sarasvathy's model (2001) on entrepreneurship essentially encompasses two different types of processes used in entrepreneurial decision-making, namely causation and effectuation. Shane (2003) mentions that entrepreneurial opportunity, discovery and opportunity exploration all influence the execution, which is where the entrepreneurial decision-making takes place. All four models also posit multiple factors that influence new venture creation and could thus potentially influence entrepreneurial decision-making. As such, a table was drawn up to find out which factors were agreed on by the models to influence new venture creation and thus ultimately the decision-making process. The complete comparison is shown in table 1.

Factors	Gartner (1985)	Bruyat & Julien (2002)	Sarasvathy (2001)	Shane (2003)
----------------	---------------------------	---------------------------------------	------------------------------	-------------------------

Opportunity cost		X		X
Working spouse			X	X
Education	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>
Career experience	<u>X</u>	<u>X</u>	X	<u>X</u>
Business experience			X	X
Functional experience			X	X
Industry experience			X	X
Start-up experience			X	X
Role model	<u>X</u>	<u>X</u>	X	<u>X</u>
Extroversion			X	X
Need for achievement	<u>X</u>	<u>X</u>	X	<u>X</u>
Risk-taking	<u>X</u>	<u>X</u>	X	X
Desire for independence			X	X
Locus of control	<u>X</u>	<u>X</u>	X	<u>X</u>
Intuition				X
Self efficiency				X
Over confidence				X
Prior life experience	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>
Social network	<u>X</u>	<u>X</u>	X	<u>X</u>
Absorptive capacity			X	X
Recognition of causal links				X
Ability to categorise in formation			X	X
Relationship recognition			X	X
Understanding processes.			X	X
Evaluation information accurately				X
Availability of land or facilities	<u>X</u>	<u>X</u>	X	<u>X</u>
Job satisfaction	X	X		
Age	X			

Venture capital availability	X			X
Experienced entrepreneurs present	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>
Technical skilled labour force	<u>X</u>	<u>X</u>		X
Accessibility of suppliers	<u>X</u>	<u>X</u>		X
Accessibility of new customers	<u>X</u>	<u>X</u>		X
Governmental influences	<u>X</u>	<u>X</u>		X
Proximity to universities.	<u>X</u>	<u>X</u>		X
Accessibility of transportation	<u>X</u>	<u>X</u>		X
Attitude of area population	X			
Value creation		<u>X</u>	X	X

Table 1: own comparison between the four models

After examining the table, it became clear that all four models agree with one another at certain points. There are however a few which are prominently stated in three out of four models, whereas Sarasvathy's model merely hints at it but does not outward state that it is so. These factors include education, role model, need for achievement, risk-taking, locus of control, availabilities of land or facilities and the presence of experienced entrepreneurs.

Some of these factors, such as need of achievement, risk-taking and local of control are inherent to an entrepreneur, meaning that they're partly derived from the nature of the individual and influenced by the environment one grew up in. Due to the nature of this research and time constraints, it is not possible to measure all factors that could have possibly influenced one's preference for either causal or effectual entrepreneurial processes seeing as a longitudinal study would have been necessary in order to be able to draw up conclusions if the factors that are inherent to an entrepreneur were to be included in the research. Leaving out the factors that would require a longitudinal study, the following factors remain: education, role models, availabilities of land or facilities and the presence of experienced entrepreneurs.

Some authors previously have combined the presence of experience entrepreneurs (social capital), availability of land or facilities (financial resources, time, place, etc.) and labeled the combined concept "family resources" (Aldrich and Cliff, 2003). Other authors also mention that it is quite common for families to be involved in the startup of a new company by one of its members (Christman, Chua & Stier, 2003; Aldrich & Wardinger, 1990; Steier & Greenwood, 2000). They do not only contribute financial resources, social

resources, time and place, but can also offer their expertise if they have already previously started a business. Parents often act as role models to their children and their experience in business influences their decision-making and how they set up a business (Chlosta et al., 2010). As such, the focus of this study will be on family resources, family business background and education and how they influence entrepreneurial decision-making. Chapters 2.2 to 2.4 will elaborate more on these topics.

2.1.2. Causal decision-making processes.

“Causation processes take a particular effect as given and focus on selecting between means to create that effect” (Sarasvathy, 2001b, p.245). It involves the exploration, discovery and exploitation of already existing opportunities. Exerting causal logic entails picking target segments based on predictive information (Wiltbank, Dew, Read & Sarasvathy, 2006). It provides decision criteria that can be used to achieve given goals when faced with an uncertain future and thus causal logic is often taught in business schools (Sarasvathy, 2001b). Causal logic starts with a to be created effect. In order to achieve that effect, means will be selected that are likely to further the advancement towards that effect. The means that one is able to choose from are limited by the environment. Throughout the decision-making process, different means will be employed and different sub-goals will arise, all used to further the original goal. Segmentation, Targeting and Positioning is often used in causal decision-making processes (Sarasvathy, 2008). Information is gathered about the predefined market using techniques such as focus groups, surveys, and the gathering of information is useful for the future is a continuation of past (Dew et al., 2009). Unlike effectual problems, causal problems are of decision-making, instead of design. Causal logic is especially useful when the future is predictable, goals are clearly defined and the environment does not change no matter what we do.

2.1.3. Effectual decision-making processes.

Effectuation is “the process that takes a set of means as given and focus on selecting between possible effects that can be created with that set of means” (Sarasvathy, 2001, p. 245). It’s about redesigning the existing reality into new opportunities (Wiltbank et al., 2006). Effectuation is based on the extent to which we can control the future and it’s especially useful when the future is unpredictable, goals are unclear and the environment can be changed by human action. Unlike someone using causal logic, an effectuator starts with his/her means and thinks to himself/herself “What can I do with them?” An effectuator seeks to create new ends using non-predictive control. Effectuation focuses on design rather than decision (Sarasvathy, 2001). The table below describes the important aspects of effectual logic versus causal logic.

Issue	Causal frame	Effectual frame
View of the future	Predictive. Causal logic frames the future as a continuation of the past. Hence accurate prediction is both necessary and useful.	Creative. Effectual logic frames the future as shaped (at least partially) by wilful agents. Prediction is therefore neither easy nor necessary.
Basis for taking action	Goal-oriented. In the causal frame, goals, even when constrained by limited means, determine sub-goals. Goals determine actions, including which individual to bring aboard.	Means-oriented. In the effectual frame, goals emerge by imagining course of action based on given means. Similarly, who comes on board determines what can be done and needs to be done. And not vice versa.
Predisposition towards risk and resources	Expected return. Causal logic frames the new venture creation problem as one of pursuing the (risk-adjusted) maximum opportunity and raising required resources to do so. The focus here is on the upside potential	Affordable loss. Effectual logic frames the problem as one of pursuing adequately satisfactory opportunities without investing more resources that stakeholders can afford to lose. The focus here is on limiting the downward potential.
Attitude towards outsiders	Competitive analysis. Causal frames promulgate a competitive attitude toward outsiders. Relationships are driven by competitive analyses and the desire to limit dilution of ownership as far as possible.	Partnerships. Effectual frames advocate stitching together partnerships to create new markets. Relationships, particularly equity partnerships drive the shape and trajectory of the new venture.
Attitude towards unexpected contingencies	Avoiding. Accurate predictions, careful planning and unwavering focus on targets form hallmarks of causal frames. Contingencies, therefore, are seen as obstacles to be avoided.	Leveraging. Eschewing predictions, imaginative rethinking of possibilities and continual transformations of targets characterize effectual frames. Contingencies, therefore, are seen as opportunities for novelty creation and hence to be

leveraged.

Table 2: the differences between effectual and causal logic (Sarasvathy, 2001, in Dew et al. 2009).

The model illustrated below shows an illustration of the dynamic model of effectuation. As mentioned previously, an effectuator starts with means. Means in Sarasvathy's model is broken down into "Who I am", "What I know" and "Whom I know". "Who I am" is the identity of the entrepreneur and is influenced by multiple factors such as for instance religion: "Christian identity may lead a person to forgive" (Sarasvathy, 2008, p. 19). The effectuator then focuses on what he or she can do with those means. When he or she knows someone that is likely to benefit the venture, the entrepreneur is likely to call them, possibly resulting into stakeholder commitment, for unlike in causal logic, an effectuator is not opposed to partnerships. Partnerships change the venture in that new partners bring in both new means and new goals (Sarasvathy & Dew, 2006).

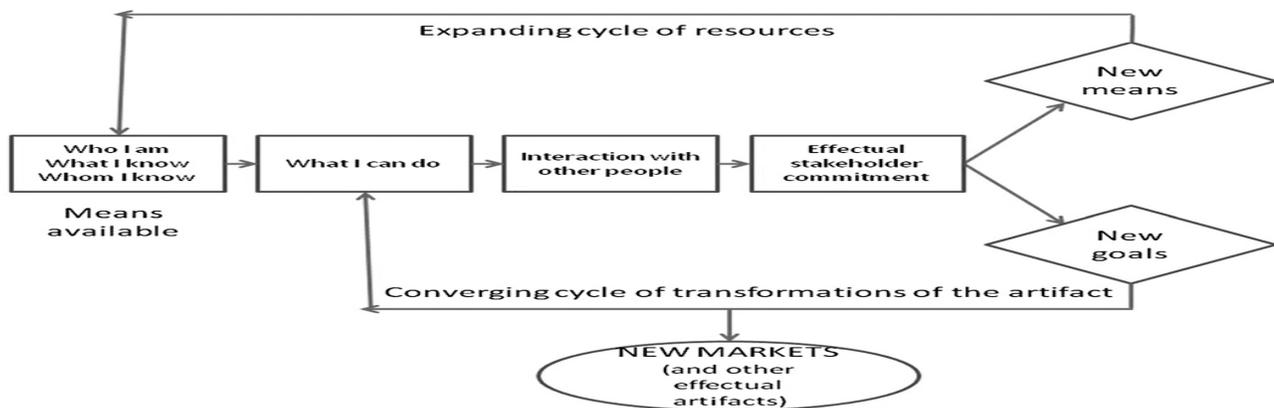


Figure 4: A dynamic model of the effectual network and new markets (Sarasvathy & Dew, 2006)

2.2 Factors influenced entrepreneurial decision-making.

As mentioned previously, various factors are thought to influence decision-making and a lot of research has been done on this subject. All four models on entrepreneurial processes mention the environment as an important factor. Sarasvathy, in her dynamic model of effectuation, posits that who someone knows, the connections that one has and what the identity of someone entails influences the entrepreneurial decisions one makes (Sarasvathy, 2001). Gartner's article (1985) also mentions several other factors that researchers have deemed probable exert influence on entrepreneurship: (1) job satisfaction, (2) previous work experience, (3) entrepreneurial parents (Collins & Moore, 1970; Roberts & Wainer, 1968; Schrier, 1975; Secret, 1975; Shapero, 1972; Susbauer, 1972; in Gartner, 1985), (4) age and (5) education (Brockhaus & Nord, 1979; Collins & Moore, 1964; Howell, 1972; Roberts, 1969; Susbauer, 1969; in Gartner, 1985). As such, it is clear that the environment an entrepreneur grows up in influences his/her decisions later on, but how remains unclear.

Based on the comparison between the four entrepreneurial processes models, the removal of several factors suggested by the models due to the fact that they have to be

measured using a longitudinal study, and the work of Aldrich and Cliff (2003) used to group several factors together, this study will focus on clarifying the effects of family resources, family business background and education on the decision-making process of entrepreneurs.

2.3 Family background and its influences on entrepreneurial decisions.

Social learning theory posits that individuals learn by observing what their parents do. These observations later on become part of the child's mental model, which determines their decision-making policy (Bandura, 1986). Behavioural explanation posits something similar, namely that individuals tend to learn from someone who they see as a role model (Mancuso, 1974). As such, what children observe and experience in terms of behavior their parents display affects how they grow up (Chlosta et al, 2010). Menaghan and Parcel (1995) state that research has shown that parental work experiences influence children and that they internalize their parent's experience as norms of behavior. Various other studies (Collins & Moore, 1970; Roberts & Wainer, 1968; Schrier, 1975; Secrest, 1975; Shapero, 1972; Susbauer, 1972; in Gartner, 1985) have also mentioned that having an entrepreneurial parent influences the decision-making of an entrepreneur, but what one's parents do for a living is not the only way in which family influences entrepreneurial decision-making. Bruno and Tyebjee (1982) found that living conditions and as an extension of that, funds available to entrepreneurs also influence entrepreneurs.

Aldrich and Cliff (2003) developed a framework based on the family embeddedness perspective on new venture creation. They posit that factors such as resources, changes in the composition of the family and norms, attitudes and values held by of families influence each other and in turn influence the venture creation process, which influences the new venture outcomes. The new venture outcomes in turn influence the family characteristics.

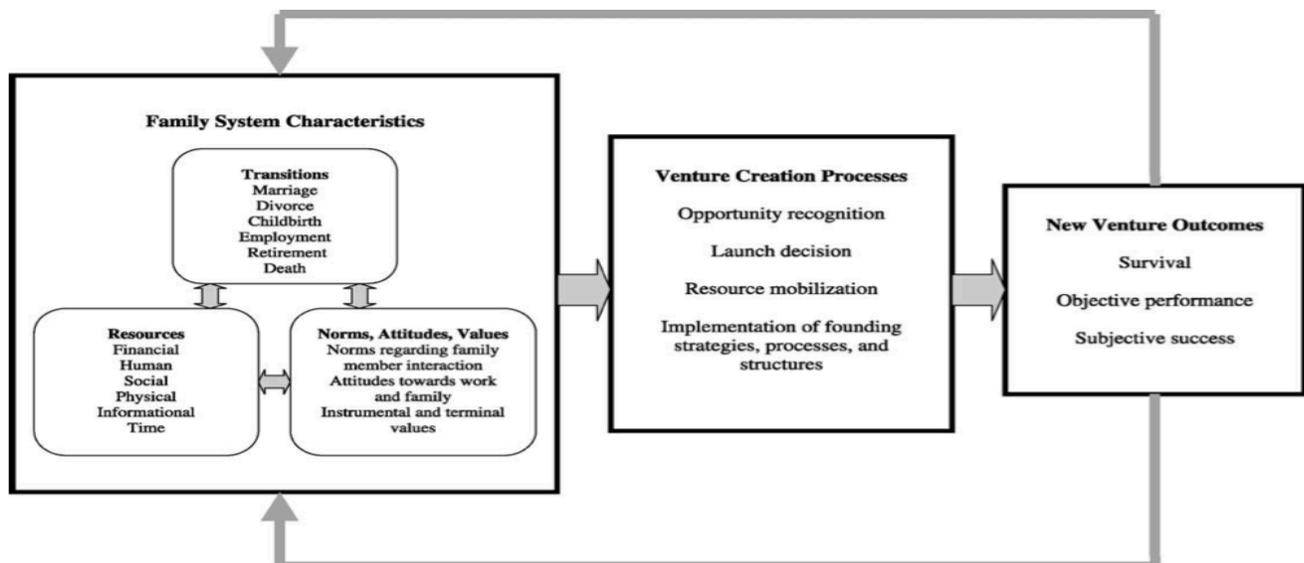


Figure 5: Family embeddedness perspective on new venture creation (Aldrich & Cliff, 2003).

Aldrich and Cliff (2003) weren't the only ones to note that family resources were often used in new venture creation. Christman, Chua and Steier (2003) found that family resources are in fact commonly used in entrepreneurial start-ups. Seeing as both resources and entrepreneurial parents have been mentioned as influences on entrepreneurial decision-making, chapter 2.2.1 and 2.2.2. delve into these topics more deeply.

2.3.1. The impact of family resources on entrepreneurial decision-making.

In the model depicted above, several resources are mentioned that a family has that may influence entrepreneurial decision-making, namely financial resources, social resources, physical resources, information resources and time (Aldrich & Cliff, 2003). Family often plays an important part in the mobilization of financial resources (Aldrich and Waldinger, 1990). Steier and Greenwood (2000) found that strong ties, such as family members, were often the first "angel investors", often investing the initial financial resources needed to start a company. People from the same church as you, university colleagues, and friends are also likely sources of angel investors. Family members also offer social resources, in that they may know people that could help the entrepreneur with his/her venture, and bring them into contact with them. Sometimes they help open doors that would have remained closed otherwise. Sarasvathy (2001) provides an example of this, namely that a friend of the family who has previous experience in that specific field wants to join you in your business. Family members are also known to help an entrepreneur by providing them with the space necessary to conduct their business, for instance let them operate from a basement or living room. Time itself is often also invested by family members in order to help the budding entrepreneur and his/her venture (Aldrich & Cliff, 2003). This claim is supported by a study on the importance of family members as human resources for the data gathered showed that 73% of all business-owning households had at least two residential household members working in the business (Heck & Trent, 1999). As such, it seems clear that family members and their resources are often utilized in setting up a new business, but the amount of resources available differ per family.

Not every family is as well off as the other, and not every family has the time to spare to help entrepreneurial family members, nor do they want to. The availability of resources differs per family and could potentially influence the entrepreneurial decision-making process for certain knowledge, funds and social networks are not available, closing doors that the entrepreneur might have utilized if given the option. In their 2005 research, resource availability has been posited as a factor that influences entrepreneurial decision-making for the more resources there are available, the more likely someone is to use the causal decision-making process. This is due to the fact that when the resources are available to attain a certain goal, people are less inclined to change their goal for it should be obtainable and thus are more likely to make goal oriented decisions (Read & Sarasvathy, 2005).

Start-up funds are often a limiting factor when starting a business. The entrepreneur often starts a firm with his/her own funds, contributions from his/her social network and loans

granted by financial institutions. The entrepreneur can both suffer from discrimination or benefit from nepotism and favouritism depending on his/her social network. What someone is able to obtain is also often based on the perceived risk of the investment (Cassar, 2004). Family members are able to reduce the perceived risk by vouching for the budding entrepreneur, thus allowing the entrepreneur to borrow more funds than he/she could have borrowed otherwise, while also reducing the costs of the loan. Based on the literature above, the following hypothesis was drawn up:

H1a: Entrepreneurs that have more than average amounts of family financial resources are more likely to rely on causal logic when making entrepreneurial decisions.

In the survey, participants are asked to answer a question in regards to their parent's income. Previous research done by Shao could not confirm the previous hypothesis but the author wonders whether the same will hold true in the USA.

If entrepreneurs that have access to more than average amounts of family resources, especially in regard to financial resources, are more inclined to use causal logic, does this mean that the opposite holds true for entrepreneurs that have access to less than average amounts of family resources? Sarasvathy (2008) herself implicates that this holds true in "Curry in a hurry". She and Read (2005) also imply that it's the case for they posit that entrepreneurs have access to fewer resources are more inclined to use effectual knowledge. They often have to be creative in how they deal with problems due to the fact that the resources necessary to take the more "causal route" simply aren't there (Read & Sarasvathy, 2005). Instruments necessary for the predicting the future, such as extensive market research, are often costly and the benefits of "predicting the future" often do not outweigh the costs of it for the budding entrepreneur, especially if they bring a disruptive, innovative, totally new product to the market.

Family financial resources however aren't the only option to finance a new start-up. It is also possible to acquire a loan from a bank or to get financial aid from a venture capitalist in exchange for a certain percentage of your company. Both banks and venture capitalist however require business plans, a definition of the business, projected growth and forecasts of future sales in order to determine whether or not it is worth the risk to invest in your company (Hayton, 2006). Obtaining a business loan however is quite difficult. Approximately only a third out of all small business owner is able to require the credit that their business needs for it's more riskier and costly to loan money to a small company than it is to loan money to a large company (Shane, 2013). Seeing as it is quite difficult to obtain the commercial loans to start one's venture an entrepreneur may turn to whom he or she knows, hoping that perhaps they're able to help them acquire the necessary funds, perhaps even forming an alliance if that is necessary to obtain the funds needed.

H1b: Entrepreneurs that have access to less than average amounts of family financial resources are more likely to rely on effectual logic when making entrepreneurial decisions.

2.3.2 Impact of family business background.

As shown in the comparison table of the four entrepreneurial processes models, many authors think that and have researched whether having an entrepreneurial parent influences an entrepreneur and the startup of his/her venture. Schröder, Schmitt-Rodermund, and Arnaud (2011) mention that entrepreneurs that have family members with entrepreneurial experiences are influenced by their entrepreneurial parent in that they are more likely to continue the path already taken by the parent than introduce a new idea, especially if the family business has proven to be successful. They simply aren't willing to risk a successful venture or idea over an unproven, risky, new idea, (Autio & Mustakallio, 2003; Dertouzos, Lester, & Solow, 1989) especially if it could result in the decline of the family's wealth (Sharma, Chrisman, & Chua, 1997).

Furthermore, parents are often seen by children as role models, someone they should strive to imitate if the bond between them is strong (Chlosta, Patzelt, Klein & Dormann, 2010). It is natural for them to take their parents' advice on business to heart in regards to problems encountered when starting a business. As such, children in an entrepreneurial family often benefit from being monitored by their parents (Kim et al., 2006).

Due to the fact that children in an entrepreneurial family also often have access to the business network of their parents, it does not seem that surprising to question whether they act differently when starting a company. Since they have more access to people who have experienced what it's like to set up a business, they may have gathered some knowledge and perhaps even experiences that entrepreneurs who lack entrepreneurial parents aren't privy to.

This leads to the question whether entrepreneurs with entrepreneurial parents are more inclined to use effectual logic rather than causal logic, for Sarasvathy (2001) has found that more experienced entrepreneurs are more likely to use effectual logic than causal logic when setting up a new venture. Entrepreneurs that have a family business background have shown to act more conservative in setting up a business (Zahra, 2005) and take fewer risks than entrepreneurs that don't have a family background (Naldi, Nordqvist, Sjöberg & Wiklund, 2007), due to the risk associated with changes (Gomaez-Mejia, Haynes, Nunez-Nickel, Jacobson, Moyano-Fuentes, 2007; in Yordanova, 2011). But is this the only way in which entrepreneurs that have a family business background differ from entrepreneurs that do not?

It was already mentioned previously that entrepreneurs with a family business background are often hesitant to try a new approach. In her 2011 study, Yordanova could not reject her hypothesis that family firms exhibit less EO (Entrepreneurial Orientation, comprising of the dimensions "risk-taking", "innovativeness" and "proactiveness") than non-family firms. In her study, she used definitions posited by Lumpkin and Dess in their 1996 article. As such, Risk-taking refers to "incurring heavy debt or making large resource commitments, in the interest of obtaining high returns by seizing opportunities in the marketplace" (Lumpkin and Dress, 1996, p. 144); innovativeness to "a tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may

result in new products, services, or technological processes” (Lumpkin and Dess, 1996, p. 142); proactiveness refers to “processes aimed at anticipating and acting on future needs” in order to capitalize on emerging opportunities and establish a first-mover advantage in the marketplace (Lumpkin and Dess, 1996, p. 146). Seeing as risk-taking was already covered in the previous hypotheses, let’s find out if there are other authors backing Yordanova’s claim in regards to innovativeness and proactiveness.

One of the requirements for being innovative, according to Yordanova (2011) is that one has to abandon existing practices and approaches, and adopt novel solutions, something which family owned firms are often reluctant to do (Morck, Strangeland & Yeung, 2000). Morck et al. gave two explanations as to why. First of all, any innovation brought to the market challenges the status quo, thereby increasing risk to the family’s financial stake in the business for the outcomes of the challenge are unknown. Secondly, any innovation driven growth tends to dilute family ownership and control and is therefore often discouraged (Morck, Strangeland & Yeung, 2000). Entrepreneurs that have entrepreneurial parents or have parents that work in a family owned business often do not start their own enterprise or introduce innovations due to the high risk of failure (Morris, 1998). Furthermore, the risk of disturbing the status quo in such a way that it hurts the family’s wealth instead of adding to it also works off-putting (Morck, Strangeland & Yeung; Sharma, Chrisman & Chua, 1997). Entrepreneurs that have a family business background often focus on defending against competitive treats and place more emphasis on survival and family employment, rather than focusing on the maximizing profitability or increasing market share (Daily & Dollinger, 1992). All in all, this seems to hint that entrepreneurs that have a family business background are more likely to take on an affordable loss state of mind, rather than an expected return state of mind when making business decisions. This leads to the following hypothesis:

H2: Entrepreneurs with entrepreneurial parents are more likely use to affordable loss heuristics than expected return heuristics when making entrepreneurial decisions.

Furthermore, due to the risk of disturbing the status quo, and possibly harming the family’s wealth as a result, it seems that entrepreneurs with a family business background are more likely to view contingencies as something that should be avoided, instead of using them to bring novel ideas into play. Family firms often act less proactive than non-family firms. Instead, they often employ the defender strategy, focusing on cost control, efficiency and specialization rather than on opportunity-driven behaviors (Short, Payne, Brigham, Lumpkin & Broberg, 2009).

H3: Entrepreneurs with entrepreneurial parents are more likely going to avoid contingencies rather than embrace them when making entrepreneurial decisions.

Due to the risks associated with innovations, entrepreneurs that have a family business background have less incentive to try and predict the future. Instead, they spend more of their time and resources on making competitive analysis, for survival is often the main focus of family owned business and they tend to do so due to by being more efficient and

cost aware than their competitors. As such, it seems likely that entrepreneurs that have a family business background are more likely to think along the lines of competitive analyses rather than partnering up with other entrepreneurs. Based on the literature mentioned above, the following hypothesis was drawn up:

H4: Entrepreneurs with entrepreneurial parents are more likely to employ competitive analyses rather than use alliances or partnerships.

2.4. Education.

Many authors have already posited that education influences entrepreneurial decision-making. All four entrepreneurial processes used in this study imply that education could potentially influence entrepreneurial decision-making. In their 2009 study, Dew et al. mentioned that MBA students are more likely to use causal processes than effectual processes. Sarasvathy posits that that students trained in economics are strongly bought into the notion of rationality, which sometimes results in a rejection of effectual logic due to cognitive limitations for they see all techniques that are not necessarily rational as “irrational” and “intuitive” (Sarasvathy, 2008, p. 213). She also posits that most students in MBA courses tend to be risk-averse and because they’re likely to interpret effectuation as the need to take risk, may reject it without a second thought (Sarasvathy, 2008, p. 236). Receiving any kind of education also influences what you know, who you know and who you are. In turn who you are also influences what kind of education you receive. Family businesses have been known for having CEO’s that have lower educations than CEO’s normally would have, so if your parents owned a successful company, would you really study as hard as you could? All in all, it seems clear that any kind of education influences the decision-making process but how exactly remains unclear. Based on Dew et al.’s 2009 study the following hypothesis was drawn up:

H5: Entrepreneurs that are studying a business related study are more likely to use causal processes than effectual processes.

However, seeing as much remains unclear on how education could possibly influence entrepreneurial decision-making, all codes attributed in this study will be tested once more using education as the independent variable.

3. Methodology

3.1. Introduction

In this chapter the methodology used in this study will be explained and discussed. Eighteen students that had entrepreneurial experience by starting their own business, working in a student enterprise, participated in a class in which they had to start their own company, or expressed that they wanted to start their own company in the near future were presented with a fictional case in which they had to build up their own company from scratch. Along the way, they were asked to solve several business problems that commonly arise when starting and growing a company. The students were asked to answer questions via the speak aloud method. Afterwards they were presented with a survey that was used to cross-reference whether participants answered the case truthfully and consistently. The participants were also asked several questions. The whole session was recorded and the interviews were later transcribed and coded using a coding scheme based on Sarasvathy's 2001 article. Afterwards, another researcher coded three interviews and the inter-rater reliability was tested using Cohen's kappa. If the inter-rater reliability found was less than 65%, the interviews had to be re-coded.

3.2 Sample

The data used in this study was gathered in the United States. Students, both student-entrepreneurs and nascent entrepreneurial-students, were chosen as the units of analysis due to the fact that they often have limited working experience and limited financial resources, making them more likely to resort to effectual solutions. Budding entrepreneurs often face problems when trying to obtain the finances needed to start the venture and often lack experience needed to easily obtain them. As such, students are decent representatives of "individuals who are in the process of starting business, developing not-for-profit organizations, or engaging in other activities where effectuation might apply" (Perry, Chandler et al. 2011, p. 13).

In order to prevent possible biases due to differences in the institutional context between states, and make the sample as homogenous as possible, it was decided to limit the sample to those attending an university/college in the same state, in this case Georgia. Students of Berry college, a college located in Rome, Georgia, were asked to participate in the study. Berry college was picked for several reasons: first of all, the relationship between the University of Twente and Berry college is well established, easing the difficulties in finding participants willing to participate in this study. Secondly, Berry college is an institute that heavily emphasizes the importance of entrepreneurial activities.

Originally, the goal was to interview at least twenty people, the minimum amount of interviewees being the result of a tradeoff between statistical power, the "normal" duration of a master assignment and the requirements of the Entrepreneurial Process in Cultural Context (EPICC) project. However, given the time frame of the master assignment, it was difficult to find 20 participants in the same state, for the academic year ends earlier in the USA. As a result, only 18 students were interviewed. One

interviewed student turned out to be an exchange student from the Netherlands, therefore his results have been excluded from the study to prevent cultural aspects from causing a bias in the results. In total nine men and eight women participated in this study, all between the ages of 18-23. A total summary of the characteristics of the participants participating in this study can be found in appendix A.

The interviewees were selected through non-probability sampling, namely snowball sampling. Snowball sampling is a sampling method in which each interviewee is asked to suggest the next, or another interviewee (Babbie, 2009). This sampling method was chosen due to the fact that willingness to participate in a two hour during study is rather low when one still has to study for his/her finals and they're less than a week away. Another reason why snowball sampling was chosen as the sampling method for this study is that it is difficult to locate students who are starting their own company for it's not always visible yet, seeing as they may have only drawn up plans or may have gone bankrupt already or stopped running the business for undisclosed reasons. As such, contact was made with several professors teaching at Berry college and they were asked whether they knew students who would be willing to participate in this study. Furthermore, the author was also given the time in several classes to promote her study, hoping to further the willingness to participate in the study. The students mentioned by the professors were also asked if they knew other students that were willing to participate in the study, and so the number grew from 5 at the arrival of the author, to 34 during the three weeks that she remained at Berry college. The total amount of 34 however was split up between different researches and as such, the total sample of this study contains 17 students. Of these 17 students, nine of them have at least one entrepreneurial parent.

3.3. Data collection methods used

Multiple methods were used in this study to research how family and education influence the entrepreneurial decision-making process. Although using multiple methods increases the workload of the researcher, it has many benefits that make it worth the researchers' while. "Multi-method research allows a researcher to replicate results and to evaluate the extent to which results are biased by the particular methods used to study a phenomenon" (Yukl & Van Fleet, 1982). As such, it improves the construct validity for it helps prevent the mono-method bias from occurring (Shadish, Cook and Campbell, 2002). Another argument why someone would want to use multiple methods is that the first method can be used to "collect data that can be used to focus or facilitate application of the next method" (Van Someren, Barnard & Sandberg, 1994).

Many previous studies that researched effectuation did so using the think aloud method (Dew, Read, Sarasvathy, & Wiltbank, 2009; Read, Dew, Sarasvathy, Song, & Wiltbank, 2009; Sarasvathy, 1998; Sarasvathy & Dew, 2005; Sarasvathy et al., 1998). The think aloud method is a research method used to model cognitive processes. It is most commonly used to map and document how people do the things they do, why they do it and what strategies they employ while doing it. Researchers often use the think aloud method when researching things that subjects do unconsciously (Van Someren, Barnard & Sandberg,

1994).

Due to the difficulties of deducting someone's thought pattern and strategy based solely on the answer/solution given when presented with a problem, the participant of the study is asked to solve the problem while saying everything that comes to mind in regards to solving the problem, or to quote Van Someren, Barnard & Sandberg, "saying what goes through their head" (Van Someren, Barnard & Sandberg, 1994, p.8). By saying everything out loud, the participant provides the researcher with a look inside his cognitive process (Saravathy, 2008). The research participants' thoughts are recorded during the session and later drawn up as interview protocols. These protocols are then coded so that they can be used to statistically test hypotheses.

According to Ericsson & Simon (1993) the think aloud method is the most reliable method one could use when trying to map and document how people do the things they do, why they do it and what strategies they employ while doing it. Unlike other strategies such as prompting, talking out loud in general does not interfere with task performance (Ericsson & Simon, 1993) for talking continuously becomes a routine after several minutes (Van Someren, Barnard & Sandberg, 1994). The fact that both the recordings and the interview protocols are accessible ensures objectivity. This way, fellow researchers are also free to use the data and come to their own conclusions, increasing the validity of the claims of the researcher.

However, like every research method, the think aloud method also has several cons. The first one is that the content of the long-term memory cannot be verbalized unless it is retrieved (Van Someren, Barnard & Sandberg, 1994). As such, if the problem or case presented to the research subject does not trigger the retrieval of a certain bit of knowledge, whereas the real life situation or a different case perhaps would have triggered the knowledge, a part of the cognitive process may be left undocumented for it was not triggered in the case.

A second problem with the think aloud method is that it is difficult to prompt the participant to keep on talking without interrupting the thought process or altering it and thus risk rendering the data invalid due to disturbance of the cognitive process (Van Someren, Barnard & Sandberg, 1994).

A third issue with the think aloud method is that thinking aloud takes place simultaneously with the thinking itself. As such, thinking something and then saying it slows the cognitive process down, resulting in either a longer cognitive process or in the incompleteness of the data thanks to the research subject not saying everything because his mind is faster than his mouth, causing holes in the data (Ericsson & Simon, 1993).

The fourth problem with the think aloud method, according to Van Someren, Barnard & Sandberg, is invalidity due to problems with the working memory. "If reasoning takes place in verbal form then verbalizing the contents of working memory is easy and uses no capacity of working memory. However, if the information is non-verbal and complicated

then verbalization will not only cost time but also space in working memory because it becomes a cognitive process by itself. This will cause the report of the original process to be incomplete and it can sometimes even disrupt this process” (Van Someren, Barnard & Sandberg, 1994, p.33). As such, this threatens the external validity of the research, for if the case was presented in another form, the findings could have possibly been different.

The final problem with the think aloud method is the coding of the data supplied by the participant. Due to a differences in interpretation, it is possible that one researcher codes one sentence a certain way, whereas another researcher would code it as something entirely different. This limits the inter-coder reliability of the study (Van Someren, Barnard & Sandberg, 1994). This could be due to the fishing and error rate problem. According to Shadish, Cook & Campbell (2002), the fishing and error rate could result in an inaccurate inference about the covariation due to “fishing” for certain effects, pursuing leads suggested by the data and multiple investigators reanalyzing the same data set (Shadish, Cook & Campbell, 2002, p. 48).

At the beginning of the session, the participants were presented with a brief introduction to the think aloud method. To familiarize the participant with the method, they were asked to describe their room while thinking aloud. If the participants had trouble speaking aloud, they were also asked to state how many windows their house had, while speaking aloud. They were presented with a fictional case in which they were going to start a coffee shop called Coffee Inc. and they were faced with ten decision problems one typically encounters when starting a business. The case used in this research is an adapted version of a case used by Sarasvathy in her 2008 work, adapted by Dr. Harms and Stienstra Msc.. The case used in this study can be requested from Stienstra Msc..

The fact that the case actually consists of multiple problems counters one of the cons of the speak aloud method (Van Someren, Barnard & Sandberg, 1994), because it triggers different aspects and as such is likely to trigger what would have been triggered in real life as well.

In total, the students were given two hours to complete the case and they were free to work on it in any way they wanted, providing that they continued to speak their thoughts aloud. As such, they were allowed to use calculators and a pen and paper if they wanted. If the participant forgot to speak their thoughts out loud, they were prompted to continue to do so by the researcher asking them to “please keep on thinking aloud”. Otherwise, the researcher would keep quiet, or as one participant put it so eloquently “basically act like a fly on the wall”.

After having finished the case, the participants were asked several questions regarding the case itself. These questions were used to test whether the interviewer steered the interviewee in a different direction than that they normally would have taken. The questions that were asked during the session can be found in appendix B.

The first question was asked to find out whether or not the case possibly steered the

entrepreneur towards a certain direction. If this occurred often then there could possibly be something wrong with the case, resulting into data that does not necessarily measure what the researcher wants to measure, or think that he/she is measuring. The second question was asked to delve further into the cognitive process of the entrepreneur. It also allows the researcher to understand the reasoning of the entrepreneur. The third question was asked to test whether or not the case was understandable and unambiguous. If the case is ambiguous, the ambiguousness of the case could influence the cognitive processes of the entrepreneur. Due to this, the researcher could end up with data that actually measures something differently from what he/she set out to measure. As such, any ambiguous questions will have to be rephrased until they are no longer ambiguous. The fourth question was asked so that the researcher is able to understand the motivation of the entrepreneur. The fifth question was asked to determine whether experience would change the way the entrepreneur would have acted, given the same situation. The sixth question was asked to rule out time pressure as a mediating variance. The seventh question was asked to rule out whether the data might be incomplete or altered due to the think aloud method and the final question was asked for the same reason.

The questionnaire used in this research is a combination of open ended and closed questions. The majority of the questions used in this questionnaire were already supplied by the EPICC project. The original questionnaire as designed by M. Stienstra Msc. contained questions on general information (such as the interviewer's name, the interviewees' name, code number of the interview, the email address of the interviewee and the name of his/her company/website), some biographic information on the interviewee (such as name, nationality, study program and level, date of birth, experience, etc.), as well as general information on the company and a reflection on the company founded by the interviewee. The reflection part of the questionnaire was originally made by Chandler, DeTienne, McKelvia and Mumford (2011). The interviewee is able to reflect on certain statements using a five point likert scale, ranging from "Do not agree" to "Fully agree". However, seeing as the EPICC project does not specifically focus on the topic of this research, several questions were added to the survey. The questionnaire used can be requested from Stienstra Msc. and contains questions used by Kaish and Gilad in their 1991 article that measure the level of alertness to opportunities in the environment and questions on network integration used by Cooper, Scott and Baggio (2012).

Perhaps something that is interesting to note is that the researcher actually adapted her clothing to appear similar as the participants. Babbie mentioned that all "interviewers should dress in a fashion similar to that of the people they'll be interviewing" (Babbie, 2010, p. 275). This is due to the fact that different styles of dress elicit different styles of responses from people, especially if the style of dress differs vastly from their own (i.e. the interviewer wears a suit whereas the interviewee wears an overall, or the interviewer wears worn clothes whereas the interviewee wears a suit). This is due to the fact that people tend to "regard the way someone dresses and grooms themselves as a sign of that person's attitude and orientation" (Babbie, 2010, p. 276). Originally, the researcher

arrived at the university dressed in a suit, but came back the next day wearing shorts and a t-shirt for students mostly dressed in those items.

The think aloud sessions were recorded and transcribed. The interview protocols were later analyzed and coded, using a coding scheme drawn up by dr. Rainer Harms and Stienstra, Msc..

Trigger question & operationalization into Causal or Effectual indicators

View of the Future	(Causal) P = Prediction of the future: what is being predicted?	(Effectual) C = Creation of the future: what is being created?
(P vs C)	The future can be acceptably predicted on the basis of past experiences (Read et al., 2009, p.3; Sarasvathy & Dew, 2005, p. 390). There is a relationship between past and future (Dew et al., 2009, p. 290; Sarasvathy, 2001, p. 251).	The future can be (co) created (Read et al., 2009, p. 3). The future comes from what people do (not from inevitable trends). You can create a new market. Focus on the extent to which you can control the future, then there is no need to predict the future (Dew et al., 2009, p. 290; Sarasvathy, 2001, p. 251).
Basis for taking action	(Causal) G = Goal-driven: what is the goal, what is the effect?	(Effectual) M = Means-based: what are the means, what are the tools?
(G vs M)	Goal-oriented / growth intention: ends based. Vision of a desired world: goals / effects are given. In the causal frame, goals, even when constrained by limited means, determine sub-goals. Goals determine actions, including which individuals to bring on board.	Means-oriented: start with means: who I know, what I know, who I am. - Who I know: social & professional networks; e.g. family, business school professors. - What I know: personal experience, training, education, expertise. -Who I am: traits (such as trust, risk propensity), tastes and abilities. Goals emerge by imagining courses of action based on given means. Similarly, stakeholders who come on board determine what can be and needs to be done, not vice versa. First possible sub-goals are set; goals emerge through aggregation of sub-goals.
View of Risk resources	(Causal) R = Expected Returns: how much do you need to borrow to reach a predetermined goal?	(Effectual) L = Affordable loss: how much do you and your stakeholders personally have to spend and what are you willing to lose?
(R vs L)	Expected returns: pursue new opportunities based on the (risk-adjusted) expected value. Financials (investments, loans, incubation capital) needed to reach a goal. Causal logic frames the new venture creation problem as one of pursuing the	Affordable loss: private capital (could be 0 euro). Invest what you are willing to/can lose: small bets. Totally in their control. Effectual logic frames the problem as one of pursuing adequately satisfactory opportunities without investing more resources than stakeholders can afford to lose. The focus here

	(risk-adjusted) maximum opportunity and raising required resources to do so. The focus here is on the upside potential.	is on limiting the downside potential.
	Choose multiple market segments to chase the largest expected return.	
Attitude towards outsiders	(Causal) B = Competitive analysis: which competitors are identified and analysed?	(Effectual) A = Use of alliances or partnerships: what sorts of alliances are mentioned?
(B vs A)	<ul style="list-style-type: none"> • Competitors mentioned; expected competition level. • A competitive attitude towards outsiders. Relationships are driven by competitive analysis and the desire to limit ownership of outsiders as far as possible. • Recruiting sales force. • Protect what you have and maximize your share of the opportunity. 	<ul style="list-style-type: none"> • Partnerships: build a network of self-selected stakeholders (not competitive analysis). Realised partnerships and or potential partnerships are discussed. • Through partnerships you are better able to create new markets. Relationships, particularly equity partnerships drive the shape and trajectory of the new venture. • Personally approaching customers. • Both partners acknowledge to share risks and rewards.
Attitude towards unexpected events	(Causal) K = Avoid contingencies: what is done to avoid contingencies/ is there an indication that surprise is bad?	(Effectual) E = embrace contingencies: what is done to leverage contingencies/ is there an indication that surprise is good?
(K vs E)	<ul style="list-style-type: none"> • Surprise is bad. Develop techniques to avoid or prevent surprises from occurring. • Prediction, careful planning and focus enable the firm to minimize the impact of unexpected events. Avoid obstacles. Contingencies are seen as obstacles to be avoided. • No change when confronted with new information, means or surprises. 	<ul style="list-style-type: none"> • Surprise is good. Leveraging/ embracing contingencies, rethinking possibilities, are challenges. Leverage contingencies and even failures, they're not avoided. • Prevent from predictions, imaginative rethinking of possibilities or continual transformations of targets characterize effectual frames. Contingencies, therefore, are seen as opportunities for novel creation- and hence to be leveraged. • Change when confronted with new information, means or surprises.

Table 3: Coding scheme, based on Read et al. (2009), Sarasvathy (2001), Dew et al. (2009), Read, Song and Smit (2009), Sarasvathy and Dew, (2005,) in Sarasvathy (2008, p. 55).

The interview protocols were coded twice, first by the author, and three were later on coded by Martin Stienstra, Msc.. The inter-rator reliability in this study was assessed using Cohen's kappa. Seeing as this research is also part of the EPICC program, the inter-rator reliability has to be between 0.61 and 0.80, meaning that there has to be substantial agreement between the inter-rators (Fleiss, 1981). Given the fact that coding an interview is quite time consuming, only three interviews were coded by Martin Stienstra, whereas all interviews were coded by the author. Even though a sample of three is relatively small,

the kappa coefficient should be representative of the whole dataset (Hallgren, 2012).

The Cohen's kappa coefficient was calculated with the following equation:

$$\kappa = \frac{\text{Pr}(a) - \text{Pr}(e)}{1 - \text{Pr}(e)},$$

The K in this formula is the kappa. Pr (a) stands for the percentage of agreement between the coders and Pr (e) stands for the percentage of agreement that could have been expected due to chance (Hallgren, 2012).

Seeing as multiple codes were used in this study, both causal and effectual codes and several sub-sets that belong to those two groups, it was decided to measure the similarities in codes of both the causal and effectual codes, to make sure that both coders agreed on the two major groups.

Starting off with effectuation, the first coder coded 25 effectual processes out of a total of 52 processes counted, whereas the second coder coded 21 effectual processes out of a total of 50 processes. Pr (a) – Pr (e) will first be calculated separately.

Pr (a) was calculated by calculating the agreement in regards to causation scores and effectuation scores over the three interviews coded by both coders. In regards to effectuation, coder 1 (the author) counted a total of 91 codes whereas coder two (Martin Stienstra, Msc.) counted a total of 74 codes. $74/91 = 0.81\dots$ In regards to causation, coder one counted 110 codes whereas coder two counted 96. $96/110 = 0.87$. The mean was taken of both scores : $(0.87+0.81)/2 = 0.84$.

Pr (e) was split up in two different parts, namely the probability of agreeing on effectuation due to chance, which was calculated as $(25/52) \times (21/50) = 0.202$ and the probability of agreeing on causation due to chance was calculated as $(1-(25/52)) \times (1-(21/50)) = 0.301$. After adding these two numbers up, the total probability of chance, Pr (e) = $0.202 + 0.301 = 0.503$.

As such, the whole equation can be filled out, resulting in Cohen's kappa coefficient = $(0.84-0.503) / (1-0.503) = 0,678$.

3.4. Data analysis methods used.

In order to test the hypotheses posited in this study, the frequency of the different codes were counted. As such, it will become clear how many times a participant expressed causal reasoning and how many times he or she expressed effectual thoughts when challenged with a certain problem. Overall, by adding up all the causal counts, you can compare them with the effectual counts and see whether someone was more inclined to use one type of reasoning over the other, and when. Percentages will also be calculated for all of the codes by dividing the amounts attributed to that code with the total amount of codes (numbers) attributed.

Hypotheses 1-4 will also be tested using an independent-samples t-test seeing as the independent-samples t-test is commonly used to compare the means between two groups (Huizingh, 2007). For hypotheses 1a and 1b, the means of causal and effectual logic will once again be used. Hypotheses 2-4 however required a different approach. For H2, every code attribute to affordable loss was divided by the total amount of codes attributed, resulting in the mean of affordable loss. The same was then done to the codes attributed to expected return, avoid contingencies, embracing contingencies, competitive analysis and alliances, resulting in the means of those variables. They were then tested with their respective independent variable and the results can be found under section 4, results.

Hypotheses 5, regarding background of the education that they received, will be tested using an univariate analysis of variance test, also known as ANCOVA (field, 2012). All codes attributed will be tested once more using education as the independent variable in order to see whether education influences whether one prefers competitive analyses over alliances for instance. The sample will be split up in two groups, one group that has a business background and another that has not. The results of the different tests can be found in section 4, results.

3.5. Control variable.

In this study, one variable served as control variables, namely the Chandler scale (Chandler et al, 2011). The Chandler test will be tested using a paired sample test in which the mean of effectual scores (case) will be paired with the mean of the effectual scores (survey) and the mean of causal scores (case) will be paired with the mean of the causal scores (survey). A paired T-test is used because it determines whether the means of two groups are equal. It is commonly used to find out whether (on average) respondents have changed their opinions on something (Huizingh, 2007). As such, a paired t-test will be used to determine whether the answers given in regards to the case are representative of what a student normally would have done when faced with that problem.

4. Results.

In section 4.1., 4.2. and 4.3., the mean shares for the variables family (financial) resources and family business background will be tested using independent sample T-tests. The overall results of the independent sample T-test indicate that there is no statistically significant difference between the tested groups.

4.1. Families' financial resources and the decision-making process.

In this part the effects of one's family financial resources on the decision-making process will be analysed. Both H1a, that "entrepreneurs that have more than average amounts of family financial resources are more likely to rely on causal logic when making entrepreneurial decisions" and H1b, that "entrepreneurs that have less than average amounts of family financial resources are more likely to rely on effectual logic when making entrepreneurial decisions." posit claims in regards to the effect of one's family's financial resources on the decision-making process. As such, an independent-sample t-test was computed in SPSS using the total amount of codes attributed to causation divided by the total amount of codes attributed (share % causation) and the total amount of codes attributed to effectuation divided by the total amount of codes attributed (share % effectuation) as the depended variables and one's family's financial resources as the independent variable. The results regarding H1a are shown in table 4.

Group Statistics					
	Parent Income	N	Mean	Std. Deviation	Std. Error Mean
Share causation (%) total	Middle Half	13	.5508	.09023	.02502
	Upper Quartile	3	.5333	.15695	.09062
Share effectuation (%) total	Middle Half	13	.4492	.09023	.02502
	Upper Quartile	3	.4667	.15695	.09062

Independent Samples Test						
		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Share causation (%) total	Equal variances assumed	1,972	.182	.266	14	.794
	Equal variances not assumed			.185	2,314	.868
Share effectuation (%) total	Equal variances assumed	1,972	.182	-.266	14	.794
	Equal variances not assumed			-.185	2,314	.868

Independent Samples Test					
		t-test for Equality of Means			
		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
				Lower	Upper
Share causation (%) total	Equal variances assumed	.01744	.06562	-.12331	.15819
	Equal variances not assumed	.01744	.09401	-.33869	.37356
Share effectuation (%) total	Equal variances assumed	-.01744	.06562	-.15819	.12331
	Equal variances not assumed	-.01744	.09401	-.37356	.33869

Table 4: the effect of more than average family financial resources on entrepreneurial decision-making.

13 participants mentioned that their parents earning would fall in the middle half of what people normally earn in the USA and only three mention that their parent's earnings would place them in the upper quarter. Levene's test is greater than the p-value of 0.05 so the variances between the two groups can be assumed to be equal. The significance under Sig. (2-tailed) is 0,794, which is much greater than the p-value of 0.05. As such, H1a was rejected.

The results in regards to H1b can be found in table 5.

Group Statistics					
	Parent Income	N	Mean	Std. Deviation	Std. Error Mean
Share causation (%) total	Lower Quartile	1	.5300	.	.
	Middle Half	13	.5508	.09023	.02502
Share effectuation (%) total	Lower Quartile	1	.4700	.	.
	Middle Half	13	.4492	.09023	.02502

Independent Samples Test						
		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Share causation (%) total	Equal variances assumed	.	.	-.222	12	.828
	Equal variances not assumed			.	.	.
Share effectuation (%) total	Equal variances assumed	.	.	.222	12	.828
	Equal variances not assumed			.	.	.

Independent Samples Test					
		t-test for Equality of Means			
		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
				Lower	Upper
Share causation (%) total	Equal variances assumed	-.02077	.09363	-.22478	.18324
	Equal variances not assumed	-.02077	.	.	.
Share effectuation (%) total	Equal variances assumed	.02077	.09363	-.18324	.22478
	Equal variances not assumed	.02077	.	.	.

Table 5: the effects of less than average family financial resources on entrepreneurial decision-making processes.

Of all 17 participants, just one student mentioned that their parents' earnings would fall in the lower quartile. The Sig. (2-tailed) is 0,828, which is much larger than the p-value of 0.05. As such, H1b was rejected. However, given the small amount of participants that fall under the lower quartile, it would be best to research whether the same findings hold when using a larger sample that has more participants that fall under that variable.

4.2. Entrepreneurial parents and their effect on the decision-making process

Three hypotheses were drawn up in regards to entrepreneurial parents and their effect on the entrepreneurial decision-making process, namely H2, “entrepreneurs with entrepreneurial parents are more likely to use affordable loss heuristics than expected return heuristics when making entrepreneurial decisions.”, H3, “entrepreneurs that have entrepreneurial parents are more likely going to avoid contingencies rather than embrace them when making business decisions”, and H4, “entrepreneurs that have entrepreneurial parents are more likely to employ competitive analyses rather than use alliances or partnerships”.

In order to test H2, an independent-sample t-test was done, of which the results can be found in table 6.

Group Statistics					
	Family Background	N	Mean	Std. Deviation	Std. Error Mean
L codes / total amount of codes attributed	>= 2	9	.1011	.03951	.01317
	< 2	8	.0900	.04309	.01524
R codes / total amount of codes attributed	>= 2	9	.1211	.05326	.01775
	< 2	8	.1663	.07130	.02521

Independent Samples Test						
		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
L codes / total amount of codes attributed	Equal variances assumed	.071	.793	.555	15	.587
	Equal variances not assumed			.552	14,356	.590
R codes / total amount of codes attributed	Equal variances assumed	.360	.558	-1,490	15	.157
	Equal variances not assumed			-1,464	12,890	.167

Independent Samples Test					
		t-test for Equality of Means			
		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
				Lower	Upper
L codes / total amount of codes attributed	Equal variances assumed	.01111	.02003	-.03158	.05380
	Equal variances not assumed	.01111	.02014	-.03198	.05421
R codes / total amount of codes attributed	Equal variances assumed	-.04514	.03029	-.10969	.01942
	Equal variances not assumed	-.04514	.03083	-.11181	.02153

Table 6: the influence of entrepreneurial parents on L or R.

Levene's test shows that the variance between the two groups can be assumed to be equal for it is greater than 0.05. The p-value that can be found in the table (Shown under sig 2-tailed), respectively 0,578 and 0,187 are both more extreme than the critical value 0,05. As such, H2 was rejected for it was not supported by the evidence provided by this study.

The results of the independent-samples t-test done to either reject or support H3 can be found in table 7.

Group Statistics					
	Family Background	N	Mean	Std. Deviation	Std. Error Mean
K codes / total amount of codes attributed	>= 2	9	.1044	.02555	.00852
	< 2	8	.0938	.04274	.01511
E_e codes / total amount of codes attributed	>= 2	9	.0656	.03909	.01303
	< 2	8	.0563	.04809	.01700

Independent Samples Test						
		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
K codes / total amount of codes attributed	Equal variances assumed	2,182	.160	.635	15	.535
	Equal variances not assumed			.617	11,167	.550
E_e codes / total amount of codes attributed	Equal variances assumed	.154	.700	.440	15	.666
	Equal variances not assumed			.434	13,548	.671

Independent Samples Test						
		t-test for Equality of Means				
		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
				Lower	Upper	
K codes / total amount of codes attributed	Equal variances assumed	.01069	.01684	-.02519	.04658	
	Equal variances not assumed	.01069	.01735	-.02741	.04880	
E_e codes / total amount of codes attributed	Equal variances assumed	.00931	.02115	-.03577	.05438	
	Equal variances not assumed	.00931	.02142	-.03678	.05539	

Table 7: Influence entrepreneurial parents on K and E

Levene's score is greater than the p-value of 0,05 (respectively 0,160 and 0,700) and as such the variances are assumed to be equal. H3 was rejected for both values under Sig (2-tailed) are greater than 0,05.

Group Statistics					
	Family Background	N	Mean	Std. Deviation	Std. Error Mean
B codes / total amount of codes attributed	>= 2	9	,1067	,04743	,01581
	< 2	8	,1488	,05643	,01995
A codes / total amount of codes attributed	>= 2	9	,0522	,02774	,00925
	< 2	8	,0463	,03815	,01349

Independent Samples Test						
		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
B codes / total amount of codes attributed	Equal variances assumed	1,007	,332	-1,671	15	,115
	Equal variances not assumed			-1,653	13,794	,121
A codes / total amount of codes attributed	Equal variances assumed	,696	,417	,372	15	,715
	Equal variances not assumed			,365	12,676	,721

Independent Samples Test					
		t-test for Equality of Means			
		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
				Lower	Upper
B codes / total amount of codes attributed	Equal variances assumed	-,04208	,02518	-,09576	,01159
	Equal variances not assumed	-,04208	,02546	-,09676	,01259
A codes / total amount of codes attributed	Equal variances assumed	,00597	,01604	-,02821	,04016
	Equal variances not assumed	,00597	,01635	-,02945	,04139

Table 8: Influence entrepreneurial parents on B vs A.

Once again Levene's test shows that the variances can be assumed to be equal. Seeing as the numbers under Sig. (2-tailed) are 0,115 and 0,715 respectively, H4 has to be rejected for both numbers are greater than the critical value 0.05.

As such, whether someone has an entrepreneurial parent does not influence one's preference for affordable loss heuristics over risk-taking heuristics, nor does it influence whether one prefers to embrace contingencies instead of avoiding them or whether one thinks more in terms of competitors instead of possible alliances.

4.3. Education and its influence on entrepreneurial decision-making process.

First of all, an univariate analysis of variance test was done to determine whether or not education could be ruled out as a third variable. The results are shown in table 9.

Between-Subjects Factors			
		Value Label	N
Study Background	1,00	Business Study	9
	2,00	Social Sciences	1
	4,00	Engineering- non IT	1
	5,00	Natural Sciences	1
	6,00	Other	5
Family Background	1	Entrepreneur / self employed	8
	2	Private Company	4
	3	Public servant	3
	4	other	1
	5		1

Tests of Between-Subjects Effects					
Dependent Variable: Share effectuation (%) total					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.097 ^a	8	.012	1,914	.189
Intercept	2,337	1	2,337	368,200	.000
Background New	.019	3	.006	1,012	.437
Subject family background	.042	3	.014	2,183	.168
Background New * Subject family background	.000	1	.000	.044	.838
Error	.051	8	.006		
Total	3,645	17			
Corrected Total	.148	16			

a. R Squared = .657 (Adjusted R Squared = .314)

Table 9: Univariate analysis of variation on family and study background

The table shows that neither family background and/or study background significantly influence the share of effectuation codes attributed. However, seeing as study background could be divided into two types of groups, namely people that have a business background and people that don't have a business background, an independent-samples t-test was done to determine whether Drew et al.'s claim hold that MBA students tend to favour causation over effectuation. In the independent-samples t-test, the sample was split up into two groups. The first group is the group currently studying a business related study. The second group holds all participants who are currently studying at Berry college but major in something other than business. The means of the causal scores and effectual scores of both groups were analysed to determine whether a significant different between the two groups could be found.

Group Statistics					
	Study Background	N	Mean	Std. Deviation	Std. Error Mean
Share causation (%) total	>= 2,00	8	.4913	.06490	.02295
	< 2,00	9	.5956	.09515	.03172
Share effectuation (%) total	>= 2,00	8	.5088	.06490	.02295
	< 2,00	9	.4044	.09515	.03172

Independent Samples Test						
		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Share causation (%) total	Equal variances assumed	1,677	.215	-2,604	15	.020
	Equal variances not assumed			-2,665	14,140	.018
Share effectuation (%) total	Equal variances assumed	1,677	.215	2,604	15	.020
	Equal variances not assumed			2,665	14,140	.018

Independent Samples Test					
		t-test for Equality of Means			
		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
				Lower	Upper
Share causation (%) total	Equal variances assumed	-.10431	.04005	-.18967	-.01894
	Equal variances not assumed	-.10431	.03915	-.18819	-.02042
Share effectuation (%) total	Equal variances assumed	.10431	.04005	.01894	.18967
	Equal variances not assumed	.10431	.03915	.02042	.18819

Table 10: the difference in means contributed to a different study background.

Levene's test has a significant value greater than the p-value of 0.05 so the variances can be assumed to be equal. Sig. (2-tailed) shows that the difference between the two scores of causation is significant for 0.02 is smaller than 0.05, the critical value. As such, it shows that those with a business background are more inclined to use causal decision-making processes than their peers that do not study business and hypothesis 5 can't be rejected.

The test also shows that students that do not study business are more inclined to use effectual decision-making processes for sig (2-tailed) is also 0.02, which is smaller than the critical value 0.05. As such, it is unlikely that the differences between the means are caused by simple variations in answers. This supports what Drew et al.'s claim that MBA students tend to favour causation over effectuation. However, when testing the different dimensions of causation and effectuation separately, no significant difference between the groups can be found in regards to all separate codes. As such, further research should be done on why the total share of effectuation and causation differs significantly when no significant difference can be found when breaking the sample down into the coding used

in this study. Perhaps another currently unknown factor is influencing the results. An overview of the significance levels of all the individual codes tested using education as the independent variable can be found in Appendix C.

4.4. Control variable Chandler scale.

A paired t-test was done to determine whether what the participants said in during the interview corresponds with what they filled in in the survey.

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Share effectuation (%) total	.4343	14	.09419	.02517
	Share effectual answers vs m	.5657	14	.14206	.03797
Pair 2	Share causation (%) total	.5657	14	.09419	.02517
	Share causal answers vsm	.4343	14	.16085	.04299

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Share effectuation (%) total & Share effectual answers vsm	14	.102	.730
Pair 2	Share causation (%) total & Share causal answers vsm	14	.161	.583

Paired Samples Test							
		Paired Differences					t
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		
					Lower	Upper	
Pair 1	Share effectuation (%) total - Share effectual answers vsm	-.13143	.16228	.04337	-.22513	-.03773	-3,030
Pair 2	Share causation (%) total - Share causal answers vsm	.13143	.17284	.04619	.03163	.23123	2,845

Paired Samples Test			
		df	Sig. (2-tailed)
Pair 1	Share effectuation (%) total - Share effectual answers vsm	13	.010
Pair 2	Share causation (%) total - Share causal answers vsm	13	.014

Table 11: Chandler scale as controle variable

The table shows that the answers given during the interview were slightly less effectual than the answers given on the survey, however, the findings of this test were not significant. As such, the findings of this study cannot be rejected due to differences caused by perhaps the speak aloud method. However, seeing as some participants (3) did not fill

in the questions pertaining to the Chandler scale, it is doubtful whether the same results would have been found if they had filled them out.

5. Discussion, conclusion and limitations.

5.1. Conclusion

The goal of this study was to shed more light on how family resources, having entrepreneurial parents and education influence the entrepreneurial decision-making processes when setting up a new venture. Based on the theoretical research done in this study, several hypotheses were drawn up in regards to how the variables mentioned above influence the entrepreneurial decision-making process when setting up a new venture. Seventeen students participated in this study in order to gather the data necessary to either support or reject the hypotheses. After analysing the results, it was found that four out of five hypotheses had to be rejected due to the lack of evidence provided by this study. Below, all hypotheses will be covered and discussed in depth.

5.1.1. Family resources

Read and Sarasvathy claimed in their 2005 article that the more resources one has available, the more likely one is to use the causal decision-making process. The data gathered in this study does not support that claim. This might be due to the fact that this study only measured the influence of financial resources and not the other resources that were listed by Aldrich and Cliff (2003). As such, future research should be done on whether for instance time invested by family members in the venture influences the decision-making processes of the participants for the more time one spends with someone, the more chances and time one has to influence how one thinks and approaches problems. Furthermore, this study was done at Berry college, a college that is relatively expensive for one looking to earn a degree. This shows in that hardly anyone's parents earning less than the mean income of the USA. As such, it is doubtful how representative this study is and future research could perhaps best also include samples from state universities for the tuition fee to that universities and colleges is quite a lot lower than that of Berry college.

5.1.2. Family background.

This study also researched whether the family background of an entrepreneur, focusing on whether one of his/her parents has entrepreneurial experience, influences the decision-making process of an entrepreneur. The data gathered in this study did not support hypotheses two to four, meaning that having an entrepreneurial parent does not influence the decision-making process of an entrepreneur, at least in regards to affordable loss versus expected return, avoiding contingencies versus embracing contingencies and employing competitive analysis versus using alliances. Another test was done to determine whether having entrepreneurial parents influenced the entrepreneurial decision-making process on the remaining codes and it was found that they did not influence whether someone employed mean-oriented reasoning or goal-oriented reasoning or thought that the future could be projected or was something that is

influenced by multiple actors. This differs with the findings of Shao in his 2012 study, that entrepreneurs with an entrepreneurial family background are more likely to employ mean-oriented reasoning. This difference between the two studies might be due to cultural differences and future research should be done to determine whether culture truly is the cause of this difference.

5.1.3. Education.

The data gathered in this study showed that entrepreneurs that do not study business are more inclined to use effectual decision-making processes. This is in line with Drew et al.'s 2009 claim that MBA students tend to favour causation over effectuation. However, when testing the different dimensions of causation and effectuation, no significant difference between the groups can be found in regards to all separate codes. As such, further research should be done on why the total share of effectuation and causation differs significantly when no significant difference can be found when breaking the sample down into the coding used in this study. A future study should perhaps research whether the gender of an entrepreneur possibly influences the relationship between the decision-making process, one's family's background and one's education.

5.1.4. Implications for practice

The goal of this study was to determine to what extent the factors family resources, family business background and education influence entrepreneurs in regards to their entrepreneurial decision-making. Although only a relationship was found between education and effectuation and not on the separate factors, entrepreneurs and researchers should be aware that these results might not hold true in a different country. Entrepreneurs and researchers should also be aware that an unknown factor might also be influencing whether someone uses effectual or causal processes during entrepreneurial decision-making. As such future research is recommended in regards to education and effectuation.

Seeing as the findings of Shao (2012) do not correspond with the findings of this study, it perhaps would be interested to research whether this difference between these two studies could be attributed to cultural differences. As such, future research is recommended in regards to cultural differences and the effects on one's preference on effectual processes versus causal processes.

Further research is also recommended in regards to the affects of all family resources as mentioned by Aldrich & Cliff (2003) on one's preference on one type of process over the other. Even though the hypothesis in regards to family (financial) resources could not be supported, it remains unclear whether the same holds true for the all the other factors that encompass the concept "family resources".

Furthermore, more awareness should be raised on the topic of both effectuation and causation. Different does not necessarily have to mean wrong, and even though it is not taught in most business schools, MBA students should not be afraid to utilize effectual processes for they've proven to be quite beneficial to experienced entrepreneurs.

5.2. Limitations

Like all research, this study has several limitations that need to be discussed and considered. The first and major limitation of this study is that almost all of the participants are either nascent entrepreneurs that are trying to start their business or entrepreneurs that are still in the start-up stage of starting a business. This could have possibly influenced the outcome of this study for Sarasvathy (2001) indicated effectual logic is used heavily in the start-up stage of starting a business, whereas causal logic becomes necessary as the organization grows. As such, a longitudinal follow-up study is necessary to truly map the influences of family resources and family background on entrepreneurial decision-making processes.

Secondly, if more experienced entrepreneurs were included in this research, the data in this study would have most likely been more effectual than causal for Sarasvathy also found that more experienced entrepreneurs usually more heavily rely on effectual decision-making processes.

Thirdly, the sample itself of this study is rather small, giving the study low statistical power (Shadish, Cook and Campbell, 2002). The time it took to complete the case, answer the interview questions and fill in the survey is also a threat to this study's validity for it appears that two hours is long enough for people to start getting bored or agitated, leading to them rushing through the remaining part of the study. As such, it is doubtful whether the study truly obtains correct measures on what it set out to measure. However, seeing as the study uses multiple groups to test the hypotheses, the assumption can be made that both groups mature at the same time, meaning that both groups become bored around the same time and start rushing things. As such, maturation isn't really a threat to the validity of this study.

The generalizationability of this study is not that high for it remains unclear how representative the sample of this study is in regards to the total population of student-entrepreneurs starting companies or working in their own start-ups, seeing as Berry college is a relatively expensive institution and not all student-entrepreneurs are lucky enough to either have parents that can afford the tuition fees, are able to work for them themselves or are able to fund them through other ways. As such, a future study could perhaps do research at both a more expensive institution and at a state owned college/university.

Another threat in regards to the validity of this study is the unreliability of measurements due to the fact that the codes were attributed to what a participant said based on the interpretation of the researcher of what was said. This was partially countered by making sure that that was a significant overlap between the codes attributed to the interviews by two separate people coding the interviews, namely more than 65%. The inter-rator reliability of this study was 68%, which means that the codes attributed were sufficiently similar, yet it does not look at the individual coding but at the total amounts of codes attributed to either effectuation and causation. As such, the coding could still significantly differ causing perhaps an unreliability of measurements.

Extraneous Variance in the Experimental Setting is also a threat in regards to the statistical conclusion validity of this study for two researchers did research at Berry college at the same time and shared an office in which the interviews took place. Although the researchers both occupied a different office, one office was build within the other office, making it so that sometimes participants disturbed each other when entering or leaving one of the offices. This however was kept to a minimum by rescheduling the interviews.

The novelty of the speak aloud method was also a threat to the validity of this study. This threat however was minimized by practising the speak aloud method several times before actually starting on the case, so that the disruptive effect of using a new method could not possibly be an explanation for any differences found between the two groups compared.

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Appendix A: A total summary of the characteristics of the participants in this study.

Characteristics of the sample	Male	Female	Total
Number of interviewees	9	8	17
Years of university education : 1 year	-	1	1
Years of university education : 2 years	1	3	4
Years of university education : 3 years	6	2	8
Years of university education: 4 years	2	2	4
Average amount of years of working experience	6,56 years	3.5 years	
Amount of business students (marketing, management, finance, accounting)	3	4	7
Other study programs (specified)	2	1	3
Unspecified	3	2	5
Average amount of years of working experience	6,55 years	3,5 years	
Average amount of years of working experience outside own company (excluding side jobs).	0,44 years	1,12 years	
Amount of participants that have at least 1 entrepreneurial parent	4	5	9

Table 12: a total summary of the characteristics of the participants in this study.

Appendix B:

1. Did you, at any point of time during the case, want to choose a direction that was specified in the case itself?
2. If so, could you explain a bit more about your alternatives and why you wanted to choose them? Could you also explain why you did not choose some of the alternatives that you mentioned?
3. During the case, did you ever think or felt that you could not continue with the case due to missing background information, ambiguous questions or possible other reasons? If so, how did you solve this? How did you proceed?
4. Could you provide us with a short summary of your motives for setting up a coffee company the way you did?
5. If you had to do the case again, would you change anything? If so, what would you change?
6. Was there enough time to complete the case?
7. Did you experience any difficulties with speaking aloud as you progressed through the case?
8. Do you feel like you've been able to express your thoughts complete and correctly?

Appendix C: An overview of the significance levels of all the individual codes tested using education as the independent variable.

Group Statistics					
	Study Background	N	Mean	Std. Deviation	Std. Error Mean
P codes / total amount of codes attributed	>= 2,00	8	<u>.0913</u>	<u>.03720</u>	<u>.01315</u>
	< 2,00	9	<u>.1000</u>	<u>.06519</u>	<u>.02173</u>
C codes / total amount of codes attributed	>= 2,00	8	<u>.0375</u>	<u>.03732</u>	<u>.01319</u>
	< 2,00	9	<u>.0400</u>	<u>.04062</u>	<u>.01354</u>
M codes / total amount of codes attributed	>= 2,00	8	<u>.2538</u>	<u>.07347</u>	<u>.02598</u>
	< 2,00	9	<u>.1867</u>	<u>.10404</u>	<u>.03468</u>
G codes / total amount of codes attributed	>= 2,00	8	<u>.0838</u>	<u>.04241</u>	<u>.01499</u>
	< 2,00	9	<u>.1000</u>	<u>.04583</u>	<u>.01528</u>
L codes / total amount of codes attributed	>= 2,00	8	<u>.1013</u>	<u>.03271</u>	<u>.01156</u>
	< 2,00	9	<u>.0911</u>	<u>.04755</u>	<u>.01585</u>
R codes / total amount of codes attributed	>= 2,00	8	<u>.1363</u>	<u>.05449</u>	<u>.01927</u>
	< 2,00	9	<u>.1478</u>	<u>.07546</u>	<u>.02515</u>
E_e codes / total amount of codes attributed	>= 2,00	8	<u>.0588</u>	<u>.02748</u>	<u>.00972</u>
	< 2,00	9	<u>.0633</u>	<u>.05408</u>	<u>.01803</u>
K codes / total amount of codes attributed	>= 2,00	8	<u>.0950</u>	<u>.01773</u>	<u>.00627</u>
	< 2,00	9	<u>.1033</u>	<u>.04472</u>	<u>.01491</u>
B codes / total amount of codes attributed	>= 2,00	8	<u>.1063</u>	<u>.05069</u>	<u>.01792</u>
	< 2,00	9	<u>.1444</u>	<u>.05434</u>	<u>.01811</u>
A codes / total amount of codes attributed	>= 2,00	8	<u>.0538</u>	<u>.02669</u>	<u>.00944</u>
	< 2,00	9	<u>.0456</u>	<u>.03745</u>	<u>.01248</u>

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
P codes / total amount of codes attributed	Equal variances assumed	3,346	.087	-.334	15	.743
	Equal variances not assumed			-.344	12,949	.736
C codes / total amount of codes attributed	Equal variances assumed	.006	.939	-.132	15	.897
	Equal variances not assumed			-.132	14,975	.897
M codes / total amount of codes attributed	Equal variances assumed	.558	.467	1,516	15	.150
	Equal variances not assumed			1,548	14,337	.143
G codes / total amount of codes attributed	Equal variances assumed	.200	.661	-.756	15	.462
	Equal variances not assumed			-.759	14,965	.460
L codes / total amount of codes attributed	Equal variances assumed	.958	.343	.505	15	.621
	Equal variances not assumed			.517	14,188	.613
R codes / total amount of codes attributed	Equal variances assumed	.444	.515	-.357	15	.726
	Equal variances not assumed			-.364	14,455	.721
E_e codes / total amount of codes attributed	Equal variances assumed	6,300	.024	-.216	15	.832
	Equal variances not assumed			-.224	12,151	.827
K codes / total amount of codes attributed	Equal variances assumed	11,957	.004	-.492	15	.630
	Equal variances not assumed			-.515	10,697	.617
B codes / total amount of codes attributed	Equal variances assumed	.630	.440	-1,492	15	.156
	Equal variances not assumed			-1,499	14,953	.155
A codes / total amount of codes attributed	Equal variances assumed	.823	.379	.513	15	.615
	Equal variances not assumed			.524	14,386	.609

Table 13: An overview of the significance level of all codes tested using education as the independent variable.