The influence of a higher education on the use of effectuation and causation; a study among Dutch expert entrepreneurs.

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Bachelor's thesis Business administration

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Abstract

This thesis is a spin-off of the EPICC Project and researches to which extent the educational level expert entrepreneurs have of influence on how they think. A case containing ten business related problems is used to conduct think aloud protocols from 16 Dutch expert entrepreneurs. The effectuation theory of Sarasvathy is used as a framework on which the coding scheme is based. The protocols are coded into the opposing categories of causation (focus on goals) and respectively effectuation (focus on means). We come with several propositions that are predominantly based on the research of Dew et al. (2009a).

The data shows there is no correlation between age/years of experience and effectuation. If an entrepreneur meets the 'expert entrepreneur' criteria it does not matter how old he/she is or how many years of experience he has. In our sample all the expert entrepreneurs who have had a higher education favor effectual thinking. The same goes for the kind of higher education the entrepreneurs has enjoyed; whether the entrepreneur attended an HBO school or a university does not seem to matter, all entrepreneurs favor effectual thinking.

Acknoledgements

This thesis could not have been written without the participation of the 16 expert entrepreneurs that have all helped me out of goodwill. So first of all I would like to sincerely thank them all for sacrificing their valuable spare time and allowing me to conduct the think aloud protocols.

I would also like to thank my supervisors at the University of Twente; M.R. Stienstra, MSc. and DR. M.L. Ehrenhard. Both of them helped me write and improve this thesis.

Last but certainly not least I would like to thank my parents for supporting me. I would like to dedicate this thesis to them in honour of their unconditional support. I would not have finished my bachelor without you and I'm truly grateful that I did. Thank you both.

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1. Introduction

1.1 Background

Steve Jobs (Apple), Gabe Newell (Valve), Mark Zuckerberg (Facebook); all these men are high school or college-dropouts that became billionaire entrepreneurs. How did these men achieve what they have achieved? Autobiographies of these self-made billionaires are bestsellers and all the media coverage makes it seem like many entrepreneurs became highly successful with (almost) no formal education. This raises the question whether it only seems like a formal education does not benefit success or whether it might actually have a negative influence on success. This is the question that will be addressed in this thesis.

During the first few post-war decades the economies of North America and OECD Europe were dominated by the factors capital and labour. These factors were combined in large scale production plants that dominated the business world until the arrival of the 1990s (Thurik, 2008). Chandler (1993) characterized this era as 'the managed economy'. It is argued that with the end of the managed economy a 'new economy' has risen, namely 'the entrepreneurial economy' (Audretsch & Thurik, 2001). In this new type of economy knowledge is added as another central factor and Audretsch and Thurik (2001, p. 5) argue that due to different people evaluating knowledge in different ways, new and small firms have an increased role in the economy. New and small firms are the domain of entrepreneurs who have been increasingly present in both literature and the business world. Take for example Lusch and Vargo (2006) who published a ground-breaking article on Service-Dominant logic; a model that describes how marketing theory is evolving from a product-centred view of markets, to a service-centred view. This model of S-D logic suggests that organisations exist because entrepreneurs have the skills to envision services that people want to have. The entrepreneur will then gather and pay micro-specialists so their knowledge can be integrated to provide said service. In this sense entrepreneurial spirit and the skills of both individual and groups of cooperating entrepreneurs are one of the most important resources in a society and its economy. Since Schumpeter (1942) has introduced the concept of 'creative destruction' entrepreneurship has been affiliated with economic growth. Through generating new ideas and business concepts, recognizing opportunities when they arise and taking risks while exploiting their ideas, entrepreneurs create wealth (Wennekers & Thurik, 1999). Nowadays this view, that entrepreneurship is a key component of our economy, is a widely accepted (Robert A. Baron, 1998).

Through the years the field of entrepreneurship studies has grown. In the late 1990s the academic world was gradually starting to accept that entrepreneurship was not un-teachable; which was the established understanding up until then. This caused a rapid rise of entrepreneurship courses being taught at universities and graduate schools. In 1999 a total

of 170 universities were offering entrepreneurship courses while 3 years earlier, in 1996, less than half of those existed (Brown, 1999b).
This continuing interest in entrepreneurship also entailed a growth in the entrepreneurship literature. Through the years researchers have tried to unveil the black box of entrepreneurship by approaching the subject in many different ways. Several studies have tried to answer psychological questions such as: 'How come certain people see opportunities others do not?', 'Why do some people take the plunge?' (Shaver & Scott, 1991). Entrepreneurship has also been studied through a cognitive lens; do the cognitive processes of entrepreneurs differ from those of 'ordinary' people and can you train your cognition to recognise (business) opportunities (Robert A Baron, 1998); (Perry, Chandler, & Markova, 2012a). There have also been studies that tried to identify the differences in personality traits between entrepreneurs and 'ordinary' people (Bygrave, 1989); (Llewellyn & Wilson, 2003) these studies were unable to find unifying personality characteristics that predict who will become a successful entrepreneur (Hatten, 2011, p. 32).

'Entrepreneurial processes' is yet another field within entrepreneurship research. Moroz and Hindle (2012) published a meta-analysis of entrepreneurial process models. Their main research question is: *"What is both generic and distinct about entrepreneurship as a process?"* This is a question that could resolve many issues concerning the nature of the field of entrepreneurship. They argue that in order to determine whether entrepreneurship really differs from other phenomena (e.g. leadership or management) in our world, it has to have activities that are both generic (they <u>always</u> happen during entrepreneurial activities) as well as distinct to entrepreneurship (they <u>never</u> happen in other processes). Without a core process that is both generic and distinct to what we call entrepreneurship, it would not be entrepreneurship, it could either be unrelated activities that we amalgamated and labelled entrepreneurship, or it could be a set of connected activities that could just as well be labelled anything different from 'entrepreneurship'. In layman's terms; we all talk about entrepreneurship but there is no consensus on how we define it and how it takes shape.
A huge strength of their study is the fact that their research covered every peer-reviewed and published entrepreneurial-process model available at the time of writing. Their research sample consisted of 32 entrepreneurial models. After examination they found that; 20 models were conceptual constructs, only 12 models were based on or compared with empirical evidence and only 3 out of these 12 were based on both qualitative and quantitative work. 7 Of the 32 models explicitly stated practical implications for the research conducted and out of the models that were classified as 'general' (14 studies), no more than 5 were found to have a 'high' exploratory power. Out of the initial 32 models 4 were selected for an in-depth analysis; Gartner (1985), Shane (2003), Sarsvathy (2001a) and Bruyat & Julien (2001). What is important to note right off the bat is that they conclude their article by saying the most important result of their study is; there is no existing model of entrepreneurship that consists of activities that are both generic and distinct to the field:

"Nearly every entrepreneurial process model is its own … For all the superficial use of the phrase "entrepreneurial process" all we really have, to date, is a hodgepodge of different perspectives, using a variety of different multidisciplinary theories that investigate entrepreneurship in narrowly themed contexts (Moroz & Hindle, 2012, p. 810)."

Notwithstanding the disunity, there is convergence on six important items. All 4 models contain concepts and constructs that they consider essential pieces of the entrepreneurial progress. First there is the relationship between opportunity and the individual, not every individual recognises every opportunity. Second, entrepreneurs have to carefully evaluate the distorting and transformative value of knowledge. Third, all 4 models emphasize that the entrepreneurial process involves some sort of evaluation of value creation for stakeholders through inventing new business models. There is also consensus on the importance of action, time and temporality; these are item four, five and six. Planning is only part of the process, unless there is action the process is not completed. Time is important since opportunities perish and market receptiveness is not a constant. And last but certainly not least context is crucial, it is impossible to abstract an entrepreneurial process from its context.

This meta-analysis is a good reference when it comes to choosing an entrepreneurship framework for this thesis since it gives a clear overview of every entrepreneurship theory developed up till 2012.
One of the four models that received an in depth analysis is that of Gartner (1985). Gartner's model seems appealing since it has clarity, simplicity and great explanatory power. However, there are several issues with Gartner's model. The first issue is that an individual has to complete every step of the model, if an entrepreneur sells his idea or does not satisfy the 'profit' criteria it is not clear whether this individual is actually an entrepreneur. Also, there are multiple definitions of entrepreneurship that do not involve a focus on wealth (Austin, Stevenson, & Wei-Skillern, 2006). Another important issue is that of innovation. Gartner talks about emergence, this could translate to non-innovative outcomes that generate profit which is very different from what many scholars consider new 'innovative' value; which is generic to all entrepreneurial processes (Moroz & Hindle, 2012).
The next model considered is that of Bruyat and Julien (Bruyat & Julien, 2001). Unlike Gartner his model, this model does incorporate the concept of temporality and the profit-motivation is incorporated in a broader definition of new value creation. However the authors hope to redirect focus onto the 'black box' of entrepreneurship; they have no intent to describe the actual process happening in the 'black box'. This leads to an over-simplistic model that does not describe the entrepreneurial process itself which makes it unusable for this thesis.
Sarasvathy (2001a) her effectuation framework is the third model that is discussed. Like Gartner she focuses on the entrepreneur and she tries to differentiate him from the non-entrepreneur. Of the four selected models, this is the only model with a focus on

pragmatism. The foundation of the theory was deduced from think aloud sessions with expert entrepreneurs around whom the theory was crafted. This is exactly the criticism it receives from Moroz and Hindle: *"Due to its complexity, theoretical evolution (retrospectively applied) and contradictory nature, it would appear that effectuation may be more divisive than unifying in theoretical terms … we find it hard to assess the value and utility of the effectuation argument until some of the apparent inconsistencies noted above are clarified as they well may be given the rapidly growing volume of scholarship devoted to effectuation."*
The last model selected by Moroz and Hindle is that of Shane (2003). According to Shane researchers have a tendency to focus on one element of a process which is cause for the absence of a coherent entrepreneurship model. Shane attempts to lay down a unifying theoretical framework based upon the connection between opportunity and the individual. Moroz and Hindle argue that the model of Shane (2003) is very hard to falsify as a whole. However when broken down into single components one can imagine situation that differ from the model, but could happen in the real world. Also, and more importantly, Shane dedicates very little time to the aspect of opportunity evaluation which is an integral part of entrepreneurship according to many scholars (Bygrave & Hofer, 1991).

These frameworks are all viable simplifications of reality, it is impossible to select the 'best' framework. We can however select the framework that best fits our research.
Right of the bat the effectuation theory of Sarasvathy seems very appealing. Where Bruyat and Julien have no intent to look into 'the black box' and Shane and Gartner their models fail to incorporate innovation and temporality, Sarasvathy her effectuation theory stems from the real life behavior of expert entrepreneurs and thus allows for practical insight into the actual behavior of expert entrepreneurs which makes it a powerful theory for our research. Also, of the four frameworks it is the only one that takes a pragmatist approach. Yet another reason to choose Sarasvathy her framework is exactly what she is criticized for by Moroz and Hindle; its complexity. It is the only framework that incorporates all the concepts that scholars agree on to be affiliated with entrepreneurship. Even though (just like the other models discussed) effectuation is not a proven theory yet, according to Perry at al. many believe the theory to have face validity and they believe effectuation best describes the actual thoughts and behaviors experienced by entrepreneurs while creating new ventures, it is a field with much promise (Perry et al., 2012a). Additionally, the theory differentiates between different types of entrepreneurs and non-entrepreneurs based on the logic that is used. This makes it ideal for our research, if education is an influential factor then predictions can be made about entrepreneurs who have the same educational background, this will be explained in the methodology chapter.

The empirical basis for the theory of effectuation was laid in 1998 when Sarasvathy started her research (Sarasvathy, 1998), on which she published an article in 2001 (Sarasvathy). Effectuation is a logic of entrepreneurial expertise which Sarasvathy describes as the

opposite of causation. If one uses causal reasoning one starts with the ends; set a goal and then gather the means to attain this predefined goal. A simple but effective metaphor Sarasvathy uses (2001); it is your time to cook and you browse through a cookery book, select a recipe and then buy the ingredients and utensils needed to cook the meal. This is the causal approach. The effectual thinker reverses this manner; you start with the means and try to envision what ends you can create with these given means. To use the cooking metaphor again: You look through all the cupboards and gather several ingredients and start to imagine what magnificent meals you could create with the given ingredients.
Effectual reasoning has 5 principles which are (in chapter 2.1 these will be discussed in more detail): Means driven rather than goal driven, affordable loss rather than expected returns, strategic alliances rather than competitive analyses, exploitation of contingencies rather than exploitation of pre-existing knowledge and controlling an unpredictable future rather than predicting an uncertain one.

The effectuation theory presents a paradigmatic shift in the way that we understand entrepreneurship; it challenges everything we know about entrepreneurship thus far. This might be one the reasons effectuation literature seems to be growing very slowly; since the establishment of effectuation only few researchers have tried to empirically test effectuation (Perry et al., 2012a). Perry et al. performed a meta-analysis on effectuation literature and compared it to other paradigmatic shifts in management literature; upper echelons theory, the resource-based view of the firm, and the punctuated equilibrium model of organizational change where looked at. It took respectively 23, 13 and 19 years after the theories where first published, to the first year in which there were more than 10 articles in which the theories where used, this suggests effectuation is still in its infancy.
In the effectuation field most existing studies focus mainly on the phenomenon of effectuation itself, this is what Edmondson and McManus (2007) classify as nascent research state. The next state would be the intermediate state; this is where relationships between the new and existing constructs are proposed. According to Perry et al. effectuation is currently on the verge of entering the intermediate research state, to enter this next stage of development the relationship between effectuation and established constructs should be explored. Studies like this exist but there are few. Examples of such studies are Goel and Karri (2006) linking effectuation and trust and Dew, Read, Sarasvathy & Wiltbank (2009a) linking effectuation to entrepreneurial expertise.
The latter is a very interesting study that compares MBA students (novice entrepreneurs) with expert entrepreneurs. If expert entrepreneurs use effectual logic to tackle problems and seize opportunities, what logic is used by novice entrepreneurs? Dew et al. found that novice entrepreneurs predominantly used predictive (causal) reasoning. The results showed that expert entrepreneurs behave fundamentally different as opposed to novice entrepreneurs. For example: expert's tent to show disbelief in presented data, they prefer to form alliances and partnerships and they focus on achieving the best results with minimum

resources. Novices on the other hand tent to belief presented data, they focus significantly less on partnerships, alliances and available resources (Dew et al., 2009a).
These findings imply that current MBA education is not teaching its students what it should. It is not that novice entrepreneurs are less experienced and have not yet mastered using effectual logic, they actually frame situations in a completely different way (Dew et al., 2009a). This could have major implications for the way our current education system is structured. If education 'makes' you a causal thinker then having an education has a negative influence on new venture creation which, as Sarasvathy and her colleagues found, favours effectual thinking. And after all, new venture creation is what entrepreneurship is all about (Baron, 2007). This is a subject that we are interested in and that deserves attention.

In order to get more familiar with the subject a literature search was done. As a starting point, the article (2001a) and book (2008) written by Sarasvathy and the article of Dew et al. (2009a) were used in combination with the search facilities to which the University of Twente allows access (e.g. Scopus, Web of Science and Google Scholar). Keywords used in the online search were (combinations and/or plurals of): effectuation, causation, entrepreneur, entrepreneurship, start-up, (new, emerging, small, young) + (business, company, venture, firm, organization), education, school, learning, teaching, curriculum, MBA, course, university, training, coaching, program and lesson. Literature found was also used to do a backward citation analysis. As a result there was quite some literature found on the effects of education on the (financial) success of entrepreneurs (Douglas, 1976); (Robinson & Sexton, 1994); (Sluis, Praag, & Vijverberg, 2008), on ways to teach entrepreneurship to students (Gorman, Hanlon, & King, 1997) and on the legitimacy of teaching entrepreneurship (Kuratko, 2005). However there was very little to no literature linking effectuation directly to education, which is the goal of this thesis; spur further research on this subject.

1.2 Research Question

As mentioned in the background part of the introduction this thesis is built around the concept of effectuation. The goal of this thesis is to uncover if there is a link between the educational background of an expert entrepreneur and the degree to which he uses causal and/or effectual thinking. The main research question is: *"To which extent is the educational level expert entrepreneurs have of influence in the choice of causal versus effectual reasoning?"* In order to answer this main research question we first need to look at the current literature that is written on effectuation, what exactly is effectuation and what does effectual thinking look like compared to its opposite; causal thinking (Sarasvathy, 2001a). Based on reasonable assumptions and current literature, propositions will be formed. These will be tested and analyzed after gathering the data, in order to derive a conclusion.

1.3 Importance and contributions to research and practice

Governments as well as private organizations spend billions trying to increase entrepreneurial success by education (Brown, 1999a), but is this money well spent? Both popular literature on entrepreneurship and anecdotal wisdom have claimed MBA programs are not appropriately preparing entrepreneurship students (Dew et al., 2009a, p. 301). Dew et al. propose this claim is worth taking seriously (2009a, p. 301). Higher education programs mainly teach students to think in a causal manner; business and economic programs focus on market segmentation and analysis. *"With the assumptions of neoclassical economics underpinning this predominant theoretical base, most entrepreneur ship researchers have assumed that individuals engage in rational goal-driven behaviors when pursuing entrepreneurial opportunities (e.g., Bird, 1989). Thus, the predominant entrepreneurial decision model taught in many business schools is a goal-driven, deliberate model of decision making (Perry et al., 2012a, p. 837)."* However, Sarasvathy (2008a) and her colleagues (Dew et al., 2009a) argue expert entrepreneurs benefit more from effectual thinking when they are in the early stages of creating new ventures. This claim is supported by Merrill E. Douglass (1976) who found that, compared to other degrees, a degree in economics or business administration is about the worst preparation a future entrepreneur can have. This thesis will try to help us better understand and give more insight into this paradox. In turn we encourage researchers to do more research on the subject, since it could have a profound impact on future entrepreneurs. If studies are capable to find evidence that indicates higher levels of education 'brainwash' you to continuously use causal thinking over effectual thinking in order to avoid risk, then having an education might have a counteractive effect on your entrepreneurial success. Though we should not fear current knowledge will not become obsolete, according to Sarasvathy (2008), causal thinking is needed in later stages of a venture's life cycle. Nonetheless it would ask for a change in current entrepreneurship education programs.

There is another important reason why this research is a contribution to the effectuation field. As was mentioned in chapter 1.1, effectuation is currently on the verge of entering the intermediate research state. In order to enter this intermediate research state the relation between effectuation and other already established constructs should be explored. This is exactly what we will do; we will explore the relation between education (the established construct) and effectuation.

The third and last reason is that understanding the thinking processes that take place inside entrepreneurs their minds while they are out doing what they do, could make entrepreneurs more aware of the different approaches they can take to bypass obstructions they encounter. This in turn might help them perform better by selecting the most appropriate approach for problems they encounter.

1.4 Outline of the thesis

In this thesis we will try to answer our main research question: *"To which extent is the educational level expert entrepreneurs have of influence in the choice of causal versus effectual reasoning?"* In order to answer this question we will lay down a theoretical framework in chapter 2. In chapter 3 we will explain our methodology; how our data was collected and how our research was conducted. Chapter 4 will discuss the findings from our data. In chapter 5 we will elaborate on our findings and try to answer our main research question. In the last chapter we will also discuss the limitations of our research and we will do recommendations for future research.

2. Theoretical Framework

In this chapter literature will be discussed to provide an up to date overview of the effectuation field. After an overview of effectuation is provided literature covering the (possible) effects of education on effectuation theory will be discussed. Finally we will, based on both our findings and on reasonable assumptions, establish the propositions that are tested in this thesis.

2.1 Effectuation theory

As was briefly discussed in chapter 1.1, effectuation theory was pioneered by Saras D. Sarasvathy (2001a). Having been an entrepreneur herself she wanted to figure out what we should be teaching entrepreneurship students in the classrooms. This led her to approach the subject from a different angle; she became interested in how entrepreneurs think in environments of complete uncertainty. There had been extensive research on how to identify market segments and select target markets (Blythe, 2006); (Kotler & Armstrong, 2010), entrepreneurs however have to work in environments of complete uncertainty. During the start-up phase of a company it is very hard to identify markets, often these do not yet exist and once they do, they are entirely unpredictable (Sarasvathy, 2001a). Sarasvathy uses the example of the internet to illustrate these vastly changing markets. The speed at which things change nowadays causes a lack of knowledge and predictability of markets, which poses a problem. After all, how can you establish a price if there is no market or not even a product? How do you hire someone for an organization that does not yet exist? In other words how can you make decisions in a world with immeasurable risk also known as Knightian uncertainty (Sarasvathy, 2001a, 2008)?

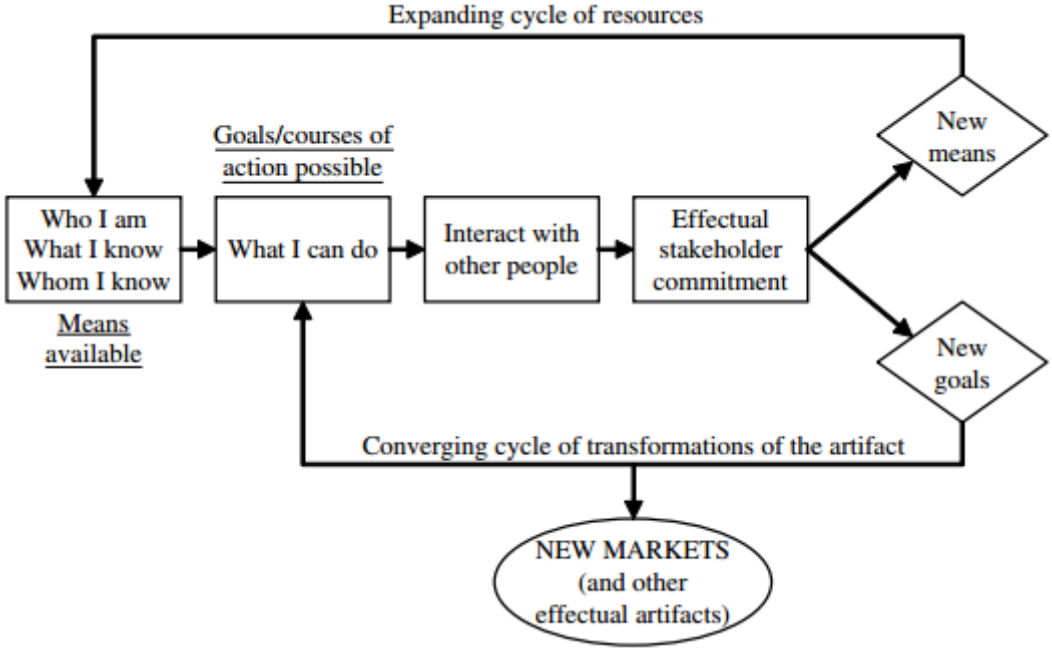

Figure 2.1; a schematic overview of the effectuation process.

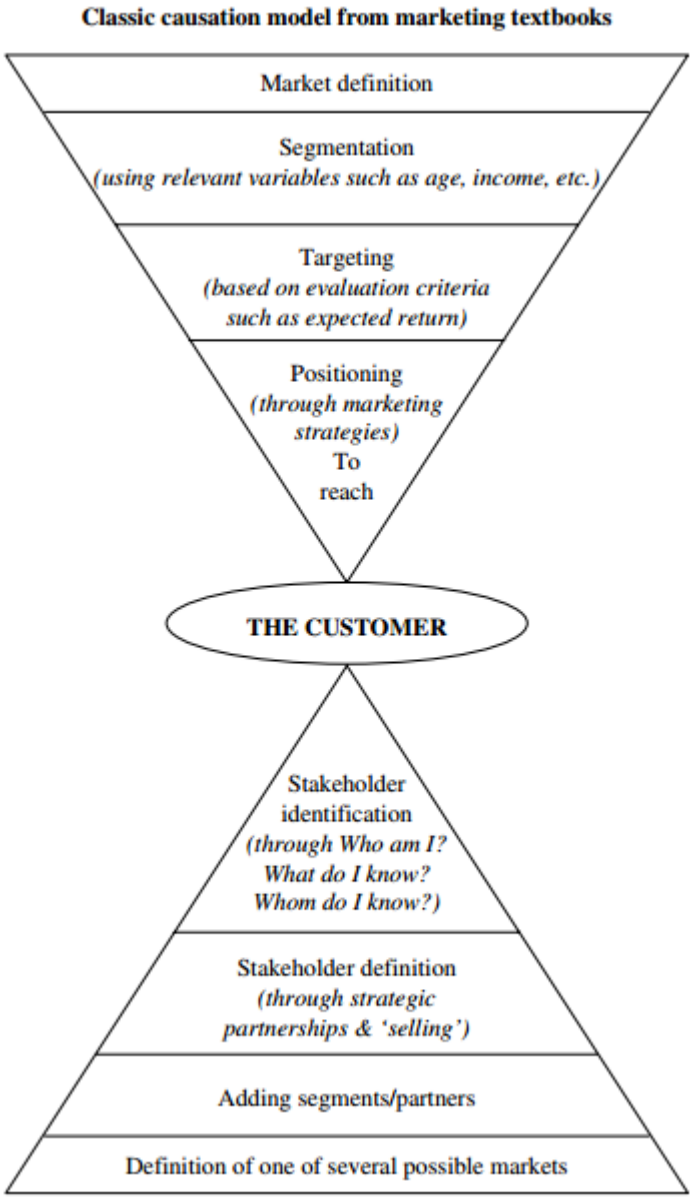

Figure 2.1; causational marketing versus effectual marketing.

Since these vastly changing and newly emerging markets are the domain of entrepreneurs the logical next step for Sarasvathy was to find out how expert entrepreneurs (founded 1 or more companies, remained CEO for at least 10 years, and participated in taking at least one company public) act in environments with Knightian uncertainty. She let a sample of 27 expert entrepreneurs use their problem solving skills on a business case containing ten typical situations that are encountered during the start-up of a new firm. The entrepreneurs explained how they would deal with these situations while thinking aloud. Extensive discussion and analysis of these so called 'think aloud' protocols led to the conceptualization of effectuation; a logic of entrepreneurial expertise depicted in figure 2.1 (Sarasvathy, 2008) on the previous page.

Figure 2.1 shows effectuation starts with means as opposed to predetermined goals. Perry et al. (2012b, p. 837) describe the effectuation process as follows; entrepreneurs start with a generalized aspiration and try to gratify this aspiration by employing resources they have at their immediate disposal (i.e., what they know, who they know and who they are). There is no clearly envisioned overall objective at the start and while using effectuation processes entrepreneurs use environmental contingencies to their advantage as they arise, they remain flexible and keep learning as they continue.

As was mentioned in chapter 1.1, Sarasvathy describes effectuation as the inverse of causation: *"Causation processes take a particular effect as given and focus on selecting between means to create that effect. Effectuation processes take a set of means as*

given and focus on selecting between possible effects that can be created with that set of means." (Sarasvathy, 2001a, p. 245).
The difference between a marketing process based on causational logic and one based on the effectuation process is graphically depicted in figure 2.2. It shows the causational approach is about careful planning and selection; using knowledge and predictive reasoning to achieve predetermined goals as fast, efficient and/or cheap as possible. This is what Sarasvathy (2001b) calls the MBA-way.

The five principles of effectuation are (Sarasvathy, 2001a):
1. **Means-driven (as opposed to goal-driven)**: focus on the question 'What can we do?' with our means rather than 'What should we do?' given our environment. The emphasis here is on creating something new with existing means rather than discovering new ways to achieve given goals.
2. **Affordable loss (rather than expected returns)**: Causation models focus on maximizing the potential returns for a decision by selecting optimal strategies. Effectuation predetermines how much loss is affordable and focuses on experimenting with as many strategies as possible with the given limited means. The effectuator prefers options that create more options in the future over those that maximize returns in the present.
3. **Strategic alliances (rather than competitive analyses)**: Causation models, such as the Porter model in strategy, emphasize detailed competitive analyses. Effectuation emphasizes strategic alliances and pre-commitments from stakeholders as a way to reduce and/or eliminate uncertainty and to erect entry barriers.
4. **Exploitation of contingencies (rather than exploitation of pre-existing knowledge)**: When pre-existing knowledge, such as expertise in a particular new technology, forms the source of competitive advantage, causation models might be preferable. Effectuation, however, would be better for exploiting contingencies that arose unexpectedly over time.
5. **Controlling an unpredictable future (rather than predicting an uncertain one)**: Causation processes focus on the predictable aspects of an uncertain future. The logic for using causation processes is: to the extent that we can predict the future, we can control it. Effectuation, however, focuses on the controllable aspects of an unpredictable future. The logic for using effectuation processes is: To the extent that we can control the future, we do not need to predict it(Sarasvathy, 2001a). This effectual logic is called non-predictive control.

Effectuation is not better than causation or vice versa, these concepts are dichotomous (Robert Wiltbank, Nicholas Dew, Stuart Read, & Saras D Sarasvathy, 2006b). It is actually very possible to use both effectual and causal reasoning at different points in time hence effectuation theory is not normative. The best entrepreneurs are in fact capable of using both ways and select which style to use based on what the specific situation calls for. Expert entrepreneurs prefer effectual reasoning during the start-up phase of new venture creation: *"Over 63 per cent of expert entrepreneurs in the think-aloud protocol study preferred effectuation to causal approaches more than 74 per cent of the time."* (Sarasvathy, 2008, p. 131).

Later stages in the venture creation process require more causal reasoning (Sarasvathy, 2001b). As an example, Sarasvathy argues that most enduring high growth firms will have started out effectually; especially the firms that opened up new markets and transformed industries. However exploiting these newly formed markets and gaining a long-term competitive advantage favours a management team with a causal approach (Sarasvathy, 2008, p. 132). Table 2.1 gives an overview of the differences between causal and effectual logics.

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 useful.
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 individuals to bring on board.	Means-oriented. In the effectual frame, goals emerge by imagining courses of action based on given means. Similarly, who comes on board determines what can be and needs to be done. And not vice versa.
Predisposition toward 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 than stakeholders can afford to lose. The focus here is on limiting downside potential.
Attitude toward 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.
Attitudes toward 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 2.1; differences between causation versus effectuation (Dew et al., 2009a, p. 290).

Effectuation is not solely for the entrepreneur as a human being; it is argued that effectuation theory might help at different levels of the firm and/or economy (Sarasvathy,

2001a). Entrepreneurs start with who they are, whom they know and what they know. At the level of the firm this could be translated to physical resources, human resources and organizational resources in conformation with the resource-based view theory (Barney, 1991). At the level of an economy the corresponding means are demographics, socio-political institutions (i.e. property rights) and current technology regimes (Sarasvathy, 2001a). The other 4 principles simply have to be applied, which can also be done by a team or organisation.

As was mentioned in chapter 1.1 empirical evidence on effectuation theory is scarce. In mathematics a formula is either correct or incorrect whereas in social sciences researchers have different definitions of concepts and constructs so in order to move on, first consensus has to be reached. In the case of effectuation; theory, concepts, and constructs have to be understood before they can be tested (Perry et al., 2012b). This means little is known about what effects education has on the use of effectual and/or causal reasoning, we will now discuss the literature that was found during a search (for specific details on the search see chapter 1.1).

2.2 Effects of education on effectuation theory

In 2008 a study was conducted that compares the manner in which expert entrepreneurs make decisions and problem-solve to how business administration students in graduate school do it (Dew, Sarasathy, Read, Wiltbank, & Song, 2008). In order to do this, part of the case used by Sarasvathy in her effectuation research was also given to a new sample of business administration students. They were asked to answer the questions in the case exactly like Sarasvathy had asked the expert entrepreneurs to do so. As an extra robustness test the findings were also compared with a sample of 34 executives. The executives had an average of 14 years of experience and all held senior positions at major multinationals, they however had no significant experience in entrepreneurship and new venture creation.
The think-aloud protocols were coded and analysed and the results were compared. Dew et al. (2009a) found:

1. Expert entrepreneurs were significantly more likely to not believe market data.
2. Expert entrepreneurs were significantly more likely to utilize previous experience.
3. Expert entrepreneurs were significantly more likely to consider available financial resources in making decisions around the given scenario.
4. Expert entrepreneurs were significantly more likely to think holistically about building a business (meaning they looked beyond the data to make decisions and did not just answer the posed scenario questions) and were also significantly more likely to be concerned about long-term issues.
5. Expert entrepreneurs were significantly more likely to identify or pursue markets not mentioned in the scenario.
6. Expert entrepreneurs were significantly more likely to base pricing decisions on a skim pricing strategy (relatively high starting price) and managers were significantly more likely to base pricing decisions on a penetration pricing strategy (relatively cheap starting price).

7. Expert entrepreneurs were significantly more likely to make initial sales themselves and managers were more likely to engage a sales force to approach a segment.
8. Experts entrepreneurs were significantly more likely to incorporate partnerships into their decision-making as they solved problems during the scenario.

In chapter 1.1 a study conducted by Dew et al. (2009a) was briefly discussed. The findings of this study are based on exactly the same data (i.e. same sample, same analysis of data) as the study discussed in the paragraph above. However the results are framed in a different way. Part of the differences is attributed to expertise in general while the other part is attributed to entrepreneurial expertise. The findings that are linked to entrepreneurial expertise can be viewed as differences attributed to the use of causal or effectual logic since effectuation is a 'logic of entrepreneurial expertise' (Sarasvathy, 2001a).

The findings linked to entrepreneurial expertise are:
- Finding number 2 is linked to means-driven (more specifically to 'what they know') as opposed to goal-driven.
- Finding number 3 is linked to affordable loss as opposed to expected returns.
- Finding number 7 is linked to partnerships as opposed to competitive analysis.
- Finding number 8 is linked to partnerships as opposed to competitive analysis.

These findings show that both the graduate students and the executives executed the task in a fundamentally different way than the expert entrepreneurs did. These findings have major implication: *"Clearly such a strong difference could not simply be attributed to lack of entrepreneurial experience. It has to be related to the one fact that unifies this group—namely the very fact that are all MBA students. What is it about MBA students that leads them to choose a frame in stark contrast to expert entrepreneurs? Our conjecture in this regard is that it is their experience in the MBA program, i.e. the knowledge structures they have acquired through their education in courses within the MBA curriculum."(Dew et al., 2009a, pp. 300-301)*
Sarasvathy (2001a) already wrote this discrepancy when she introduced the concept of effectuation. She begins her article by explaining there is a gap between what is taught in MBA classes and what people in business, entrepreneurs, actually struggle with. MBA courses focus on analysing existing knowledge, extrapolating this knowledge in order to try and predict possible future scenarios. This can range from economic aspects such as price calculations to more psychological aspects such as HRM decisions. Perry et al. *(2012a, p. 837)* confirm that the predominant entrepreneurial decision model taught in business schools is a deliberate, goal-driven model of decision making.

2.3 Formulation of propositions

The article of (Dew et al., 2009a) begs the question whether current MBA programs are teaching students what they should be thaught. While concluding the article the authors even imply that current MBA programs are counterproductive! Instead of preparing students

for their feature as entrepreneur they get taught to focus on the opposite aspects; a good example is that novices were found to focus on expected returns as opposed to affordable loss, on which the experts in the sample focused. If this scenario turns out to be correct the consequences could be very severe. Which is the main reason this subject deserves immediate attention.

This research will gather more data on the effects that a higher education has on the degree to which entrepreneurs use effectual and/or respectively causal thinking, to do this we will be using propositions instead of hypotheses. Since this is a bachelor thesis our research sample is biased (i.e. small sample and entrepreneurs form the same area) on top of that there is very little to no literature on the subject; researchers have not even proven a relation exists between education and effectuation. This makes it very hard to come up with testable and falsifiable hypotheses. In this case literature suggest (Whetten, 1989), and we believe, it is better to work with propositions that will hopefully lead to a better understanding of this sub-field of effectuation. We hope our results will motivate others to do more research on the subject.

2.3.1 Main research question

The main research question of our exploratory research is: *'To what extent does having a higher education influence the degree to which expert entrepreneurs use effectual and/or causal thinking?'*
If education has no influence on the degree to which expert entrepreneurs use effectual and/or causal thinking then there should be no significant differences in our data. In order to see whether there are indeed no significant differences across the data, we have to execute several tests. In the following section we will explain the propositions that will be tested in this thesis.

2.3.2 Effectuation versus causation

One of the first things that stands out from Dew et al. their sample is that it exists solely of fortune 500 entrepreneurs and MBA students. The entrepreneurs are all outliers in the sense that they have achieved remarkable and extreme success whereas the MBA students are all outliers in the sense that they enjoy some of the highest possible form of education. The question that comes to mind is how our sample of entrepreneurs will reason. If, as Sarasvathy claims (2001a), effectuation is the way of thinking that serves entrepreneurs in the process of new venture creation and opportunity identification, then how does our sample of entrepreneurs compare to that of Sarasvathy? For example; how does the sample itself compare in the use of effectual and causal logic? And do they focus on affordable loss rather than expected returns?

2.3.3 HBO compared to University

Our sample that consists of expert entrepreneurs can be split in two when it comes to education level; entrepreneurs who went to a 'Hoger Beroeps Onderwijs' school (HBO) and entrepreneurs who attended university. In the Netherlands there are two ways to attain

your bachelor degree. The first possibility is at a university where you will follow courses for 3 years and then conclude with a scientific research project. And the second option to attain the same bachelor degree is at an HBO school; you have 4 years of courses while having to complete several internships during these 4 years. In short the difference between these two is that; an HBO education is practically oriented and focuses on applying knowledge whereas the university curriculums focus on scientific research.
Effectuation is all about acting; the future can be (co)created (Read, Song, & Smit, 2009, p.574). The future comes from what people do (not from inevitable trends), you can create new markets. Focus on the extent to which you can control the future, then there is no need to predict the future (Dew et al., 2009a, p. 291; Sarasvathy, 2001a, p. 251). Whereas causation is all about planning and prediction; The future can be acceptably predicted on the basis of past experiences (Read, Song, et al., 2009, p. 574). There is a relationships between past and future(Dew et al., 2009a, p. 291; Sarasvathy, 2001a, p. 251). While, in the end, students learn mostly the same matter, the way in which the matter is taught differs significantly. This implies that entrepreneurs that attended university would use causal logic more often than entrepreneurs who have attained an HBO degree. Since university programs focus on causal reasoning to support the scientific method (Perry et al., 2012a), whereas HBO schools focus on practical solutions for everyday problems. Our first proposition will test this assumption. Even though the propositions might seem equivalent they most certainly are not. It could, for example, turn out that entrepreneurs that have attended university will use both; causal and effectual reasoning, more than entrepreneurs with an HBO degree.

Proposition 1a: Entrepreneurs that attended university focus on causal logic more often than entrepreneurs that have attended an HBO school.
Proposition 1b: Entrepreneurs that attended an HBO school use effectual logic more often than entrepreneurs that have attended university.

2.3.4 Age and years of experience

Dew et al. (2009a, p. 299) found that: "expert entrepreneurs were significantly more likely to draw on their means of personal experience … in their decision-making." On top of that experts tend to disbelief data, they tend to focus on partnerships and on affordable loss more often than the MBA students in the sample did.
What is the impact of the total years of experience an entrepreneur has on these findings? Is there a difference between an expert that has 40 years of experience and an expert with a higher education that has 10 years of experience? Do they fall back on personal experience more often? Do they focus on affordable loss more often? Do they focus on partnerships more often?

In order to attain more experience and to become an expert you need age; could this play a role in how often an entrepreneur uses effectual and causal logic? Are there differences between entrepreneurs who are 50 to 60 years of age and have 10 years of experience relative to entrepreneurs who are 50 to 60 years of age and have over 30 years of

experience? You would expect both, years of experience and age, to correlate with effectuation since usually people with more experience are older. But how do these correlation coefficients compare? There are entrepreneurs who do not become an entrepreneur directly after they finish school but instead have 'regular' jobs first. So the prognosis is that the correlation between age and effectuation is weaker than the correlation between experience and effectuation.

Proposition 2a: The older the expert entrepreneur, the more he/she focuses on effectual logic.
Proposition 2b: The older the expert entrepreneur, the less he/she focuses on causal logic.

Proposition 3a: The more experience an expert entrepreneur has, the more he/she focuses on effectual logic.
Proposition 3b: The more experience an expert entrepreneur has, the less he/she focuses on causal logic.

2.3.5 Business studies compared to other studies

Another control variable that could very well have an effect on which logic entrepreneurs predominantly use, is the type of study entrepreneurs have had. An entrepreneur that has attained his degree in business administration was taught very different matter than for example an engineer. During a business administration curriculum students get taught various methods of prediction (Sarasvathy, 2008, p. 24). One would expect entrepreneurs that attained a business degree to fall back on these predictive methods which all fit straight into the causal logic category (Perry et al., 2012a; Sarasvathy, 2008). On the opposite side, an art study or design study require students to be creative. Entrepreneurs that studied art, engineering or physics will have never faced most, if not all, off these predictive methods during their education, they might have never even heard of the concepts. For this reason it seems logical to assume that entrepreneurs who have a business background, would use causal logic (i.e. competitive analyses, expected returns, etc) more often. This is our last proposition.

Proposition 4a: Expert entrepreneurs with a business education use causal logic more often than expert entrepreneurs with a non-business education.
Proposition 4b: Expert entrepreneurs with a non-business education use effectual logic more often than expert entrepreneurs with a business education.

3. Methodology

This chapter will explain how the study was conducted. Paragraph 3.1 describes how the data was collected and paragraph 3.2 will discuss the research sample. Then paragraph 3.3 will explain how the data was analysed and paragraph 3.4 will conclude chapter 3 by discussing the validity.

3.1 Data collection

3.1.1 Data, think aloud protocols

The data for this study was obtained through the think aloud method. A think aloud protocol refers to a recording of a research participant who verbalizes his or her thoughts and successive behaviours while performing cognitive tasks. (Ericsson & Simon, 1984; Van Someren, Barnard, & Sandberg, 1994).

Every subject was given a case consisting of 10 problems that are typical situations entrepreneurs encounter while starting and growing new ventures. The participants were asked to verbalize their thoughts continuously; the case included several reminders to keep thinking aloud. The whole session was recorded so it could be transcribed and coded.

The case began by asking the entrepreneur to imagine they would start a coffee corner on a university campus. While progressing through the case the entrepreneurs were continually provided with basic information about, for example, the environment they operated in and the market information with predictions of the future. When a choice had to be made as to move into a new direction the entrepreneur would first be asked which direction he would choose, then on the next page the case would present the direction it would move in as to not influence the choice of the entrepreneur. If at any time the entrepreneur felt like the case was unclear he was instructed to make an assumption in order to continue.

The role of the researcher during the protocols was next to non-existent. To prevent a biased subject in any way, the researcher was not allowed to answer any content related questions. If the entrepreneur felt like he was unable to proceed, due to missing information or whatever other reason, they were encouraged to verbalise the assumptions they made in order to continue.

3.1.2 Case evaluation

After the entrepreneurs had finished the case they were asked to shortly evaluate the case with the researcher. The entrepreneurs were asked if they felt like they, at any point, had to choice a direction not included in the case, or whether anything had been unclear or missing. Most importantly they were asked if they would do anything different if they had to work through the case again and whether they felt like they had been able to appropriately express their thoughts. Although almost all entrepreneurs had comments and/or remarks about for example missing or unclear information all of them felt like they had been able to properly express their thoughts. Comments ranged from ‘this is an extremely bad case’ to ‘this is a very credible and good case’. Despite all the comments and remarks none of the

entrepreneurs had felt like they were unable to continue. One entrepreneur did skip a question because he had chosen a different direction than the case and felt like the question was not applicable to him.

3.1.3 Transcribing and coding

For coding the think aloud protocols a coding scheme based on Sarasvathy her framework was used:

Causal	Effectual
P-Prediction of the future	C-Creation of the future
G-Goal-driven	M-Means-based
R-Expected returns	L-Affordable loss
B-Competitive analysis	A-Use of alliances or partnerships
K-Avoid contingencies	E-Embrace contingencies
X-Causal (no subcategory given)	N-Effectual (no subcategory given)

Table 3.1; EPICC coding scheme.

This coding scheme is used throughout the entire EPICC project. On top of Sarasvathy's five categories of effectuation and causation an additional catch-all category was added for both causation and effectuation. This 6th category of 'no subcategory given' can be used to code any statements that are either causal or effectual but do not directly fit in one of the other categories. This category should only be used if there is no other alternative. A more in-depth explanation of how the coding was done can be found in Appendix 1, it shows how the coding scheme was operationalized. Appendix 2 is the coded think aloud protocol of expert entrepreneur 1.

3.2 Research sample

Participant #	Sex	Age	Years of experience	Type of education	Type of study	# of FTE contracts	Annual turnover
1	Male	53	20	HBO	Business	3	550.000
2	Male	64	32	HBO	Non-business	135	6.500.000
3	Female	53	17	HBO	Non-business	1	100.000
4	Male	45	20	University	Non-business	25	2.200.000
5	Male	57	34	University	Business	6	300.000
6	Male	39	12	University	Non-business	10	Unknown
7	Male	31	6	HBO	Business	1	400.000
8	Male	48	20	University	Non-business	2	1.000.000
9	Male	49	20	HBO	Business	18	750.000
10	Female	32	6	HBO	Non-business	1	90.000
11	Male	62	11	University	Non-business	1	Unkown
12	Male	32	6	HBO	Non-business	8	500.000
13	Male	48	22	University	Business	135	12.000.000
14	Male	49	22	University	Business	60	15.000.000
15	Male	57	25	University	Business	1	Unkown
16	Male	30	8	HBO	Non-business	4	350.000

Tabel 3.2; an overview of the sample.

The research sample for this study consists of 16 expert entrepreneurs who have had a higher education. Expert entrepreneurs are defined as people who have; either started at least one venture themselves or have been involved in starting at least one venture with one or multiple partners. On top of that these entrepreneurs have also worked in their own company/companies for at least five years. This is a toned down version of the definition Sarasvathy used in her effectuation research, which is used to enlarge the population the sample can be drawn from. This would assure the data could be collected in the time span of a Bachelor assignment. An additional requirement is that the entrepreneurs have followed a higher education meaning they either studied at a 'hoger beroepsonderwijs (HBO)' school or a university. 16 Entrepreneurs attained a degree in their field of study, while two did not finish their study. Pretty much all the entrepreneurs have some form of international experience, 2 were even born in a foreign country; the United States of America and Armenia. However both of these entrepreneurs have lived in the Netherlands for over 20 years. The field of expertise of the entrepreneurs differs a lot; it ranges from creative studies like graphic multimedia design to mathematics to an MBA. On top of that, while some entrepreneurs are active in the same sector, none of them have the same kind of business. The types of businesses range from a company specializing in training and education to a mobile application development company to a company that develops and produces coffee (vending) machines for the B2B market.

The entrepreneurs were found through a lot of different channels. First lists were compiled of entrepreneurs who fulfilled the requirements for this study. Due to travel costs the original search was confined to entrepreneurs who lived in 'Twente', an area in the east of

the Netherlands. These lists were initially compiled with the help of LinkedIn.com (search keywords 'owner (town/city)'), personal network and Google were used trying to find clubs or organizations that had something to do with entrepreneurship. For example the 'Twente Ondernemers Magazine (TOM)' has a list on their website with their 'business club' members.
If the entrepreneurs met the requirements then the next step was to find their contact information in order to contact them. This turned out to be very time consuming so entrepreneurs who lived outside of the Twente area were eventually contacted as well. Entrepreneurs who had participated in the research were also asked if they knew people that might want to participate. At first the plan was to not do this as it might introduce a bias. Friends could be very alike in the way they see and do things, which could influence the research results. To minimize this effect at most two entrepreneurs who were referred by others were asked to participate. Eventually 18 entrepreneurs were found who, as mentioned, have very different educational backgrounds, careers and personalities.
Working through the entire case would cost approximately one and a half hour, include some explanation and the additional questionnaire and a session would take about two hours of the entrepreneur's time. Not every entrepreneur might have or want to spend two hours of his/her free time on this case. So to increase the chance of entrepreneurs participating in this study there was a shorter version of the session which would take approximately an hour. Although some entrepreneurs said upfront they wanted to do the short version, all but one entrepreneur completed the entire case. One entrepreneur had to stop after case problem 8 due to other appointments he had. After transcribing all the protocols two of them were deemed unusable. One because the entrepreneur did not understand the case; he gave a very confusing answers that did not seem to match the questions asked. The other because the protocol was wrongfully conducted (a question was skipped). The remaining 16 protocols were coded and used as data.

3.3 Method of analysis

3.3.1 Selection of statistical tests

In order to draw meaningful conclusions our data will have to be analysed. First of all the descriptive statistics of our data will be discussed. Then, for further data analysis we want to test whether relationships exist between age/experience and the use of effectuation. If such a relationship exists the variables will covary; when one variable deviates from its mean, the other variable will also deviate from its mean in a similar way. By standardizing the covariance we end up with a correlation coefficient which tells us whether the relationship exists. Regression analysis could also be used but is intended for predicting dependent variables from one or multiple independent variables and thus will not be used.
We also need to test whether the difference in effectual and causal statements (is there a difference in means) between different groups is significant. This will be done with Mann-

Whitney test (Field, 2013). The reason these two tests are selected is explained in the next paragraph.

First of all it's important to note that the data that was obtained through coding the think aloud protocols is all distributed on an interval scale; there is a linear and comparable difference between the different number of statements and the scale has an absolute zero. If an entrepreneur his answer to the think aloud case results in 3 times a 'G-code' and another entrepreneur his answer result in 6 times this 'G-code', then the second entrepreneur has made twice as many goal oriented remarks. This means one of the assumptions of normality is met. The data is also independent since the entrepreneurs did not have the ability to influence each other's protocols.
However the amount of statements made in the protocols is discrete and thus not normally distributed (Huizingh, 2008). This would mean Pearson's correlation coefficient, which is seen as the standard test, cannot be used to calculate the correlation and Spearman's rho should be used.
However since there is an enormous spread in the number of statements made in the think-aloud protocols (the total number of statements made by participants varies from 40 to 107 with a mean of 69.6) so using absolute numbers would most likely result in a distorted view of the findings and in this case relative numbers (percentages) will be used instead of absolute numbers. Since relative numbers are not discrete, assumptions for parametric data might be met. In order to be able to use parametric tests, assumptions of normality should be met so first of all we should test for normality with a Kolmogorov-Smirnov test (Field, 2013). The results of this test, see appendix 3, show that not all variables can be assumed to be normal. On top of that our sample is very small which means non-parametric tests are preferred since they are more reliable and less prone to type 1 errors in these situations (De Veaux, Velleman, & Bock, 2005).
This means the non-parametric spearman's rho correlation coefficient will be used to calculate the correlation between effectual/causal logic and respectively the correlation between age and the usage of effectual/causal logic (Field, 2013).
In order to test whether there is a significant difference between the usage of causation and effectuation, the Mann-Whitney test is used. For our data the independent T test is seen as the standard for testing whether two populations have the same distribution. However, since the collected data is not normally distributed the Mann-Whitney test is preferred since it has greater efficiency than the t tests when parametric assumptions are not met (Field, 2013).

3.4 Validity

In this chapter both the internal and external validity of our research will be assessed. Earl Babbi (2012) discusses threads to validity that are based on the works of Campbell and Stanley (1963) and Cook and Campbell (1979). Their seminal work in the field of experimental design is still widely used even though it is over three decades old. We will use

this framework to evaluate how factors that affect our research might cause a thread to our validity and how these threads were dealt with.

Internal validity refers to the possibility that conclusions drawn from an experiment might not accurately represent what happened in the experiment itself. This threat is present when factors other than the experimental stimulus (might) have affected the dependent variable.
The research design takes care of the threads to the internal validity. *Maturation*, *testing*, *Experimental mortality* and *History* cannot take place since there is only one 2 hour session (no pre- and post-test) after which the test subject is done, this combined with the fact that the same case and coding scheme was used for all the protocols also takes care of *instrumentation* and the think-aloud method ensures hindsight bias cannot take place (Sarasvathy, 2008, p. 12; Van Someren et al., 1994, pp. 21-23). It is possible however that throughout the coding process the coder his standards evolved. To counter this all the protocols where looked at twice to ensure the same standard was applied. On top of that one of the protocols was coded by an independent coder which resulted in a good inter-rater reliability of 79% (Fleiss, 1971; Landis & Koch, 1977). The fact that no stimulus/treatment is applied means *selection biases*, *compensation, compensatory rivalry, statistical regression, diffusion or imitation of treatments* and ambiguity about the *causal time order* cannot take place. Last, *demoralization* is countered by the fact that the researcher ensured the participant knew up front how long the session would take. The researcher also ensured the participant had something to drink available.

External validity relates to the generalizability of a study its findings to the bigger or entire population. Campbell and Stanley (1963) describe 4 forms of this problem that they call representativeness. The first form they discuss is *interaction of testing and X* which cannot take place in our research design since there is only one session (test). There could also be *interaction of selection and X* which is a thread to the external validity of our study. For example; with the exception of 3 entrepreneurs all the participants live in Twente. And with the exception of a few entrepreneurs all run relatively small companies with an annual turnover below 1 million euros a year. Even though none of the entrepreneurs where close friends several of them knew each other which lowers external validity since this might have caused interference between the participants. Another threat to external validity discussed by Campbell and Stanley is *other interactions with X* which comes down to the fact that the variables for most studies are very specific (age of test subjects, time and place, circumstances, etc) this makes it very hard to generalize the findings of any study and can only really be countered by increasing the sample size and repeating the experiment over time which is obviously very costly and time consuming and impossible for our research. A last threat to external validity is what Campbell and Stanley call *reactive arrangements*. This is an ever present threat; participants are always aware of the fact that they participate in a study which could make them behave different than they would in the real world.

4. Findings

Chapter 3.3 explains how the data is analysed; which statistical tests are used and why they were used. In this chapter the data is presented and the preliminary findings will be discussed and. In the next chapter these findings will be discussed in more detail.

4.1 Descriptive statistics

Table 4.1 shows a summary of the descriptive statistics. First it shows the sum of statements made, both effectual and respectively causational, in absolute numbers and then it shows the corresponding relative numbers (percentages). A more in depth version of this table can be found it appendix 4, it shows the descriptive statistics per category in both absolute and relative numbers. An important note is that the two catch-all categories discussed in chapter 3.1.3 are not included. There are only 5 statements that fit in the causal catch-all category and 4 statements that fit in the effectual catch-all category, therefor they will not be analysed separately, they are however included in the total effectuation/causation count. Table 4.2 shows the statements every individual entrepreneur made per category in both absolute and relative numbers.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Sum Effectuation Codes	16	26	73	49,31	15,374
Sum Causation Codes	16	10	38	20,31	9,307
Share effectuation of totall (%)	16	60,87	83,95	71,0814	7,33563
Share causation of totall (%)	16	16,05	39,13	28,9186	7,33563
Valid N (listwise)	16				

Table 4.1; discriptive statistics.

Absolute statements per entrepreneur per category																		
#Entrepreneur	G	R	B	K	P	Z	X	M	L	A	E	C	D	N	Totall	Totall C	Totall E
1	1	2	1	5	3	0	0	20	6	5	2	4	0	1	50	12	38
2	7	13	10	2	6	0	0	33	6	12	7	11	0	0	107	38	69
3	3	4	1	4	2	0	0	18	3	4	2	4	0	1	46	14	32
4	2	1	1	3	2	0	1	19	4	2	2	7	0	0	44	10	34
5	1	2	6	0	5	0	0	16	5	2	2	10	0	0	49	14	35
6	4	3	5	10	11	0	0	37	6	4	0	9	0	0	89	33	56
7	2	3	1	5	2	0	1	11	3	4	1	7	0	0	40	14	26
8	1	5	2	3	2	0	0	45	5	5	5	8	0	0	81	13	68
9	4	3	2	11	6	0	0	36	4	5	1	14	0	0	86	26	60
10	2	1	4	2	3	0	0	34	5	7	4	12	0	0	74	12	62
11	8	4	4	2	4	0	0	23	5	7	2	6	0	0	65	22	43
12	6	10	4	12	1	0	3	23	3	11	6	13	0	0	92	36	56
13	8	2	4	4	3	0	0	29	2	8	1	10	0	0	71	21	50
14	3	4	4	1	5	0	0	16	5	4	2	3	0	0	47	17	30
15	2	2	6	4	0	0	0	31	7	4	2	11	0	2	71	14	57
16	5	4	7	10	3	0	0	43	7	8	6	9	0	0	102	29	73
	G	R	B	K	P	Z	X	M	L	A	E	C	D	N			
Totall	59	63	62	78	58	0	5	434	76	92	45	138	0	4	1114	325	789

Relative statements per entrepreneur per category																	
#Entrepreneur	G	R	B	K	P	Z	X	M	L	A	E	C	D	N	Totall	Totall C	Totall E
1	2,00	4,00	2,00	10,00	6,00	0,00	0,00	40,00	12,00	10,00	4,00	8,00	0,00	2,00	100,00	24,00	76,00
2	6,54	12,15	9,35	1,87	5,61	0,00	0,00	30,84	5,61	11,21	6,54	10,28	0,00	0,00	100,00	35,51	64,49
3	6,52	8,70	2,17	8,70	4,35	0,00	0,00	39,13	6,52	8,70	4,35	8,70	0,00	2,17	100,00	30,43	69,57
4	4,55	2,27	2,27	6,82	4,55	0,00	2,27	43,18	9,09	4,55	4,55	15,91	0,00	0,00	100,00	22,73	77,27
5	2,04	4,08	12,24	0,00	10,20	0,00	0,00	32,65	10,20	4,08	4,08	20,41	0,00	0,00	100,00	28,57	71,43
6	4,49	3,37	5,62	11,24	12,36	0,00	0,00	41,57	6,74	4,49	0,00	10,11	0,00	0,00	100,00	37,08	62,92
7	5,00	7,50	2,50	12,50	5,00	0,00	2,50	27,50	7,50	10,00	2,50	17,50	0,00	0,00	100,00	35,00	65,00
8	1,23	6,17	2,47	3,70	2,47	0,00	0,00	55,56	6,17	6,17	6,17	9,88	0,00	0,00	100,00	16,05	83,95
9	4,65	3,49	2,33	12,79	6,98	0,00	0,00	41,86	4,65	5,81	1,16	16,28	0,00	0,00	100,00	30,23	69,77
10	2,70	1,35	5,41	2,70	4,05	0,00	0,00	45,95	6,76	9,46	5,41	16,22	0,00	0,00	100,00	16,22	83,78
11	12,31	6,15	6,15	3,08	6,15	0,00	0,00	35,38	7,69	10,77	3,08	9,23	0,00	0,00	100,00	33,85	66,15
12	6,52	10,87	4,35	13,04	1,09	0,00	3,26	25,00	3,26	11,96	6,52	14,13	0,00	0,00	100,00	39,13	60,87
13	11,27	2,82	5,63	5,63	4,23	0,00	0,00	40,85	2,82	11,27	1,41	14,08	0,00	0,00	100,00	29,58	70,42
14	6,38	8,51	8,51	2,13	10,64	0,00	0,00	34,04	10,64	8,51	4,26	6,38	0,00	0,00	100,00	36,17	63,83
15	2,82	2,82	8,45	5,63	0,00	0,00	0,00	43,66	9,86	5,63	2,82	15,49	0,00	2,82	100,00	19,72	80,28
16	4,90	3,92	6,86	9,80	2,94	0,00	0,00	42,16	6,86	7,84	5,88	8,82	0,00	0,00	100,00	28,43	71,57
	G	R	B	K	P	Z	X	M	L	A	E	C	D	N			
Totall	5,25	5,51	5,39	6,85	5,41	0,00	0,50	38,71	7,27	8,15	3,92	12,59	0,00	0,44	100,00	28,92	71,08

Table 4.2; overview of statements made per entrepreneur.

4.2 Effectuation versus causation

As can be seen in table 4.2; 16 participants made 325 statements that fit within the causal category and 789 statements that fit in the effectual category. This equals an average of 20.3 causal and respectively 49.3 effectual statements per entrepreneur. Table 4.3 shows whether the differences between these opposing categories of effectuation and causation are statistically different. Table 4.4 does the same for the aggregated categories and thus tells us whether there is a significant difference between the usage of effectual and causal thinking. As explained in chapter 3 the Mann-Whitney test was used. If a significance lower than 0.05 is displayed there is only a 5% chance (or less) that the differences occurred due to chance and thus that there is a significant difference between the two means. This means our sample of expert entrepreneurs use effectual logic significantly more often than they use causal logic. To be more precise there is strong evidence that our sample of expert entrepreneurs tends to: create the future instead of trying to predict it, focus on means instead of goals and use alliances and/or partnerships instead of focusing on competitive analysis. The p-value of 0.086 in the other categories is higher than 0.05 so we have to conclude that there is no significant difference.

Test Statistics[a]

	Prediction of the future vs Creation of the future	Goal-driven vs Means-based	Expected returns vs Affordable loss	Competitive analysis vs Use of alliances or partnerships	Avoid contingencies vs Embrace contigencies;
Mann-Whitney U	24,000	,000	82,000	61,000	82,000
Wilcoxon W	160,000	136,000	218,000	197,000	218,000
Z	-3,920	-4,825	-1,735	-2,526	-1,734
Asymp. Sig. (2-tailed)	,000	,000	,083	,012	,083
Exact Sig. [2*(1-tailed Sig.)]	,000[b]	,000[b]	,086[b]	,011[b]	,086[b]

a. Grouping Variable: Effectual_vs_Causal

b. Not corrected for ties.

Table 4.3; Mann-Whitney U for the difference in use of causation and effectuation.

Test Statistics[a]

	cumulated percentages of effectual and causal statements per entrepreneur
Mann-Whitney U	,000
Wilcoxon W	136,000
Z	-4,824
Asymp. Sig. (2-tailed)	,000
Exact Sig. [2*(1-tailed Sig.)]	,000[b]

a. Grouping Variable: Effectual_vs_Causal

b. Not corrected for ties.

Ranks

	Effectual_vs_Causal	N	Mean Rank	Sum of Ranks
cumulated percentages of effectual and causal statements per entrepreneur	Causal	16	8,50	136,00
	Effectual	16	24,50	392,00
	Total	32		

Table 4.4; Mann-Whitney U for the difference in use of causation and effectuation (aggregated).

4.3 HBO compared to University

Table 4.4 and 4.5 show whether there is a significant difference in the degree to which entrepreneurs use effectual and causal thinking for entrepreneurs that attended either an HBO school or a university. Table 4.5 tells us whether there is a significant difference per subcategory of effectuation/causation whereas in table 4.4 the subcategories are aggregated into effectuation and causation. As explained in chapter 3 the Mann-Whitney test was used. Since not a single P-value is below 0.05 for both the subcategories as well as the aggregated data we reject our hypothesis. Based on our sample it does not seem of influence whether an entrepreneur has attended an HBO school or a university, it makes no significant difference in the use of causal and effectual logic. Entrepreneurs that attended an HBO school do not seem to use effectual thinking significantly more than entrepreneurs that have attended a university.

Test Statistics[a]

	Share effectuation of totall (%) totall
Mann-Whitney U	27,000
Wilcoxon W	63,000
Z	-,525
Asymp. Sig. (2-tailed)	,600
Exact Sig. [2*(1-tailed Sig.)]	,645[b]

a. Grouping Variable: Attended HBO or Uni

b. Not corrected for ties.

Table 4.4; Mann-Whitney U for the difference in use of causation and effectuation (aggregated) between HBO and university schooled entrepreneurs.

Test Statistics[a]

	Percentage G of the totall amount of statements made per entrepreneur	Percentage R of the totall amount of statements made per entrepreneur	Percentage B of the totall amount of statements made per entrepreneur	Percentage K of the totall amount of statements made per entrepreneur	Percentage P of the totall amount of statements made per entrepreneur	Percentage M of the totall amount of statements made per entrepreneur	Percentage L of the totall amount of statements made per entrepreneur	Percentage A of the totall amount of statements made per entrepreneur	Percentage E of the totall amount of statements made per entrepreneur	Percentage C of the totall amount of statements made per entrepreneur
Mann-Whitney U	28,000	21,000	19,000	16,000	25,000	23,000	22,000	16,000	21,000	31,000
Wilcoxon W	64,000	57,000	55,000	52,000	61,000	59,000	58,000	52,000	57,000	67,000
Z	-,420	-1,156	-1,365	-1,682	-,735	-,945	-1,050	-1,682	-1,155	-,105
Asymp. Sig. (2-tailed)	,674	,248	,172	,093	,462	,345	,294	,093	,248	,916
Exact Sig. [2*(1-tailed Sig.)]	,721[b]	,279[b]	,195[b]	,105[b]	,505[b]	,382[b]	,328[b]	,105[b]	,279[b]	,959[b]

a. Grouping Variable: Attended HBO or Uni

b. Not corrected for ties.

Table 4.5; Mann-Whitney U for the difference in use of causation and effectuation between HBO and university schooled entrepreneurs.

4.4 Age and years of experience

Correlations

			Age	Share effectuation of totall (%) totall	Years of entrepreneur ship	Share causation of totall (%) totall
Spearman's rho	Age	Correlation Coefficient	1,000	-,007	,707**	,007
		Sig. (2-tailed)	.	,978	,002	,978
		N	16	16	16	16
	Share effectuation of totall (%) totall	Correlation Coefficient	-,007	1,000	,156	-1,000**
		Sig. (2-tailed)	,978	.	,564	.
		N	16	16	16	16
	Years of entrepreneurship	Correlation Coefficient	,707**	,156	1,000	-,156
		Sig. (2-tailed)	,002	,564	.	,564
		N	16	16	16	16
	Share causation of totall (%) totall	Correlation Coefficient	,007	-1,000**	-,156	1,000
		Sig. (2-tailed)	,978	.	,564	.
		N	16	16	16	16

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.6; correlations table for years of experience, age and the use of effectuation (aggregated).

Table 4.6 and 4.7 show the Spearman rank correlation-coefficients, and their significance, for both the variable 'age' and 'years of experience'. The correlation-coefficient presents the found ranked correlation, a significance of 0.05 or less indicates there is only a 5% chance there is no linear relationship. Table 4.6 shows these correlation-coefficients for the aggregated categories of effectuation and causation whereas table 4.7 shows the correlation-coefficients per subcategory of effectuation and causation.
Based on table 4.6 we reject our hypotheses; in our sample there is no correlation between age and the use of effectual thinking. Nor is there a correlation between the years of experience an entrepreneur has with entrepreneurship and the use of effectual thinking.
Table 4.7 also shows several interesting correlations (which we will discuss in more detail in chapter 5). The most important finding for us is the fact that the older an entrepreneur gets the less he tries to avoid contingencies. Even more interesting is that this correlation is even stronger for the years of experience an entrepreneur has.

Correlations

			Age	Years of entrepreneur ship	Percentage G of the totall amount of statements made per entrepreneur	Percentage R of the totall amount of statements made per entrepreneur	Percentage B of the totall amount of statements made per entrepreneur	Percentage K of the totall amount of statements made per entrepreneur	Percentage P of the totall amount of statements made per entrepreneur	Percentage M of the totall amount of statements made per entrepreneur	Percentage L of the totall amount of statements made per entrepreneur	Percentage A of the totall amount of statements made per entrepreneur	Percentage E of the totall amount of statements made per entrepreneur	Percentage C of the totall amount of statements made per entrepreneur
Spearman's rho	Age	Correlation Coefficient	1,000	,707**	,124	,251	,289	-,535*	,300	-,186	,229	-,011	-,061	-,161
		Sig. (2-tailed)	.	,002	,647	,348	,277	**,033**	,260	,490	,394	,968	,824	,552
		N	16	16	16	16	16	16	16	16	16	16	16	16
	Years of entrepreneurship	Correlation Coefficient	,707**	1,000	-,118	,005	,427	-,565*	,238	,009	,199	-,301	-,074	,006
		Sig. (2-tailed)	**,002**	.	,665	,985	,099	**,023**	,375	,974	,459	,257	,784	,983
		N	16	16	16	16	16	16	16	16	16	16	16	16
	Percentage G of the totall amount of statements made per entrepreneur	Correlation Coefficient	,124	-,118	1,000	,402	,216	,027	,052	-,550*	-,403	,638**	,004	-,196
		Sig. (2-tailed)	,647	,665	.	,123	,421	,922	,850	**,027**	,121	**,008**	,987	,468
		N	16	16	16	16	16	16	16	16	16	16	16	16
	Percentage R of the totall amount of statements made per entrepreneur	Correlation Coefficient	,251	,005	,402	1,000	,104	-,028	,099	-,731**	-,138	,426	,418	-,333
		Sig. (2-tailed)	,348	,985	,123	.	,700	,918	,716	**,001**	,609	,100	,107	,208
		N	16	16	16	16	16	16	16	16	16	16	16	16
	Percentage B of the totall amount of statements made per entrepreneur	Correlation Coefficient	,289	,427	,216	,104	1,000	-,631**	,144	-,238	,141	-,063	,079	,079
		Sig. (2-tailed)	,277	,099	,421	,700	.	,009	,594	,374	,602	,816	,770	,770
		N	16	16	16	16	16	16	16	16	16	16	16	16
	Percentage K of the totall amount of statements made per entrepreneur	Correlation Coefficient	-,535*	-,565*	,027	-,028	-,631**	1,000	-,140	-,054	-,294	,090	-,300	,056
		Sig. (2-tailed)	**,033**	**,023**	,922	,918	**,009**	.	,606	,841	,268	,741	,259	,837
		N	16	16	16	16	16	16	16	16	16	16	16	16
	Percentage P of the totall amount of statements made per entrepreneur	Correlation Coefficient	,300	,238	,052	,099	,144	-,140	1,000	-,353	,312	-,265	-,462	-,074
		Sig. (2-tailed)	,260	,375	,850	,716	,594	,606	.	,180	,240	,321	,072	,787
		N	16	16	16	16	16	16	16	16	16	16	16	16
	Percentage M of the totall amount of statements made per entrepreneur	Correlation Coefficient	-,186	,009	-,550*	-,731**	-,238	-,054	-,353	1,000	,009	-,480	-,041	-,006
		Sig. (2-tailed)	,490	,974	**,027**	**,001**	,374	,841	,180	.	,974	,060	,880	,983
		N	16	16	16	16	16	16	16	16	16	16	16	16
	Percentage L of the totall amount of statements made per entrepreneur	Correlation Coefficient	,229	,199	-,403	-,138	,141	-,294	,312	,009	1,000	-,391	-,121	-,156
		Sig. (2-tailed)	,394	,459	,121	,609	,602	,268	,240	,974	.	,134	,656	,564
		N	16	16	16	16	16	16	16	16	16	16	16	16
	Percentage A of the totall amount of statements made per entrepreneur	Correlation Coefficient	-,011	-,301	,638**	,426	-,063	,090	-,265	-,480	-,391	1,000	,258	-,234
		Sig. (2-tailed)	,968	,257	**,008**	,100	,816	,741	,321	,060	,134	.	,336	,383
		N	16	16	16	16	16	16	16	16	16	16	16	16
	Percentage E of the totall amount of statements made per entrepreneur	Correlation Coefficient	-,061	-,074	,004	,418	,079	-,300	-,462	-,041	-,121	,258	1,000	-,194
		Sig. (2-tailed)	,824	,784	,987	,107	,770	,259	,072	,880	,656	,336	.	,471
		N	16	16	16	16	16	16	16	16	16	16	16	16
	Percentage C of the totall amount of statements made per entrepreneur	Correlation Coefficient	-,161	,006	-,196	-,333	,079	,056	-,074	-,006	-,156	-,234	-,194	1,000
		Sig. (2-tailed)	,552	,983	,468	,208	,770	,837	,787	,983	,564	,383	,471	.
		N	16	16	16	16	16	16	16	16	16	16	16	16

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.7; correlations table for years of experience, age and the use of effectuation.

4.5 Business studies compared to other studies

Table 4.8 and 4.9 show whether there is a significant difference in the degree to which entrepreneurs use effectual and causal thinking for entrepreneurs that attended either a business related study or a non-business study. Table 4.8 tells us whether there is a significant difference per subcategory of effectuation/causation, in table 4.9 the subcategories are aggregated into effectuation and causation. Once more; the Whitney-Mann test was used and if a significance lower than 0.05 is displayed there is a significant difference between the two means.

Based on table 4.9 we reject our hypothesis; entrepreneurs that have attended an HBO school do not focus significantly more on effectual thinking. However table 4.8 shows that entrepreneurs who have attended an HBO school are significantly better at exploiting contingencies on which we will elaborate in chapter 5.

Test Statistics[a]

	Percentage G of the totall amount of statements made per entrepreneur	Percentage R of the totall amount of statements made per entrepreneur	Percentage B of the totall amount of statements made per entrepreneur	Percentage K of the totall amount of statements made per entrepreneur	Percentage P of the totall amount of statements made per entrepreneur	Percentage M of the totall amount of statements made per entrepreneur	Percentage L of the totall amount of statements made per entrepreneur	Percentage A of the totall amount of statements made per entrepreneur	Percentage E of the totall amount of statements made per entrepreneur	Percentage C of the totall amount of statements made per entrepreneur
Mann-Whitney U	26,000	27,000	27,000	31,000	22,000	25,000	19,000	28,000	10,000	23,000
Wilcoxon W	54,000	55,000	72,000	76,000	67,000	53,000	64,000	56,000	38,000	68,000
Z	-,583	-,477	-,476	-,053	-1,006	-,688	-1,323	-,371	-2,276	-,900
Asymp. Sig. (2-tailed)	,560	,634	,634	,958	,315	,491	,186	,711	,023	,368
Exact Sig. [2*(1-tailed Sig.)]	,606[b]	,681[b]	,681[b]	1,000[b]	,351[b]	,536[b]	,210[b]	,758[b]	,023[b]	,408[b]

a. Grouping Variable: Business study vs non-business study

b. Not corrected for ties.

Table 4.8; Mann-Whitney U for the difference in use of effectuation and causation between business and non-business studies.

Test Statistics[a]

	Share effectuation of totall (%) totall
Mann-Whitney U	30,000
Wilcoxon W	75,000
Z	-,159
Asymp. Sig. (2-tailed)	,874
Exact Sig. [2*(1-tailed Sig.)]	,918[b]

a. Grouping Variable: Business study vs non-business study

b. Not corrected for ties.

Ranks

	Business study vs non-business study	N	Mean Rank	Sum of Ranks
Share effectuation of totall (%) totall	Business	7	8,71	61,00
	Non-business	9	8,33	75,00
	Total	16		

Table 4.9; Mann-Whitney U for the difference in use of effectuation and causation (aggregated) between business and non-business studies.

5. Discussion, limitations, suggestions for future research and the conclusion

This chapter will further discuss the findings that were presented in chapter 4. We will try to explain the results from testing our propositions and in this way attempt to answer our main research question: *'To what extent does having a higher education influence the degree to which expert entrepreneurs use effectual and/or causal thinking?'*
First we will discuss the results gained from testing our propositions and other notable findings. Then we will discuss the limitation of this thesis. After which, based on the discussion, we will try to answer the main research question and review our findings. We will conclude this thesis with suggestions for future research.

5.1 Discussion of results

5.1.1 Effectuation versus Causation

In chapter 2.3.2 we explained that it would be interesting to compare our sample of 'average' expert entrepreneurs to the sample of 'extremely' successful expert entrepreneurs of Sarasvathy. The comparison has limitations which will be discussed in Chapter 5.3.
A quote used before in this thesis: *"Over 63 per cent of expert entrepreneurs in the think-aloud protocol study preferred effectuation to causal approaches more than 74 per cent of the time."* (Sarasvathy, 2008, p. 131). This was the result of Sarasvathy her original research among expert entrepreneurs. When we look at table 4.2 it is remarkable to see that a 100% of the entrepreneurs in our sample preferred effectuation to causal approaches. The entrepreneur who made the most causal statements (39.1% of the statements) still used effectual logic in 60.9% of the statements made. However not a single entrepreneur used solely effectuation, especially later on in the case (when the imaginary company was no longer a start-up), all experts showed they were capable of using causal logic. The entrepreneur who used effectual logic the most (84.0% of the statements) still used causal logic in 16.0% of the statements made. Which is in line with the literature saying effectuation is a dichotomous concept (Sarasvathy, 2001a; Wiltbank et al., 2006b).
As was discussed in chapter 4.2 table 4.4 shows our sample of entrepreneurs uses effectual logic significantly more often than causal logic ($U = 0,0$, $n1 = n2 = 16$, $P < 0.05$ two-tailed). Note that the U value is ,000 because all the effectuation scores are higher than the causal scores. In our sample the entrepreneurs also significantly more often: create the future instead of trying to predict it ($U = 24$, $n1 = n2 = 16$, $P < 0.05$ two-tailed), focus on means instead of goals ($U = 0,0$, $n1 = n2 = 16$, $P < 0.05$ two-tailed) and use alliances and/or partnerships instead of focusing on competitive analysis($U = 61$, $n1 = n2 = 16$, $P < 0.05$ two-tailed). For the other two categories our chosen alpha level is lower than the test result: expected returns instead of affordable loss ($U = 82$, $n1 = n2 = 16$, $P > 0.05$ two-tailed) and avoiding contingencies instead of embracing them ($U = 82$, $n1 = n2 = 16$, $P > 0.05$ two-tailed), so these have to be rejected. Note however that in our sample the expert entrepreneurs on

average favor avoiding contingencies over exploiting them, which is not in line with the literature (Sarasvathy, 2001a).

If we look at table 4 it shows that a major part, in one case even more than half, of the statements were assigned to the category 'M'. M stands for the category 'means' which represents all the statements made relating to: who I am (traits, tastes and abilities), who I am (traits, tastes and abilities) and who I know (social & professional experience). However this is not abnormal; expert entrepreneurs have a lot of experience on which they fall can fall back. On top of that the categories 'personal experience' and 'traits' are very broad. If an entrepreneur mentioned anything along the lines 'I believe …' or 'In my opinion…' this should be placed in the category means. This might indicate a flawed framework which will be discussed in the conclusion (chapter 5.3)

Based on our data it seems that our sample of expert entrepreneurs favors effectual logic over causal logic at least as often as Sarasvathy her original sample of expert entrepreneurs (the outliers) did. When it comes to the subcategories our entrepreneurs favor effectual approaches over causal methods in 4 of the 5 categories, in Sarasvathy her sample this was 5 out of 5. It seems like there is no real difference between our sample and that of Sarasvathy. If there is, the entrepreneurs in our sample might even favor effectual logic more often than the expert entrepreneurs in Sarasvathy her sample. Keep in mind that this comparison has a low validity (see chapter 5.3).

5.1.2 HBO compared to University

Proposition 1a: Entrepreneurs that attended university focus on causal logic more often than entrepreneurs that have attended an HBO school.
Proposition 1b: Entrepreneurs that attended an HBO school use effectual logic more often than entrepreneurs that have attended university.
As can be seen in Table 4.4 and 4.5; whether an entrepreneur has attended an HBO school or a university does not influence the degree to which an entrepreneur uses either effectual of causal thinking ($U = 27$, $n1 = n2 = 8$, $P > 0.05$ two-tailed). As a matter of fact, when we look at the averages of our entrepreneurs: university schooled entrepreneurs use effectual reasoning in 72,0% of their statements whereas HBO schooled entrepreneurs use effectual reasoning in 70,1% of their statements.
If we exclude participant 12 (attended HBO, 39.1% of statements causal versus 60.9% of statements effectual) there is still no significant relation between the two variables. And on average university schooled entrepreneurs still use effectual reasoning in 72,0% of their statements whereas HBO schooled entrepreneurs use effectual reasoning in 71.5% of their statements.
The results seem to indicate that our propositions are flawed. Even though the difference is minimal university schooled entrepreneurs use effectual logic more often than HBO schooled entrepreneurs.

A possible explanation for our results is the fact that all our entrepreneurs are expert entrepreneurs; they have been an entrepreneur for at least 5 years, often for a lot longer. In this period they have accumulated experience (i.e. means (Sarasvathy, 2001a)) and as Dew et al. (2009a) found expert entrepreneurs favor means (non-predictive control) over goals (predictive control). Our results show that all entrepreneurs in the sample fall back on their means surprisingly often. If education level has an influence on the use of effectual and causal logic it could be overwhelmed by this phenomenon. However, we can only speculate about the underlying reason, based on our data the propositions are rejected.

5.1.3 Age and years of experience

Proposition 2a: The older the expert entrepreneur, the more he/she focuses on effectual logic.
Proposition 2b: The older the expert entrepreneur, the less he/she focuses on causal logic.
Proposition 3a: The more experience the expert entrepreneur has, the more he/she focuses on effectual logic.
Proposition 3b: The more experience the expert entrepreneur has, the less he/she focuses on causal logic.
Table 4.6 shows us there is neither a correlation between age and the degree to which an entrepreneur uses effectual thinking ($r(14) = -0.007$ $P > 0.05$ two-tailed), nor is there a correlation between years of experience and the degree to which an entrepreneur uses effectual thinking ($r(14) = -0.156$ $P > 0.05$ two-tailed). It is interesting to see the correlation coefficient of age and the usage of effectual thinking is negative. This means the older an entrepreneur becomes, the less he uses effectual reasoning. However this correlation coefficient is very close to zero and there is a 97.8% chance that this correlation occurred due to chance. The correlation coefficient for age and years of experience is positive, as expected. But a P-value of 0.564 means this result is, again, not significant so a meaningful conclusion cannot be drawn. Even if we exclude outliers; participant 10 (32y, 6y experience, 83.8% effectual) or participant 15 (49y, 22y experience, 36.1% causal), no significant correlation is found, our propositions are rejected.
The only subcategory that has a significant correlation with age($r(14) = -0.535$ $P < 0.05$ two-tailed) and years of experience ($r(14) = -0.565$ $P < 0.05$ two-tailed) is 'avoiding contingencies' (K). The older you get, and the more experience you get, the less you focus on avoiding contingencies. It is interesting to see there is no significant correlation for its effectual opponent 'embracing contingencies' (E). This combined with the fact there is no significant correlation between age/years of experience and the degree to which an entrepreneur uses effectual thinking, this correlation could very well be explained by an alternative reason. For example; the older you get the more you have experienced and witnessed, you handle stress better and do not fear surprise as much and thus avoiding contingencies becomes less of a focus. On top of that if you have a small sample, the more variables you have the bigger the chance you find a significant correlation (De Veaux et al., 2005).
Table 4.7 also shows a correlation between means (M) and goals (G) ($r(14) = -0.550$ $P < 0.05$ two-tailed), between means (M) an expected returns (R) ($r(14) = -0.731$ $P < 0.05$ two-tailed)

and between alliances/partnerships (A) and goals (G) (r (14)= 0.638 P < 0.05 two-tailed). The first finding is in line with the effectuation theory; expert entrepreneurs favor means over goals (Sarasvathy, 2008) and thus the more they focus on means the less they focus on goals. The negative correlation between means and expected returns and the positive correlation between alliances/partnerships and goals could mean a lot of different things. For example; clear goals improve communications within a team (Pronovost et al., 2003). This could be the reason entrepreneurs that focus on alliances and partnerships also focus on goals more often. However this is all speculation and more research is needed to draw meaningful conclusions.

5.1.4 Business studies compared to other studies

Proposition 4a: Expert entrepreneurs with a business education use causal logic more often than expert entrepreneurs with a non-business education.
Proposition 4b: Expert entrepreneurs with a non-business education use effectual logic more often than expert entrepreneurs with a business education.
No significant difference was found when we compared entrepreneurs who studied something business related with entrepreneurs that completed a non-business related study (U = 30, n1 = 7 n2= 9, P > 0.05 two-tailed). Even if we look at the subcategories of effectuation and causation only one of the subcategories, 'embrace contingencies' (E), significantly differs between the two groups (U = 10, n1 = 7 n2= 9, P < 0.05 two-tailed). Entrepreneurs who have attended a business study embrace contingencies significantly more often than entrepreneurs who have studied a non-business subject, this directly contradicts our propositions. It means that in our sample the entrepreneurs that completed a business related study are significantly better at rethinking possibilities; they see contingencies as challenges that can be used as advantages. An alternative explanation could be similar to the explanation given in paragraph 5.1.2; they completed their study so many years ago, any possible effects it might have are overshadowed by the effects of experience. It will take more research in order to make any viable claims on the subject. For now our propositions are rejected.

5.1.5 Other remarks

While conducting the think aloud protocols it became clear every entrepreneur took a different approach to answering the questions. Some immediately started calculating as soon as they read the first numbers whereas others only took a quick glance. Some extensively read the introductory text while others skimmed through it. But there was a trend in the way the entrepreneurs went through the case. The older entrepreneurs seemed to take the case more seriously. Extensively reading the case, making notations, using calculations before answering, coming back on things they had previously said and taking more time in general to go through the case. The younger entrepreneurs in the sample did the opposite; quickly reading introductory texts, no notations or calculations, short and quick answers and in general taking less time to complete the case. There were exceptions to this trend, but in general it seems to apply.

5.2 Limitations

First of all we will discuss the limitations of the comparison we made in paragraph 5.1.1. This comparison can only be made if we have a valid basis to compare, this is mostly true. In the case the type of company was changed from an IT-product to a coffee corner which means some of the figures have changed. However substantively the case has not been changed and all the questions are taken directly from Sarasvathy her case. Different people conducted and coded the think aloud procedures but the same coding scheme and procedure was used, which allows us to compare the data.
Another big limitation is the fact that there are so many variables, so many factors that could influence the behavior of entrepreneurs, that it is impossible for a student to cover all these factors in a bachelor thesis. There is a time restraint and the resources are very limited compared to a study such as the one of Sarasvathy. There are obvious factors that might influence our findings. For example when we look at our sample, almost all entrepreneurs are not only Dutch but also from the same region which could very well be of influence on their behavior. One would almost expect gender to play a role in entrepreneurial behavior and the fact that our sample contains only two female entrepreneurs is a limitation. There are also less obvious factors that might influence our findings. The fact we have just been through an economic crisis might have influenced behavior of the entrepreneurs. On top of that our sample is small, which makes the data prone to statistical errors. All in all more research is needed before we can draw conclusions with relative certainty.

As was already discussed in chapter 5.1.1 our sample of expert entrepreneurs have made significantly more statements belonging in the 'means' category than in any other categories. While it seems logical that expert entrepreneurs have a lot of experience on which they can fall back, this might also indicate the category 'means' in our coding scheme is flawed. As mentioned before the categories 'personal experience' and 'traits' are very broad. If an entrepreneur mentioned anything along the lines 'I believe …' or 'In my opinion…', according to the coding scheme this should be placed in the category means. However some entrepreneurs seemed to use sentences such as: 'I believe…' as a figure of speech. Every time they started answering a question they would start with 'I believe' or 'I think that'. It could be the entrepreneurs use these sentences as safety mechanisms; if they use these words they cannot be wrong since it is their own humble opinion, they do not claim it is the truth or the best way to achieve something; it is just how they would have done it. This means the context in which things are said is very important; especially for this category. This is however, not, included in our coding scheme.

Another limitation is our suboptimal research design. As this thesis is a side project of the EPICC project it was more useful to the project in its entirety to gather data from expert entrepreneurs who enjoyed a higher education. So we reasoned that if there was a significant difference between the entrepreneurs, then education level does not influence the degree to which expert entrepreneurs use effectual and causal logic. This is solid

reasoning, however as mentioned before there are many variables that could influence the way entrepreneurs think. So comparing 10 expert entrepreneurs who have had a higher education with 10 expert entrepreneurs who have not had a higher education would have higher face validity.

5.3 Conclusion and suggestions & implications for future research

Now that we have discussed our literature background, our methodology and our findings, in this paragraph we will try to answer our main research question: *'To what extent does having a higher education influence the degree to which expert entrepreneurs use effectual and/or causal thinking?'*

After selecting Sarasvathy (2001a) her effectuation framework as a basis for our research, we predominantly used the empirical data of Dew et al. (2009a) to establish our propositions. We proposed that entrepreneurs that attended university focus on causal logic more often than entrepreneurs that have attended an HBO school. We also proposed that entrepreneurs with a business related education would use causal logic more often than entrepreneurs with a non-business education. To answer these questions we conducted think aloud protocols from 16 expert entrepreneurs. After converting the verbal protocols to text documents, the data was coded as is explained in chapter 3.

Statistical testing has not delivered significant evidence that confirm our propositions, which resulted in us rejecting all our propositions. An interesting fact however is that; there is no correlation between age/years of experience and effectuation. If an entrepreneur meets the 'expert entrepreneur' criteria it does not matter how old he/she is or how many years of experience he/she has. Based on our results it seems like all the expert entrepreneurs who have had a higher education favor effectual thinking. The same goes for the type of higher education the entrepreneurs has. Whether the entrepreneur attended an HBO school or a university, no matter what subject he/she studied, all entrepreneurs with a form of higher education favor effectual thinking.

Future research should further investigate this finding; what makes expert entrepreneurs with a higher education favor effectual thinking? While Dew et al. (2009a) found that all the MBA students in their sample favor causational thinking, our findings imply that something about having a higher education makes expert entrepreneurs favor effectual thinking, what causes this preference? What is the difference between any form of higher education and specifically an MBA? Uncovering this apparent paradox will help us better understand entrepreneurship.

Further research should also verify our propositions. Repeat the study with a bigger sample of entrepreneurs who have attended university in different countries. Subsequently splitting up this sample and comparing the influence of a higher education on the use of effectuation for individual countries. Comparing a sample of entrepreneurs who all have an MBA degree with entrepreneurs who had no higher education could also be very interesting.

We have also analyzed the correlations between age and effectuation and respectively experience and effectuation for expert entrepreneurs. Since different stages of new venture

creation favor different approaches (Sarasvathy, 2001a), it would be interesting to compute and compare these correlations for a sample of expert entrepreneurs who have had no form of higher education. If these correlations differ then a higher education might, positively or negatively, influence the learning curve for framing a situation (and subsequently selecting an appropriate approach).
In chapter 5.2 we discussed the possibility of a flawed coding scheme. This is a good subject for future research; should the category 'means' be deepened? And if so, how? Context seems very important and should be included in the coding scheme.

Then a last recommendation, we have pointed out there are so many variables that could influence the degree to which entrepreneurs use effectual and causal logic. Mapping and testing these variables will be an immense job but will greatly increase our understanding of effectuation. As was discussed in chapter 1 effectuation is one of multiple entrepreneurship frameworks. In the 10 years it exists it has been steadily developed. But like Moroz and Hindle (2012) pointed out there are several inconsistencies within the framework. It is important to keep developing and perfecting the effectuation framework. It has the potential to greatly enhance our understanding of entrepreneurship, which will allow us to shape entrepreneurship education accordingly.

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7. Appendixes

Appendix 1

The following pages depict an exact copy of the used coding scheme and its operationalization.

Causal	Effectual
P-Prediction of the future	C-Creation of the future
G-Goal-driven	M-Means-based
R-Expected returns	L-Affordable loss
B-Competitive analysis	A-Use of alliances or partnerships
K-Avoid contingencies	E-Embrace contingencies
X-Causal (no subcategory given)	N-Effectual (no subcategory given)

Table 1: effectual and causal codes, based on Sarasvathy (2008: p.55).

The coding of transcripts should be done on the basis of the categories found in table 1. In order to understand what the codes are about, the operationalization can be found in table 2 (below).

Table 2: operationalization codes.

ISSUE	**Trigger question & operationalization into Causal or Effectual indicators**	
View of the future (P vs C)	**(Causal) P =Prediction of the future: what is being predicted?**	**(Effectual) C =Creation of the future: what is being created?**
	The future can be acceptably predicted on the basis of past experiences (Read et al., 2009, p.3; Sarasvathy and Dew, 2005, p.390). There is a relationships between past and future (Dew et al., 2009, p.290; Sarasvathy, 2001, p.251). Causal logic frames the future as a continuation of the past: you can control what happens on the basis of previously obtained knowledge (Sarasvathy, 2001, p251). Hence accurate prediction is both necessary and useful to control the future (Dew et al., 2009, p.290).	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). The future is shaped (at least partially) by wilful agents (investors, partners and customers) who "precommit" to the venture (Read et al, 2009, p.576; Sarasvathy and Dew, 2005). Prediction is neither easy nor useful (Dew et al., 2009, p.290).

Basis for taking Action (G vs M)	(Causal) G = Goal-driven: what is the goal, what is the effect?	(Effectual) M = Means-based: what are the means, what are the tools?
	Goal-oriented / growth intention; ends based. Vision of a desired world: goals / effect are given (Dew et al., 2009, p.293; Sarasvathy, 2001, p.251). Do what you ought to do, based on maximization (Sarasvathy and Dew, 2005, p.390). In the causal frame, goals, even when constrained by limited means, determine sub-goals. Goals determine actions, including which individuals to bring on board (Dew et al., 2009; p.290; Read et al., 2009, p.3; Sarasvathy and Dew, 2005, p.390).	Means-oriented; Start with means: who I know, what I know, who I am. Do NOT start with the goal. You do this by looking at: - 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. Sarasvathy, 2001, p.250; Sarasvathy and Dew, 2005, p.390; p.250; Wiltbank et al., 2006, p.992) Goals emerge by imagining courses of action based on given means (Read et al., 2009, p.3). 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 trough aggregation of sub-goals (Dew et al., 2009; p.290).

View of Risk and resources (R vs L)	**(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 are you maximally willing to lose?**
	Expected returns; pursue new opportunities based on the (risk-adjusted) expected value (Read et al., 2009, p.3). Financials (investments, loans, incubation capital) needed to reach a goal (Read et al., 2009, p.3; Sarasvathy, 2001) 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. (Sarasvathy and Dew, 2005, p.390) Choose multiple market segments to chase the largest expected returns (Dew et al., 2009, p.299)	Affordable loss; Private capital (could be 0 euro). Invest what you are willing to / can lose; small bets. (Read et al., 2009, p.3; Sarasvathy, 2001; p.246). Totally in their control (Wiltbank et al., 2006, p.993) 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 is on limiting downside potential. (Read et al., 2009, p.3; Sarasvathy and Dew, 2005, p.390)

Attitude toward Outsiders (B vs A)	**(Causal) B = Competitive analysis: which competitors are identified and analysed?**	**(Effectual) A = Use of alliances or partnerships: what sort of alliances are mentioned?**
	Competitors mentioned; expected competition level. (Sarasvathy, 2001; p.252) A competitive attitude toward outsiders. Relationships are driven by competitive analysis and the desire to limit ownership of outsiders as far as possible (Read et al., 2009, p.3; Sarasvathy, 2001; p.252). Recruiting sales force. (Dew et al, 2009, p.299) Protect what you have and maximize your share of the opportunity (Read et al., 2009, p.3)	Partnerships; build a network of self-selected stakeholders (Not competitive analysis). Realized partnerships and/or potential partnerships are discussed. (Sarasvathy, 2001; p.251) Through partnerships you are better able to create new markets. Relationships, particularly equity partnerships, drive the shape and trajectory of the new venture (Read et al., 2009, p.3; Sarasvathy, 2001; p.252). Personally approaching customers. (Dew et al, 2009, p.299) Both partners acknowledge to share risks and reward (Read, Song and Smit, 2009; p.583; Read et al., 2009, p.3)

Attitude toward unexpected events (K vs E)	**(Causal) K = Avoid contingencies: What is done to avoid contingencies / where is indicated surprises is bad?**	**(Effectual) E = Embrace contingencies: What is done to leverage contingencies … where is indicated surprises are good?**
	Surprise is bad. Develop techniques to avoid or prevent from surprises (Read et al., 2009, p.3; Sarasvathy, 2001, p.251; Sarasvathy and Dew, 2005, p.390). Prediction, careful planning and focus enable the firm to minimize the impact of unexpected events (Read et al., 2009, p.3). Avoid obstacles. Contingencies are seen as obstacles to be avoided. (Sarasvathy and Dew, 2005, p.390; Dew et al., 2009; p.290) No change when confronted with new information, means or surprises. (Read, Song and Smit, 2009, p.574)	Surprise is good. Leveraging / embrace contingencies, rethinking possibilities, are challenges. Leverage contingencies and even failures, not avoid them (Read et al., 2009, p.3; Sarasvathy, 2001; p.251; Sarasvathy and Dew, 2005, p.390). Prevent from 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. (Sarasvathy and Dew, 2005, p.390) Change when confronted with new information, means or surprises. (Read, Song and Smit, 2009, p.574)
No subcategory given (X vs N)	**(Causal) X =**	**(Effectual) N =**
	No subcategory given.	No subcategory given.

Within the last category (no subcategory given), you will include components which you think are still causal or effectual but which cannot be identified as being part of either the causational categories P, G, R, B and K versus the effectual categories C, M, L, A and E.

Appendix 2

This appendix shows the coded protocol of entrepreneur #1

Causal	Effectual
P-Prediction of the future	C-Creation of the future
G-Goal-driven	M-Means-based
R-Expected returns	L-Affordable loss
B-Competitive analysis	A-Use of alliances or partnerships
K-Avoid contingencies	E-Embrace contingencies
X-Causal (no subcategory given)	N-Effectual (no subcategory given)

Red text = Interviewer
Black text = Interviewee

Misschien dat ik af en toe nog even kijk of die werkt, of die loopt. Mocht je aantekeningen willen maken eventueel een rekenmachine.

Op de universiteit...

Je mag em ook losscheuren als je dat makkelijker vindt.

Nou het is op de universiteit dus als ik begin met vraag 1, op de universiteit wat het meest rondloopt zijn studenten dus dat zal de hoofdgroep zijn. Daarnaast heb je natuurlijk lesgevende: professoren, hoogleraren en aanverwanten en eventueel ook nog mensen die er gewoon ondersteunend werken. En dan denk ik dat voor een universiteit dat de koffiecorner, dat ligt eraan of je in een gebouw zit waar gestudeerd word of dat je in een gebouw zit die in een winkelcentrum bij een universiteit zit bijvoorbeeld. Als je in dat winkelcentrum zit dan heb je in feite 2 markten, dan kun je ook gewoon mensen hebben die niks met die universiteit te maken hebben, plus wat ik net al zei. Potentiële concurrenten dat is de universiteit zelf natuurlijk die overal koffiemachines neergezet zal hebben en das meteen de lastigste. Want als het over prijs gaat zullen zei dat altijd winnen. Daarnaast werd al gezegd dat er al meer koffiecorners zijn in de buurt. Dus ja dan zul je toch wel een keer goed moeten kijken wie dat zijn, op wat voor plekken ze zitten en vooral wat voor prijzen ze nemen. Over de concurrenten denk ik dat vooral heel belangrijk is de plek waar je zit... de plek en de prijs... en de klanten nou dan zou ik meer kijken naar de aantallen klanten en hoe druk andere koffiezaken het hebben en niet precies wat ze doen. Want ik zou ervan uitgaan dat als ik een koffiezaak zou beginnen met wat aanverwante artikelen, dat ik sowieso, omdat ik erbij kom, dat ik het meest orgineel ben en het best ben in wat ik in producten neer ga zetten en de beste prijs kwaliteit verhouding. Dus wat dat betreft zou ik me niet zo heel veel zorgen maken om andere concurrenten. Mits, der maar genoeg, je wilt wel zien dat die andere concurrenten het ook druk hebben, nu al dan. Want kijk het is natuurlijk makkelijker klanten weg te halen van volle tenten dan van tenten die het al heel moeilijk hebben omdat er geen klanten zijn.

Ja.

Hoe zou je die vraag beantwoord willen zien en wat voor soort marktonderzoek. Nou ik zou daar niet al te moeilijk over doen, dat marktonderzoek. Wat ik wel zou doen is een zwakte sterkte analyse en verder zou ik dan toch vooral van mijn eigen kracht uitgaan. Ja je kunt ook onderzoeken wat je wilt maar je kunt niet altijd alles voorzien. En hetzelfde geld voor het maken een ondernemersplan, je kunt altijd klappen krijgen omdat je zelf de omzet mag verzinnen.

Ja.

Dus daar zou ik niet al te moeilijk over doen. Ik zou alleen wel goed rondkijken dat je vernieuwend bezig bent dat je je duidelijk onderscheid van anderen. Zowel kwaliteit maar ook met een nieuw concept of nieuwe producten. En voor wat dat betreft de groeimogelijkheden van een bedrijf. Ik denk dat alles je kijkt naar... als je een keten zou willen beginnen meteen heel groot aanpakken. Ik denk dat dat niet werkt met dit soort zaken want ik denk dat je voor het beste resultaat er altijd zelf bij moet zijn. Kijk de omzet binnen zo'n bedrijf die kan wel groeien, maar... kijk koffie op zich is natuurlijk een goed product met een vreselijk hoge marge. Maar ik denk dat als je heel rijk wilt worden zou ik er niet aan beginnen.

Ok.

Even kijken het beschrijven van de markt... (doornemen probleem 2)
Nou probleem 2 dan. Aan welk marktsegment wilt u het product gaan verkopen? Dat zou ik aan elk marktsegment willen doen. Want om koffie in voorraad te nemen daar gaat niet bijzonder veel geld inzitten. Dus ik denk dat je een echte keuze dat je die niet hoeft te maken als je je productenreeks gewoon breed genoeg neerstelt is de investering maakt nouwlijks uit. En je ziet wel wie er binnenkomt en dan kun je altijd gaan proberen met maximaal rendement te gaan verkopen. Welke prijs op het product plakken? Nou zoals het onderzoek al aangeeft zijn mensen nauwelijks bereid te betalen. Maar dat is denk ik inherent aan z'n onderzoek.

Hmmhmm.

Iedereen vind altijd alles te duur maar als je goedkoper zou kunnen leveren dan de goedkoopste... uit het overzicht, wat onderzocht is, of voor hetzelfde geld als de goedkoopste of voor een betere service of dat je zaak er beter uitziet dan is dat genoeg. Kijk als je de goedkoopste wil zijn hoef je niet veruit de goedkoopste te zijn. Hoe wil je het gekozen segment en in die segmenten gaan verkopen. Qua marketing denk ik dat het internet omdat het om universiteit gaat nog wel gaat. Kranten zijn veel te breed, bioscopen zijn veel te breed tenzij het om een bioscoopgelegenheid op de universiteit zelf gaat. Lokale TV ook veel te breed dus ik denk dat dat allemaal zonde geld is. Ik denk eerder dat je het slimmer aan kunt pakken dus sportkantines, studiegroepen uitnodigen voor proeverijen, handig je personeel kiezen uit bepaalde studiegroepen. Ik denk dat dat meer zin heeft. Die hebben we gehad Het salaris, welke van die 4 opties kiest u en waarom. Nou mijn eerste inzet is dat ik geen 1 van die vier opties zou kiezen omdat ik ervan overtuigd ben dat als je niet bij de bank kunt lenen van waarom ze je dat geld niet willen lenen dan hebben ze waarschijnlijk een punt. Waarschijnlijk is het dan niet verstandig om dat geld te lenen of om dat geld te investeren. Als ik toch moet kiezen uit die 4 opties zeker niet optie 4 want je medewerkers moet je altijd betalen. Je moet er vreselijk voor oppassen dat

je medewerkers niet gemotiveerd zijn. Of dat ze door jou handelen zich genoodzaakt voelen een greep in de kas te doen bijvoorbeeld. Dus die valt sowieso af. Vriendinnen gaan voorbij dus ouders van vriendinnen ook dus daar zeker geen geld van lenen. Oude vrienden is voor mij ook geen optie. Nou kijk met je eigen ouders zou je een deal kunnen maken met een extra hypotheek... tenminste als je, het ligt er ook aan weer hoe veel waarde er in hun woning zit. Dat zou je kunnen zien als een soort voorschot op je erfenis. Dat zou dan de enige mogelijkheid zijn die hierbij staat maar persoonlijk zou ik het nooit doen.

Ok, duidelijk.

Voor wat betreft de financiering zou ik zeker niet optie 2 nemen: vrienden van familie. Nou met familie en vrienden van familie handel je niet. Daarnaast of je 33% of 48% van je aandelen afgeeft maakt voor mij nog niet zo heel veel uit omdat die hoge omzetten die worden gebudgeteerd, nou dan moet je eerst nog maar is zien of je ze haalt. En bij optie 2 zit er een andere valkuil in van als je het niet haalt ben je wel die 40.000 per jaar standaard kwijt. Dus optie 1, optie 3 zijn voor mij dan de meest aantrekkelijke.

Blijf alsjeblieft hardop denken.

Maar ik denk toch wel dat ik voor optie 3 ga dat ik het zelf doe. Want ik denk dat ik daar heel... ja ik denk, ik ben ondernemer omdat ik op gevoelsbasis beslis en ik zou het heel lastig vinden om mij elke maand te moeten verantwoorden bij een derde. Dus daarom denk ik toch dat ik voor die optie 3 ga.

Oke.

Dus het tweede deel van die vraag; ook al gaat die durfinvesteerder voor 33%. Ja ik zou toch eerder voor die durfinvesteerder kiezen dan een vriend van de familie, die zou ik nooit graag meetrekken.

Ok, volgende.

Van de leiderschapvisie het kiezen van een slogan. Ik zou kiezen voor nummer drie. Maar waarom niet voor 1? Concurrenten afzeiken vind ik not done. Het hebben veel heel veel medewerkers zou nooit geen doel moeten zijn van welke ondernemer dan ook. Investeer in koffie B.V., kijk het is een artikel in de krant mensen zitten nergens op te wachten om te investeren. En de snelst groeiende koffie-cateraar vind ik eigenlijk het meest positief van deze 4. Maar nog liever had ik een slogan die de kwaliteit van het product benadrukt. Ik denk dat dat nog veel belangrijker zou kunnen zijn.

Ja.

Het herontwerpen, hoe reageer je op die feedback. Nou ja ik denk als ik zo die uitkomsten bekijk dat ik der als ondernemer niet zo heel gek veel mee zou kunnen. Dat mensen die gewone koffie drinken geen speciale producten drinken en andersom lijkt me eigenlijk wel redelijk logisch want iedereen heeft zijn voorkeur en mensen hebben niet elke week een andere voorkeur. Dus dat mensen aan hun eigen type koffie vasthouden dat lijkt me meer een gegeven. En ik snap eigenlijk ook niet hoe mensen het zich kunnen bedenken dat de sfeer naar beneden gaat omdat iemand anders een andere

koffie drinkt dan die zelf drinkt. Dus met dit verhaal kan ik niet zoveel, het enige, kijk als het niet goed draait... ik zou dan toch zelf nog een keer kijken, niet alleen naar de koffie, kijk als je ervan overtuigd bent dat die kwaliteit wel oke is. Maar ik denk ook niet dat mensen voor koffie alleen komen, je verkoopt ook iets wat je niet afrekent en dat is sfeer. Dus ik zou er heel erg naar gaan kijken, wat kun je doen om die sfeer dan te verbeteren zodat mensen liever bij je zitten.

Ja, ok.

Oke, op zich is een extra alternatief in je.. uhm concept wel aantrekkelijk om je risico te spreiden. Anderzijds is het ook wel een hele investering als je dan kijkt naar je verwachte terugverdien tijd heeft het ook wel tijd nodig. Aan de andere kant je hebt al iets wat draait.

Ja.

Je hebt al iets wat geld genereert dus je eigen inkomen hoeft er zeker niet uit te komen. Wat dat betreft zou ik zeggen doen, plus natuurlijk dat je omloopsnelheid erg omhoog gaat. Dat soort cijfers staan hier dan niet in maar de omloopsnelheid vind ik altijd wel redelijk belangrijk. Het moet er snel in en snel uit dat is altijd goede handel en dat maakt ook dat je bedrijf veel makkelijker te financieren is.

Ja precies.

Nou en dat is ook eigenlijk de enige reden want kijk... anderzijds vind ik het nog steeds wel vreemd dat boeken, kranten in een winkel liggen. Ik zou juist zeggen die moeten in je koffiecorner liggen. Ja dat vind ik een vreemde opmerking in dit verhaal.

Ok.

Want ja volgens mij horen ze daar thuis. Uhm... Ja.
Als je kijkt naar de kosten van het ontwerpen... ik neem aan dat je zelf wat voor ogen hebt hoe het moet worden.

Hmmhmm.

Als je dan naar deze prijsverschillen kijkt dan zou ik toch ook al is het in het buitenland voor dat stukje kosten gaan. Voor die 100.000, want dat scheelt gewoon de helft met uh de volgende. En je geeft toch pas de opdracht als je helemaal akkoord bent. Dus ja dan kijk voor een ton meer of minder, voor een ton kun je een boel risico nemen.

Ja.

Dus ga, dan maar in het buitenland

Ok.

Ja als iemand al zolang trouw is... Dan zou ik toch met hem gaan overleggen van wat die zelf wil. Waarschijnlijk loopt die zelf ook wel tegen een plafond aan. Maar ik zou gewoon op een min of meer gelijkwaardige manier proberen met em te overleggen. Want kijk ja, je kunt nog, je hebt 20 manager. Nou 20 is al heel veel die zijn al nauwelijks meer te sturen dus je kunt allerlei andere oplossingen ook bedenken. Je kunt het in 2 x 10, je kunt het geografische opsplitsen, je kunt het naar grote kleine winkels opsplitsen, je zou kunnen opsplitsen en dan kun je hem daar prima weer bij gebruiken. Uh... anderzijds je zou ook kunnen overwegen om hem op een hele chique manier naar een andere functie bij een ander bedrijf te begeleiden. Uhm dat is misschien wel de makkelijkste en beste oplossing. Vooral omdat er ook staat dat hij zich niet in staat is aan te passen aan de nieuwe ontwikkelingen. Iemand die zich niet kan aanpassen, moet je ook afvragen of je die nog wel in een managersclub wil hebben want ik denk dat dat een van de kenmerken is van de manager dat die goed blijft kijken en dat die daarop reageert en zich aanpast. Uhm nou ontslaan dan zou ik zeker gezien het aantal dienstjaren en dat die altijd een prima verkoper is geweest niet overwegen. En ik, een nieuwe manager aanstellen ik moet dus kiezen uit deze twee dingen, blijkbaar. Dat zou dus een nieuwe manager worden maar ik zou het wel op zo een manier met die ander overleggen dat het zou lijken of het bijna zijn eigen keuze was, in die hoek zou ik het proberen te drukken.

Ja.

Dus ik zou het hem ook zeker niet bot brengen maar ik zou hem bijna uitnodigen om mee te helpen zoeken naar een nieuwe manager zodat iedereen er toch weer redelijk gelukkig uh uit lijkt te komen.

Ja precies.

Ja, ik vind dat je trouw altijd moet belonen.

Ok.

Ja als ik zo een partner zou hebben die het allemaal heel zakelijk wil houden en veel wil vergaderen weet ik wat. Kijk dat is altijd het nadeel van als je groeit en als je een gedeelte uit je handen geeft. Dan moet je gaan afvragen of het ondernemen nog wel leuk is. En uh... kijk als hij zo'n groot aandeel heeft dat die zich ook, dat je je daarbij zou moeten neerleggen. Of dat als je je er niet bij neerlegt dat je een soort van oorlogssituatie krijgt. Dan zou voor mij de tijd denk ik wel aangebroken zijn om te zien dat ik mijn aandeel zou kunnen verzilveren misschien. Das ook... kijk als je zolang ergens inzit is het ook wel weer misschien tijd om er weer een keer uit te gaan en om een keer weer wat anders te doen, of om hetzelfde op een andere plek nog weer een keer te doen. Uhm tenminste als je ondernemen leuk vind dan is niet het doel stil blijven zitten en uhm... elke maand je geld ophalen denk ik. Dus... maar dat heeft te maken met hoe die macht verdeeld is, van uh zie je kans om te winnen of als je denkt dat je in een doorlopende crisissituatie dan terecht komt zou ik proberen gewoon mijn aandeel te verzilveren en uh op een leuke manier ergens anders weer wat anders te gaan beginnen.

Ja.

Nou dit is niet mijn sterke punt, sollicitatiegesprekken. Maar het is natuurlijk wel belangrijk om te kijken wat die mensen gedaan hebben van... uh kijk je kiest ze zelf uit dus je ziet dat ze je iets kunnen brengen. Uhm... Ik denk dat het belangrijkste is om te kijken of mensen uh... of ze hart hebben, hart voor hun zaak of ze zouden ze kunnen hebben.. of ze iets hart... kijk jij bent eigenaar maar als je iemand op zo een positie zet dan moet die op een of andere manier laten zien dat die hart heeft.

Ja.

Voor het product voor een zaak en uh EN daarnaast zou ik ook wel willen weten wat die mensen van plan zijn. Uh ik neem aan dat... of als iemand komt solliciteren heeft die zich ingelezen heeft natuurlijk alles goed bekeken. Uh... van wat kunnen, denken zei te kunnen toevoegen aan je bedrijf. Hoe denken ze dat, op welke manier denken ze dat te kunnen bereiken. Wat is hun manier van leiderschap, past het in cultuur die kant zou ik op willen met de vragen.

Ok.

Nou ja gezien de omzet en het aantal jaren dat je bezig bent, en de manager die je binnenhaalt. Met het doel dat je zelf wat meer vrije tijd krijgt om rond te kijken, om te zien naar nieuwe kansen zou dit een project kunnen zijn wat je aanpakt als je dat heel leuk vindt zeg maar. Kijk om het geld hoef je het niet te laten gezien de omzet. Je krijgt er ook een boel commitment voor terug je krijgt er gedeeltelijk wat arbeid voor terug waarschijnlijk, je krijgt er ook een sociaal gezicht door terug, niet alles draait om het geld dus ik zou het wel heel erg overwegen maar ik zou het zeker niet verkopen in dat geval. Als het dan toch om het sociale gezicht gaat dan zou ik het project doneren. Nou vind ik lesgeven helemaal niks dus ik zou het niet doen maar ik kan me voorstellen als je een ondernemer bent die het wel leuk vind om te doceren, dat je het wel doet, dan is het een kans.

Ja.

Tja dit is een lastige... Richting 1, richting 2 het is een mooi moment om uit te stappen in ieder geval. Want qua geld hoef je je niet zo heel veel zorgen meer te maken nou. Uhm... ik denk dat ik voor richting 2 zou gaan en dat komt toch omdat ik denk uhm... dat een bedrijf naar de beurs brengen je... gaat zorgen dat je alleen nog voor het geld werkt. Kijk elke aandeelhouder heeft wat te vinden en praat mee op een aandeelhoudersvergadering en uh maar je ziet er de ene, bij dat soort bedrijven, de ene na de andere CEO binnenkomen die weer een pakket opties krijgt. En die der alleen maar belang bij heeft om de aandeelhouderswaarde zo snel mogelijk omhoog te jassen, zodat die zelf na een jaar weer zoveel mogelijk opties kan verzilveren

Ja.

Ik denk voor continuïteit voor een bedrijf dat dat veel belangrijker is... dat je een uh rustige visie hebt en dat je middellange en lange doelen stelt en daar gewoon rustig aan werkt. Dus wat dat betreft kon het toch nog wel is zijn dat ik naar richting 2 ging. Kijk voor je eigen geld maakt het niet zoveel uit want je beurt zoveel dat kun je toch niet meer op krijgen. Nou dan denk ik dat ik het wel heel leuk zou vinden dat je tent instant blijft, dan zou ik voor richting 2 gaan.

Appendix 3

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Share causation of totall (%) totall	,161	16	,200*	,931	16	,257
Share effectuation of totall (%) totall	,161	16	,200*	,931	16	,257
Percentage G of the totall amount of statements made per entrepreneur	,213	16	,051	,889	16	,053
Percentage R of the totall amount of statements made per entrepreneur	,235	16	,019	,913	16	,128
Percentage B of the totall amount of statements made per entrepreneur	,200	16	,086	,903	16	,090
Percentage K of the totall amount of statements made per entrepreneur	,140	16	,200*	,929	16	,234
Percentage P of the totall amount of statements made per entrepreneur	,163	16	,200*	,947	16	,448
Percentage M of the totall amount of statements made per entrepreneur	,147	16	,200*	,961	16	,674
Percentage L of the totall amount of statements made per entrepreneur	,126	16	,200*	,971	16	,852
Percentage A of the totall amount of statements made per entrepreneur	,145	16	,200*	,920	16	,172
Percentage E of the totall amount of statements made per entrepreneur	,141	16	,200*	,951	16	,509
Percentage C of the totall amount of statements made per entrepreneur	,212	16	,052	,931	16	,249

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Appendix 4

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Sum Effectuation Codes	16	26	73	49,31	15,374
Sum Causation Codes	16	10	38	20,31	9,307
Totall 'goals' statements	16	1	8	3,69	2,442
Totall 'expected returns' statements	16	1	13	3,94	3,214
Totall 'competitive analysis' statements	16	1	10	3,88	2,553
Totall 'avoid contingencies' statements	16	0	12	4,88	3,775
Totall 'prediction of the future' statements	16	0	11	3,62	2,604
Totall 'means' statements	16	11	45	27,12	10,295
Totall 'affordable loss' statements	16	2	7	4,75	1,483
Totall 'alliance and partnership' statements	16	2	12	5,75	2,887
Totall 'embrace contingencies' statements	16	0	7	2,81	2,105
Totall 'creation of the future' statements	16	3	14	8,63	3,284
Share effectuation of totall (%)	16	60,87	83,95	71,0814	7,33563
Share causation of totall (%)	16	16,05	39,13	28,9186	7,33563
Percentage G of the totall amount of statements made per entrepreneur	16	1,23	12,31	5,2450	3,09082
Percentage R of the totall amount of statements made per entrepreneur	16	1,35	12,15	5,5106	3,21029
Percentage B of the totall amount of statements made per entrepreneur	16	2,00	12,24	5,3944	3,09268
Percentage K of the totall amount of statements made per entrepreneur	16	,00	13,04	6,8519	4,36026
Percentage P of the totall amount of statements made per entrepreneur	16	,00	12,36	5,4137	3,36599
Percentage M of the totall amount of statements made per entrepreneur	16	25,00	55,56	38,7081	7,58259
Percentage L of the totall amount of statements made per entrepreneur	16	2,82	12,00	7,2731	2,58906
Percentage A of the totall amount of statements made per entrepreneur	16	4,08	11,96	8,1531	2,68619
Percentage E of the totall amount of statements made per entrepreneur	16	,00	6,54	3,9206	1,97812
Percentage C of the totall amount of statements made per entrepreneur	16	6,38	20,41	12,5888	4,12452
Valid N (listwise)	16				