Context and Success in Entrepreneurial Decision Making; An Empirical Validation

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Abstract
Effectuation theory claims to have superior predictive power over traditional 'causal' methods for understanding entrepreneurial decision making under conditions of uncertainty. While gaining a lot of support initially, with some scholars talking about a possible paradigm shift, recently there has been a call for more a more nuanced view. This thesis aims to contribute to this debate by quantitatively testing the relationship of several context variables with entrepreneurial decision making. Furthermore an attempt is made to construct a multidimensional construct to measure entrepreneurial success in a way that is aligned with effectual thinking. Data was collected from 87 expert and novice entrepreneurs by means of a survey, and an additional existing dataset containing 185 respondents was included bringing the total dataset to 272. Findings include evidence for the impact of cognition on decision making, and a moderating effect of culture on that relationship. Interestingly, no direct or moderating effect of expertise is found, even though this is a core argument for the proponents of effectuation theory. Furthermore effectuation is found to be moderately negatively correlated with causation, indicating that a dichotomous distinction between the two styles is not productive. It is concluded that entrepreneurial decision making is a complex process, dependent on subtle differences in contextual factors, but that effectuation might be a fruitful avenue to challenge existing and traditional models of entrepreneurship.

Keywords: Effectuation, causation, expertise, culture, cognition, entrepreneurial succes, decision making.

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Chapter 1. Introduction

"The answers you get depend on the questions you ask."
~Thomas S. Kuhn

1.1 The origins of the fi eld

Entrepreneurship is probably as old as mankind itself (Tatyana & Aleksandra, 2013). The first known trading occurred already around the year 17,000 BC. Small communities of hunters and gatherers would venture out to other tribes in search of a place where they could exchange their surplus goods in return for items that they themselves did not have. The agricultural revolution, some 12,000 years ago, made it possible for people to increasingly specialize in their labor. The introduction of debt and currency made the exchange of goods significantly easier. The scientific and the subsequent industrial revolution marked the beginning global capitalism (Cook, 2004).

The early twentieth century saw the beginnings of our current conception of the social sciences, and the idea that society may be studied in a standardized and objective manner. The idea was to apply mathematics and the search for universal laws from the natural sciences to the realm of society. How wonderful would it be to be able to predict and control parts of society in the same way as we are able to with nature. As such our modern social sciences were born. In the field of economics and business, Schumpeter (1934) pioneered in systematically reflecting on the nature of entrepreneurship. He defined entrepreneurship not only in terms of economic gains, but also as a drive of innovation and technological change. Entrepreneurs not only contribute to a nation's wealth, but are also capable of being the mediators between newly developed scientific knowledge and its application in our society.

So entrepreneurship as an academic discipline was born. As with many social sciences which are based on human action, a clear definition is difficult. Most people know intuitively what is meant by entrepreneurship, but a clear definition of the concept in academia has been subject to a lot of discussion (Carton et al., 1998). Contributing to this ambiguity is the fact that the subject can be approached from many different angles and disciplines, such as sociology, economics, psychology, and management (Hebert & Link, 2009). It can be described as a multifaceted phenomenon (Low & MacMillan, 1988). Some even argue that we should not try to reach agreement on an exact definition of entrepreneurship (Stearns & Hills, 1996). Such is the fate of applying the scientific method to a social phenomenon as elusive as entrepreneurship.

However, good attempts to formalize and mathematize the field of entrepreneurship were undertaken in a quest to predict and control aspects of entrepreneurship. This led for example to a search for personality indicators of successful entrepreneurs (Zhao & Seibert, 2006), the ability of entrepreneurs to predict the future and control uncertainty (Langlois & Cosgel, 1993), or a formal description of factors leading to entrepreneurial success (Roure & Maidique, 1986). Ideally, a kind of formulae would be established, where different factors of

entrepreneurship could be filled in and which would result in a predetermined optimal course of action. However, it turned out that humans do not always behave rationally (Tversky & Kahneman, 1973), and are therefore difficult to predict or capture in theories and laws. Moreover, postmodernism eroded our notion of universal scientific truth and opened up the way to see things from many different, but equally important perspectives. Add to this a globalizing world in which fast changing circumstances lead to an ever increasing complexity, and it will become apparent that a scientific methodology based on the natural sciences might not yield the expected results when confronted with something illusive as entrepreneurial behavior.

1.2 The need for context

The study of entrepreneurship develops perhaps along similar lines as our understanding of and knowledge about the world does. While postmodernism is sensitive to local circumstances and mundane situations, rejecting notions about the universality of ideas and ideologies (Hassan, 2001), in recent entrepreneurship research there is a similar call for attention to context (Brinckmann et al. 2010; Welter, 2011; Zahra, 2007). Contextualizing entrepreneurship research means seeing entrepreneurial activity as being determined by historical, ecological and social contingencies, rather than flashes of an individual enterprising genius, or following a fixed method for starting new businesses. Recognizing the need for differences in context we can see that measuring success in entrepreneurship research is often simplistic, and in need of including aspects other than merely financial performance indicators (Amit et al., 2000; Cohen & Mitchell, 2008; Davidsson 2016; Fisher et al., 2014; Sarasvathy, Menon & Kuechle, 2013).

As for the field of entrepreneurship as an academic field of study, it can traditionally be defined as being concerned with the study of sources of opportunities; the processes of discovery, evaluation, and exploitation of opportunities; and the set of individuals who discover, evaluate, and exploit them (Venkataraman, 1997; Shane & Venkataraman, 2000). The role of the entrepreneur is thereby seen as discovering and the subsequent exploitation of new venture opportunities (Carton et al. 1998). However in the last two decades, an alternative view has emerged, one that examines how certain types of entrepreneurial action can result in forming rather than merely finding or encountering opportunities (Welter et al., 2016).

1.3 Planned versus emerging theories

The above mentioned changing views are recognized by scholars in the field of entrepreneurship, and has led to the development of a stream of research that is called emergent, as opposed to planned theories of entrepreneurship research (Fisher, 2012). Two prominent examples of such emergent theories are bricolage and effectuation, which both investigate the nature of entrepreneurial decision making.

Bricolage is a concept with an history dating back to the French anthropologist Lévi Strauss (1966), who used it as a way of describing an epistemology based on indigenous mythological thought. The novelty and attractiveness of the concept came from the fact that it

described a non Western way of thinking which nevertheless seemed productive and useful. Since then the concept has been applied in various fields of research ranging from biology (Lewens, 2013), to educational science (Wagner, 1990) and being used in theater, arts and music (Dijk, 2012).

In the field of business administration bricolage as a managerial tool is often used to describe a rational response to environmental constraints, mostly being resource scarcity and unexpected events. As such, it can be used as an approach or tool to aid in solving problems, designing, and innovating in uncertain contexts (Visscher et al. 2017). Not surprisingly it has therefore also been picked up by researchers of entrepreneurial behavior (Phillips & Tracey, 2007) as a way of supplementing traditional theories on entrepreneurial behavior (Fisher, 2012). In this context, Baker & Nelson (2005) describe bricolage as ‘’making do with whatever resources are at hand, combining of resources for new purposes, and the refusal to enact limitations.’’

Effectuation theory was first developed in the seminal article by Sarasvathy (2001). She starts from the premise that traditional thinking in economics and management is flawed by assuming the existence of artifacts such as organizations and markets. They are not adequately equipped to explain how such artifacts come into being, and therefore fail to explain a crucial component of how new businesses are developed. She argues that in all the renowned places where business is being taught, the methods rely on assumptions that multiple factors of a business environment are known and using forecasting and estimating techniques, answers to unknown variables can be extrapolated (Sarasvathy, 2008). In practice however, many decisions are subjected to Knightian uncertainty, which is defined as risk that is immeasurable and not possible to calculate, or not only unknown but also unknowable (Perry et al. 2012; Sarasvathy et al., 2003). Effectuation theory is able to bridge this gap, and provide an explanation of how new firms are created and decisions are made under conditions of such uncertainty (Dew et al. 2008; Read & Sarasvathy, 2005; Wiltbank et al. 2006).

Research has shown that traditional models of entrepreneurial decision making, such as those commonly taught in business schools, may not effectively capture and reflect the actual behavior of entrepreneurs launching new ventures in a dynamic environment (Fisher, 2012). This creates the need to at least supplement these traditional causal models with those that have an emergent perspective on decision making. As perhaps already became clear from the description, bricolage and effectuation appear to be similar in many respects as they provide a basis for the analysis of relations between resources, entrepreneurial opportunities, resource constraints and creativity (Archer et al. 2009; Fisher, 2012).

Because of the similarities, a choice for effectuation is made as the prime theory for this thesis. The reason for this is that effectuation yields more results when searching the academic databases, perhaps because it is viewed by scholars as more promising and exciting since some already talk about a paradigmatic shift in our thinking about entrepreneurial decision making (Perry et al., 2011). While talking about things like a changing paradigm should not be done lightly because it requires radical change in the way we conceive of basic

concepts and methods in a field of science (Kuhn & Hawkings, 1963), effectuation does seem to fundamentally question the way we think about entrepreneurship. Even though a lot of work still needs to be done if effectuation is to qualify as a real theory (Arend et al., 2015), it does hold much promise for better understanding the complex ways in which entrepreneurs make decisions.

1.4 Purpose and outline of the thesis

In light of the picture sketched above, the aim of this thesis is to explore why and especially in what context we should use effectuation theory to understand entrepreneurial decision making. Contributing to a nuanced understanding on the range of possibilities and situations that allow effectuation theory to be used will hopefully result in more effective and productive use of the theory. As an additional component, a critical assessment is made on the traditional use of entrepreneurial success, and a new measurement is introduced which should do justice to a more emergent view of entrepreneurship.

In order to do so, a theoretical framework is built by drawing several concepts together in order to understand the background in which entrepreneurial decision making takes place. In the framework. the concept of context and its role in academic research on entrepreneurship is explored (Boettke & Coyne, 2009; Brinckmann et al. 2010; Welter, 2011; Zahra, 2007). Three context variables are found in the literature that are expected to significantly influence entrepreneurial behavior.

First, looking at entrepreneurship from the perspective of expertise can be considered as key to effectuation theory (Sarasvathy, 2009), and a main argument in support for effectuation theory is that it turned out that entrepreneurs which are classified as experts would choose an effectual approach more often than novices would (Dew et al. 2009). Secondly, seeing entrepreneurship primarily as a mode of thinking opens up the way for an underlying cognitive order in entrepreneurial behavior, also called a global culture of entrepreneurship (Mitchell et al., 2000;2002). The third context variable found in the literature is considered less important by Sarasvathy (2009) but might nevertheless play a significant role (Triandis, 2004) and represents the concept of culture.

After the analysis of the context and its relevant factors, the theoretical framework ends with a reflection on currently used notions for measuring performance. After concluding that contemporary measures are not adequate to facilitate a changing view on the nature of entrepreneurship, a new construct is developed. The result is a holistic conception of entrepreneurial success grounded in multiple levels of analysis. An attempt is made to go beyond only financial performance indicators in order to align the concept of success with the effectual school of thought and what it means to be an entrepreneur.

Based on the theory, a conceptual model is developed in order to empirically test the corresponding hypotheses on the importance of context for effectuation theory. Data on one hundred expert entrepreneurs is collected to determine the effects of context on entrepreneurial behaviour and if a causal relationship can be found between the type of

entrepreneurial decision making and success. The results are then presented followed by a discussion on their implications in the conclusion.

Based on the above, a research question is formulated:

How do thinking style, culture, and expertise influence the entrepreneurial decision making process, and what is the predictive value for entrepreneurial success?

1.4 Scientific & societal relevance

Effectuation is a promising theory but still under development and more empirical validation is needed to strengthen it (Perry et al., 2011). A common method to test the decision making process is to use think aloud protocols (Dew et al., 2008; Sarasvathy, 2009). While think aloud protocols are suitable for explorative research, a survey offers a more quantitative approach to testing the robustness of the theory (Babbie, 2013). The scientific relevance of this thesis therefore lies in contributing to the empirical validation via quantitative means of effectuation theory. This will in the end lead to a better understanding of the forces that influence entrepreneurial decision making. Furthermore the issue of measuring performance or success, something which remains a challenging aspect in research on entrepreneurship (Fisher, 2012; Murphy, Trailer & Hill 1996), is addressed by developing a construct that is hopefully better suited to measure entrepreneurial outcomes from an effectuation perspective.

The social relevance of this thesis stems from the strong connection of entrepreneurship research to real world practice. The underlying goal of academic understanding of entrepreneurship is, or ought to be, to aid in better entrepreneurial related decision making. This is beneficial for our society for several reasons. Entrepreneurial activity is empirically proven to influence factors such as employment and job creation (Block et al., 2017), productivity growth and innovation (Praag en Versloot, 2007). Following the perspective proposed by Sarasvathy (2001), one could argue that next to beneficial outcomes for society, entrepreneurship is also a way to cultivate virtues (Sand, 2017). It is a possible pathway to attain personal autonomy in one's life, and according to Aristotle it can therefore ultimately contribute to the individual eudaimonia or good life (Barnes, 1984). Contributing to the development of effectuation theory and its outcomes is therefore directly relevant for understanding entrepreneurial decision making, whether this understanding is used by academics, policymakers, or entrepreneurs themselves.

Chapter 2. Theoretical framework

"Science may be described as the art of systematic over-simplification."
~Karl Popper

2.1 Introduction

The aim of this chapter is to develop a framework of contextual factors affecting entrepreneurial behavior, and to explore avenues for a more suitable measure of entrepreneurial success. First effectuation theory is explored. Following that, an argument for the inclusion of context and the relevant contextual factors is presented. A theoretical description of the relevant contextual factors is then given. In the final section the idea of entrepreneurial success is examined.

2.2 Effectuation theory – What makes a decision

2.2.1 Introduction

As explained in the first chapter, a combination of developments has led to the rise of an emergent stream of research in the field of entrepreneurship. Opposed to a planned approach, such a way of thinking might be more effective to explain contemporary issues relating to entrepreneurial processes. One of the promising theories in this regard is that of effectuation, first described by Sarasvathy (2001). This section contains an overview of the most important ideas in effectuation theory.

Effectuation theory was first developed in the seminal article by Sarasvathy (2001). This theory describes the entrepreneurial decision making process. Sarasvathy also recognizes that traditional planned approaches to describe entrepreneurship are not optimal. She shares these approaches based on a logic of prediction under the concept of causation. When entrepreneurs develop new products and enter new markets, the environment is too complex to rely on prediction. Instead relying on a logic of control is more suitable according to Sarasvathy. In her seminal article she articulates this theory (Sarasvathy, 2001), but also sketches a different picture of the entrepreneurial nature. This is perhaps a conceptualization which is better suited to understanding entrepreneurship in our contemporary society. About an entrepreneur who is not only strategically looking for windows of opportunities to gain optimal return on investment, but rather as a person with a unique set of capabilities and resources based on historical determined contingencies. Someone for who building a business is also a way to achieve life goals, and who might not have a clear vision of the road ahead for the venture but experiments and makes use of the situation as it unfolds.

2.2.2 Effectuation explained

Effectuation begins with means available to the effectuators. Three categories can be distinguished based on three personal aspects of the entrepreneur. '*Who I am*' refers to the traits, abilities and attributes of the entrepreneur. '*What I know*' relates to the level of

education, experience and expertise. '*Whom I know*' is comprised by the entrepreneur's social networks. These three personal circumstances together form the 'what I have', the pool of resources available to the entrepreneur (Sarasvathy et al., 2008; Sarasvathy, 2008). The central question then becomes: what effects, such as the creation of new firms or markets, can I create, given who I am, what I know, and whom I know? This leads to several possible courses of action of which the consequences are to a large extent unpredictable, and typically co-determined by interested stakeholders. For effectuation theory, the focus of the entire decision-making process for each individual involved is on what can be done with the set of given means or resources (figure 2.1).

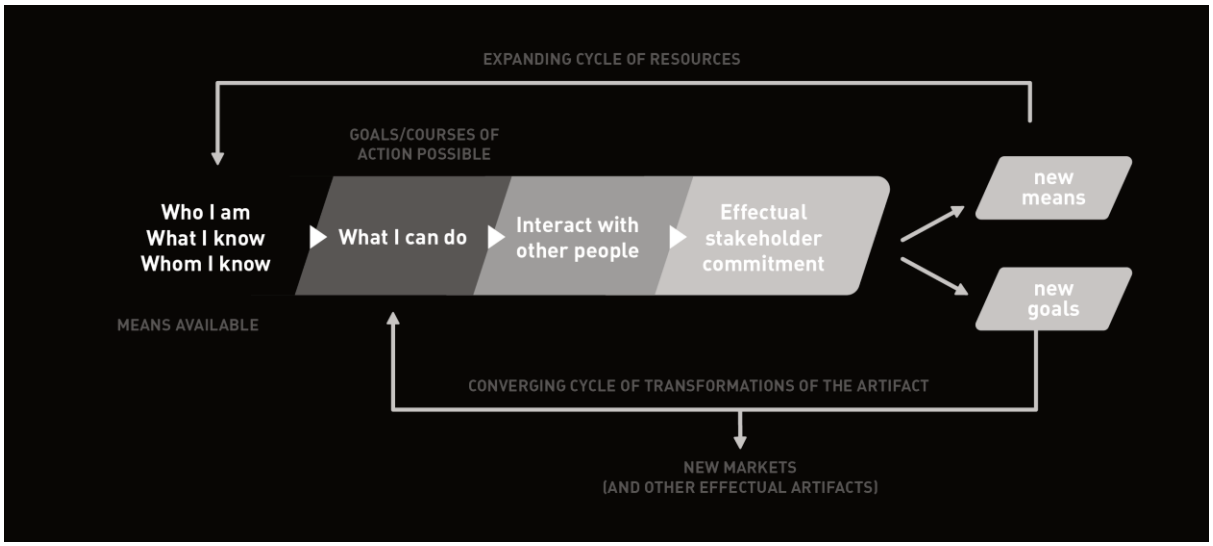

Figure 2.1: A dynamic model of effectuation, based on Sarasvathy (2008).

Effectuation is often contrasted to the traditional, causal view of entrepreneurship (Perry et al., 2011; Sarasvathy, 2003; 2008; Wiltbank et al., 2009). Sarasvathy (2001, p. 245) states that effectual processes "take a set of means as given and focus on selecting between possible effects that can be created with that set of means", while causation processes "take a particular effect as given and focus on selecting between means to create that effect." Contrasting these two different approaches can give insight into what defines effectuation. Dew, Read, Sarasvathy, and Wiltbank (2009) provided an overview of the characteristics of effectuation as opposed to causation. These will be briefly elaborated below.

Non-predictive as opposed to predictive control

The logic of control differs to the extent that an effectual logic will rely on measures of controllable aspects of an uncertain future. This is opposed to a causal logic in which a decision maker chooses between alternatives based on predictions about favourable outcomes. Using an effectual logic it would make sense to establish relations or contracts with a customer in order to develop a product which satisfies the conditions that are set. An causal logic would be to perform market analysis and research in order to develop a product to suit consumer needs, and then selling it to the customer.

Means-driven as opposed to goal-driven action

Effectuation is characterized by a means-driven action, while causation is oriented towards goal-driven action. This distinction is related to the other emergent theory of entrepreneurship, that of bricolage, which can be described as ‘’making do with whatever resources are at hand’’ (Baker & Nelson, 2005). An entrepreneur using an effectual logic is best off taking action based on what is readily available: who you are, what you know, and who you know. The available resources are partly determining the goals. In contrast, an entrepreneur using a causal logic will first set a desired goal, and subsequently will try to gather the resources necessary in achieving such outcome.

Affordable loss as opposed to expected return

From an causal point of view, the best course of action would be the one that will maximize future expected returns. When having to choose between different sets of actions, a calculation reveals which action or project will yield the highest expected returns. From an effectual perspective, the choice of action or project will depend more upon the assessment of what the entrepreneur is able or willing to lose. If potential losses are within the bounds of acceptability, the decision will per definition not become unacceptable in terms of resources spent.

Partnerships as opposed to competitive analysis

An important aspect of the effectual logic is to rely on partnerships with relevant stakeholders. Forming alliances and bringing such stakeholders on board are important, even in the stages where the exact product-market combinations are still unclear. The forming of alliances and the input of stakeholders can influence the direction of the new firm. Conversely, and causal logic will rely more on competitive analysis and strategic planning to define markets, customers and segments. Once these variables are known, the relevant stakeholders are identified and acquired.

Leveraging as opposed to avoiding contingencies

A combination of the above mentioned characteristics of effectuation such as getting major stakeholders on board early, working from one’s available means and having acceptable levels of downside risk, means that contingencies are less likely to be harmful. Not having a fixed point of destination in the future means that contingencies might alter the goal of the newly founded firm, but that this is not necessarily problematic, and that contingencies can be leveraged. This is opposed to a causal approach, where a clear goal is defined and contingencies are seen as unexpected events that can only distract from the goal and should therefore be avoided. Effectual entrepreneurs are able to see uncertainty and unexpected events as a resource and use them to their advantage.

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 frames the future as shaped (at least partially) by willful 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.

Figure 2.2: Causal versus effectual logic, based on Dew et al. (2009).

2.2.3 Conclusion

To sum up, effectual decision making relies on a set of resources available to the entrepreneur, and following a course of action into the unknown, preferably with some key stakeholders as a companion. This is opposed to a causal type of decision making, where the entrepreneur strives towards a predetermined goal, making use of market analysis to outsmart competitors. Causal decision making is thus based on prediction, while effectuation acts upon a logic of controlling certain aspects that can influence the future. Under conditions of Knightian uncertainty, the effectual approach to decision making can be considered to better explain how new entrepreneurial artifacts such as firms and markets come into being. The next question is why entrepreneurs choose either a casual or effectual way of making decisions. This may in part depend on the context, which will be explored in the next section.

2.3 On context

Academic research on entrepreneurship has long been attentive to the fact that organizations do not operate in isolation. Rather they are a player in what is called the business environment, where external factors such as customers, competitors, governments, and markets play an important role (Kaplan & Norton, 2001). Effectuation theory starts from the premise that the entrepreneurial process is in part shaped by contextual factors such as the entrepreneur's personal characteristics, level of education and expertise, and available resources such as social networks or financial means (Sarasvathy, 2001).

However, it is still a question why some entrepreneurs make more use of an effectual approach in their decision making, while others prefer a more planned or causal approach. Proponents of effectuation theory claim that entrepreneurs who are considered to be experts, are more likely to choose the effectual approach (Dew et al., 2009; Read & Sarasvathy, 2005), suggesting that effectuation is in fact better suited for entrepreneurial decision making. Others take a more nuanced approach, arguing that the effectiveness of planned and emergent approaches are dependent on the context in which they are used (Brinckmann et al. 2010).

Being sensitive to contextual factors in entrepreneurship research will increase its quality (Zahra, 2007). In order to gain a better understanding of the reasons why entrepreneurs choose a specific decision making process, several contextual factors that might have a moderating or mediating influence on this relation will be explored in later sections of the theoretical framework. The rest of this section is devoted to a brief description on entrepreneurial context beyond the business environment.

One of the key concepts to understanding context is that of institutions. Boettke & Coyne (2009) see institutions as making up the formal and informal "rules of the game." These rules create payoffs that make certain entrepreneurial opportunities more attractive than others. Institutions can be either formal or informal (Peng, 2003), and can be seen as structures and mechanisms of social order. Formal institutions are often seen as stemming from official organisations, such as the government, to provide rules in the form of legislation and regulation, property rights and the judicial system (Li & Zahra, 2012). Informal institutions can be seen as the soft rules relating to human psychology, such as social norms, culture and family (Helmke & Levitsky, 2004).

Institutions form the rules of the game, and collectively these rules make up the context in which the entrepreneur operates (Boettke & Coyne, 2009). Calling for the contextualization of entrepreneurship, Welter (2011) develops four dimensions of context. She argues that distinguishing between business, social, spatial, and institutional context, leads to better understanding of how external factors influence entrepreneurship on multiple levels of analysis. Opening up the discussion on the diversity of contexts of entrepreneurship will therefore be a step towards understanding the nature and dynamics of entrepreneurship (Zahra, 2007).

For the purpose of this thesis, three context variables are chosen that seem to have a prominent place in the literature. First, Welter (2011) sees that an important part of the institutional context consists of culture. The importance of culture as a contextual factor in entrepreneurship is supported by other authors (Brinckmann et al. 2010; Hayton et al., 2002; Meek et al., 2010). The second contextual factor stems from a psychological stream of thought and constitutes the influence of cognitive aspects on entrepreneurial behaviour (Baron, 1998; Mitchell et al., 2000; 2002). This line of reasoning is seen as an interesting avenue for research into driving forces of entrepreneurial behavior (Laskovaia, 2017). The third context variable, and relating to the work on entrepreneurial cognitions is the premise

that one of the key factors determining the choice for an effectual approach is the level of entrepreneurial expertise (Read & Sarasvathy, 2005). While evidence is already found for this relation by Dew et al. (2009), methodological issues in their article and the possibility for a more nuanced relation justify more extensive empirical validation on this matter.

To conclude, the context in which entrepreneurial activity takes place can help to better understand the entrepreneurial process and decision making procedures. Based on the literature, three major contextual factors, cognition, culture, and expertise are chosen and explored further on in the theoretical framework. These factors forms the basis for the empirical investigation on the antecedents of entrepreneurial decision making, and being attentive to these context factors should ideally help us gain a better understanding of its workings.

2.4 Cognition - Entrepreneurship as a mode of thinking

2.4.1 Introduction

Recent years have seen considerable interest in cognitive logics used by entrepreneurs (Laskiovia et al. 2017). Research into cognition has established that different thinking styles are better suited for different tasks or activities, and that the nature of the task influences the degree to which a specific thinking style is adopted (Novak & Hoffman, 2008). In this section the influence of cognitive thinking styles on the choice for either an effectual or causal logic by the entrepreneur is explored. To do this, the cognitive model of Mitchell (2000) is reviewed to see how cognition and the concepts of cognitive scripts are related to entrepreneurship. These cognitive scripts are then translated to Epstein's (1996) conception of intuitive-experiental and analytical-rational thinking styles.

2.4.2 Entrepreneurial cognitions

Mitchell et al. (2000) start from the premise that entrepreneurship is primarily a mode of thinking, meaning that differences in individual cognitive aspects are responsible for entrepreneurial behaviour. What they call entrepreneurial cognitions can explain important phenomena in global entrepreneurship. For them it is conventional wisdom that the factors influencing the decision to start a new business are different across countries. However, this apparent multitude of diverse phenomena might not be so different after all. Even though entrepreneurs are located in different cultures, they also share some important ways of thinking, and taken together these form the elements of a coherent cognitive model. As such, several heterogeneous factors that influence the decision to start a new business are in fact subject to an underlying cognitive order (Mitchell et al., 2000;2002).

Cognition is defined as ''all processes by which sensory input is transformed, reduced, elaborated, stored, recovered and used'' (Neisser, 1967 in Mitchell et al. 2002).
This definition is combined with the use of expert information processing theory, since expertise can account for the ability of entrepreneurs to transform, store, recover and use information that nonentrepreneurs do not have. As such a distinction between those two groups can be made. Experts are in the possession of knowledge structures, also called

scripts, that allow them to outperform nonexperts who do not possess such scripts. As such, their conceptual model (figure 2.3) is based on the influence of cultural values on cognitive scripts, which in turn determine the venture creation decision.

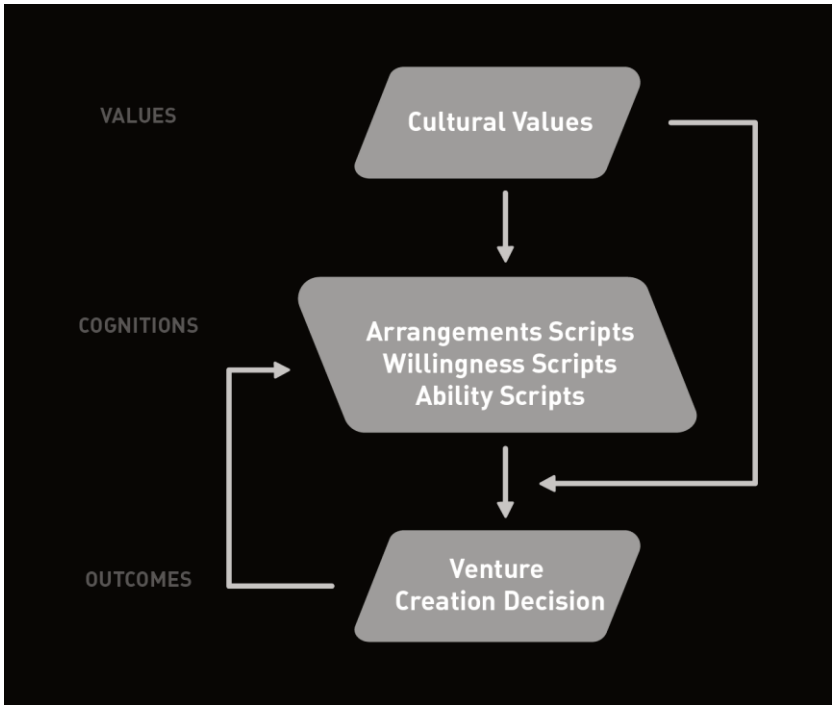

Figure 2.3: Conceptual model of culture and cognition based on Mitchell et al. (2000).

In this model, cultural values are defined as the way that human societies organize knowledge and social behaviour into a consistent set of cognitive orientations. In their study, the authors use two of the most used cultural values as described by Hofstede (1980), namely individualism and power distance. These values influence the respective cognitive scripts. Arrangement scripts are related to the individuals propensity to having contacts, relationships, resources and assets necessary to form a new venture. These scripts are the knowledge structures of individuals about the use of these arrangements to support their own performance.

Willingness scripts are the knowledge structures that are related to the commitment of receptivity of starting a new venture, and form the basis of thoughts that can inspire action towards the creation of a venture. Finally, ability scripts are the cognitive structures that individuals have about capabilities, skills, knowledge, norms and attitudes that are needed to create a new venture. In a dynamic interplay with each other, these scripts, moderated by cultural values, can determine if a person will choose to start a new business.

In sum, Mitchell et al. (2000;20002) argue that shared cultural characteristics within a group of people can lead to this group being faced with similar problems and related responses, which in turn leads to a kind of shared cognition based on these shared experiences. It can

furthermore be argued that entrepreneurs, regardless of cultural or spatial differences, also share this experience of similar problems and responses, related to the inherent nature of entrepreneurship. This in turn leads to a shared entrepreneurial cognition, or what Mitchel et al., (2000:2002) call a global culture of entrepreneurship.

2.4.3 Cognitive-experiential self theory

From the framework of Mitchell et al. (2002) it becomes clear that culture and related cognitions can influence entrepreneurial decision making, with the new venture creation decision in particular. However to explore the influence of cognition on the use of either a effectual or causal method, the cognitive-experiential self theory (CEST) developed by Epstein (1994) is deemed more appropriate. This is first because of methodological issues, for example the inability to directly measure the degree of mastery of cognitive scripts since they are, as mental operations, not directly observable (Mitchel et al., 2000; p.982). Furthermore CEST makes use of a dichotomous distinction between two types of information processing modes. As will become clear, these two modes correspond well to the two types of entrepreneurial processes under scrutiny.

Cognitive-experiential self theory (CEST) was developed by Epstein (1994), under the assumption about the existence of two parallel, interacting modes of information processing. Based on many conceptualizations about differences in information processing by a variety of high-ranking psychologists such as Jung, Tversky and Kahneman, and Pavlov, Epstein inferred the existence of a rational and an experimental mode of information processing.

The rational system operates primarily at the conscious level and is intentional, analytic, and mostly verbal and relatively free of emotional affect. The experiential system on the other hand is more automatic driven, it operates below the surface of consciousness, is more nonverbal and is intimately associated with emotional affect. The table below summarizes the main differences between the rational and experiential system.

EXPERIENTIAL SYSTEM	RATIONAL SYSTEM
1. Holistic	1. Analytic
2. Affective: Pleasure-pain oriented (what feels good)	2. Logical: reason oriented (what is sensible)
3. Assosiationistic connections	3. Logical connections
4. Behavior mediated by "vibes" from past experiences	4. Behavior mediated by consious appraisal of events
5. Encodes reality in concrete images, metaphors and naratives	5. Encodes reality in abstract symbols, words and numbers
6. More rapid processing: Oriented toward immediate action	6. Slower processing: Oriented toward delayed action
7. Slower to change: Changes with repetitive or intense experience	7. Changes more rapidly: Changes with speed of thought.
8. More crudely integrated: Dissociative, emotional	8. More highly differentiated
9. complexes; context-specific processing	9. More highly integrated: Cross-context processing
10. Experienced passively and preconsiously: We are seized by our emotions.	10. Experienced actively and consiously: We are in control of our thoughts.
11. Self-evidently valid: "Experiencing is believing"	11. Requires justification via logic and evidence.

Figure 2.4 Experiential vs Rational Systems, based on Epstein et al. (1996).

These two modes of information processing share important characteristics with the two entrepreneurial decision models of effectuation and causation. An effectual process looks similar to the experiential or intuitive system while the causal approach seems to share a lot of features with the rational system.

In their 1996 study, Epstein et al. furthermore explore the possibility of individual differences in the usage of these two thinking styles, a study in which they measure to which extent people characteristically operate in either of these modes. Evidence for individual differences is found along the conclusion that the two modes of processing are not antagonistic but are two kinds of information processing that are independent, something which is also expected to be found in effectuation theory when comparing the effectual and causal logic. Although rational and experiential are independent, they jointly contribute to behavior. This means that there are individual differences in thinking style, and that these lead to differences in action. Because both the apparent similarities between the two thinking styles and entrepreneurial processes, and methodological issues in measuring scripts, CEST will be included in the final theoretical framework in favor of cognitive scripts.

2.5 Culture - Local contingencies influencing behavioral preferences

2.5.1 Culture in Entrepreneurship

Culture is seen as an important contextual factor in entrepreneurship (Brinckmann et al. 2010). People in collectivist cultures place more emphasis on context rather than content. This is important for entrepreneurial decision making because collectivists see behavior as a result of external factors such as norms and roles (Triandis, 2004). Furthermore, culture is a shaping force in cognitive scripts and subsequent entrepreneurial cognitions and decision making. As can be seen in figure 2.3, the conceptual model as proposed by Mitchell et al. (2000), culture both influences the cognitive scripts directly, and has a moderating effect on the relation between cognitive scripts and entrepreneurial decision making.

A common conception of culture is that which has been proposed by Hofstede (1980) as: the collective programming of the mind, which distinguishes the members of one group of people from another." Hofstede's cultural dimensions are widely known as a conceptual tool for cross-cultural business analysis, however his work is not without drawbacks (Tung & Verbeke, 2010). Although the use of values to understand cultural differences has dominated the field, there is growing recognition that new perspectives are needed to supplement this approach (Gelfand, 2006). Able to draw relations from societal cultural influences to individual behavior and organisational context, the cultural-tightness concept can prove fruitful to explore entrepreneurial processes (Gelfand et al., 2006; 2011; Uz, 2015).

2.5.2 Cultural tightness-looseness

Scholars from anthropology and psychology have long argued that the strength of social norms and sanctioning is an important component of the societal normative context. Therefore Gelfand et al. (2006) developed cultural dimensions on the strength of societal

norms and sanctions that link external societal constraints with individuals' psychological processes and organizational processes.This led to the distinction between tight and loose culture. Tight cultures are defined as having strong norms and a low tolerance of deviant behavior. Loose cultures have weak norms and a high tolerance for deviant behavior (Gelfand et al., 2011). Variation in this distinction of norms and sanctions can be used to see how cultural factors can social and moral attitudes across the globe (Mrazek et al., 2013).

The degree of cultural tightness, being the strength of norms and degree of tolerance for deviance, is determined by several distal ecological and human made threats. In response to those threats, social institutions and practices are developed which together shape the tightness of a culture (Gelfand et al., 2011; Uz, 2015). A high occurrence of threats, be it natural or man-made, would increase the need for strong social norms and punishment of deviant behavior. This allows better social coordination, and a higher chance of survival. It is important, Gelfand et al. (2011) state, to refrain from value judgements on the desirability of a tight or loose culture from one's own vantagepoint. This because the these cultural aspects are in part functional in their own ecological and historical context. Figure (2.5) shows how a combination of institutional, ecological and historical factors coupled with more mundane situational aspects affect the development of societal norms and tolerance of deviant behavior.

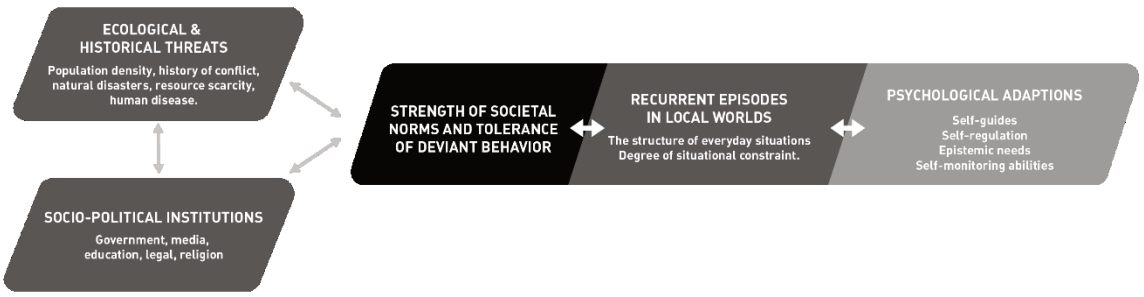

Figure 2.5: A systems model of tightness-looseness, based on Gelfand et al. (2011).

The degree of cultural tightness is thus determined at a collective level, and its influence trickles down to an organisational and individual level (Gelfand, 2006). The strength of norms and sanctioning influence a variety of aspects ranging from organizational context and outcomes, to individual behavior and decision making styles. This way it becomes clear that the historical and ecological circumstances which are shared by a collective of people, can influence everyday entrepreneurial decisions by being incorporated into their culture. Both from the behavioral perspective of individuals and through the institutional context in organizations. It can therefore be expected that the degree of cultural tightness affects the use of effectual decision making, and perhaps also the final result, firm success.

2.6 Expertise - What makes an expert?

2.6.1 Introduction

Looking at entrepreneurship from the perspective of expertise can be considered as key to effectuation theory (Sarasvathy, 2009). Instead of looking at traits or circumstances for trying to explain variance in performance, effectuation theory looks into understanding commonalities across a variety of of high performers, or experts, in a given domain. A main argument in support for effectuation theory is that it turned out that entrepreneurs which are classified as experts would choose an effectual approach more often than novices would (Dew et al. 2009). If experts in the field of entrepreneurship choose an effectual approach more often, surely this would be a sign of the effectual approach being more effective than using causal methods. Therefore the subsequent section will look into how expertise in the context of entrepreneurship looks like, by what ways it can be acquired, and how experts distinguish themselves from novices in terms of results.

2.6.2 Expertise in entrepreneurship

There is little argument that expertise is contextual (Dew et al., 2009), meaning that it is dependent on situational aspects. Expertise therefore has to be examined in separate domains, and it can be defined as attaining reliable superior performance in such a particular domain. Experts are able to do this because they possess knowledge structures, or scripts, about particular domains that allow them to significantly outperform non-experts who do not have and use such structured knowledge (Mitchell et al. 2000). Seeing entrepreneurship as a form of expertise is in line with recent productive developments in cognitive psychology on the use of heuristics (Read & Sarasvathy, 2005).

In order to be successful entrepreneurs have to have diverse skillsets, including “knowing the business and markets, being an entrepreneurial force, accommodating adversity, as well as oral presentation skills, interpersonal skills, and the ability to prepare and present a business plan’’ (Gustafsson, 2006, p.44). However in order to distinguish an expert entrepreneur from a novice, she has to to be able to perform the whole range of tasks at different levels of uncertainty. Something which requires the ability to match decision-making mode to the nature of the task (Mitchell et al. 2005). This is what entrepreneurial expertise really entails according to Gustafsson (2006), and entrepreneurs are able to match task and decision frame by the use of entrepreneurial scripts as described in section 2.3. These scripts should be derived from both successes and failures in situations characterised by different levels of uncertainty in order to let the entrepreneur become a true expert capable of making adequate decisions across a variety of tasks.

Dew et al. (2009) empirically studies the differences between expert entrepreneurs and MBA student they considered to be novice entrepreneurs trained in formal academic methods. They found that the MB students relied on predictive information that they were given to solve problems and followed textbook procedures for making decisions. Expert entrepreneurs on the other hand under-weighted, ignored and even explicitly argued against taking predictions seriously, working instead with things within their control even if that meant changing their

initial goals and visions for the venture. These two approached overlapped relatively well respectively with the causal and effectual framework, suggesting that expert entrepreneurs are more likely to use an effectual approach and novices will likely choose to use a causal logic.

2.6.3 Definitions from the literature

Since this thesis wants to examine the effects of expertise on entrepreneurial decision making and its effect on entrepreneurial success, the question becomes that of how to define an expert. Expertise can be defined as sustained superior performance (Dew et al. 2009), achieved through matching tasks and suitable corresponding decision frames (Gustafsson, 2006). Many authors on the subject in the field of entrepreneurship agree that ultimately expertise is some function of temporal experience coupled with deliberate practice (Ericsson et al., 2006; Mitchell et al. 2000; Read & Sarasvathy, 2005; Sarasvathy, 2009). Some other factors can also play a role, such as the number and type of problems encountered, metacognition and communication with other experts (Mitchell et al. 2005).

Sarasvathy (2009) defines expert entrepreneurs as, "a person who, either individually or as part of a team, had founded one or more companies, remained a fulltime founder/entrepreneur for ten years or more, and participated in taking at least one company public (p. 21)". In a similar sense, Dew et al. (2009) take a definition as "expert entrepreneurs are persons who, either as individuals or as part of a team, have founded one or more companies, remained with at least one company that they founded for more than ten years and taken it public'' (p. 294). They add a note of caution that expertise is not merely experience and that expertise when approached using the simple construct of experience, the connection with performance weakens considerably, which is supported by Ericsson and Smith (1991). Mitchell et al. (2000) argue that the distinction between experts and novices can be made based on the questions "I have started three or more businesses, at least one of which is a profitable ongoing entity'' and "I have started at least one business that has been in existence for at least two years.'' Baron and Ensley (2006, p. 1335) let entrepreneurial networking organizations decide whether an entrepreneur is considered an expert. Nevertheless in their study experienced entrepreneurs had started on average 2.6 ventures with an average lifespan of 4.8 years of existence.

2.6.4 Conclusion

In sum, experience and deliberate practice lead to the possession of knowledge structures and scripts that apply to a given domain. Expertise consists of the ability of matching these scripts with the problems in a situation, and thereby achieving sustained superior performance. This could be considered a reasonable approximation towards a measurement of expertise, although not unproblematic. Difficulties in measuring constructs like deliberate practice, the amount of experience and type of experience required to achieve expertise, other contributing factors such as motivation make a clear definition subject to discussion. Also, the importance of sustained superior performance which Dew et al. (2009) stress, might lead to the question of how such superior performance would look like to an expert in the field of entrepreneurship. That the notion of entrepreneurial performance is by no means evident in the literature will be the subject of the next section.

2.7 Entrepreneurial outcomes - a holistic notion

2.7.1 Introduction

So far several theoretical concepts which influence the entrepreneurial decision making process have been analysed. However applying an effectual or causal logic is not a goal in itself, but rather a way to reach a certain outcome (Sarasvathy, 2009). In business literature such an outcome is often translated in terms of performance or success, such as financial or operational indicators (Venkatraman & Ramanujam, 1986). In the traditional perspective entrepreneurship slightly different measures are often taken, focussing on those which relate best to new venture performance (Chandler & Hanks, 1993).

2.7.2 Dependent variables in entrepreneurship research

Determining the dependent variable in entrepreneurship research however, is considered problematic (Cohen & Mitchell, 2008). In a study done by Murphy et al. (1996) it is argued that in many cases, the generalization of empirical findings across performance indicators is not justified. They found evidence that the relationship between a given independent variable and performance is likely to depend upon the particular performance measure used. It is quite possible for an independent variable to be positively related to one performance measure and negatively related to another. This means that even though solid research is done, the outcomes may be positive or negative based on the selected performance indicator. Figure 2.7 provides an example of the wide range of possible performance indicators (Murphy et al., 1996).

DIMENSION	MEASURE	#	MEASURE	
Efficiency	Return on investment	13	Average return on assets	3
	Return on equity	9	Net sales to total capital	1
	Return on assets	9	Return on average equity	1
	Return on net worth	6	Internal rate of return	1
	Gross revenues per employee	3	Relative product costs	1
Growth	Change in sales	23	Job generation	1
	Change in employees	5	Company births	1
	Market share growth	2	Change in present value	1
	Change in net income margin	2	Number of acquisitions	1
	Change in CEO/owner compensation	2	Change in pretax profit	1
	Change in labor expense to revenue	1	Loan growth	1
Profit	Return on sales	11	Stock price appreciation	1
	Net profit margin	8	Price to earnings	1
	Gross profit margin	7	Respondent assessment	1
	Net profit level	5	Earnings to share	1
	Net profit from operations	5	Average return on sales	1
	Pretax profit	3	Average net profit margin	1
	Clients estimate of incremental profits	1	Market to book	1
Size liquidity	Sales level	13	Number of employees	5
	Cash flow level	6	Case flow to sales	1
	Ability to fund growth	5	Inventory turn over	1
	Current ratio	2	Accounts receivable turnover	1
	Quick ratio	2	Case flow to total debt	1
	Total asset turnover	1	Working capital to sales	1
	Cash flow to investment	1		
SCS/Fail	Discontinued business	4	Operating under court order	1
	Researcher subjective assessment	1	No new telephone number	1
	Return on net worth	1	Salary of owner	1
	Respondent subjective assessment	1	Change in gross earnings	1
Market share	Respondent assessment	3	PIMS value	1
	Firm product sales to industry product sales	1		
Leverage	Debt to equity	2	Long-term debt to equity	1
	Times interest earned	1	Stockholders capital to total capital	1
Other	Change in employee turnover	1	Relative quality	1
	Dependence on corporate sponsor	1		

Figure 2.7: List of performance measures, based on Murphy et al. (1996).

Another thing that this table shows is the reliance on financial indicators to measure performance. This is also recognized by Cohen & Mitchell (2008) who argue that

entrepreneurship researchers have yet to explore the full range of variance that occurs in entrepreneurial value creation. The pursuit of entrepreneurial rents as the primary driver for aspiring entrepreneurs has thereby resulted in the exclusion of other drivers and impacts of the entrepreneurial activity (Amit et al., 2000). Cohen & Mitchell (2008) even go as far as stating that the field of entrepreneurship is stuck in a Kuhnian state of normal science, and that a paradigm shift is required in looking at the way value is created by entrepreneurial activity to advance the field in a much needed new direction. A similar point is made by Murphy et al. (1996) who argue that treating performance as a unidimensional construct will stall entrepreneurship research.

Therefore the aim is to expand on the notion of entrepreneurial performance, or success, and attempts to come up with a multidimensional construct that takes different perspectives on entrepreneurial outcomes into account. Following Davidsson (2016), outcomes of entrepreneurial activity are taken to be relevant on a spectrum, which stretches from an individual's intention to engage in entrepreneurship to success at establishing a new venture in the market to the societal level impact of entrepreneurial endeavors. Developing a performance construct that takes individual, societal and firm level considerations into account serves two purposes. First it addresses the concerns of Murphy et al. (1996) about the generalizability of performance indicators. Secondly it is in line with the effectual view on entrepreneurship, which considers entrepreneurship as more than a planned approach to maximize rents. This second aim can be seen as supporting the attempt to advance what some consider a paradigm shift in the way entrepreneurship research is approached (Blenker et al., 2011; Cohen & Mitchell 2008; Perry et al., 2011; Sarasvathy, 2001). Such a new paradigm would challenge existing causal notions on what it means to be an entrepreneur, and a corresponding success construct would go beyond notions of exclusively financial performance.

2.7.3 Succes in effectuation research

In her seminal article about effectuation, Sarasvathy (2001: p.248) talks about how effectuation differs from causal reasoning by presenting the example of U-Haul. If one would present this example as a case study to students who would use causal logic, they would conclude that the project would not be successful based on either financial or psychological reasons. It seems that rather than financial returns, Sarasvathy considers a successful outcome of effectual decision making things that lead to the creation of a new venture, where other types of decision making processes would not have seen such possibility. Opportunities are not discovered but rather successful entrepreneurs create them.

In a similar manner she argues in the concluding remarks to give up notions of objective criteria to measure successful personalities or businesses (Sarasvathy, 2001: p.258). Instead we need to be sensitive for local and individual differences in markets and entrepreneurs. Rather to ask how to build a good business or how to become a accomplished entrepreneur, we should look to personal circumstances and contingencies of individuals to see what types of opportunities are suitable for the given situation. This means to disconnect the success of the individual entrepreneur from the success of the firm he or she creates. A similar argument

is made by Sarasvathy, Menon & Kuechle (2013), which will be explored later on in this chapter.

In a meta-analytic review of effectuation and venture performance, Read et al. (2009) compared the use of effectuation principles with new venture performance on 48 entrepreneurship studies. Performance measures ranged from revenue per employee at the first round of financing, to revenue growth, return on assets (ROA), firm size, net interest margin, and productivity. The authors try to eliminate possible biases by reducing subjective measures and running a comparative analysis. However they acknowledge that these results only provide some assurance that they were not biased by performance measures that reflect too broad a set of outcomes, and Murphy et al. (1996) show us that the bias in their independent variable would most likely still be substantial.

Using furthermore a search string with the words effectuation, success, performance and dependent variable, several papers were found which addressed the operationalized notion of new venture performance or success from an effectual perspective. Most focus on financial indicators such as profit and sales (Song et al. 2008), the internal rate of return (IRR) for angel investors (Wiltbank et al., 2009), growth, profitability and survival (Brinkmann et al., 2010), sales growth, market share growth, and profit growth (Laskovaia et al., 2017). One recent study included next to a host of financial indicators also a subjective comparison with direct competitors (Deligianni et al., 2017). Only a single study did not rely on a financial indicator but chose for the degree to which outcomes aligned with company vision as a notion of success (Wiltbank et al., 2006).

2.7.4 Multiple dimensions

Murphy et al. (1996) conclude that valid conclusions regarding the outcomes of entrepreneurship would preferably require a multidimensional construct. Ideally such a construct would not only take financial performance indicators into account (Cohen & Mitchell, 2008), but also more contingency based factors that cause individuals to become entrepreneurs. From an effectual perspective, such factors would also be likely to play a role in notions of entrepreneurial success (Sarasvathy, 2001). For this reason, the remainder of this section is devoted to exploring the possibility of a more holistic conception of entrepreneurial outcomes.

In their analysis of serial entrepreneurship as a temporal portfolio, Sarasvathy, Menon & Kuechle (2013) offer a valuable starting point for a multidimensional view of success. They do this by arguing for a separation of the entities entrepreneur and firm. What constitutes a failure as a firm, might be a success in terms of learning experience for the entrepreneur. Since the entrepreneur has the opportunity to form a portfolio of multiple firms, failure at one firm might lead to increased performance at others. This means that success from the perspective of the entrepreneur is different from success from a firm perspective. Combining this insight with the common approach for distinguishing different levels of analysis in the social sciences (Babbie, 2013), success of an individual entrepreneur can be classified as

occurring on a micro level, and a firm level investigation would constitute a meso level analysis.

A good basis for understanding what exactly constitutes a desired outcome for the entrepreneurial individual is the empirical analysis performed by Fisher et al. (2014). Their literature study supports the line of thinking by Sarasvathy, Menon & Kuechle (2013), that entrepreneurial success is typically understood through the context in which it is found. As a result, academics, policy makers and entrepreneurs can have different perspectives on what it means to be successful (Fisher et al., 2014). Taking as their starting point the entrepreneur's own perception, the study found that the construct entrepreneurial success is a combination of personal and business performance indicators. It includes the entrepreneur's feelings of satisfaction and personal expectations for their life and business, combined with continuous business growth and exceeding business goals.

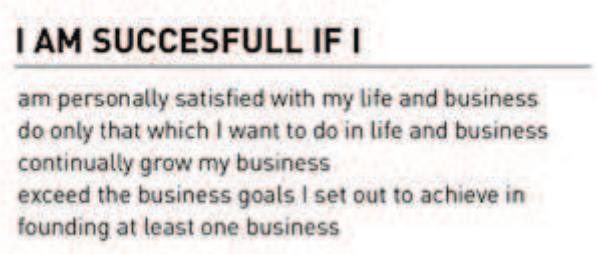

Figure 2.8: Entrepreneurial success factors, based on Fisher et al. (2014).

Thus, Fisher et al. (2014) argue, entrepreneurial performance is "a hybrid of individual success and the success of entrepreneurial activities; it is a multidimensional construct'' (p. 488). Their scale captures the micro level measurement constituted by the individual entrepreneur. Furthermore, their personal factors include also the financial performance indicators growth and exceeding established business goals. It is argued here that these performance indicators count as an adequate measure of meso level success since they are in line with commonly used firm level performance indicators in the literature (Amit et al., 2000; Cohen & Mitchell, 2008; Murphy et al., 1996; Read et al., 2009).

Building then on the conception of entrepreneurship as outlined in the introduction, the collective efforts of entrepreneurs are an influencing force stretching also beyond the individual or organisational level. Such a macro level unit of analysis is often taken to be constituted by society (Babbie, 2013). The most common understanding then is that in modern societies, entrepreneurship is widely seen as a key source of economic growth and welfare increases (Dew & Sarasvathy, 2007). Not surprisingly, entrepreneurial activity is empirically proven to influence factors such as employment and job creation (Block et al., 2017; Carton et al., 1998), productivity growth and innovation (Praag en Versloot, 2007).

The macro level notion of successful entrepreneurship is thus reflected by broader economic variables that span across society. Employment levels could be considered one of the more popular topics in contemporary discourse on the economic status of society. Following Poh Kam Wong et al. (2005) who show that one of the most important factors for economic growth is job creation, and Davidsson (2016) on desirable dependent variables for entrepreneurship research, the number of created jobs is to be considered an important indicator for entrepreneurial success on a societal level. Furthermore, following Montiel and Delgado-Ceballos (2014), income inequality between employees and environmental impact are important indicators for desired societal outcomes of entrepreneurship

2.7.5 Conclusion

To sum up, the current notion of measuring desired outcomes in entrepreneurship research is not without flaws. Often used unidimensional constructs lack the ability to be generalized, which is problematic. Besides, there is a consistent focus on financial indicators, leaving out possibilities to assess entrepreneurial outcomes on other fronts. An overview has been made of the use of entrepreneurial performance in the effectuation literature. Recognizing the need for adequate performance measurements that are suited to a possible changing view on the nature of entrepreneurship, an attempt is made to build a more holistic notion of entrepreneurial outcomes. This construct includes an individual, firm, and societal perspective. It includes financial indicators, individual entrepreneurial satisfaction, environmental and socio-economic factors. Operationalization of this construct can be found in chapter four, and will hopefully be more aligned to the effectual school of thought.

Chapter 3. Model & Hypotheses

"Prediction is very difficult, especially about the future."
~Niels Bohr

The aim of the thesis is to perform an empirical validation of contextual factors affecting the use of entrepreneurial decision making models, and to introduce a multidimensional measure of success. To achieve those goals, this chapter is devoted the development of the hypotheses that form the basis for empirically testing assumptions related to context and success. The hypotheses and the subsequent conceptual model are based on the theoretical framework discussed in the previous chapter.

According to some authors, entrepreneurship is primarily a mode of thinking, and decisions to start a new business are in fact subject to an underlying cognitive order (Mitchell et al., 2000;2002). Such a cognitive order might be found in the distinction between intuitive and rational thinking styles (Epstein et al., 1996). Therefore the relationship between these two thinking styles and the choice for an entrepreneurial decision making model is captured as:

H1: Entrepreneurs who have an intuitive thinking style are more likely to use effectual reasoning than those who have a rational thinking style.

The conception of culture was made as being tight or loose (Gelfand et al., 2006; 2011, Uz, 2015). Tight cultures value stronger norms and reject deviant behavior from those norms. It is hypothesized that stronger norms and less tolerance for deviant behavior results in a desire for a planned, i.e. a causal approach. Mitchell et al. (2000:20002) argue furthermore that the influence of culture on the relation between cognitive scripts and entrepreneurial decision making is likely to be moderating in its effects (see also figure 2.3). This relation is tested in the following hypothesis:

H1a: A high perceived cultural tightness of society has a negative moderating effect on the relation between intuitive thinking style and effectual reasoning

Being an expert is tied to situational specific domains (Dew et al., 2009), and is seen as a heuristic (Read & Sarasvathy, 2005) or possession of scripts (Mitchell et al., 2000) that allow entrepreneurs to match a task with a suitable decision model (Gustafsson, 2006). In order to gain a deeper understanding of how expertise influences the decision making of entrepreneurs, two hypotheses are tested. First the possession of expert knowledge structures is tested for a moderating influence on the relation between cognitive thinking style and choice for decision model. Dew et al., (2009) already tested the direct relation between expertise and entrepreneurial decision making. However a methodological weakness in their study concerned generic MBA students being defined as novices. This thesis contributes by an empirical validation based on a better operationalization of novice entrepreneurs. These two hypotheses are formulated as:

H1b: Being an expert has a positive moderating effect on the relation between intuitive thinking style and effectual reasoning.

H2: Expert entrepreneurs are more likely to use effectual reasoning than novice entrepreneurs.

Applying an effectual or causal logic is not a goal in itself, but rather a way to reach a certain outcome (Sarasvathy, 2009). Effectuation theory claims that people who are good at entreprneurship, experts, are more likely to use effectual principles in their decision making. This implies that the use of effectuation should lead to better entrepreneurial outcomes than the use of causation. Therefore effectuation theory only makes sense when it leads to more succes. The effect of effectual reasoning on a broad notion of entrepreneurial succes is thus tested:

H3: The use of effectual reasoning is more likely to lead to entrepreneurial success than the use of causal reasoning.

The theory and hypothesis are summarized in the conceptual model, shown in figure 3.1 below. For clarity, it is chosen to visualize one aspect of the concepts, i.e. intuitive thinking instead of cognitive style, because this allows to represent the direction of the expected effects, being positive or negative. This means that, in line with the use in other research, the concepts of thinking style, cultural tight-looseness and decision style are treated as if they were dichotomous and antagonistic. In practice such clear distinction might not exist, meaning that intuitive thinking does not per se exclude a more rational thinking, and that effectuation can be used simultanously with causation. However for research purposes this distinction is assumed. In the discussion this fact is taken into account and reflected upon.

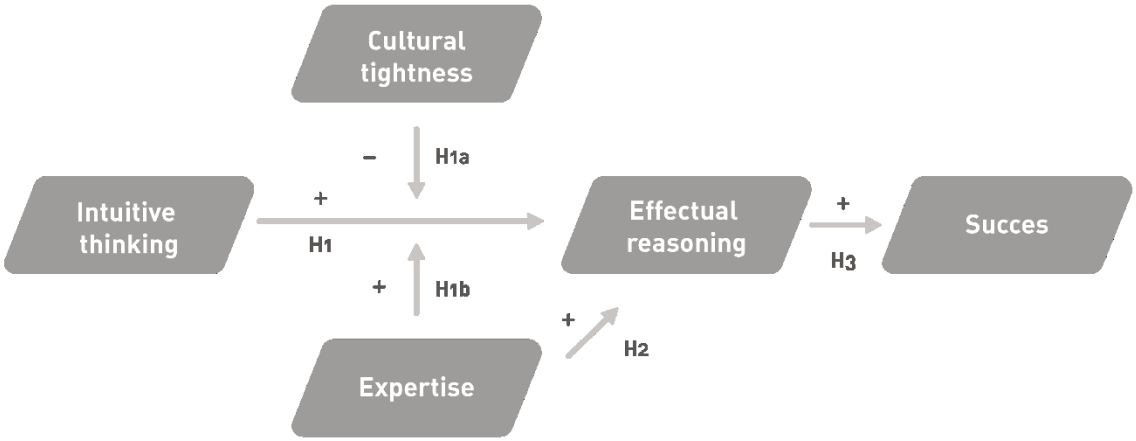

Figure 3.1: The conceptual model.

Chapter 4. Methodology

"Science is made up of mistakes, but they are mistakes which it is useful to make, because they lead little by little to the truth."
~Jules Verne, Journey to the Center of the Earth

4.1 Introduction

Following the literature review and model construction in the previous chapters, we will now turn to the methodology. Ideally the appropriate research design and subsequent methods come from and are thus in line with the literature review (Kothari, 2004). Although much new knowledge is derived from qualitative methods such as the 'think aloud protocol' (Dew et al., 2008; Sarasvathy, 2009), this thesis will follow up on recommendations made by other authors that effectuation theory needs more robust theory testing by means of quantitative analysis (Arend et al., 2015; Perry et al., 2011).

The research design will therefore be primarily quantitative, and make use of survey instruments. Following the hypotheses, expert entrepreneurs will be aimed for as respondents in the survey. The main theoretical constructs are operationalized by using survey instruments developed and validated in the literature. The constructs of expertise and success will be of particular importance since they are developed based on a combination of different theoretical contributions. The validity and generalizability are discussed, and the conclusion of this chapter contains a short reflection on the strengths and weaknesses of the methodological approach.

4.2 Research Design

Research design is the framework that has been created to find answers to research questions (Creswell, 1994). Within that framework, social science researchers ask primarily one of two fundamentally different questions. The first is framed as 'what is going on?' and is classified as descriptive research, the second goes into 'why it is going on?', and is viewed as explanatory research (de Vaus, 2001). The current research aims to describe factors influencing entrepreneurial decision making, and by doing so tries to explain why some entrepreneurs use a specific decision method and how this leads to entrepreneurial success.

The research design is therefore quantitative and explanatory. Following the classification by Vaus (2001), the methods that are used in this study fall into the category of a causal design. It seeks to determine causal relations between precursors of entrepreneurial behaviour and actual behaviour, and if there is a causal relationship between entrepreneurial decision making type and entrepreneurial success. The hypotheses are tested by statistical analysis using SPSS to test for these relations.

4.3 Sample

The population

As part of the methodology, a suitable set of respondents should be defined. Sampling is the act of defining a subset of the total population for which inferences are made. If the subset represents the relevant properties of the total population, inferences about the subset can be generalized to the total population (Babbie, 2013). The first step is thus to define the total population. There were two options to do this. First there is a possibility to take entrepreneurs in the Netherlands as the total population. Since most respondents are Dutch, this is the obvious choice. There are some limitations resulting from the sampling strategy so that a higher portion of the respondents lives in a certain geographical area and thus are somewhat overrepresented. However the assumption is made that interprovincial differences between entrepreneurs in the Netherlands are not substantial.

Another possibility for defining the population stems from the literature review. Following the line of argument by Mitchell et al. (2000;2002), it is possible to frame entrepreneurship as a special type of cognitive mindset. This means that entrepreneurs, facing roughly similar challenges in their daily operations, share enough cognitive features that they can be grouped within a global culture of entrepreneurship. This would mean that research into entrepreneurial decision making can be generalized across national boundaries. In that case the total population can be defined as entrepreneurs around the world. However that seems like stretching things a bit to far, and it might be better to be prudent. Therefore the total population is defined as entrepreneurs across the Netherlands.

Sample size

Sampling error is often taken to be the difference between the sample mean and population mean (Cohen, Manion, and Morrison, 2013). A variation between the sample and the population can occur due to the chance selection of different individuals. To minimize the effect and occurence of sampling error, the sample size should contain sufficient respondents. Cohen et al. (2013) specify a range so that a sample of below thirty would be considered precarious, and for sample sizes of eighty and above there would be little effect on the sampling error. The obtained sample size of eighty seven entrepreneurs should therefore be enough to minimize sampling error effects.

Sampling procedure

After defining the proper population, there are several ways to perform a sampling procedure. Babbie (2013) distinguishes between two main techniques, that of probability and nonprobability sampling. Probability sampling gives a random sample from the total population, and has the advantage that it makes sure the sample is representative of the population. Nonprobability sampling can be used in cases where information about the total population is difficult to retrieve, or when it is appropriate to select a sample on the basis of certain elements of the population combined with the purpose of the study (Babbie, 2013)

For this thesis a combination of purposive and snowball sampling is used. Purposive sampling allows to leverage access to an existing network of expert entrepreneurs. These entrepreneurs are active in different industries, and are different in terms of age and entrepreneurial experience, although as noted specific geographies are slightly overrepresented. Because of the personal connection, response rates were probably higher than a impersonal approach. Another advantage of this strategy over a probability sample consisting of Chamber of Commerce data on entrepreneurs is that in the latter there is a possibility of differences between likelihood of responding to an email questionnaire. One could imagine that those entrepreneurs with more time on their hands would reply to an emailed questionnaire, and thereby creating bias.

Nevertheless the purposive sampling strategy using the author's personal network yielded no higher response rate than roughly fifty percent. Even after two reminders it seemed that filling in the questionnaire was not top priority for everyone. Therefore several other channels had to be used. Snowball sampling was employed to ask specific people, including the supervising professors, friends and family in the author's network to send a ready made text to the entrepreneurs they knew. An internal email was sent by the CeeSpot community, business club JongGedaan and TEC Twente to their members. The Nesst Foundation sent a request to participate to all its alumni and mentors.

Furthermore a call for respondents was made to entrepreneurial Linkedin groups and Twente University alumni networks. The forum Higher Level and the Facebookgroup Young Creators, both having a considerable entrepreneurial member base, had the policy to not allow questionnaires. To circumvent this, a post was created to inform the members of those communities about the latest academic insights into entrepreneurial decision making in order to create a win-win situation. Sadly, the moderators could not be convinced to post it.

4.4 Operationalization & instruments

Now that the population is defined and a sampling procedure have been established, it is time to turn to the operationalization of the relevant theoretical constructs as identified in the literature. Following the conceptual model as shown in figure 3.1, there are five theoretical constructs that need to be operationalized in order to be able to measure them.

Thinking style

Some of the most interesting work on entrepreneurial cognitions is done by Mitchel et al. (2000). However as was noted in the theoretical framework, their operationalizations using cognitive scripts is not without drawbacks. A major problem for example is the inability to directly measure the degree of mastery of cognitive scripts since they are, as mental operations, not directly observable (Mitchell et al., 2000; p.982). Cognitive-experiential self theory (CEST) as developed by Epstein (1994), with its dichotomous distinction between two types of information processing modes, fits the purpose of this study relatively well. Therefore the validated scales designed by Epstein (1994; 1996) are used to operationalize the construct of cognitive thinking style.

Thinking style is then measured by ten questions with scores range from one till five on a Likert-type scale. From the total ten questions, the first five of them cover the Need for Cognition (NFC) and question six till ten cover Faith in Intuition (FI). Questions one, two and five have been subject to reversed coding so their scores have been reversed. The mean of these two constructs is calculated using SPSS. The total mean is then divided by the amount of answer possibilities, in this case five, to ensure comparability between the constructs that have different Likert-type scales. The results are two variables NFC and FI with a mean score ranging between zero and one. The Cronbach's alphas for NFC and FI were satisfactory, being .734 and .747 respectively. Factor analysis showed two components with cumulative loadings of .49 and .64.

Culture

The cultural aspects are defined by a tight/loose distinction as suggested by the work of Gelfand (2006; 2011). From his work there are also validated measurement instruments available which measure the theoretical construct of national culture, which are used as part of the construction of the survey.

Cultural tightness is measured by six questions with scores range from one till six on a Likert-type scale. Question four is reverse coded and thus reverse scored, and added to the scores of the other five questions of culture. The total mean is then divided by the amount of answer possibilities, in this case six, to ensure comparability between the constructs that have different Likert-type scales. The result is a variable CulturalT which reflects the degree of cultural tightness with a mean score ranging between zero and one. It reported a Cronbach's Alpha of .712. Factor analysis reported one component with a cumulative loading of .42.

Expertise

The proponents of effectuation view entrepeneurs as either novice or expert, with a clear tendency to view expertise as resulting from experience (Dew et al. 2009; Read & Sarasvathy, 2005; Sarasvathy, 2008). Even though some reckognize that this approach might have limitations, for example Dew et al. (2009) issue a warning that only taking experience into account will not lead to an optimal measurements, they do not include this idea in their operationalization.

A dichotomous approach to expertise must lead to an arbitrary cutoff point between novice and expert entrepeneurs. A conception of expertise as occuring along a scale might be more adequate to describe reality. Therefore expertise in this thesis is operationalized as a variable based on four criteria to which weights are assigned based on the definitions from the literature. In table 4.1 below the four characterstics of expertise as described in the theoretical framework are presented, and for each time such characteristic is mentioned in a definition from the authors, the weight is increased by one point.

Expert criterium	Literature reference	Category	Score	Weight
Years Entrepreneur[1]	Sarasvathy (2009) Dew et al. (2009) Mitchell et al. (2000) Baron and Ensley (2006)	1 year 2 years 3 years 4 years 5 years 6+ years	.5 1 1.5 2 2.5 3	4
Started more than 1 company	Sarasvathy (2009) Dew et al. (2009) Mitchell et al. (2000) Baron and Ensley (2006)	No Yes	0 1	4
Education level	Ericsson & Smith (1991) Gustafsson (2006)	Other Bachelor Master PhD	0 1 2 3	2
Entrepeneurial courses	Ericsson & Smith (1991) Gustafsson (2006)	No Yes	0 1	2

Table 4.1. Operationalization of expertise

Decision style

Decision style is measured by ten questions with scores range from one till seven on a Likert-type scale (Alsos et al. 2014). From the total ten questions, the first five of them cover the Causal Decision Style (CDS) and question six till ten measure Effectual Decision Style (EDS). The mean of these two constructs is calculated using SPSS. The total mean is then divided by the amount of answer possibilities, in this case seven, to ensure comparability between the constructs that have different Likert-type scales. The results are two variables CDS and EDS with a mean score ranging between zero and one. The Cronbach's alphas for CDS and EDS were satisfactory, being .751 and .808 respectively. The factor analysis was also acceptable, albeit not with a big margin, and showed two components with cumulative loadings of .37 and .54.

[1] From 65 entrepeneurs there was no data available on how many years they already were entrepeneur. However all of them were the founder of their first startup, and the age of this startup ranges between 0 and 4 years. Therefore the assumption is made that the age of the startup reflects the number of years experience of the entrepeneur.

Success

The components for this construct were described in the theoretical framework. It includes entrepreneurial success factors as identified by Fisher et al. (2014) for the micro and meso level measurement, using the instrument that was validated in that study. Job creation, environmental impact and income equality constructs are used for the macro level measurement, and are operationalized respectively by measuring the number of jobs created by the company, the effects of business operations on the environment, and the degree of income inequality between employees (Montiel and Delgado-Ceballos, 2014; Poh Kam Wong et al., 2005).

The resulting five theoretical concepts and their corresponding measurement instruments are combined into a single survey instrument.Six of the questions are measured using a one till five points Likert scale and so can be added to one another. The amount of jobs are categorized in five sections in order to allow this data to be integrated. One employee is considered not successful in terms of additional job creation and is given a score of one. Two employees means that the company offers a small benefit to society so is given a score of two. A score of three is given to companies that have created between three and nine jobs. Employing between ten and forty nine people is considered relatively successful in job creation so is given a four out of five score. Fifty or more employees is considered to have substantial benefits in terms of employment for society so those companies are given a score of five. This results in a new variable called EmploymentScore.

The mean of the total scores is is then divided by the amount of answer possibilities, in this case five, to ensure comparability between the constructs that have different Likert-type scales. The result is a variable ESuccess which reflects the degree of entrepreneurial success with a mean score ranging between zero and one. Additionally because several items were included into an already existing scale, another variable, ESuccessI was made consisting only from the questions from the validated scale by Fisher et al. (2014).

To test for the internal consistency, the Cronbach's Alphas were calculated. The variable ESuccessI reported a value of .652. The Cronbach's Alpha for the scale developed by Fisher et al. (2014) was .71 in their original study, but that number was not replicated here and care should therefore be taken since it is slightly below the accepted .70-.90 range (Tavol & Dennick, 2011). Factor analysis was performed and revealed two factors with a cumulative loading of .51 and .77, suggesting that in fact two concepts were measured.

The Cronbach's Alpha for ESuccess reported a value of .551 which is significantly lower than the accepted range. Factor analysis revealed three factors with cumulative loadings of .32, .55 and .67, meaning multiple concepts are in fact measured. Instead of discarding the construct, it is argued that it can nevertheless be included in this study, taking some caution and prudence for the use into account.

Cronbach's Alpha is affected by test length and dimensionality, and can be used to confirm whether or not a sample of items is actually unidimensional (Tavol & Dennick, 2011).

Shorter tests which measure multidimensional constructs can therefore be expected to have lower Alphas. The success construct deliberately tries to include multiple dimensions into a single measure. These dimensions, such as environmental impact are only measured by a single question. The nature of the construct therefore elicits a low Cronbach's Alpha, and while internal consistency is low, the decision is made to carry on with the construct because one of its aims was to broader the measurement of success to include multiple factors. That being said, the conclusions should be assessed critically, and it is clear that this notion of success can only be used for exploratory purposes. For more future research the construct has to be developed further, which was also in line of the expectations. A more detailed reflection on this can also be found in the discussion.

Control variables

In order to control for effects that might be considered to be an underlying explaining factor, several control variables are included in the data analysis. The focus is primarily on historical contingencies that can influence the choice for effectuation or the level of expertise. These include the level of education, completed courses on entrpeeneurship, whether the indivdual had entrepeneurial parents from which he or she could learn. The reason to start a business might also influence the type of decision making. Furthermore gender is included to see if any differences between males and females (no other classifications were given by the respondents) exist. Finally experience might come trough age, and this could possibly effect expertise.

Gender

Gender is included as a control variable, not because theory indicates likely differences between males and females, but because data is collected and it could be interesting to see what its effects are.

Age

As experience in a variety of areas increases with age, it might have an effect on the level of expertise and is therefore included.

Education

The level of education, operationalised as being either PhD, Master, Bachelor or other type of education. The level of education can be expected to influence the choice for a causal or effectual decision style, at the minimum because causal methods are thaught in business schools (Sarasvathy, 2001), and the development and degree of expertise.

Entrepeneurial education

Having followed courses related to entrepeneurship is considered to be classified as entrepeneurial education. This means that the entrepreneur did have at least some contact with theory. Having knowledge about entrepeneurship theory might influence entrepeneurial decision making or the development and degree of expertise.

4.5 Procedures

Data collection

The survey was administered using Google Forms. The introductory text is written to stimulate participation but does not entail too much information about the study in order not to create biased answers. The survey is distributed online, mostly by providing a link to the form via email, Whatsapp or Linkedin. Personal and company name are asked in order to track response rates, since Google Forms does not allow to track responses based on IP addresses. However the option is given to complete the survey anonymously since especially entrepreneurs from larger companies do not want to give insight in their ways of working without the guarantee of anonymity. At the end there is a possibility to leave an email address to receive results of the study. This was done as a gesture to create goodwill and to increase response rate.

Data analysis

The constructs that have been measured use different Likert scales. For the sake of comparability, all mean scores resulting from these scales have been divided by the by the number of possible answers. This results in a measurement scale for all constructs ranging from zero to one. The only problem here might be that a respondent could respond slightly different to differences in ranking scales (Colman, Norris & Preston, 1997). To make sure this adjustment gave similar results, a comparison was made on the correlation between effectual decision style and entrepreneurial success for both the normal and Likert point adjusted constructs. The correlation was the same, indicating that adjusting for the amount of answering options did not influence the effect of the relation but does allow for better face value understanding of the means.

Furthermore, the results of the analysis are classified in terms of correlation strength. For this the classification of Evans (1996) will be used which categorizes correlations according to the following definitions:

00-.19 “very weak”
.20-.39 “weak”
.40-.59 “moderate”
.60-.79 “strong”
.80-1.0 “very strong”

4.6 Validity

Internal validity

Internal validity can be defined as the validity of inferences about whether the observed covariation between the treatment and outcome reflects a causal relationship (Shadish, Cook and Campbell, 2002). It is the extent to which a causal inference is justified, which is

determined by the degree of systematic error, or the difference between measured value of a quantity and its true value (Brewer, 2000). It is the approximate truth about inferences regarding causal relationships.

The issue of causality is one of the most challenging for this study. Care has to be taken to ensure that it is really causation and not mere covariation that is measured. Empirical association, or correlation, is expected based on the literature study. The appropriate time order follows to some extent logically, as entrepreneurial decision making should come before entrepreneurial success. For the other variables this relation is not logically straightforward, for example expertise can lead to effectual decision making, but it might also be the other way around. The assumption about these relations and their time order are made based on the literature, see for example Dew et al. (2009) or Read & Sarasvathy (2005). The main challenge however comes from the causality criterium that the relationship should be nonspurious (de Vaus, 2001).

Construct validity

Construct validity refers to the degree to which inferences can be made from the operationalizations in a study to the theoretical constructs on which those operationalizations were based (Trochim, 2006), or the ‘’validity of inferences about the higher order constructs that represent sampling particulars’’ (Shadish, Cook and Campbell, 2002). Simply stated this means that construct validity boils down to being a degree to which the instruments indeed measure the theoretical constructs. Ideally these should correspond perfectly, since by operationalizing the theoretical construct the instrument is determined.

As the operationalizations for effectuation, entrepreneurial cognition and culture involved well validated scales from peer reviewed journals, which took several measures to ensure construct validity on their own, the instruments for measuring these constructs are assumed to have an adequate degree of construct validity. As already state in section 4.4, operationalization of expertise is challenging. This is mostly because the theoretical concept of expertise is not well defined and understood in the literature. Since it is not exactly clear when someone is an expert, or what the path is to become one, an operationalized construct of expertise is inherently prone to ambiguity. A mean definition based on several articles is taken to hopefully increase construct validity on the concept of expertise. Finally, the success construct is partly made from the tested and validated scale of Fisher et al. (2014). However it also includes measures on job creation, the environment and income equality. Although these measure are independently proven to have an impact on entrepreneurial success (Poh Kam Wong et al., 2005; Montiel and Delgado-Ceballos, 2014), their operationalizations required simplicity to align to the scope of this thesis. This results in somewhat unsophisticated macro level indicators of the success construct.

4.7 Ethical considerations

Trochim (2006) identifies several ethical issues in social science research. *Voluntary participation* is ensured because the respondents can choose to participate and there is no real cost for them to decline the request for participation. There has to be the requirement of

informed consent. This is achieved by an introduction into the instruments and use of data at the beginning of the survey. Even though not too much about the methodology is revealed to minimize the risk of social bias, it is sufficient to give the respondents a picture of the overall research and possible risks they are under. There is little *risk of harm* when participating as respondent in this survey. One major risk is careless storage and use of data, which could result in sensitive information about business processing or decision making to leak.

This risk is mostly related to issues of *confidentiality* and of *privacy*. In the introduction of the survey is a statement that the data will be handled confidentially and that it will be made available for subsequent research within the University of Twente. There is also an option to fill in the questionnaire anonymously for those respondents who wish to remain anonymous. Besides that, personal and company names will not be made available to the subsequent research within the University of Twente. In the case that there is a need for these names or contact information about a set of questions or respondent, it is possible to contact the author. Permission to share this data can then be asked to the individual respondent and can be shared with his or her permission. Finally all respondents are given the choice to provide an email address so that the results of the study can be given as a bonus for taking the time to complete the survey.

4.8 Conclusion on methods

In this chapter the research design and the methods were discussed. The aim of this study is to uncover causal relationships using statistical analysis of empirical data. Such a design has an advantage over previously often used think aloud protocol analysis (Sarasvathy, 2009), in that it can better establish causal relations which is needed to support effectuation theory (Perry et al., 2011; Shadish, Cook and Campbell, 2002). However in this type of research that is performed at a single point in time, determining causality can be problematic. Furthermore while the sampling strategy ensures enough respondents for adequate statistical analysis, it relies on nonprobability sampling which decreases external validity. It is therefore stated that in terms of methods this thesis is a step in the direction of empirically validating theoretical constructs relating to effectuation, but that the conclusions have to be evaluated with the context in mind.

Chapter 5. Results

"Truth has nothing to do with the conclusion, and everything to do with the methodology."
~Stefan Molyneux

5.1 Introduction

This chapter contains the results of the statistical analyses using hierarchical regression, which were performed on the available data. The first four hypotheses are tested using the combined dataset of 272 respondents in section 5.3 Since no additional data was available that contained information on measures of success as defined by this paper, the hypotheses on the relation between effectuation and entrepreneurial success is tested using only the origional collected data in section 5.4. Following these results, chapter 6 will conclude by answering the research question, discussing limitations and providing an outline for further research.

5.2 Data description

The first set of hypotheses are tested by examining the relations between thinking style, culture, expertise and decision style. The descriptives of these variables are shown in table 5.1 below. As can be seen, almost all variables are significantly correlated with one another, except for expertise and causation.

Table 5.1. Descriptives and correlation matrix.

		N	Mean	Std. Deviation	1	2	3	4	5
1	Need for Cognition	272	0,72	0,21					
2	Faith in Intuition	272	0,71	0,17	0,56**				
3	Causation	272	1,67	0,18	0,51**	0,37**			
4	Effectuation	272	0,56	0,17	0,2**	0,25**	-0,13*		
5	Cultural Tightness	272	0,62	0,15	0,57**	0,62**	0,45**	0,28**	
6	Expertise	272	12,29	4,54	0,41**	0,32**	0,11	0,21**	0,28**

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

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

5.3 Hypothesis testing

This section will provide an overview of the results and the corresponding acceptance or rejection of the hypotheses. A hierachical regression was performed to give insights into the effects of the various context variables. Four models are defined. First, only the control variables are included. Secondly, the relations between thinking and decision style are added. Then in the third model, culture and expertise are included. In the fourth and final model, interaction variables are presented in order to test for moderation effects of culture and expertise on the relation between thinking and decision style. Table 5.2 below shows the results of the regression analysis.

Table 5.2

Summary of Hierarchical Regression Analysis for Variables Predicting Effectual Decision Making (N = 272)

	Model 1				Model 2				Model 3				Model 4 (Z values)			
	B	SE_B	t	p	B	SE_B	t	p	B	SE_B	t	p	B	SE_B	t	p
Age	0,00	0,00	11,20	0,00	0,01	0,00	-0,07	0,94	0,00	0,00	-1,15	0,25	0,00	0,00	-1,16	0,25
Gender	0,00	0,02	1,15	0,25	0,00	0,02	-0,19	0,85	0,01	0,02	0,26	0,79	0.26	0.21	1.24	0.22
Education Bachelor	0,14	0,04	-0,14	0,89	0,12	0,04	3,13	0,00	0,09	0,04	2,29	0,02	0.22	0.17	1.31	0.19
Education Master	0,07	0,03	3,85	0,00	0,05	0,03	1,75	0,08	0,03	0,03	1,00	0,32	0.19	0.22	0.86	0.39
Education PhD	-0,09	0,12	2,31	0,02	-0,05	0,12	-0,43	0,66	-0,07	0,12	-0,58	0,56	0.05	0.15	0.36	0.72
Need for Cognition					0,04	0,07	0,54	0,59	-0,03	0,07	-0,43	0,67	-0.03	0.03	-0.77	0.44
Faith in Intuition					0,18	0,07	2,46	0,01	0,08	0,08	0,98	0,33	0,01	0,01	0,70	0,48
Cultural Tightness									0,25	0,09	2,69	0,01	0.26	0.21	1.38	0.22
Expertise									0,01	0,00	1,76	0,08	0.22	0.17	1.45	0.19
Culture_Intuition													0.19	0.22	0.14	0.39
Culture_Cognition													0.05	0.15	0.64	0.72
Expertise_Intuition													-0.04	0.03	-0.78	0.44
Expertise_Cognition													0,00	0,02	0,11	0,92
	Adj. R2	F	Df	p	Adj. R2	F	Df	p	Adj. R2	F	Df	p	Adj. R2	F	Df	p
	0,07	4,09	5;259	0,00	0,08	5,03	2;257	0,01	0,11	5,00	2;255	0,01	0,11	0,69	4;251	0,60

H1: Entrepreneurs who have an intuitive thinking style are more likely to use effectual reasoning than those who have a rational thinking style.

As we can infer from table 5.2, we see that when Need for Cognition and Faith in Intuition are added in model 2, the model is significant and explains 8% of the variance on the choice for an effectual decision style (*Adj. R2* = .08, *F*(2,257), *p* = .01). Need for Cognition does not have a significant effect (*B* = .04, *p* = .59), and Faith in Intuition does have a significant effect effect (*B* = .18, *p* = .01).

After adding the variables on culture and expertise, model 3 is still significant and explains now 11% of the variance for an effectual decision style (*Adj. R2* = .11, *F*(2,255), *p* = .01). Need for Cognition still does not have a significant effect (*B* = -.03, *p* = .67), and Faith in Intuition lost its significant effect effect (*B* = .08, *p* = .33).

It is therefore concluded that although it seems that an intuitive thinking style does have a significant effect on the use of effectual decision making, this effect is removed when adding the concepts of culture and expertis. Therefore the hypothesis is partially accepted, reckognizing that the effects are not robuust enough to remain significant when more variables are added.

H1a: A high perceived cultural tightness of society has a negative moderating effect on the relation between intuitive thinking style and effectual reasoning

In model 4 in table 5.2 the interaction variables Culture_Intuition and Culture_Cognition are included to test for possible moderation effects. However after doing so, the model is not significant anymore (*Adj. R2* = .11, *F*(4,251), *p* = .06). Therefore the hypothesis is rejected.

H1b: Being an expert has a positive moderating effect on the relation between intuitive thinking style and effectual reasoning.

Similar to the moderating effect of culture, the interaction variables for expertise, being Expertise_Intuition and Expertise_Cognition, are added in model 4. However the model turns out to being not significant (*Adj. R2* = .11, *F*(4,251), *p* = .06), so the hypothesis is rejected.

H2: Expert entrepreneurs are more likely to use effectual reasoning than novice entrepreneurs.

In table 5.2 it can be seen that in model 3 expertise is included as an independent variable to test its effect on effectual decison making. The model is significant (*Adj. R2* = .11, *F*(2,255), *p* = .01). Expertise has no significant effect (*B* = .01, *p* = .08) although it is not far from it. Nevertheless the hypothesis is rejected.

H3: The use of effectual reasoning is more likely to lead to entrepreneurial success than the use of causal reasoning.

Table 5.3 shows the descriptive statistics for the variables causation, effectuation and entrepeneurial success. The data set ($N = 87$) contains only respondents from collected data and excludes those from the additional dataset as was used for the previous hypotheses. It is shown that causation is negatively correlated with effectuation ($r = -.372$, $p < 0.01$), and that only effectuation is significantly correlated with Entrepeneurial Success ($r = .217$, $p < 0.05$).

Table 5.3

		N	Mean	Std. Deviation	1	2
1	Causation	87	0,54	0,16		
2	Effectuation	87	0,61	0,19	-,372**	
3	Entrepeneurial Success	87	0,67	0,12	-0,14	,217*

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

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

The regression analysis in table 5.4 shows then that the model is significant and explains 4% of the variation of entrepeneurial success (*Adj. R2* = .04, $F(1;85)$, $p = .04$). Effectuation has a significantly influence on success ($B = .13$, $p = .04$), and the hypothesis is therefore accepted.

Table 5.4 *Regression results for Effectuation predicting Entrepeneurial Success*

	Model 1			
	B	SE_B	t	p
Effectuation	0,13	0,07	2,05	0,04
	Adj. R2	F	Df	p
	0,04	4,22	1;85	0,04

Chapter 6. Conclusion, discussion, future research

"All statements are true, if you are free to redefine their terms."
~Thomas Sowell

6.1 Interpretation of the results

On the relation between intuitive thinking and effectual decision making
While in a more simplified model a relation was found between intuitive thinking and effectual reasoning, the effect disappeared when adding variables that measured cultural tightness and expertise. This indicates that in a simple model the relationship holds, but it is not robuust enough to remain significant when context variables culture and expertise are added in the equation. This can either mean that the effect is small, or that culture and expertise contain underlying effects that influence the relationship. It is an indication that intuitive thinking has an effect on effectual decision style, however it also indicates the importance of the context for entrepreneurial decision making.

Furthermore the origional collected data show a negative correlation between the two types of decision styles, indicating that entrepreneurs who use some form of causal decision making tend to rely less on an effectual style of decision making. This is also a contested issue in the literature.

Sarasvathy (2001: p. 245) states that she created the dichotomy between effectuation and causation only for a more clearer theoretical exposition. She argues that it would not be logical to strictly follow the divide and simultaneous use of the models can be expected. This makes sense since a causal approach of strict planning in a controlled environment, as for example was advocated by Taylorism, is rejected by most scholars (Freedman, 2015). And when using a reductio ad absurdum, it becomes clear that an entrepreneur cannot use strictly effectual principles, since he or she would then be only focussing on means and totally disregarding any goals, or that decisions are made based solely on affordable losses without considering anything related to expected returns.

Still it is this argument that is used by Arend et al. (2015: p.639) to critique effectuation theory when they state that it does not consider factors such as competitive forces, thereby making it lack comprehensiveness as one of the criteria for good theory. However based on a careful reading of Sarasvathy (2001) and the results of this hypothesis it can be concluded that the preceding critique by Arend et al. (2015) is invalid when it assumes a strict separation of effectuation and causation decision styles. For research purposes it might be beneficial to make such distinction, in practice such strict dichotomy is probably not productive, and we should be careful to be attentive to this distinction.

On the moderating effect of culture

The literature indicated that culture is an important context variable, and predicted that it has a moderating effect on the relation between thinking style and decision making (Mitchell et al. 2000) A correlation analysis showed a positive correlation of both culture and intuitive thinking style and culture and effectual reasoning. When testing for moderation, it was found that the model became not significant after including the interaction terms so the hypothesis was rejected. From this data it can therefore not be concluded that there is a moderating effect of culture on the relation between intuitive thinking and effectuation. Although there seems to be some kind of relation between culture and the concepts of intuition and effectuation, the effect of moderation as predicted by the literature is not found.

On the influence of expertise on effectuation

The proponents of effectuation (Dew et al. 2009; Sarasvathy, 2008) posit that expertise has a defining influence on the choice for the entrepreneurial decsion model, putting forward the claim that experts rely more often on effectual principles for their decision making. This claim attributes a certain amount of authority and appeal to effectuation theory, since being an expert one is considered as knowing better how to perform than a novice would. Therefore if experts use effecuation more than causation, this means that effectuation would be a better decision making logic.

However expertise is a complex concept, and much depends on definitions and the selection of a sample, where Sarasvathy (2008) used primarily entrepeneurs from very large companies, and Dew et al, (2009) contrasted experts with novices although a novice was just a MBA student, and not neccesarily an entrepeneur. Besides, they used dichotomous distinctions between experts and novices. This study attempted to operationalize expertise as a scale, based on several definitions of the literature. However no effects were found that expertise has either a moderating effect on the relation between thinking style and effectual decision making, or any direct effect on an effectual decision style.

These findings indicate that the subject of expertise should be approached with care, both because it is a complex concept and hard to define, and because the findings contradict the theory as proposed by the proponents of effectuation. It is likely that different definitions and conceptions of expertise lead to dissimilar results, so that a critical reflection of the concept of expertise would benefit the development of effectuation theory.

On the relation of effectuation and succes

Whether or not experts use effectuation more often than novices do, ultimately effectuation is not the aim in itself. Rather one should only care about differences in decision making if they lead to differences in outcomes. Outcome in this sense might differ for different stakeholders, and it might be wise therefore to define outcome more broadly than just financial indicators. This is in line with effectuation theory as it is opposing a causal approach which relies more on financial criteria to evaluate outcomes (Sarasvathy, 2001).

Following this line of thinking, the research includes a broad conception of success which, although can only serve as an indicator because of methodological limitations, nevertheless might be usefull as a starting point. The findings showed that effectuation indeed has some effect on a broadly defined notion of entrepeneurial success.

6.2 Conclusion

How do thinking style, culture, and expertise influence the entrepreneurial decision making process, and what is the predictive value for entrepreneurial success?

A few words to conclude by looking back at the research question and some of the findings that are interesting in light of the background on which this study was performed. Intuitive thinking style was found to impact effectual decision making, untill culture and expertise as context variables were added. This means foremost that the relation between intuitive thinking and effectuation is not very robust. It might also mean that culture and expertise are context variables that influence this relation. However since no moderating effect of culture was found, and no direct and moderating effect of expertise was found, indicating that the lack of robustness is more probable. Although limited the amount of explained variance, there is some indication that effectuation leads to entrepeneurial success.

To conclude, this research supports the idea that thinking style and cultural context are important for explaining the use of effectuation principles in entrepreneurial decision making. However these concepts are complex and probably overlapping. Disentangling how exactly these relationships work will be a challenging task. Nevertheless it might be useful to advance our understanding of entrepreneurial decision making, especially in a global context. Expertise should be a concept to be used carefully, with attention to definitions and measurements. Effectuation in itself is promising to increase our understanding about the inherent ambivalence of entrepreneurship, especially useful to think about new ways of doing things, and when it is tied to reflection on how we as individuals and society define success.

Chapter 7. Discussion

"Science is a way of thinking much more than it is a body of knowledge."
~Carl Sagan

How can we situate the findings of this research into the broader debate? Two important trends in today's society seem to be a critical questioning of our assumptions about globalization and about economic liberalism. At least in the US, nationalism having its voice heard through resigning from the Paris climate agreement, important tariffs and trade barriers.[2] In a time where global convergence (Williamson, 1996) is not as self-evident as it once was, what is the role of a concept such as the global culture of entrepreneurship that Mitchell et al. (2000) propose? Is such a view based on a world in which the free movement of goods, capital and people allow opportunities for enterprising individuals to create their business?

These might be assumptions about context that present local challenges to general theories explaining entrepreneurial behavior. As the results of this study show, culture, cognition and historical contingencies that lead to expertise in a subject might not be easily separated, or even fully understood. In the social sciences, dealing with humans, causality is often quickly and easily assumed (Joerges, 1999). It might be wise therefore to be prudent, taking the advice of Arend et al. (2015) and be critical about new theories before accepting them into our ways on thinking.

That being said, effectuation has a certain charm, an intuitive feeling reflected in the saying that you can't learn how to do business in school. Perhaps it is more useful as a heuristic, an initial challenge to an old paradigm of rationality and the pursuit of rents. Being able to explain the more mundane considerations beside that of forecasting and cost calculations would already be quite an accomplishment. This would be the value of effectuation theory if it is able to do this.

To cross the bridge between theory and practice, to make use of abstract thinking and intuition, to work with uncertainty but also understand that some aspects of the future can be planned for. If effectuation is really different from what is being taught in business schools (Fisher, 2012), including it in the curricula will be a step towards a better understanding. A combination of approaches can offer valuable insights for teaching people about entrepreneurship, whether in an university setting or more informal organizations.

[2] https://www.forbes.com/sites/davekeating/2018/06/09/trump-ditches-summit-leaving-a-climate-g6/

Limitations and a way forward

Some limitations of this research stem from difficulties in finding entrepreneurs that qualify as experts and who would allocate their time to participate, resulting in a relatively small set of expert entrepeneurs in the data. More thorough testing of the hypotheses would benefit from a larger sample of experts. Furthermore the notion of expertise proved difficult to operationalize, resulting in suboptimal choices were the literature has no unified answer, which can lead to bias when comparing the studies. Furthermore the success construct is a bit simplistic, and did not meet internal consistency criteria, so it could only be used for explorative inferences. Finally, concepts like cognition, culture and decision making were assumed to be seperate, while such an artificial separation might not fully represent reality.

What could be a way forward from here? Effectuation is promising, but scholars lack clear definitions on what effectuation really is, on expertise, and on the relevance of context. The standard answer would therefore be to expand research, hoping that more data will lead to better definitions. A fruitful avenue could also be to use effectuation as an heuristic to challenge existing entrepreneurial and perhaps business frameworks that centre around a causal logic. If there is any merit in this approach, if it really offers novel insights, such frameworks will be successfully criticized. If such approach works, it might be that there is something in effectuation that is valuable to facilitate changing worldviews.

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Appendix A.

Summary of Hierarchical Regression Analysis for Variables Predicting Causal Decision Making (N = 272)

	Model 1				Model 2				Model 3				Model 4 (Z values)			
	B	SE_B	t	p	B	SE_B	t	p	B	SE_B	t	p	B	SE_B	t	p
Age	0,00	0,00	10,01	0,00	0,00	0,00	-1,59	0,11	0,00	0,00	-1,05	0,29	0,00	0,00	-1,05	0,29
Gender	-0,04	0,02	2,52	0,01	-0,03	0,02	-1,36	0,17	-0,03	0,02	-1,36	0,17	0.26	0.21	1.24	0.22
Education Bachelor	0,04	0,04	-1,80	0,07	-0,03	0,03	-0,73	0,46	-0,02	0,04	-0,54	0,59	0.22	0.17	1.31	0.19
Education Master	0,04	0,03	0,91	0,36	-0,01	0,03	-0,54	0,59	0,01	0,03	0,33	0,74	0.19	0.22	0.86	0.39
Education PhD	-0,18	0,13	1,43	0,16	-0,15	0,11	-1,34	0,18	-0,10	0,11	-0,88	0,38	0.05	0.15	0.36	0.72
Need for Cognition					0,45	0,06	7,55	0,00	0,40	0,06	6,47	0,00	-0.03	0.03	-0.77	0.44
Faith in Intuition					0,13	0,07	1,90	0,06	0,05	0,07	0,62	0,53	0,00	0,01	-0,21	0,83
Cultural Tightness									0,26	0,08	3,11	0,00	0.26	0.21	1.38	0.22
Expertise									0,00	0,00	-1,55	0,12	0.22	0.17	1.45	0.19
Culture_Intuition													0.19	0.22	0.14	0.39
Culture_Cognition													0.05	0.15	0.64	0.72
Expertise_Intuition													-0.04	0.03	-0.78	0.44
Expertise_Cognition													-0,03	0,01	-2,27	0,02
	Adj. R2	F	Df	p	Adj. R2	F	Df	p	Adj. R2	F	Df	p	Adj. R2	F	Df	p
	0,05	2,89	5;259	0,01	0,30	49,00	2;257	0,00	0,32	6,22	2;255	0,00	0,34	2,68	4;251	0,03

Appendix B. Factor analysis Thinking Style

Component Matrix[a]

	Component	
	1	2
Cognition1	-,763	,375
Cognition2	-,802	,351
Cognition3	,731	-,236
Cognition4	,624	-,413
Cognition5	-,563	,456
Intuition1	,548	,564
Intuition2	,815	,244
Intuition3	,716	,359
Intuition4	,723	,413
Intuition5	,683	,281

Extraction Method: Principal Component Analysis.

a. 2 components extracted.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4,932	49,320	49,320	4,932	49,320	49,320
2	1,454	14,542	63,862	1,454	14,542	63,862
3	,791	7,912	71,774			
4	,606	6,057	77,831			
5	,513	5,126	82,957			
6	,462	4,624	87,581			
7	,376	3,762	91,342			
8	,351	3,512	94,854			
9	,327	3,266	98,120			
10	,188	1,880	100,000			

Extraction Method: Principal Component Analysis.