The influence of culture and cognition on the entrepreneurial strategy of Start-Ups: the case of Turkey.

By

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"Those who have knowledge, don't predict. Those who predict, don't have knowledge"

— **Lao Tzu**

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Abstract

Why do some start-up entrepreneurs make entrepreneurial decisions based on effectual logic and others on causal logic? People have the ability to make decisions based on either their intuitive-experiential- or analytical-rational system. The question is whether one of these is linked to the entrepreneurial decision-making logics: effectuation or causation. Previous studies have shown that culture plays a role in how people in general process information. For example, in some countries the majority of the population make their decisions based on their intuitive-experiential system, whereas in other countries the majority make decisions based on their analytical-rational system.

The goal of this study is finding out whether the entrepreneurial logic of effectuation or causation is related to the entrepreneur's decision-making and culture. The following research question has been drawn up for this purpose:

To what extent do entrepreneurs have a tendency for effectual(reasoning) over/vs causal (reasoning) and does culture have an interacting effect?

This research has been conducted to assess the effects of differences between cultures and the effects on people's decision-making with a view to whether people live in a tight or a loosely organised environment. Two types of cultures have been taken as the basis for this study: a tight culture with many strong norms and a low tolerance of deviant behaviour as well as a loose culture with weak social norms and a high tolerance of deviant behaviour.

A survey has been conducted among Turkish start-up entrepreneurs as a basis for this study. The findings show that these entrepreneurs prefer causation over effectuation and they demonstrate no clear difference in the way they process information. They obviously perceive their culture as rather tight.

It appears that entrepreneurs who make their decisions based on effectuation generally process information depending on an intuitive-experiential system, but as soon as culture is taken into account this relation largely disappears. However, entrepreneurs who use causation in their decision-making do not directly process information based on an analytical-rational system. In contrast, when culture is taken into account, the relation between causation and the analytical-rational system becomes significant. These outcomes suggest that culture plays an important role in the relation between entrepreneurial decision-making and a cognitive style.

This paper highlights the importance of the entrepreneur's cultural background in the way how information is processed and how entrepreneurial decisions are made. Therefore, in further entrepreneurial and cognition studies, culture may not be neglected in order to reach a comprehensive outcome in any study on this subject.

Content

1. Introducing topic

"Those who have knowledge, don't predict. Those who predict, don't have knowledge". In this rapidly -changing world it is near impossible to predict. Among others, entrepreneurs need to deal with these events for the sake of survival or for gaining competitive advantage. Entrepreneurs are individuals that launch and manage ventures. According to literature, a regularly used definition of entrepreneurship is: "The process by which individuals – either on their own or inside organizations – pursue opportunities without regard to the resources they currently control" (Stevenson & Jarillo, 1990, p. 23). The starting point of this definition focuses on the opportunity recognition, which is in line with the widely-accepted component of Kirzner's (1973) 'alertness to opportunity'. Stevenson's definition and opportunity view is mentioned extensively in management literature, since it is coherent with modern and conventional definitions of entrepreneurship (Brown, Davidsson and Wiklund, 2001).

The question on how opportunities get recognised has been a subject of intensive research for many years, comprehensive studies have been devoted on several components of opportunity recognition. Among others: the entrepreneur's prior knowledge (Shane & Venkataraman, 2000), specific traits, skills, motivations (Baum and Locke, 2004; Garg, Matshediso & Gard, 2011), alertness (Kirzner, 1973; Shane & Venkataraman, 2000; Gaglio & Katz, 2001), strategic decision making (Busenitz & Barney, 1997) and cognition (Zahra, Korri & Yu, 2005) play a significant role in recognising opportunities. Most attention in this paper will be devoted to the entrepreneur's decision making because the question arises on how an entrepreneur deals with opportunities and decides to use them. Does the entrepreneur first invent a strategic business plan including Ansoff-strategies, SWOT-analyses, and competitive profile matrices just like what has been taught by 78 of the top 100 Business schools in the US and probably the rest of the world (Honig, 2004) or is the entrepreneur more flexible and does he make more emergent decisions related to the situation?

Business management scholars have comprehensively elaborated on entrepreneurial decision making so far. In the approach to launching a company many developments have taken place. For many years the plan-based approach was the leading way to launch a company (Honig & Karlsson, 2004; Liao & Gartner, 2006). However, some scientists among others Sarasvathy (2001) have intensely studied this process from another angle: the more unplanned and intuitive approach. Instead of looking at the goal that the entrepreneur wants to reach, it first looks at the available means in house. This phenomenon is known as effectuation and the previously-explained way of entrepreneurial decision-making is known as causation (Sarasvathy, 2001). This twofold distinction on decision making of entrepreneurs has been a popular research topic in this millennium (Nielsen & Lassen, 2012).

On the one hand, there are entrepreneurs who start a company by defining their goal first, already looked to their potential customers, potential competitors in advance, and predict how much return they could expect. Those entrepreneurs define and approach their market based on a plan. Kotler (2012) states that the market should be approached in a structured way as explained above. Everything is stipulated and if the available resources are insufficient, outside funds will be needed and unexpected events should be avoided, because those were not considered and could harm the competitive advantage. These steps belong to causation (Sarasvathy, 2001).

On the other hand, instead of tracing market opportunities, inventing a goal and searching for the means to achieve that goal, there is effectuation. The entrepreneur first looks at the available means: Who am I? What are my skills or abilities? What can I do myself? What do I know? So how far do my expertise and knowledge reach? Whom do I know? Can my network do something for me? Or when I look at my available resources: what is at my disposal? This is not only about money or physical assets, but also about customers, expertise, image, stakeholders etc. (Sarasvathy, 2001). The premise is different here, nothing is set at the start, along the way new incentives will arise and be used to find the matching products to sell. If new people or new events are faced, they will be recognised as opportunities to polish the end result. There is no fixed plan at the start. This way of making entrepreneurial decisions is optimistic and not anxious for changes (Sarasvathy, 2001; Chetty, Ojala, Leppäaho, 2015). Causation and effectuation decision-making processes are two different logics, however both ways of decision making can occur at the same time in overlapping and intertwisting situations (Sarasvathy, 2001).

The decision-making process is different for every person and the way in which decisions are being made heavily depends on several factors, such as skills, experience, abilities, cognitive style, life style, and preferences (Upadhyay, Kumar Singh, & Thomas, 2007; Ozcelik & Paprika, 2010; Riding & Pearson, 1994). Essential in this research is the role of the entrepreneur's cognitive style. Sarasvathy (2001) states that effectuative decisions during venture creation are in fact a cognition-based theory. This is also supported by Grégoire & Corbett (2011), who state that effectuation focuses on "cognitive implications of uncertainty and the consequent constraints it places on both information processing and the use of planning heuristics in entrepreneurship.'' (pp. 19) Each entrepreneur processes incoming information differently and has his/her own cognitive style, which is the personal approach to coordinate, manage and process incoming information during learnable input (Messick, 1984; Tennant, 1998). Over the years, psychologists and psychiatrists have diagnosed many different cognitive styles. Riding and Cheema (1991) reviewed and reassessed most frequent styles and concluded that all styles could be allocated either under wholist-analytic and verbal-imagery.

The wholist-analytic cognitive style is most likely related to the intuitive-experiential and the analytical-rational system (Allison & Hayes, 1996). This component corresponds to the theory on how the human brain functions. The brain consists of two parts. The right hemisphere is known as intuitive and creative, while the left hemisphere is known as the rational and logical part (Ornstein, 1997; Schore 2001). Entrepreneurs who tend to use the cognitive style of intuitive-experiential for a decision most likely make them on the preconscious level, fast, automatic, associationistic, primarily non-verbal. Alternatively, those entrepreneurs who are inclined to adopt the cognitive style of analytical-rational for a decision most likely make them on the conscious level and intentional, analytic, and primarily verbal (Epstein, Pacini, Denes-Raj and Heier, 1996). The decision-making process through either causation or effectuation is a mental process and cognition based. When decision makers assess the future as moderately predictable or estimable, it is likely that they will do analytical research. In contrast if the future is assessed as unpredictable, the decision makers are expected to confide in experiential and iterative learning techniques to combine means to get to an effect (Sarasvathy, 2001). The role of information processing (and cognitive style) in entrepreneurial decision-making is therefore an important aspect that previously mentioned scholars tend to approach together.

According to the literature, the decision-making process and the thought of an individual is strongly-related to each other (Sarasvathy, 2001). It is therefore important to know why some people are inclined to keep to an analytical mode of thought rather than an intuitive one. Norenzayan, Smith, Kim, and Nisbett (2002) assign this difference to the individual's cultural background. In some countries people are less prone to fundamental attribution error (Ross, 1977) or try to attribute findings to a wider range of factors to explain an event (Fischhoff, 1975) where other people from other countries will do the opposite. Therefore, the actions and ways of thinking by an individual are highly driven by his/her cultural setting. This applies to the entrepreneurial context as well. Hayton, George, and Zahra (2002) have elaborated the relation between information processing and cultural background in the context of entrepreneurial decision-making. Their model intertwines these three components and highlights the presence of them. García-Cabrera & García-Soto (2008) as well as Hopp & Stephan (2012) support this claim and have proven in their researches that both entrepreneurs and their decision making are affected by their national culture. For example, entrepreneurs from more collectivist societies are more comfortable to corporate entrepreneurship, whereas entrepreneurs from individualistic cultures are more associated to being founders or individual entrepreneurs (Tiessen, 1997). Brinckmann, Grichnik, and Kapsa (2010) show that entrepreneurs in some cultures have more effectual characteristics than in others within the setting of the entrepreneurial decision-making ranging from effectuation to causation.

Culture plays a significant role in the way people act, decide, assess, etc. (Hofstede, 1993; Gelfand et al., 2011; Yates & de Olievera, 2016). Instead of focusing on the traditional dimensions of Hofstede (2011): power distance, uncertainty avoidance, individualism/collectivism, masculinity/femininity, long/short term orientation, and indulgence/restraint; the view of Gelfand et al. (2011) on culture will be used. She and her colleagues have supplied not another dimension, but complemented previous work by considering how tight or how loose a culture can be (Verbeke & Merchant, 2012; Aktas, Gelfand & Hanges, 2015). As a summary of what is meant by a tight culture and loose culture: tight cultures generally have strong norms and have a low tolerance regarding deviant behaviour of an individual. The opposite are loose cultures: norms are generally weak in such cultures and deviant behaviour is highly tolerated. So, in this study the interest lies also in whether the entrenched loose/tight culture of the entrepreneur influences his/her cognition and dichotomous way of decision making as presented by Sarasvathy (2001): effectuation or causation. Over the course of years, a lot of research has been done within the University of Twente on the concept of culture and effectuation. There is no clear decisive answer in whether there is an influence. Some say yes, others say no. Therefore, there is a need to further explore this possible relation. Mainly culture has been measured by using the concepts of Hofstede and Globe. Although, a few students have been using the concept of Gelfand et al. (2011) so far, still some extension is needed to give the general research more value.

By means of this paper a contribution to the existing literature is set out to be made by researching the following central question: *'' To what extent do entrepreneurs have a tendency for effectual(reasoning) over/vs causal (reasoning) and does culture have an interacting effect?''*

1.1. Contribution

Effectuation is considered a new academic concept, which received its 'name' in its latest form in 2001. Research has been carried out on the topic of effectuation and causation. Sarasvathy (2001) as well as Dew, Read, Sarasvathy and Wilbank (2007; 2009) and more recent scholars Woetmann (2014) conducted research on effectuation and causation among successful top CEOs as experts and Post MBA students as entrepreneurs. It appeared that 89% of 27 experts used effectuation, whereas 81% of 37 Post MBA students used causation (Sarasvathy, Dew, Read & Wiltbank, 2007). Sarasvathy, Dew, Read and Witbank (2007) state that expert-entrepreneurs make decisions based upon experience and Post MBA students make decisions based on predictable logic. However, these relations have not been researched into detail and will be examined in this study.

In existing academia, the relation between entrepreneurial decision-making, cognition and culture has not been researched extensively. The ones that exist, mostly operate the concepts differently. For example, Mitchell et al. (2002) applied the dimensions of Hofstede and measured cognition based on the model of Busenitz & Lau (1996). Hayton, George, and Zahra (2002) have developed a new model and integrated the aforesaid variables on the basis of existing literature. There it became clear that on the whole the work of Globe and Hofstede was used to operationalise culture. Furthermore, among others Stienstra, Singaram and Ehrenhard (2014) made use of the scale of Allinson & Hayes (1996) to operationalise cognition on the concept of entrepreneurial decision-making. It appears that a wide variety of scales has been used in studies on entrepreneurial, decision-making, cognition, and culture. However, the studies that took culture into account have indicated it as a variable in a wider process. This paper aims to discuss the relation between entrepreneurial information processing and decision-making by means of research within the context of culture and whether culture moderates (strengthens/weakens) the relation between cognition and entrepreneurial decision-making process. The scales of Alsos, Clausen and Solvoll, (2014 *NYP), Epstein et al. (1996) and Gelfand et al. (2011) will be used. These scales have not previously been used together in a single study.

2. Theoretical orientation

As explained in the introduction, this research consists of three concepts: cognition, cultural tightness/looseness, and entrepreneurial decision-making effectuation/causation. The existing relevant academic theory related to these concepts will be analysed in this first part.

2.1. Cognition

The word 'cognition' originates from Latin and means 'to give' or 'to know' (Tsvetkov, 2014). However, the definition used by far exceeds the original meaning. In science, it has been generally accepted that cognition is about the mental process of how an individual encodes, stores, retrieves, structures, uses or learns incoming information (Neisser, 1967, as cited in Lutz & Huitt, 2003). People get many incentives daily, the way how people process the incoming information has to do with their awareness, perception, reasoning, coding, planning and own judgement (Brandimonte, Bruno, Collina, Pawlik & d'Ydewalle (2016). This process differs per individual and is known as cognitive style. In theory, this is defined as the personal approach to coordinate, manage and process incoming information during learnable input (Messick, 1984; Tennant, 1998). Over the years, it turned out that in practice a couple of methods have consistently been used by individuals. It depends on the type of information; which method is needed and whether the effect on the performance will be positive or negative. In some cases, a specific style fits the given task better than another. It is also possible to use different styles or to combine them (Riding & Sadler-Smith, 1997).

Over the years, different names have been given to frequent cognitive styles among others: dependence – independence (Witkin, Dyk, Fattuson, Karp & Goodenough 1962), impulsivity - reflectivity (Kagan, 1965), convergent – divergent (Hudson, 1966), leveller – sharpener (Holzman & Klein, 1954), holists – serialist (Pask, 1972), and verbaliser-imager (Riding & Taylor, 1976). Riding and Cheema (1991) researched all these styles and concluded, after critically reading the definitions, testing the correlations, assessing the methodologies of the tests, and at last reviewing their effects on behaviour, that these styles are different beliefs of the same dimensions which belong to two general families: Wholist-Analytic and Verbal-Imagery. The wholist-analytic family will be examined in this study. An individual may automatically dissect incoming information to its component part, which is known as analytic. The wholist cognitive style is expressed as individuals who keep the overall or general view of the incoming information. For both ways, there may exist a deficiency, a wholist can risk blurriness in the distinction between the parts of a topic. An analytic may risk unequal focus on the divided parts and therefore, neglect important information or pay too much attention to one part and unconsciously exaggerate its importance (Riding & Sadler-Smith, 1997). It should be considered that both dimensions of cognitive styles are not dependent on each other i.e. a person could be a wholist and verbaliser simultaneously or the other way around. This differs also per individual (Riding & Cheema, 1991).

The interest lies in the entrepreneurs' cognitive style, the role of the intuitive-experiential- and analytical-rational system, for making key decisions. This mental way of making decisions between the intuitive-experiential- and analytical-rational belongs to the wholist-analytic family (Allinson & Hayes, 1996; Riding & Sadler-Smith, 1997). Based on these cognitive styles, Epstein et al. (1996) have developed a theory and introduced a self-report measure on how the individual processes information. This measure is known as the Rational Experiential Inventory (REI) and determines an individual's preference for processing information as either intuitive-experiential or analytic-rational. Epstein et al. (1996) do not perceive intuition as a single component of information processing, they attach an individual's experience directly to intuition. Shane (2011, as cited in Blume & Covin, 2011) attribute more value to the role of experience in intuition by saying that when entrepreneurs have no experience in an entrepreneurial context, their prior knowledge will not be the basis of their decisions and therefore its chance of leading to an effective entrepreneurial intuition will be ruled out. Referring to Epstein's measurement, they included in their measurement two different scales: one scale that covers the analytic-rational system known as NFC (need for cognition) and the other scale, which covers the intuitive-experiential system and is known as faith-in-intuition (FI). They tested this on undergraduate psychology students and concluded that NFC and FI are two independent systems. This theory is all covered and known as the cognitive-experiential self-theory (CEST) of Epstein (1990, 1991, 1993, 1994, as cited in Epstein et al., 1996). The first system: analytical-rational information processing occurs on the conscious level and is intentional, analytic, principally verbal, and relatively affect free while the other system: the intuitive-experiential, occurs on the preconscious level and is automatically, holistic, makes associations, chiefly non-verbal, and closely associated with effects. This is in line with a dilemma on a daily basis: how do people respond to a task based on their feeling or do they really think in depth about it to get to a solution?

Scientists like Mintzberg (1976) say that in some situations your intuition should direct you in making a decision, others say that you should think thoroughly and analyse the possibilities before making a decision. Hayashi (2001) states that people unconsciously combine both processes before making a decision. Without knowing, our emotions and feelings help us filter between different choices, even though our conscious mind is unaware of this action. Cognition is a complex concept and therefore it is attractive to do further research on whether this is related to entrepreneurial decision-making as suggested by Sarasvathy (2001).

2.2. Effectuation and causation

Sarasvathy (2001) has proposed two logics of entrepreneurial decision-making, either through effectuation or causation. Both concepts must not be seen as contrary, although their reasoning is both based on an entirely separate logic. It totally depends on the timing and situation which approach should be used (Sarasvathy, 2008; Perry, Chandler, & Markova, 2012). In more recent studies, it is argued that it is not entirely impossible for entrepreneurs to combine both strategies (Alsos et al., 2014). Sarasvathy (2001) exemplified effectuation and causation as the bipolar way on how a chef can prepare a meal and stated the following:

"The host or client picks out a menu in advance. All the chef needs to do is list the ingredients needed, shop for them, and then actually cook the meal" (Sarasvathy, 2001, p. 245). This logic is known as causation. Effectual logic is exemplified in the paper as follows: "*The host asks the chef to look through the cupboards in the kitchen for possible ingredients and utensils and then cook a meal. Here, the chef has to imagine possible menus based on the given ingredients and utensils, select the menu, and then prepare the meal"* (Sarasvathy, 2001, p. 245)". The difference between both logics is in what the entrepreneur takes as his/her starting point. If an entrepreneur first looks at the goal (s)he wants to reach and then focuses on the means to reach that goal, (s)he follows a causal logic. When an entrepreneur first looks at the available means and decides which effects can be created from combing those means and therefrom sets a goal, (s)he follows an effectual logic (Sarasvathy, 2001).

One of the key characteristics is that causation determines the customers ex ante and effectuation ex post i.e. causation is used when the future is predictable and effectuation used when the future is unpredictable (Sarasvathy, 2001). Therefore, it is argued that causation is the strategy which can be used in industries where the future is predictable (Sarasvathy et al., 2007). Harms and Schiele (2012) stick to the principle that the world is a rapidly changing environment, which influences the entrepreneur and it is therefore comprehensible that it might be more efficient to follow an effectual logic instead of a causal logic. A year before Sarasvathy et al. (2007) found supporting evidence among experts as entrepreneurs. 89% of them used effectuation in favour of causation. However, in contrast to experts, MBA students as entrepreneurs preferred causation over effectuation in 81% of the cases. The latter is perfectly conceivably, because in business studies it has been taught that decision makers start by identifying a potential market for a specific product, followed by inventing and implementing the appropriate marketing strategy for the potential customers in order to acquire substantial market share; known as the STP-process (Sarasvathy, 2001; Honig, 2004).

Sarasvathy (2005) worked on different principles to make both logics clear from both perspectives. Over the years she came up with five key principles in order to differentiate effectuation from causation. In current literature, they are known as the patchwork quilt-, affordable loss-, bird-in-hand-, lemonade-, and the pilot-in-the-plane principle (Sarasvathy, 2005), although Alsos et al. (2014) found gaps in work published earlier and built upon Sarasvathy's theory but which approached the relation between causation and effectuation differently. Previously published work either took causation as one-dimensional measure (DetTienne and Chandler, 2010), took both methods as direct opposites from each other (Brettel, Mauer, Engelen & Küpper, 2012; as cited in Alsos et al., 2014) or analysed the construct of causation and its principles as one (Fisher, 2012). Therefore, Alsos et al. (2014) placed both effectuation and causation next to each other as two possible entrepreneurial decision-making strategies, which both consist of a set of five contrasting principles. In general, the five principles are known as: basis for taking action, view of risk and resources, attitude towards others, attitude towards unexpected events, and view of the future. These principles are shown in the table below and will be separately highlighted in the next sections.

DIMENSION	SARASVATHY	EFFECTUATION	CAUSATION
BASIS FOR TAKING ACTION	*Bird-in-hand*	Means-based approach	Goal-oriented approach
VIEW OF RISK AND RESOURCES	*Affordable loss*	Focus on affordable loss	Focus on expected returns
ATTITUDE TOWARDS OTHERS	*Patchwork Quilt*	Pre-commitments with stakeholders	Competitive analyses
ATTITUDE TOWARDS UNEXPECTED EVENTS	*Lemonade*	Exploiting contingencies	Pre-existing knowledge
VIEW OF THE FUTURE	*Pilot-in-the-plane*	Controlling an unpredictable future	Predicting an uncertain future

Table 1: Differences between Effectuation and Causation (Alsos et al., 2014; Sarasvathy, 2008)

2.2.1. Basis for taking action

The biggest difference in this principle is the kind of approach the entrepreneur takes at first. Is the first decision made about what the goal is and how it can be reached or does the entrepreneur first look at the means and looks at the circumstances before setting a goal? The first approach, selecting the goal first before looking at the means, belongs to a causal decision-making logic. The second approach as stated, focuses first on the available means. In jargon, this is known as the means-based approach or by Sarasvathy (2008): the bird-in-hand. 'Means' is subdivided in three categories: understanding who you are, what you know, and whom you know. From a personal perspective, these three categories consist of the following: the characteristics or traits of the entrepreneur, the requisite knowledge, and the social network they are bound to (Sarasvathy, 2001). From the organisational perspective, 'means' comprises the psychical resources, human resources, and organisational resources which are available (Barney, 1991). In that case, the entrepreneur follows an effectual decision-making logic.

2.2.2. View of risk and resources

Effectuation focuses on affordable loss, known as the affordable loss-principle of Sarasvathy (2008). The entrepreneur decides and determines how much loss is acceptable beforehand. Based on that (s)he makes entrepreneurial decisions with the comprehension and admission that the resources may be lost (Sarasvathy, 2008; Chandler et. al, 2011). In contrast, entrepreneurs who stick to a causal logic focus on maximising returns of their investments and select between alternative strategies, the one which has the highest predictability in terms of returns. If the necessary means are not available, they will be requested from outside lenders. For this method, a lot of preparation is needed because entrepreneurs base their decision on complete competitive analysis and the entrepreneur needs to sketch the whole life cycle of the organisation beforehand (Sarasvathy, 2008; Newbert, 2015; Honig, 2004).

Take as an example an entrepreneur who is about to start a company. In order to acquire knowledge of the market and competitors he starts to do some analysis because he would want to know something about the risks and potential returns. In addition, he would do some cost analysis and budgeting and conclude that he needs €1.5 million to make his dream come true and start his own company. Due to his father who recently died and left him a legacy and because of his own well-paid job he would only need €750K and then in the industry concerned it would take only 3 years to become profitable. This example shows how an entrepreneur who makes decision based on a causal logic acts. In contrast, the entrepreneur who makes decisions based on an effectual logic first looks how much he can spend and then designs his business idea. Based on €750K the company will be sketched, formed, and launched.

2.2.3. Attitude towards others

This principle is about the entrepreneur's perspective on (potential) stakeholders. An entrepreneur who makes use of an effectual logic looks upon them as positive influencers or allies to some extent, whereas an entrepreneur who makes use of a causal logic sees them as business opponents. An effectual logic values alliances and commitments from stakeholders in order to become more certain and to lower barriers in the industry (Sarasvathy, 2008). One frequent approach then is hooking up to incumbents and signalling your presence in the industry to others (Zaheer, Gözübüyük & Milanov, 2010). Entrepreneurs following an effectual logic are open for any kind of stakeholders and have them make commitments to getting engaged in forming the company no matter what the opportunity costs are because in the future they can get their stake in the company. Therefore, this type of cooperating is labelled as crazy-quilt or patchwork-quilt (Sarasvathy, 2008). Entrepreneurs, who follow a causal logic see others as threats because they start the process with a pre-determined goal and expected turnover for their company. During the business plan phase, they have made a thorough competitive analysis and consider every entity that can lower their income, make their goal unreachable or steal a slice of the pie; as a potential threat.

2.2.4. Attitude towards unexpected events

The difference in this principle is how an entrepreneur reacts to unforeseen challenges. The goals of entrepreneurs who follow an effectual logic are not predetermined. They might have a slight idea of their goal, but their plans will be made along their path and incoming uncertain information will be seen as guidance in determining their goal (Lindblom, 1959 as cited in Sarasvathy, 2008). Therefore, this principle is recorded as the lemonade principle and is line with the expression, 'When life gives you lemons, make lemonade' (Sarasvathy, 2008). In other words, unexpected events should be seen as positive input. The contra-distinction is for entrepreneurs that follow a causal logic, who see uncertainties as new obstructions to reach their predetermined goal. Those entrepreneurs want to reduce the chance of getting non-expected outcomes (University of Virginia, 2011). In most cases, their existing knowledge about innovations or new technology functions as their competitive strength and if for example unexpected events occur, their whole plan may be discomposed.

2.2.5. View of the future

In this dimension, there is a clear distinction by how forecasting is done. Both approaches want to control the future as much as possible. However, entrepreneurs who follow a causal logic focus more on the predictable aspects of the unknown future. They say: 'To the extent that we can predict the future, we can control it'. In contrast, entrepreneurs who follow an effectual logic are engaged with the controllable aspect of the unpredictable future. Their logic is as follows: 'To the extent that we can control the future, we do not need to predict it' (Read, Sarasvathy, Dew, Wiltbank & Ohlsson, 2010; Sarasvathy, 2008). Sarasvathy (2008) labels this principle as 'pilot-in-the-plane' and it is related to human behaviour. It stems from the idea that you must trust and give responsibility to employees. If this is the case, all the rest will flow like enabling the automatic pilot mode in the airplane. If entrepreneurs who follow an effectual logic are given freedom, and are not told that they should comply with strict formats, agreements, and procedures; they will be able to respond effectively to new trends and uncertainties (Sarasvathy, 2008).

Overall, an entrepreneur who makes decisions based on a causal logic has a goal-oriented approach, which does not fully depend on the available resources and in some cases, borrows resources to reach the goal. Furthermore, it focuses on predetermined returns in the coming years, sees others in this industry as competitors, reacts anxiously to new unexpected events and tries to predict the uncertain future. This contrasts with the entrepreneur who makes decisions based on an effectual logic and who has a different view on doing business. Such an entrepreneur first looks at the means, looks at the resources (s)he can afford to lose and does not expect that the investment will pay off for sure. (S)he considers others in the industry not as competitors but as allies with whom to cooperate to some extent. Furthermore, (s)he reacts to unexpected events positively and tries to convert them into opportunities, and finally (s)he does not try to predict the future but tries to control it as far as it is possible (Alsos et al., 2014). It is essential to repeat the fact that Sarasvathy (2008) does not view them as direct opposites but as strategies, while causation fits better in some industries and effectuation in others. The model of Sarasvathy and Dew (2005) shows the way how effectuation and causation approach entrepreneurship:
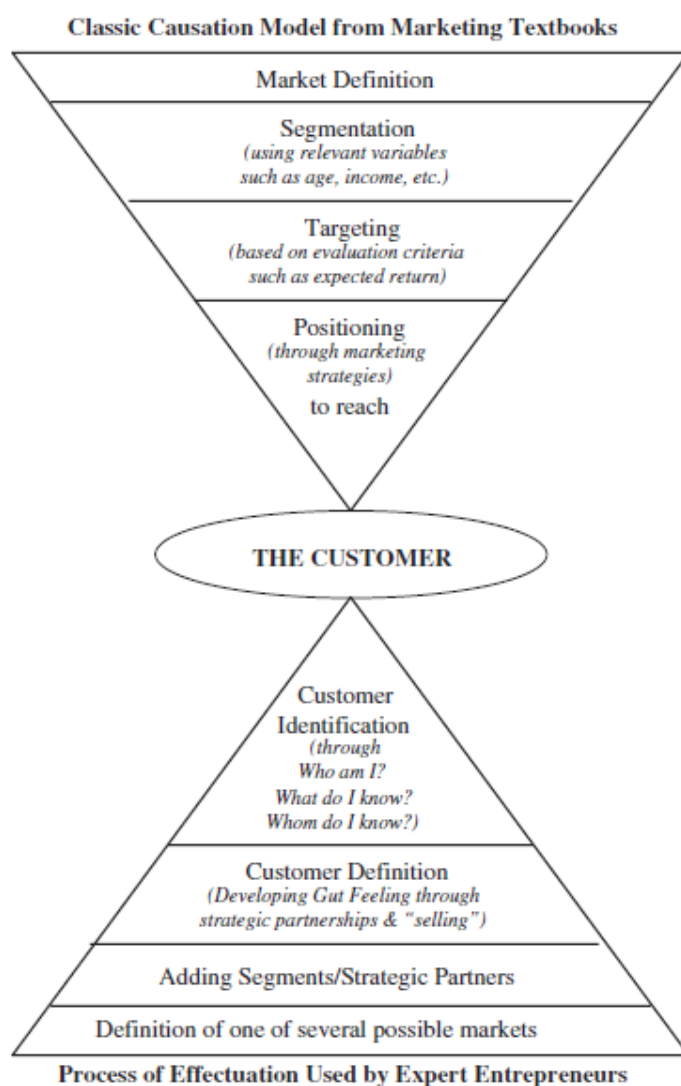

Figure 1: Contrasting causation with effectuation (Sarasvathy & Dew, 2005)

2.3. Country's tightness or looseness

When talking about culture, well-educated businesspeople frequently think of Geert Hofstede and his corresponding dimensions (Wursten & Jacobs, 2013). It is therefore not surprising that his work has been used in more than 100,000 scientific papers and books since 2009 (as cited in the Social Sciences Citation Index, 2016). The overall influence of Hofstede in science, education and the business world is tremendously high, therefore Fang (2010) cited the following*: ''Hofstede's masterful capacity to elaborate the complex phenomenon of culture in simple and measurable terms explains his enormous popularity''* (p. 156). However, as an artefact's popularity grows, more people will question its robustness. Therefore, over the years Hofstede's earlier cultural work has been criticised by various scientists on: among others validity (Schwartz, 1999), generalisability (Dorfman & Howell, 1988), timing (Sondergaard, 1994; Newman, 1996), delimitation of the world (McSweeney, 2000, as cited in, Shaiq, Khalid, Akram & Ali, 2011), statistical integrity (Jones, 2007).

In order to get everyone on the same line, this study aims to concretise how the concept of 'culture' is to be perceived and interpreted as a major influential factor in entrepreneurial practice. According to Hill (1997, as cited Doney, Cannon, and Mullen, 1998), who based his definition on the work of Kroeber and Kluckhohn (1952), Namenwirth and Weber (1987, as cited in Doney et al., 1998), Clark (1990, as cited in Doney et al., 1998), and Hofstede (1984, as cited in Doney et al., 1998), culture means: "*A system of values and norms that are shared among a group of people and that when taken together constitute a design for living*" (Doney et al., 1998, p. 607). To give a practical meaning to the definition: culture is a pattern of unconsciously and partly intangible deeply ingrained behaviour, which influences the daily life and view of life (Schiffman, Kanuk & Hansen, 2012; Stienstra, Harms, Van der Ham & Groen, 2012). In culture, one can make a distinction that exists on different levels: organisational, national, clan and individual culture (Mitchell et al., 2002, as cited in Stienstra et al., 2012). The distinction between cultures becomes apparent through the 'Onion Diagram' of Hofstede (2010), which consists of four layers: values, rituals, heroes, and symbols. These layers are experienced differently per group, whereas some groups are different from each other, other groups can be nearly the same. The values, which belong to the not directly visible part, are known as the core which makes the distinction between one group and the other (Hofstede, 2010). This gave rise to the world-famous six dimensions of Hofstede, which are known as: power distance, individualism vs. collectivism, masculinity vs. femininity, uncertainty avoidance index, long term orientation vs. short term normative orientation and indulgence vs. restraint (Hofstede, 2010).

The national culture will be further analysed since this group of individuals, according to both Hofstede (2010) and Trompenaars (2007 as cited in Stienstra et al., 2012) is the best representative of culture. However, instead of adhering to the dimensions by Hofstede, the complementary work by Gelfand, Nishii and Raver (2006) that deals with national culture in a business environment will be used. She and her colleagues have looked to cultural differences from a different angle by looking at how tight and loose cultures are. They expanded on early research in anthropology, sociology, and psychology which proved the existence of tightness and looseness in cultural differences (Gelfand et al., 2006). But what does it mean? The essential point is that tightness and looseness function as complementary to the dimensions by Hofstede and are unique. All the combinations are possible e.g. a country can be loose and have a high uncertainty avoidance or vice versa which is also applicable to the other dimensions. Tightness and looseness are related to the influence of social norms and sanctions on individualistic behaviour. Tight cultures are described as a country's society which have strong norms and low tolerance of deviant behaviour, whereas loose cultures are contradictory and have fewer norms and less tolerance of deviant behaviour (Gelfand et al., 2006).

Tightness and looseness have been caused by a wide variety of both ecologically and human-made social threats that countries have experienced over the years. If a country faced many threats of this kind in its history, its willingness of becoming more secure increases (Berry, 1979; Triandis, 1972, as cited in Gelfand et al., 2011). To reach more security in a country, stricter norms are needed to ensure that people will show less deviant behaviour. To both frighten and discourage people from showing intolerant behaviour, individuals who have shown intolerant action will be punished. All these actions are aimed at creating social coordination for survival (Gelfand et al., 2011). Some examples that can have a negative impact on the social coordination of a country are: a high population density, resource shortage, natural disasters, territorial attacks/threats or spread of diseases. Countries that have faced or are being threatened with such challenges are expected to have strong norms and a low level of tolerance of deviant behaviour in order to maintain social coordination and to deal with such threats appropriately. In contrast, countries with less ecological and human-made danger are in need of order and social coordination to a far less extent, thus having weaker social norms and are less stringent (Gelfand et al., 2011).

People that have been raised in a country that is considered tight or who have been in such a country for a longer period experience a limited variety of behavioural options. They know that every behaviour and action will be judged and that they might be punished if their action is not within the (subjective) range of family, friends, or state. For this reason, they will be more preventive so as to avoid making mistakes, they will constantly try to act appropriately and in accordance with every situation, and will have a higher degree of self-monitoring ability. As opposed to this, people who have been raised in a country that is considered loose or people who have lived in a such a country for a longer period of time will show opposite behaviour and will have opposite thoughts (Gelfand et al., 2011). To make it more concrete, Gelfand et al. (2011) exemplified activities where the characteristic differences between a loose and tight country become clear.

ACTIVITY:	TIGHT COUNTRY:	LOOSE COUNTY:
PREVAILING INSTITUTIONS AND PRACTICES	Narrow socialisation restricting the range of permissible behaviour	Encourage broad socialisation affording a broader range of permissible behaviour
GOVERNING SYSTEM	Autocratic	Democratic
FREEDOM OF SPEECH	Different views are being suppressed	People are allowed to say nearly anything
MEDIA INSTITUTIONS	Restricted content, more laws, and controls	Freedom of media
CRIMINAL JUSTICE SYSTEMS	High monitoring, more severe punishments more deterrence and high control of crime	Less monitoring/suspicious, appropriate sanction, less deterrence and low control of crime
RELIGIOUS PRACTICE	More religious people	More paganists
CHALLENGES TO SOCIAL INSTITUTIONS (DEMONSTRATIONS, BOYCOTTS, STRIKES)	Less common	More freedom to strike or demonstrate in disagreements
EVERYDAY SITUATIONS IN LOCAL WORLDS (HOME, HORECA, SCHOOLS, WORK, LEISURE FACILITIES ETC.)	Higher range of restricted appropriate behaviour, higher censuring, little room for individual judgement	few external constraints on individuals, afford a wide range of behavioural options, and leave much room for individual discretion

Table 2: Differences between tight- and loose countries (Gelfand et al., 2011)

2.4. Hypotheses

The research question consists of various components and in order to answer it, testable hypotheses will be compiled. The earlier explained components together will be visualised in the conceptual model below, this will give more clarity on how this study has been constructed.
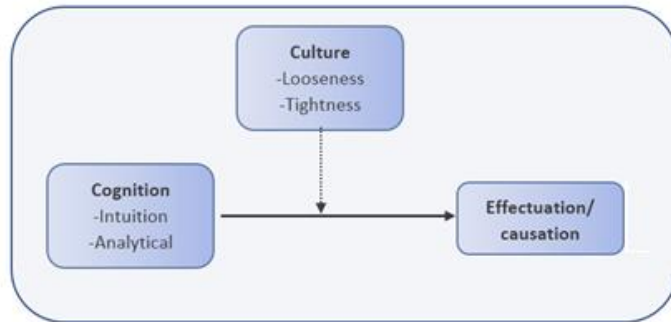

Figure 2: Conceptual model

As in Sarasvathy et al. (2007) there was evidence that most expert entrepreneurs identified the market for a product by using effectuation compared to MBA-graduates, who used causation. The difference between this group is that the expert entrepreneurs mostly make decisions based upon their experience. They seek for effects by combing the means they have at their disposal. Due to the presence of their experience they are able to integrate and synthesis this knowledge into a tangible asset (Boshuizen & Schmidt, 1992; Blume & Covin, 2011). Combing this way of thinking (cognition) forms the basis of the effective use of intuition (Chase & Ericsson, 1981). It is therefore expected that entrepreneurs whose decisions are based upon their expertise-intuition system have a propensity to prefer an effectual logic of decision-making.

H_1: *Entrepreneurs with an intuitive-experiential thinking style have a propensity to prefer effectual over causal decision-making.*

At the same time, Sarasvathy et al. (2007) proved the that most MBA students used the other approach, causation, to select a market for a product. This entrepreneurial decision-making process is based on the logic of prediction. Entrepreneurs tend to do systematic research to gather information, order that information and spend some time to reasonably analyse that information when they think that the future is somewhat predictable (Sarasvathy, 2001; Sarasvathy et al., 2007). This is in alignment with the analytical-rational system of Epstein et al. (1996). Decisions are based upon analyses: information will be gathered, ordered, if needed split, and processed on a rational level. Since these both theories comply with each other it is expected that entrepreneurs whose decisions are based upon their analytical-rational system have a propensity to prefer a causal decision-making logic.

H_2: *Entrepreneurs with an analytical-rational thinking style have a propensity to prefer causal over effectual decision-making.*

This research is examining the role of culture in the entrepreneurial decision-making process as well as the role of cognition. Culture influences the characteristics of people and can create more entrepreneurs in a certain country. It is important, since it influences values, motives, and beliefs of people (Davidsson & Wiklund, 1997). Therefore, Hayton et al. (2011) highlighted the importance of culture as a component of entrepreneurial decision-making. Since this research has been performed in Turkey, it is of utmost importance to determine how Turkish entrepreneurs perceive their culture. Gelfand et al. (2011) surveyed this among various types of individuals and described Turkish culture as one of the tightest cultures with a score of 9.2. It is interesting to find out whether entrepreneurs perceive their culture the same as their fellow citizens.

H_3: *Entrepreneurs from Turkey have the propensity to perceive their culture tight.*

Existing scholars suggest that people from tight cultures are more preventive and have a higher need for structure in order to avoid making mistakes. Everything is tightly planned to minimise possible deviation (Gelfand et al., 2011). As in the causal decision-making process, first the purpose i.e. goals, the strategy and resources are defined before starting. During this process, every decision is made to achieve the stated long-term goals. Short-term goals are considered irrelevant and surprises are seen as something bad (Sarasvathy, 2001).

Therefore, we expect that entrepreneurs who perceive their country as tight follow the same principles as causal decision-makers. In Turkey, it is expected that the culture is perceived tight as suggested by Gelfand et al. (2011) and it is therefore interesting to establish whether Turkish entrepreneurs will make decisions based on causation. An important side note is that Stienstra et al. (2012) found contradictory results. Germany, perceived as a tight culture, preferred effectuation over causation. But Mexico was in line with the hypothesis, since that culture is perceived as tight and entrepreneurs preferred causation over effectuation. This makes it more attractive to see whether the theory could be replicated in Turkey as well. Therefore, the following hypothesis is established:

H_4: *Entrepreneurs from a tight culture have a propensity to prefer causal- over effectual decision making.*

Norenzayan et al. (2002) have proven that there exists a relation between culture and the preference for either formal (analytic or rule based) or intuitive (experience-based or holistic). They have shown that East Asian undergraduate students tend to favour analytical reasoning in contrast to European American university students who rely more on intuitive reasoning. This is supported by Nisbett, Peng, Choi, and Norenzayan (2001) that an analytic mode of processing information is predominant in Western cultural countries and that an intuitive mode of thought has been predominated in East Asian countries.

The countries which have been examined are Chinese and Korean for the East-Asian. The Western countries in this study are Europeans who were emigrated and live in America. The East-Asian countries are defined as rather tight (China: 7.9 and South Korea: 10.0). The Western countries, among others the USA, are defined as a looser culture (5.1) and so is the average of the European countries (5.8) (Gelfand et al., 2011). The average of Europe is taken, since this paper does not provide more specific information about the European American's country of origin (Nisbett et al., 2001). It appears from literature that perceived loose cultures (Western-countries) held an analytic way of processing whereas perceived tight cultures (East-Asian) held a more intuitive mode of thought. However, Turkey according to Gelfand et al. (2011), scores a 9.2 and therefore belongs to the category tight and the people, according to the theory, are expected to prefer an intuitive way of processing information. This makes it attractive to see whether it also applies in this research.

H_5: People from a tight culture have a propensity to process information based on intuition.

People from different national cultures all have their own manner of addressing particular problems or how to decide (Mitchell et al., 2002). This has been supported by existing academia, who state the factors that influence venture-creation decisions and business planning diversify across national cultures (Busenitz, Gomez, & Spencer, 2000; Brinckmann et al., 2010). In Hayton et al. (2002) evidence has been found that cultural context influences the way how entrepreneurs process information and that it amplifies entrepreneurs in making decisions. Therefore, it is expected that the culture moderates between cognition and entrepreneurial decision making. (This also tests the conceptual model of this research).

H_6: The relationship between cognition and entrepreneurial decision-making is affected by the culture.

3. Methodology

In this section, the methodology will be examined. First the sample will be described, followed by the operationalisation of the variables, analyses, and the control variables.

3.1. Sample

This research has been conducted using a quantitative method. The sample of this research consists of Turkish entrepreneurs originating from the country itself, whose own launched venture is not older than 5 years (start-up) and who are higher educated i.e. at least graduated at a Bachelor level. This country has been chosen on the basis of both practical- and academical reasons: due to my Turkish background, I knew how to find the Turkish start-up entrepreneurs and since not many studies about entrepreneurship have been conducted there. The survey has been sent via University of Twente Student email and has been drafted by making use of Qualtrics, an online survey tool. In order to find suitable candidates, AngelList (a website where start-ups can enrol themselves) and TechnoParks (local high-tech industrial parks belonging to Universities) were used. The following TechnoParks have been addressed: Eskişehir Teknoloji Geliştirme Bölgesi, Teknopark İstanbul, Bilkent Cyberpark, Erciyes Teknopark, ODTÜ Teknokent, SUCool, and Teknopark İzmir. These websites show lists of companies and in most cases their year of founding. After 2,5 weeks about 65 entrepreneurs responded. At that moment, I decided to send a reminder and in one day 29 people responded. On the 28th of May the survey was closed and the total number of respondents was 103. This number is consistent with previous theses within the University of Twente on the concept of effectuation.

The 103 respondents included some respondents who did not meet the following requirements: company older than 5 years, study-level (at least a Bachelor degree), not the founder or raised outside Turkey (based on the nationalities (s)he had and universities (s)he went to). Furthermore, a control for outliers on the scales has been carried out. This test is known as the Mahalanobis-distance (Mahalanobis, 1936) with a threshold of 0.001 (Gemperline & Boyer, 1995). Values below this threshold indicate the presence of one or more multivariate outliers, which should be excluded since they can harm the test (Filzmoser, Maronna & Werner, 2004). After filtering these respondents out, the number was 78.

3.2. Scales

The questionnaire completed by the respondents included questions about different aspects of effectuation/causation, influence of culture, and intuitive-experiential/analytical-rational information processes. These statements were in English and needed to be translated. In cooperation with two native speakers, who are currently teachers of English and psychology, these statements were translated into Turkish. The English statements were also mentioned next to the Turkish version in order to avoid confusion. To make sure that the influence of these variables was measured several control variables were questioned, among others about age, previous experience in a venture and prior study. The measurement methods of the variables will be explained in the upcoming section.

3.2.1. Cognition: intuition-experiential vs analytical-rational

The ten-item scale of Epstein et al. measures which cognitive style the entrepreneur uses (1996). This scale has been used to measure the entrepreneur's personality and is called the rational-experiential inventory (REI). The questionnaire was set up to determine the information processing style and has been widely used in psychology and social cognition literature (Evans, 2008). In the same way, it has been used to measure cognitive characteristics of entrepreneurs in entrepreneurship literature (Blume & Covin, 2011; Krueger & Kickul, 2006; Haynie & Shephard, 2009). The scale consists of five statements about need for cognition (NFC) and five statements about faith in intuition (FI) in order to determine which cognitive style is preferred. The NFC-scale represents the analytical-rational system and the FI-scale represent the intuitive-experiential system. These two scales are not contradictory, but they exemplify two different kinds of independent information processing (Epstein et al., 1996). The entrepreneurs are expected to give an answer based on a 5-point Likert scale; 1 indicates: I strongly disagree and 5 indicates: I strongly agree. The REI consists of 3 (1,2 & 5) reversed items. These will be recoded (1 = 5, 2 = 4, 3 = 3, 4 = 2, and 5 = 1).

3.2.2. Entrepreneurial decision-making: effectuation & causation

This research topic and the dependent variables is about the binominal entrepreneurial decision-making process of effectuation and causation as introduced by Sarasvathy (2001). To operationalise these concepts, the measurement scale of Alsos et. al (2014) has been used. They revised earlier measurement scales and found gaps: Chandler et al. (2011) as well as Gabrielsson and Politis (2011) did not treat effectuation and causation reciprocally or equally, Brettel et al. (2012, as cited in Alsos et al., 2014)) as well as Wernhan and Brettel (2012 as cited in Alsos et al., 2014)) failed to treat effectuation and causation as contrasting, Chandler et al. (2011), da Costa and Brettel (2011) as well as Johansson and McKelvie (2012) lacked construct and discriminant validity in their research, Brettel et al., (2012), Chandler et al. (2011) as well as Da Costa & Brettel (2011) had a low internal reliability in their research and finally Brettel et al. (2012), Da Costa & Brettel, (2011), DeTienne & Chandler, (2010), Gabrielsson & Politis, (2011), Johansson & McKelvie, (2012) as well as Werhahn & Brettel, (2012) lacked criterion validity in their scale. Alsos et al. (2014) tried to improve these shortcomings and introduced a 10-item questionnaire with a high reliability and validity on both decision-making processes. Thus, it accurately measures effectuation and causation, it also includes the five principles in order to measure effectuation properly. The respondents can answer in the range from 1 to 7, where 1 is 'I strongly disagree' and 7 is 'I strongly agree' (Alsos et al., 2014).

3.2.3. National culture: tightness vs looseness

In order to measure how entrepreneurs, experience their own national culture, the scale based upon the theory of Gelfand et al. (2011) has been used and the participants have been asked to assess the degree to which social norms and sanctioning exists in their country. The questionnaire covers 6 statements about tightness and looseness. Answers on the questionnaire could be given between 1, indicating strong disagreement and 6, indicating strongly agreement. The higher the scores given, the tighter the national culture is perceived. This scale consists of 1 (4) reversed item, this will be recoded (1 = 6, 2 = 5, 3 = 4, 4 = 3, 5 = 2, and 6 = 1)

3.3. Method of analysis

The application IBM SPSS Statistics 23.0 has been used to analyse the results of the survey. The first analysis is known as the reliability analysis followed by the explanatory factor analysis, and by the distribution-testing.

3.3.1. Reliability analysis

In order to ascertain whether the survey measures what it should measure, the construct will be tested among the several scales in this study (Dooley, 2001). A tool for that is Cronbach's Alpha. This tests the internal consistency of the statements in the survey (Dooley, 2001). The threshold is somewhat arbitrary as well. Hair et. al (2010) have set 0.7 as acceptable, whereas Loewenthal (2001) accepts 0.6, though under strict conditions. In several scholars, the threshold for acceptance ranges from 0.7 to 0.95 (Nunnally & Bernstein, 1994; Bland & Altman, 1997; DeVilles, 2016) and therefore the support for the outcome is highly important (Takavol & Dennick, 2011). An important note has been made by Sijtsma (2009), who states that Cronbach's Alpha underestimates the true reliability, and that it should be seen as a lower boundary to the reliability. Thus, in theory it is possible that the Alpha can be higher than the outcome.

First the Cronbach's Alpha has been tested for the cognition scales. The α for the NFC scale is 0.455. At this moment this is unacceptable, but the reliability can be improved to an acceptable level when the 4th statement: ''I prefer complex to simple problems'' gets removed. It is expected that this statement will conflict in the factor analysis as well. The α for the FI scale is 0.782 indicating a good reliable measurement level. For the scales of Alsos et al. (2014) to measure effectuation and causation both Cronbach's Alphas are at an acceptable level. The scale of causation has an α of 0.625 and the α of effectuation is 0.648. The scales without NFC are not highly acceptable and as Loewenthal (2001) suggests these levels are acceptable under strict conditions. Streiner (2003) gives a possible explanation why this is the case. He states that the length of the scale can have a negative influence on the alpha level as well. Since the scales in this research are relatively small, this suggestion may not be excluded. Furthermore, since this research is of exploratory nature i.e. therefore less bounded by strict rules, it is imaginable that the Cronbach's alpha is lower as well (Hair et al., 2010).

3.3.2. Factor analysis

This analysis identifies the underlying structure of the variables used in this survey and tests whether there is a relation between the variables (Hair, Black, Babin & Anderson, 2010). This type of factor analysis fits better than its alternative, confirmatory factor analysis, since we have no prior knowledge of the possible relations. Thus, we generate new hypotheses instead of confirming existing ones (Hair et al., 2010). To test whether factor analysis is the right tool, the sampling adequacy should be checked by applying the Kaiser-Meyer-Olkin (KMO) test because KMO tests whether correlations between pairs of variables can or cannot be explained by other variables (Cerny & Kaiser, 1977). This threshold is set at 0.5, which is acceptable. At least 0.7 is preferable. However, below 0.5 means that the data has widespread correlations, which make the data unsuitable for a factor analysis (Hair et al., 2010). The rotation technique that has been used is varimax, since we expect no relation between the variables during the rotation (Field, 2009). The last part of the factor analysis is Bartlett's Test of Sphericity. Here, the assumption that will be tested is about whether one deals with an identity matrix or not, i.e. a problem exists here because of a low correlation between variables. This will be tested using a 0-hypothesis, indicating that the population variances are equal (identity matrix). The alternative hypothesis states that at least one population has a different variance with respect to the others ($\alpha < 0.05$) (Hair et al., 2010). Normally, the choice of extraction between the principal component and common factor should depend on the amount of measurement error expected in the survey. Principal component analysis will be used to stay consistent with Chandler, DeTienne, McKelvie, and Mumford (2011) as well as with Harms and Schiele (2012), who have done research on the concept of effectuation as well.

Cognition scale (REI):

The correlations between the variables of cognition have been looked at. In this stage, it becomes evident how much the variables correlate with each other and whether measurement error plays a part. When looking at the variables it becomes clear that, as expected, the variables indicating causation correlate negatively with the variables that indicate effectuation. Furthermore, Kaiser-Meyer-Olkin (KMO) is a statistic that determines whether the sample is adequate and indicates whether the variables should be reconsidered or whether more respondents are needed. This is the case when the KMO < 0.5 (Field, 2009). In this case the KMO is 0.73 indicating a good and adequate sample size. To ensure for this issue that the data are being organised as an identity matrix, Bartlett's Test of Sphericity has been carried out. Identity matrix means that every individual variable correlates extremely low with all the other variables (Field, 2009) i.e. there is no relation between the items in the scale. The p-value is < 0.001 indicating that we can reject the hypothesis stating that there is an identity matrix (Henseler, 2016).

Furthermore, it has been assumed that in these scales not a lot of measurement error is being expected (Hair et al., 2010) and therefore principal component analysis will be used. Since we deal with two principles (NFC and FI), it is expected that two factors will appear (Eigenvalue >1.0). However, this is not the case. There are 3 factors standing out, all the statements indicate that NFC and FI correlate well with each other, however the 4th statement of NFC ''I prefer complex to simple problems'' stands on its own as expected and the third factor only correlates highly with the 3rd NFC variable: '' I prefer to do something that challenges my reasoning abilities rather than something that requires little thought''. Also after rotating this remains still the case. See the original component matrix below.

FACTOR 1		*FACTOR 2*		*FACTOR 3*	
FI 1	0.395	**NFC 1**	0.801		
FI 2	0.679	**NFC 2**	0.631		
FI 3	0.826	**NFC 3**	0.386	**NFC 3**	0.748
FI 4	0.838	**NFC 4**	-0.165	**NFC 4**	0.680
FI 5	0.842	**NFC 5**	0.740		

Table 3: Factor analysis (after rotation) on FI & NFC

Instead of running a factor analysis based on the eigenvalue of 1.0, I tried to limit the number of factors to 2. Here it became evident again that the 4th statement is conflicting.

Effectuation vs Causation scale:

For effectuation and causation, the KMO is 0.69 thus indicating a good and adequate sample size. The Bartlett's Test of Sphericity is (P-value) < 0.001 as well indicating that there is no identity matrix in this scale. For the correlation, the same problem appears as in the previous scale. The third statement of causation: '' We work systematically in order to achieve long-term goals and do not consider short-term opportunities'' conflicts with his original scale and stands on its own.

FACTOR 1		*FACTOR 2*		*FACTOR 3*	
CAUS 1	0.384	**EFFE** 1	0.845		
CAUS 2	0.697	**EFFE** 2	0.805		
CAUS 3	0.018	**EFFE** 3	0.298	**CAU 3**	0.677
CAUS 4	0.693	**EFFE** 4	0.527		
CAUS 5	0.770	**EFFE** 5	0.546		

Table 4: Factor analysis on causation & effectuation

Running this tool by limiting the number of factors to two, increases the loading (Caus. 3: 0.190 → 0.291), but in the meantime lowers the power of some of the variables in both factors. Therefore, it will not be changed.

Monte Carlo simulation

Based on the theory, it was expected that the factor analysis would only produce four factors in total (NFC & FI and causation & effectuation). However, it became clear that at both times the factor analysis was run, that instead of two factors, three factors popped up. A possible explanation could be the limited number of respondents and the need for control of this matter, which resulted in the use of the Monte Carlo simulation for this research.

This statistical method is used to calculate with probabilistic or stochastic systems i.e. this method stimulates and relies on repeated random sampling to obtain results. Scientists mostly make use of this method when there are a lot of uncertainties expected in their research. For example, when it is expected that a single simulation (based on one sample) does not sufficiently represent the truth or the population. Furthermore, due to the algorithm of Monte Carlo, SPSS is able to stimulate about (or less) than 10,000 'samples' based upon the data that have been used in these tests (Murthy, 2004; Matala, 2008). Besides that, in Monte Carlo one is not fixed to the widely accepted threshold in factor analysis to compute factors that have at least an eigenvalue of 1.0 (Matsunaga, 2010). In Monte Carlo, these eigenvalues are based on raw data eigenvalues and percentile (based on confidence level) random data eigenvalues.

Unfortunately, this tool is no longer provided by SPSS and therefore has been used by making use of specific codes which have been entered and conducted via Syntax. O'Connor (2000) provided these codes and therefore it was possible to carry this method out.

As in the factor analysis, all the NFC and FI statements have been taken together totalling a number of 10 statements. Based on 1000 samples and 95% confidence, the Monte Carlo simulation indicated two factors (the raw data EV that are higher than the random data EV are the factors). The same shows for the causation and effectuation statements. Under the same conditions, Monte Carlo indicated two factors as well. This meets the theory of both Epstein et al. (1996) and Alsos et al. (2014). An overview of the values:

NFC & FI		Causation & Effectuation	
Raw Data EV	Random Data EV	Raw Data EV	Random Data EV
2,235217	1,787377 (1)	3,074706	1,787377 (1)
1,890136	1,533691 (2)	1,7701188	1,533691 (2)
1,280536	1,356080	1,245155	1,356080
1,112512	1,220916	0,865754	1,220916

Table 5: Monte Carlo Simulation NFC & FI and Causation & Effectuation

3.3.3. Normal distribution

Multiple methods have been used to test whether data are *approximately* normally distributed. This means that the, the testable variables are approximately symmetrically bell-shaped curved. It is highly essential that the dependent variables are being assessed, since the independent variables are not based on possible relations in this research. To exemplify, the choice of effectual/ causal decision-making can be influenced by the gender. However, the gender cannot be influenced by effectual or causal decision making. An overview of the concepts and their distribution is shown below. The appendix provides more elaboration on the plots, Shapiro & Wilk, and the kurtosis of the concepts is given.

Dependent variables	Outcome
Need for cognition (NFC)	Normal distribution
Faith in Intuition (FI)	Non-normal distribution (due to skewness)
Causation	Normal distribution
Effectuation	Normal distribution
Gelfand Tightness- Looseness	Normal distribution

Table 6: Distribution of variables

To ensure that all variables are treated equally, this research will be continued by treating the data as approximately normally-distributed. Looking at the graphs, which give a good indication, all the variables are bell-shaped, the dots are in the normal Q-Q plots along the line, and the outcomes (based on Shapiro & Wilk, kurtosis, and significance level) apart from the variable Faith in Intuition, were approximately normally distributed.

3.4. Control variables

Test variables could always be influenced by other variables than the independent ones. These should be controlled to ensure that the results are not being influenced by them. The control variables in our case are: (1) gender. Bardasi, Sabarwal and Terrel (2011) have found significant results that gender can influence the entrepreneurial decision-making process. (2) Age and (3) previous working experience as well as (4) entrepreneurial experience could have an influence. Shepherd, Zacharakis and Baron (2003) show that experience influences the decision-making, although not entirely positive in some cases, but still has an effect. The last control variable is about a distinction between the study of the entrepreneurs. Entrepreneurs, who graduated from a (5) STEM-discipline (technology, engineering, and mathematics-related studies) and who did not graduate from a STEM-discipline could influence the results as well. Berry (1996) states that the mindset of these type of entrepreneurs is different and that they pay more attention to the technical aspects of their business ideas. He, therefore, argues that STEM entrepreneurs make sense of their business opportunity in another way than non-STEM entrepreneurs. Based upon the overview of STEM-studies provided by ICE (2012) the studies have been either categorised as 1: STEM, 2: non-STEM or 3: Both. Both mean that the entrepreneur both had a background in a STEM and non-STEM studies. All these variables say something about the entrepreneur and these could be the basis of them making certain entrepreneurial decisions and should therefore be controlled.

4. Results

4.1. Descriptive statistics

The testable sample consists of (n=) 78 Turkish higher educated start-up entrepreneurs. All the respondents have only one nationality, which is the Turkish one (n=78). The variable gender has been looked at in this sample. It appeared that N=71 males (91%) and N=7 females (9%) have filled in the survey. This distinction was expected since Turkey had approximately 7.5% of women at the top in 2012, although this percentage is growing it still will not be equally divided (Ökten, 2015). The age of the entrepreneurs ranges from (min) 24 to (max) 54 with an average ($\bar{x}$) of 33 years old ($\sigma = 6.149$). The entrepreneurs have entrepreneurial experience of 4.4 years on average ($\bar{x}$) ($\sigma = 3.541$). This ranges from only 8 months experience to 20 years of entrepreneurial experience (excluding one case since he gave the same figure for his age than for his entrepreneurial experience =38, thus in this case n=80). Most entrepreneurs are active in the ICT-industry (n=35), followed by the manufacturing (n=10). 66 of the respondents only operate in Turkey with their company and 12 operate outside Turkey as well. 4 respondents did not fill in in which specific country they were operating outside Turkey. The most frequently mentioned country abroad is the USA (n=6). All 78 were the founders of the companies, however 2 are not the owner at this moment anymore.

Looking at the spread of the type of studies followed by the entrepreneurs, it appears that 59 (75.6%) entrepreneurs have finished a STEM study. 12 (15.4%) followed a non-STEM study, 4 (5.1%) have studied both a STEM and non-STEM study and 3 (3.8%) did not fill in their type of study. 52 (66.7%) followed courses related to entrepreneurship and 26 (33.3%) did not. Fewer entrepreneurs ever followed courses related to Business Administration/ Management, only 40 (51.3%) and 38 did not (48.7%). 29 entrepreneurs (37.2%) know the term effectuation or have heard about it. 49 (62.8%) entrepreneurs did not and this could be due to the fact that these terms were introduced in 2001 and that there are universities where this is not covered (Sarasvathy, 2001).

The NFC-statements have a mean ($\bar{x}$) of 3.70 ($\sigma = 0.636$) and the FI-statements have a mean ($\bar{x}$) of 3.52 ($\sigma = 0.651$). Here, the differences are minute. Further elaboration is therefore needed. The second measured scale is about causation and effectuation. The mean ($\bar{x}$) of the causation-measuring statements is 3.86 ($\sigma = 0.564$) and the mean ($\bar{x}$) of the effectuation-measuring statements is 2.80 ($\sigma = 0.746$). In this scale, the difference is much clearer. It shows that causation is preferred among this sample.

4.2. Correlation

Since we continue by treating the variables as normally distributed, the tool that will be used to test the correlations between the variables is Pearson correlation. Only the significant results below p < .05 will be treated. These values are marked yellow.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Gender									
2. Age	.032								
3. STEM discipline	**.304***	-.106							
4. Entre. experience	-.106	**.247**	-.041						
5. Working experience	.030	**.816****	-.040	-.003					
6. Need for Cognition	-.051	.143	-.051	.121	-.024				
7. Faith in Intuition	-.046	.093	.041	-.015	.148	*-.189**			
8. Causation	-.055	*-.203**	.150	**-.241**	-.102	-.058	-.023		
9. Effectuation	**-.234**	.129	-.055	.179	.158	-.062	*.199**	**-.238**	
10. Culture	*.214**	.145	**.229**	-.163	.168	.129	.028	.153	**-.283**

*p < .10, **p<.05, ***p<.01, ****p<0.001

Table 7: Pearson correlation

There are a few relationships between the variables. Gender is highly positively correlated to STEM-discipline studies (r = 0.304, p = 0.008). The next correlating variable with gender is effectuation; effectuation is negatively correlated with the gender (r = -0.234, p = 0.039). It is no surprise that age and working experience are highly positively correlated (r = 0.816, p < 0.001). The older the respondent is, the more working experience the person has. The same goes for entrepreneurial experience (r = 0.247, p = 0.03). The STEM-discipline is correlated with cultural tightness (r = 0.229, p = 0.048). It is expected that the tighter the country is the more students tend to choose a STEM-related study for example students from India mostly take up engineering degrees (Pushkar, 2013). Chen (2009) has found evidence that more Asian students are entering STEM fields compared to US students. In general, Asian countries are perceived as tight (Gelfand et al., 2011). Therefore, this outcome is not surprising. Furthermore, causation is negatively correlated with entrepreneurial experience (r = -0.241, p = 0.035). It could be expected that the more experienced entrepreneurs prefer making fewer decisions based upon causal logic. This is in line with the findings of Sarasvathy et al. (2007) who say that 89% of the interviewed expert entrepreneurs prefer effectuation over causation, on the condition that the concepts of effectuation and causation are seen as opposites as suggested by Brettel et al. (2002). This theory applies to the next finding as well. Causation and effectuation are negatively related with each other (r = -0.238, p = 0.036).

The last (negative) relation exists between culture and effectuation (r= -0.283, p = 0.023). This is in line with the hypothesis as well. It is expected that people from a tight culture are more preventive in working and that they make well-considered choices (Gelfand et al., 2011; Chua et al., 2015).

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An additional analysis in this section is determining whether there is a ''huge'' difference between Pearson correlation and Spearman correlation. Pearson is used when the data are assumed to be normally distributed (parametric) and Spearman when the data are not normally distributed (Field, 2009). As explained in the previous section, the data are assumed as normally distributed and therefore the differences between Pearson and Spearman should be similar (Bishara & Hittner, 2012). There are only two differences in significance ($p < .05$). The first is the correlation between Age and Entrepreneurial Experience. In the Pearson correlation, it is significant ($r= 0.247, p = 0.03$) and in the Spearman, it is not significant ($r= 0.187, p = 0.103$). The second is the correlation between Causation and Entrepreneurial Experience. In the Pearson correlation, it is significant $r = (-0.241, p = 0.035)$ and in the Spearman, it is not ($r= -0.158, p = 0.169$). Some other correlations between variables became weaker and some stronger, but there are no further major influences on the significance levels.

	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Gender									
2. Age	.032								
3. STEM discipline	.325***	-.088							
4. Entre. experience	-.096	.187	-.066						
5. Working experience	.012	.836****	-.019	-.058					
6. Need for Cognition	-.057	.031	-.083	.208*	-.132				
7. Faith in Intuition	-.043	.068	.137	-.029	.113	-.158			
8. Causation	-.068	-.160	.117	-.158	-.107	-.011	.070		
9. Effectuation	-.233**	.135	-.086	.207*	.139	-.066	.149	-.255**	
10. Culture	.177	.094	.285**	-.217*	.113	.087	.120	.217*	-.292***

*p < .10, **p<.05, ***p<.01, ****p<0.001

Table 8: Spearman correlation

4.3. Tightness/Looseness score

Finally, the entrepreneurs' perceptions of tightness/looseness have been compared to the scores Gelfand and colleagues have given for that specific country. However, Gelfand et al. (2011) make use of standardised scores and since answers on their questionnaire should be given based on a 6-point Likert scale, some modification is needed. The average scores should be calculated and standardised to compare the findings of Gelfand with the scores of the entrepreneurs (Eun, Wang, and Xiao, 2015).

For Turkey, the mean ($\bar{x}$) based upon the six-point-Likert scale is 3.69 ($\sigma = 0.744$) indicating that the country tends to be perceived tight. It appeared, after discussion with experts on the field of methodology, that with the information revealed it is impossible to get to the final index scores as computed by Gelfand et al. (2011). All the outcomes of the survey have been translated to a within-subject standardised score and have been multiplied by 10 as suggested by Eun et al. (2015). However, the indexed tightness score was not in line with the scores proposed by Gelfand et al. (2011). Therefore, the mean ($\bar{x}$) as calculated before will be used as base for further research. This is in line with the methodology of Rauch et al. (2013) who made use of the mean values to operationalise cultural practises as perceived by business owners.

As previously suggested the 4th statement: *''People in this country have a great deal of freedom in deciding how they want to behave in most situations''* is reversed coded. Since we do not stick to Gelfand et al. (2011), the mean of this score (without reversing) should be compared and checked whether it differs notably. With reversing the scores were $\bar{x} = 3.69$ ($\sigma = 0.744$) and without reversing the scores are $\bar{x} = 3.29$ ($\sigma = 0.926$). Both scores still indicate that the country tends to be perceived tight and that the differences are minimal, therefore the original outcome (with reversing the 4th item) according to Gelfand et al. (2011) will be used.

4.4. Hypotheses

In this section, the prepared hypotheses will be tested.

H_1: Entrepreneurs with an intuitive-experiential thinking style have a propensity to prefer effectual over causal decision-making.

Assumption Checks for the Multiple Regression analysis

The model has been checked for the assumptions, which should be matched to carry out a multiple regression. All the following assumptions have been tested: residuals are normally distributed and independent from the prediction, homoscedasticity among the error term, and there is no multicollinearity between the variables (recommended VIF is below 5 as suggested by Rogerson, (2001) or even below 4 as suggested by Pan & Jackson (2008)).

Test

The Pearson correlation shows that Faith in Intuition is significantly positively related to effectuation only marginally, r = 0.199, p= 0.081. The table below shows the results of the multiple regression analysis.

Hierarchical Ordinary Least Squares Regression Models Estimating Effect of FI on Effectuation (n = 78)

Variables	Model 1		Model 2	
	B	SE	B	SE
Intercept	3.133	(0.760)	2.247	(0.904)
Control variables				
Gender	-0.392	(0.327)	-0.337	(0.324)
Age	-0.010	(0.026)	-0.08	(0.026)
STEM	0.003	(0.162)	-0.012	(0.160)
Entrepreneurial experience	0.032	(0.026)	0.033	(0.026)
Work experience	0.039	(0.030)	0.033	(0.030)
Main effects				
Faith in Intuition			0.239*	(0.136)
F	1.404		1.718	
Adjusted R^2	0.028		0.058	
Change in Adjusted R^2			0.030	

*p < .10, **p<.05, ***p<.01, ****p<0.001

Table 9: OLS Regression effect of FI on Effectuation

H1 is partly confirmed. There is a marginally significant positive relation between Faith in Intuition (intuitive-experiential) and Effectuation, B = 0.239, p=0.085 (P< α =0.05)

H_2: Entrepreneurs with an analytical-rational thinking style have a propensity to prefer causal over effectual decision-making.

Assumption Checks for the Multiple Regression analysis

The model has been checked for the assumptions, which should be matched to carry out a multiple regression. All the following assumptions have been tested: residuals are normally distributed and independent on the prediction, homoscedasticity among the error term, and there is no multicollinearity between the variables (recommended VIF is below 5 as suggested by Rogerson, (2001) or even below 4 as suggested by Pan & Jackson (2008)).

Test

The Pearson correlation shows that Need for Cognition is not significantly negatively related to causation, r = -0.058, p= 0.615. The table below shows the results of the multiple regression analysis.

Hierarchical Ordinary Least Squares Regression Models Estimating Effect of NFC on Causation (n = 78)

Variables	Model 1		Model 2	
	B	SE	B	SE
Intercept	4.507	(0.585)	4.583	(0.644)
Control variables				
Gender	-0.251	(0.252)	-0.251	(0.254)
Age	-0.014	(0.020)	-0.013	(0.021)
STEM	0.160	(0.125)	0.159	(0.126)
Entrepreneurial experience	-0.033	(0.020)	-0.033	(0.021)
Work experience	0.005	(0.023)	0.004	(0.024)
Main effects				
Need for Cognition			-0.031	(0.108)
F	1.575		1.308	
Adjusted R^2	0.039		0.026	
Change in Adjusted R^2			-0.013	

*p < .10, **p<.05, ***p<.01, ****p<0.001

Table 10: OLS Regression effect of NFC on Causation

H2 was not supported. There is no significant relation between Need for Cognition (analytical - rational) and Causation, B = -0.031, p=0.771 (P< α =0.05)

H3: Entrepreneurs from Turkey have the propensity to perceive their culture as tight.

Since it is not possible to conduct index scores as done by Gelfand et al. (2011), a selection of the one-sample T-test was used to answer this hypothesis. As the descriptive statistics have already described, the minimum score could be 1 and the maximum score could be 6 (due to 6-point Likert scale). The mean ($\bar{x}$) of the answers on the statements is 3.67 ($\sigma = 0.740$) indicating that the country is perceived as rather tight than loose.

Comparing the outcomes of this test with the outcomes of Gelfand is like comparing apples and oranges. We have no start value, only the value Gelfand has attributed to Turkey, which is not applicable since the methodology is unknown. It is therefore difficult to make a comparison and state something about significance though we can accept this hypothesis since the results ($\bar{x}$=3.67) show that the respondents experience the country as rather tight than loose.

One Sample T-Test

Variable	mean	s.d.
Gelfand Culture	3.7****	0.74

*p < .10, **p<.05, ***p<.01, ****p<0.001

Table 11: OLS Regression effect of FI on Effectuation

H3 is confirmed. The culture's tightness/looseness ($\bar{x}$ =3.67) p < 0.001 (P< α =0.05).

H4: Entrepreneurs from a tight culture have a propensity to prefer causal- over effectual decision making.

Assumption Checks for the Multiple Regression analysis

The model has been checked for the assumptions, which should be matched to carry out a multiple regression. All the following assumptions have been tested: residuals are normally distributed and independent from the prediction, homoscedasticity among the error term, and there is no multicollinearity between the variables (recommended VIF is below 5 as suggested by Rogerson, (2001) or even below 4 as suggested by Pan & Jackson (2008)).

Test

The Pearson correlation shows that a tight culture is not significantly positively related to a tight culture, r = 0.153, p= 0.182. The table below shows the results of the multiple regression analysis.

Hierarchical Ordinary Least Squares Regression Models Estimating Effect of Culture on Causation (n = 78)

	Model 1		Model 2	
Variables	**B**	**SE**	**B**	**SE**
Intercept	4.507	(0.585)	4.203	(0.638)
Control variables				
Gender	-0.251	(0.252)	-0.300	(0.255)
Age	-0.014	(0.020)	-0.016	(0.020)
STEM	0.160	(0.125)	0.133	(0.127)
Entrepreneurial experience	-0.033	(0.020)	-0.030	(0.021)
Work experience	0.005	(0.023)	0.004	(0.023)
Main effects				
Gelfand			0.115	(0.098)
F	1.575		1.552	
Adjusted R^2	0.039		0.045	
Change in Adjusted R^2			0.004	

Table 12: OLS Regression effect of culture on Causation

H4 was not supported. There is no significant relation between a tight culture (x̄ =3.67) and Causation, B = 0.115, p=0.243 (P< α =0.05). However, surprisingly there is a marginally negatively significant relation between a tight culture (x̄ =3.67) and Effectuation: B= -.242, p = .057 (P< α =0.05).

*H*5*:* Entrepreneurs from a tight culture have a propensity to process information based on intuition.

Assumption Checks for the Multiple Regression analysis

The model has been checked for the assumptions, which should be matched to carry out a multiple regression. All the following assumptions have been tested: residuals are normally distributed and independent from the prediction, homoscedasticity among the error term, and there is no multicollinearity between the variables (recommended VIF is below 5 as suggested by Rogerson, (2001) or even below 4 as suggested by Pan & Jackson (2008)).

Test

The Pearson correlation shows that a tight culture is not significant positive related to intuition, r = 0.028, p= 0.807. The table below shows the results of the multiple regression analysis. In this case, the control variable age is taken into account since the older a person is the more (s)he will be aware of the home culture. The only control variables in this case are gender and age. The older people get, the more familiar they will be with their culture (Seginer & Halabi-Kheir, 1998) and for a woman or a man culture can be experienced differently (Bagozzi, Wong & Youjae Yi, 1999).

Hierarchical Ordinary Least Squares Regression Models Estimating Effect of Culture on Faith in Intuition (n = 78)

Variables	Model 1 B	Model 1 SE	Model 2 B	Model 2 SE
Intercept	3.312	(0.492)	3.253	(0.562)
Control variables				
Gender	-0.111	(0.260)	-0.123	(0.268)
Age	0.010	(0.012)	0.10	(0.012)
Main effects				
Gelfand			0.023	(0.105)
F	0.416		0.291	
Adjusted R^2	-0.015		-0.028	
Change in Adjusted R^2			-0.013	

Table 13: OLS Regression effect of culture on FI

H5 was not supported. There is no significant relation between a tight culture (x̄ =3.67) and Faith in Intuition (intuitive-experiential), B = 0.023, p=0.824 (P< α =0.05).

H6: The relationship between cognition and entrepreneurial decision-making is affected by the culture.

Hierarchical Ordinary Least Squares Regression Models Estimating (Interaction) Effect of Culture and FI on Effectuation (n = 78)

Variables	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Intercept	3.133	0.760	2.824	(0.743)	2.825	(0.748)
Control variables						
Gender	-0.392	(0.327)	-0.229	(0.321)	-0.240	(0.325)
Age	-0.010	(0.026)	-0.005	(0.025)	-0.006	(0.026)
STEM	0.003	(0.162)	0.046	(0.159)	0.057	(0.164)
Entrepreneurial experience	0.032	(0.026)	0.025	(0.026)	0.026	(0.026)
Work experience	0.039	(0.030)	0.036	(0.029)	0.039	(0.030)
Main effects						
Faith in Intuition			0.161*	(0.087)	0.164	(0.088)
Gelfand			-0.185**	(0.091)	-0.016	(0.560)
Two-way interaction						
Faith in Intuition x Gelfand					-0.048	(0.157)
F	1.404		2.132		1.851	
Adjusted R^2	0.028		0.102		0.089	
Change in Adjusted R^2			0.074		-0.013	

*p < .10, **p<.05, ***p<.01, ****p<0.001

Table 14: OLS Regression effect of culture and FI on Effectuation

Assumption Checks for the Multiple Regression analysis

The model has been checked for the assumptions, which should be matched to carry out a multiple regression. All the following assumptions have been tested: residuals are normally distributed and independent from the prediction, homoscedasticity among the error term, and there is no multicollinearity between the variables (recommended VIF is below 5 as suggested by Rogerson, (2001) or even below 4 as suggested by Pan & Jackson (2008)). Only between the Z-Score of the culture and interaction in the third model, which was expected.

Test

This model with these variables does not indicate a significant interaction between Faith in Intuition (intuitive-experiential) and Gelfand's tightness (cultural) score, B = -0.048, p = 0.760. According to this test, we have to reject H6. However, it depends on table 15 whether we can fully reject this hypothesis.

Hierarchical Ordinary Least Squares Regression Models Estimating (Interaction) Effect of Culture and NFC on Causation (n = 78)

Variables	Model 1		Model 2		Model 3	
	B	SE	B	SE	B	SE
Intercept	4.507	0.585	4.569	(0.609)	4.525	(0.592)
Control variables						
Gender	-0.251	(0.252)	-0.303	(0.256)	-0.328	(0.249)
Age	-0.014	(0.020)	-0.013	(0.021)	-0.008	(0.021)
STEM	0.160	(0.125)	0.130	(0.128)	0.083	(0.126)
Entrepreneurial experience	-0.033	(0.020)	-0.029	(0.021)	-0.030	(0.020)
Work experience	0.005	(0.023)	0.001	(0.024)	0.001	(0.023)
Main effects						
Need for Cognition			-0.033	(0.069)	-0.047	(0.067)
Gelfand			0.091	(0.074)	0.134*	(0.075)
Two-way interaction						
Need for Cogn. x Gelfand					-0.151**	(0.069)
F	1.575		1.347		1.848	
Adjusted R^2	0.039		0.034		0.088	
Change in Adjusted R^2			-0.005		0.054	

*p < .10, **p<.05, ***p<.01, ****p<0.001

Table 15: OLS Regression effect of culture and NFC on Causation

Assumption Checks for the Multiple Regression analysis

The model has been checked for the assumptions, which should be matched to carry out a multiple regression. All the following assumptions have been tested: residuals are normally distributed and independent from the prediction, homoscedasticity among the error term, and there is no multicollinearity between the variables (recommended VIF is below 5 as suggested by Rogerson, (2001) or even below 4 as suggested by Pan & Jackson (2008)).

Test

There was a significant interaction between Need for Cognition (analytical-rational) and Gelfand's tightness (cultural) score, B = -0.151, p = 0.032. This means that an increase in the respondent's preference for an analytical-rational information-processing system will decrease the choice for causal decision-making, and this relation will be even stronger when one lives in a tighter culture in contrast to a looser culture. Therefore, we do not reject H6 based on this test.

5. Discussion

The findings of this study are quite surprising. Since relatively little research has been done on the relation between entrepreneurial information processing and decision-making in the context of culture based on the theory of Gelfand et al. (2011), there are some insights which need further elaboration. These concepts have been operationalised by the scales of Alsos et al. (2014), Gelfand et al. (2011), and Epstein et al. (1996). These relations have been partly assessed by fellow- students from the University of Twente, who cooperated on the concept of effectuation. Some students only assessed the relation between entrepreneurial decision-making and cognition, where others assessed the relation between entrepreneurial decision-making and cultural influences. In general, they have been using other scales to assess these variables. This research has been carried out among Turkish start-up (0-5 years) entrepreneurs and evidence was found to support (some partially) three out of six hypotheses.

Although results showed that the intuitive-experiential- and the analytical-rational system both are used to process information, this does not always significantly influence the choice of making decision based on a causal or effectual logic. The theory states that entrepreneurs who think that the future is somewhat predictable (a causal logic) tend to do systematic analytical research to gather information so as to find the right product (Sarasvathy et al., 2007). However, there was no significant evidence to support this statement. In other words, the entrepreneurs who make well-considered and deeply analysed decisions do not per se prefer causation over effectuation. Entrepreneurs who do the opposite, thus making use of their experience and intuition, are expected to prefer an effectual decision-making because they are expected to combine the available means to get an effect (Blume & Covin, 2011; Sarasvathy, 2001). For this hypothesis, we found evidence and we (marginally) replicate the theory indicating that entrepreneurs, who make choices based on their intuitive-experiential system prefer effectuation. A side note is that it should be taken into account that there are only a few women in this survey.

The relation between effectuation/causation and the degree of tightness and looseness is stated in some hypothesis. Six statements operationalise the degree of tightness i.e. the presence of social norms and the denial of an individual's deviant behaviour. The higher the scores on the statements, the tighter the country. According to Gelfand et al. (2011) Turkish culture has been considered as tight, since the score is 9.2. This has been confirmed by one of the co-authors of this article. Unfortunately, due to limited information, it was not possible to calculate the index score and therefore the mean as suggested by Rauch et al. (2013) has been used. With an average score of 3.69 out of 6, the third hypothesis, proposing that Turkish entrepreneurs have the propensity to perceive their culture as tight, can be confirmed.

As theory suggests, people from tighter cultures are more preventive and have a higher need for structure to avoid making mistakes (Gelfand et al., 2011). It was therefore expected that the entrepreneurs from Turkey have a propensity for a planned-based approach (causation). The results were somewhat surprising. There was no significant relation found between a tight culture and causation. However, it was obvious that the tighter the culture becomes, the more the entrepreneurs stand away from effectuation. Therefore, the fourth hypothesis should be rejected, though with some reservation. It might be accepted, when considering effectuation and causation as opposites, that when an individual goes further away from effectuation (s)he gets closer to effectuation as proposed by Brettel et al (2002). However, Perry et al. (2012) as well as Sarasvathy (2001) do not treat effectuation and causation as opposites, but state that entrepreneurs can use both depending on the situation.

Norenzayan et al. (2002) suggest that an analytic mode of processing information is predominant in Western cultural countries and that intuitive mode of thought predominates in East Asian, indicating that the Western countries are loose compared to the East Asian countries which are perceived as tight (Gelfand et al., 2011). The theory suggested that individuals from tighter countries therefore are expected to rely more on intuitive reasoning than an analytical one. However, during the test it became clear that there is no significant relation between both phenomena. Thus, this hypothesis has been rejected. It is important to again address the fact that the Turkish entrepreneurs tend to perceive their culture as tight and in proportion to the East Asian countries, it is less tight.

Lastly, the overall model has been tested. According to Michell et al. (2002) the culture has an influence on the way of processing information and decision-making. The results show that culture functions as an interactor. The more an individual makes use of the analytical-rational decision-making system, the less (s)he will make use of causation and this relation is even stronger when one perceives culture as tighter. This agrees with Hayton et al. (2002), who place cultural values and cognition as possible amplifiers in the relation between institutional context and entrepreneurship, including decision making process. It is therefore expected that culture plays a part in this relation. However, when testing the other part of the independent variable, effectuation, there is no significant effect. Therefore, this statement is partially accepted.

(Management) Implications

The outcome of this study is especially interesting for Angel investors. Every entrepreneur has his/her own reason to start a company and some are successful others are not. Understanding the entrepreneurs' way of thinking and their decision-making process could provide investors more clarity why start-up entrepreneurs choose to chase a specific product or deviate from their original idea. Angel Investors are normally very tough in funding start-up entrepreneurs if they have not a solid business plan to show which product they sell and how much revenue they expect to generate (Mason & Stark, 2004). Therefore, it is very difficult for effectuative decision-makers to get funds. This study also shows that there are many entrepreneurs that make use of effectuation and they should not be excluded. The same goes for educational purposes as well, since this topic also needs more attention. Almost every study related to business administration teaches how to approach a market based on theory, which is described by Sarasvathy as causation (Honig, 2004). Previous research and this area has shown that this way of decision-making is not the leading way among expert entrepreneurs and therefore the other entrepreneurial decision-making process (effectuation) should be nominated more often to give a clear picture on how entrepreneurship works starting from different views (Sarasvathy et al., 2007).

Furthermore, the relation between entrepreneurial decision-making and cognition has been tested. This is interesting for social studies and for business psychologists who now could get a more comprehensive knowledge of the link between ways of thinking and certain entrepreneurial decisions. This research provides evidence that entrepreneurs who make decision based on their experience and intuition have a propensity to prefer effectuation as suggested by Blume and Covin (2011). On the other hand, entrepreneurs who make decisions based upon analytical research do not per se tend to use causation. It does not seem that these relations exist as proposed by Sarasvathy et al. (2007). However, this relation does exist though in a negative form, when culture is added as a moderator. In a tighter culture, people who make use of analytical research, stand more away from causation. The possibility exists that entrepreneurs who make use of effectuation can also base their decisions on analytical research. This relation may be tested in the future.

For scientists who would like to do a research in the Turkish context (among others based on the paper by Gelfand et al. (2011), this paper offers more elaboration on how the Turkish culture should be perceived and addressed. Owing to the efforts by Gelfand et al. (2011) Turkey is currently considered as a tight culture, since it scored high on the scale (9.2). In reality, it has a tendency to be tight but it is not that tight as has been suggested. Therefore, in any future studies on the culture the level of tightness should be reinvestigated. In this research, it has not been proved that entrepreneurs from this country prefer a more causal decision-making approach. Again, that could be devoted to the fact that Turkey is not perceived as that tight as suggested in existing literature. In the meantime, this research does show that the tighter an entrepreneur perceives his/her culture, the further (s)he stands away from effectuation. Thus, Gelfand's theory can be confirmed stating that the tighter a society is, the more a planned-based approach an individual will use. Sticking to the theory of Brettel et al. (2012) that effectuation and causation are polar opposites. When an individual deviates from one of the two decision-making processes, (s)he automatically gets closer to the other one.

Limitations and Future research

As in every research, this research also has its deficiencies. The first limitation is that the Cronbach alpha levels are in general not very high (as in the original articles), but are acceptable. This could have several reasons. One could be the interpretation or translation. In the future, these statements could be independently translated by several native speakers of both English and Turkish. In this research, one person translated the questions and the other double checked it. Another solution could be that another native speaker tries to translate the questions back to English and look whether the statements remain the same as in the paper. Another reason for low alphas can be allocated to the small scales. Only 5 statements to operationalise a concept is very small and it could therefore be the case that the alpha is low (Field, 2009). For the next study, the original scales which are stated in the paper could be used since they exist of more statements. This scale was tested in Norway, but it appeared to be not highly correlated (Alsos et al., 2014). However, that could be due to the setting and the outcome could be different in Turkey. Furthermore, it cannot be due to outliers i.e. respondents who filled in the questionnaire without any attention, since the Mahalanobis test has been carried out.

Unfortunately, the division between the level of education could not be clearly surveyed. In this research, the only distinction has been made between the intermediate vocational education (or high school), university and others. No distinction has been made between the levels of university: A bachelor from a university of applied sciences, master from a university of applied sciences, bachelor from a research university (BSc.), Master from a research University (MSc.) or a PhD. Therefore, mutual differences could not be tested. However, the distinction between higher and lower education was clear and therefore enough for the hypotheses stated for this research.

In possible further studies, the successfulness of both ways of entrepreneurial decision-making may be tested. At an early stage of this paper, this variable was included. This kind of information however is sensitive and therefore difficult to acquire but it may be obtained and tested in the future in cooperation with and on behalf of potentially interested investors. At this particular point, it has been difficult to find respondents and it would have been even tougher to get respondents if information such as the increase in number of employees and increase in turnover/profit had been requested.

In this study, the division between male and female entrepreneurs was skewed. 91% (71) of the respondents were male and only 9% (7) were female. Therefore, it was in this study impossible to draw general conclusions about the entrepreneurs, since the sample of the females was too small. For a further study, it might be interesting to look at the differences between the decision-making of both males and females.

In addition, this research has focussed only on the cultural influence as a moderator on the relation between cognition and the entrepreneurial decision-making process. Besides these independent variables there could be more concepts that predict entrepreneurial decision-making.

Conclusion

The reason for conducting this research is to get an understanding of whether cultural tightness-looseness has a moderating influence on cognition and entrepreneurial decision-making. Cultural tightness-looseness is measured by means of the Gelfand-scale (Gelfand et al., 2011). The REI-scale of Epstein et al. (1996) has measured cognition on a scale of several statements. The statements in this scale indicate whether an individual processes information based on expertise and intuition or on an analytical and rational basis. Furthermore, entrepreneurial decision-making is measured by making use a scale for effectuation and causation that was developed by Alsos et al. (2014). They revised the effectuation and causation scales of various other scholars and improved its shortcomings. The moderating influence of cultural tightness on the relation between cognition and the entrepreneurial decision-making process is applied as the 6th hypothesis in order to answer the central research question:

'' To what extent do entrepreneurs have a tendency for effectual(reasoning) over/vs causal (reasoning) and does culture have an interacting effect?''

Evidence has been found that entrepreneurs who are influenced by a tight culture and process information based on the analytical and rational system, use a less causal logic in their decision-making process. Furthermore, no significant evidence has been found for entrepreneurs who are influenced by a tight culture and who process information based on the intuitive and experiential system, that they rely on an effectual logic in their decision-making process. The first finding indicates that culture acts as a moderator between information processing and decision-making. However, in the other finding this is refuted. Testing the hypotheses independently, it appears that effectuative decision-making is positively correlated with intuitive-experiential information processing and this relation vanishes as soon as culture is taken into account. This contrasts with causal decision-making which is not significantly correlated with rational-analytical information processing. This relation becomes significant when culture is being added as a moderator.

Therefore, the outcome of this research is in line with the papers by Mitchell et al. (2002) and Hayton et al. (2002), which indicate that the cultural context plays a significant role in the way how individuals process information and make entrepreneurial decisions.

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Appendix

In this section, an impression of the tools used will be given. An impression in this case means that from every analysis a small section will be shown.

Reliability analysis

An impression on how the reliability analysis is conducted is shown below. This example consists of the Cronbach's Alpha of ''Faith in Intuition''.

Reliability Statistics

Cronbach's Alpha	N of Items
,782	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I trust my initial feelings about people.	14,47	7,785	,315	,145	,830
I believe in trusting my hunches.	13,62	8,292	,468	,290	,770
My initial impressions of people are almost always right.	14,17	6,738	,697	,525	,695
When it comes to trusting people, I can usually rely on my ''gut feelings''.	14,09	6,187	,713	,527	,683
I can usually feel when a person is right or wrong even if I can't explain how.	14,12	6,779	,667	,512	,704

Factor analysis

An impression on how the factor analysis is conducted is shown below. This example consists of the factor analysis of ''Need for Cognition'' and ''Faith in Intuition''.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,726
Bartlett's Test of Sphericity	Approx. Chi-Square	194,774
	df	45
	Sig.	,000

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3,228	32,283	32,283	3,228	32,283	32,283	2,806	28,063	28,063
2	1,545	15,448	47,731	1,545	15,448	47,731	1,833	18,327	46,390
3	1,167	11,669	59,400	1,167	11,669	59,400	1,301	13,011	59,400
4	,943	9,431	68,831						
5	,906	9,061	77,892						
6	,630	6,295	84,187						
7	,527	5,268	89,456						
8	,429	4,287	93,743						
9	,332	3,317	97,060						
10	,294	2,940	100,000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

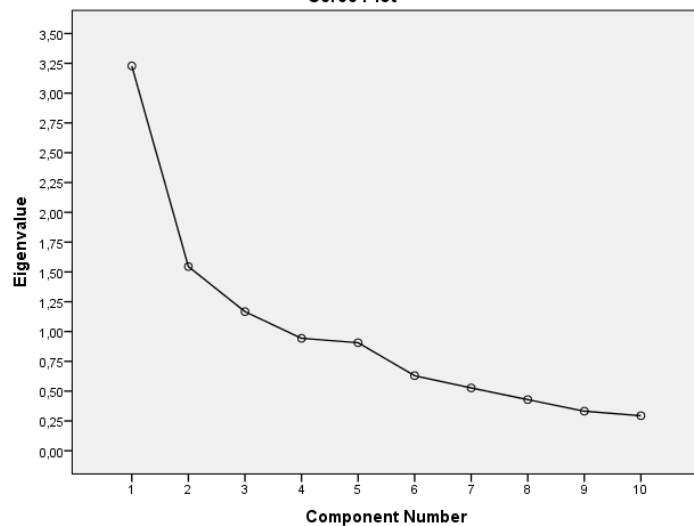|	Component		
	1	2	3
NFC_1_Recoded	-,121	,801	,093
NFC_2_Recoded	-,059	,631	-,379
I prefer to do something that challenges my thinking abilities rather than something that requires little thought.	-,099	,386	,748
I prefer complex to simple problems.	,181	-,165	,680
NFC_5_Recoded	-,185	,740	,083
I trust my initial feelings about people.	,395	-,126	,290
I believe in trusting my hunches.	,679	-,171	-,052
My initial impressions of people are almost always right.	,826	-,118	,147
When it comes to trusting people, I can usually rely on my ''gut feelings''.	,838	-,064	,105
I can usually feel when a person is right or wrong even if I can't explain how.	,842	-,080	-,026

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Scree Plot

Monte Carlo Stimulation

```
PARALLEL ANALYSIS:

Principal Components & Random Normal Data Generation

Specifications for this Run:
Ncases       78
Nvars        10
Ndatsets   1000
Percent      95

Raw Data Eigenvalues, & Mean & Percentile Random Data Eigenvalues
       Root       Raw Data        Means      Prcntyle
    1,000000      2,235217      1,606930      1,787377
    2,000000      1,890136      1,408297      1,533691
    3,000000      1,280536      1,256374      1,356080
    4,000000      1,112512      1,134404      1,220916
    5,000000       ,939315      1,018341      1,101961
    6,000000       ,790081       ,915185       ,991381
    7,000000       ,593624       ,816271       ,891353
    8,000000       ,481625       ,720503       ,800816
    9,000000       ,383361       ,619258       ,699270
   10,000000       ,293593       ,504436       ,595484

------ END MATRIX -----
```
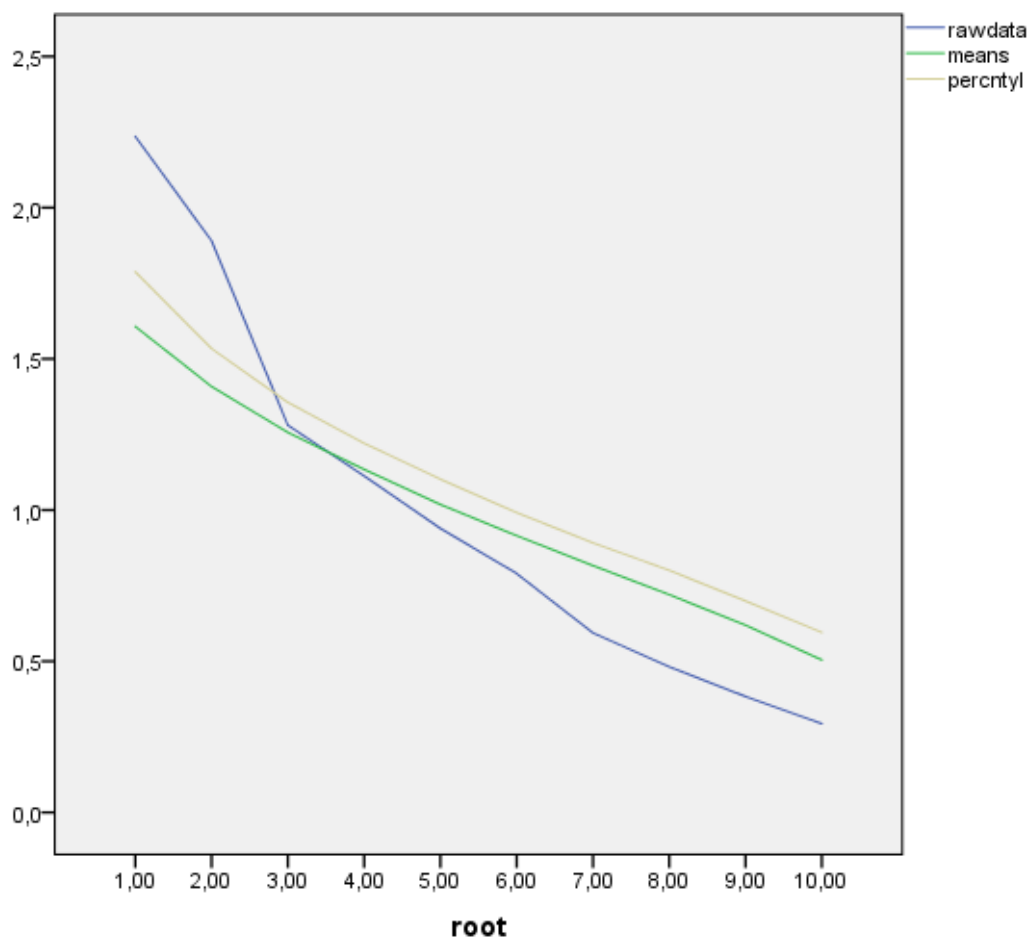

Model Description

Model Name		MOD_9	
Series or Sequence	1	rawdata	
	2	means	
	3	percntyl	
Transformation		None	
Non-Seasonal Differencing			0
Seasonal Differencing			0
Length of Seasonal Period		No periodicity	
Horizontal Axis Labels		root	
Intervention Onsets		None	
For Each Observation		Values not joined	

Applying the model specifications from MOD_9

Normal distribution

An impression on how the normal distribution is conducted is shown below. This example consists the normal distribution of the variable NFC.

Descriptives

			Statistic	Std. Error
NFC_Total	Mean		3,7026	,07196
	95% Confidence Interval for Mean	Lower Bound	3,5593	
		Upper Bound	3,8459	
	5% Trimmed Mean		3,7142	
	Median		3,8000	
	Variance		,404	
	Std. Deviation		,63552	
	Minimum		1,80	
	Maximum		5,00	
	Range		3,20	
	Interquartile Range		,60	
	Skewness		-,240	,272
	Kurtosis		,652	,538

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
NFC_Total	,112	78	,017	,970	78	,062

a. Lilliefors Significance Correction

Histogram — NFC_Total (Mean = 3,70, Std. Dev. = ,636, N = 78)

Normal Q-Q Plot of NFC_Total
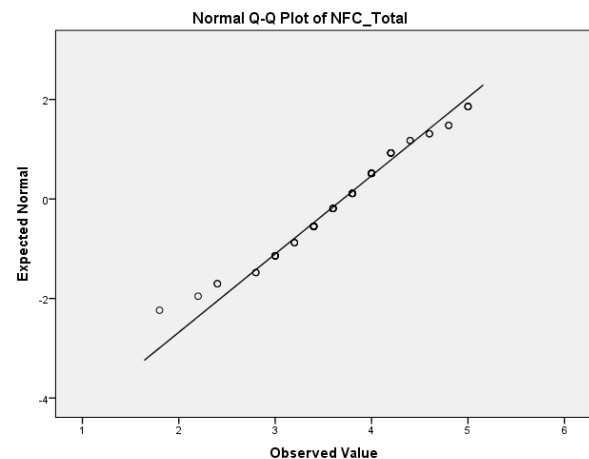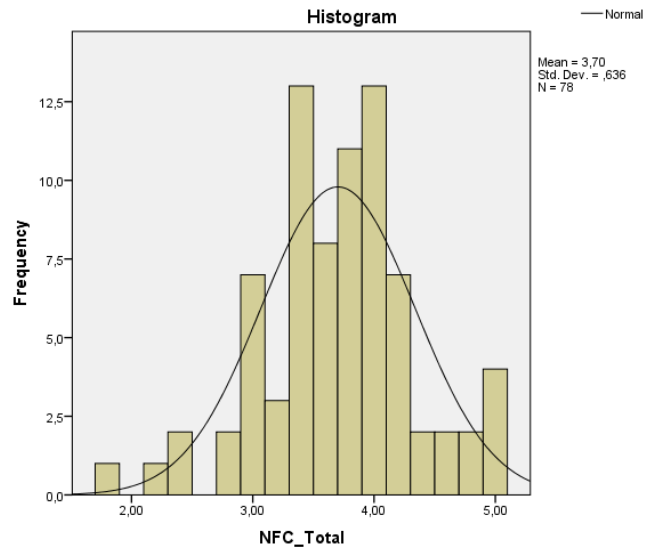
Analysis of Normal Distribution

To get a visual overview, histograms and normal Q-Q plots have been constructed. In general, the DV NFC looks at the first sight look normally distributed. To support this a Shapiro Wilk's Test has been carried out (P>0.05) (Shapiro & Wilk, 1965). Based on a skewness of -0.240 (SE = 0.272) (-0.240/ 0.272 = -1.96> -0.88 <1.96 and a kurtosis of 0.652 (SE = 0.538) (0.652/ 0.538 = -1.96> 1.21 <1.96). Looking at the Shapiro-Wilk test the significance level of NFC is 0.062 indicating a normal distribution. In general, based on these figures we could assume that NFC is *approximately* normally distributed. The graphs for the variable FI look normally distributed as well however looking at the descriptive data: Skewness -0.684 (SE = 0.272) (-0.684/ 0.272 = -2.51 > -1.96 and a kurtosis of .0.274 (SE = 0.538) (0.274/ 0.538 = -1.96 < 0.509 > 1.96 (SW (78) = 0.943, p= 0.002 indicating non-normal distribution. The graphs for the variable Causation look normally distributed as well, looking at the descriptive data: Skewness -0.087 (SE = 0.272) (-0.087/ 0.272 = -1.96 > -0.32 < 1.96 and a kurtosis of -0.330 (SE = 0.538) (-0.330/ 0.538 = -1.96 > -0.61 < 1.96 (SW (78) = 0.987, p= 0.63 indicating a normal distribution. Effectuation looks normally distributed as well, looking at the descriptive data: Skewness 0.106 (SE = 0.272) (0.106/ 0.272 = -1.96> 0.39 <1.96 and a kurtosis of -0.752 (SE = 0.538) (-0.752/ 0.538 = -1.96> -1.40 <1.96) (SW (78) = 0.978, p= 0.209 indicating a normal distribution. The last variable (Gelfand's Tightness score) looks normally distributed as well, looking at the descriptive data: Skewness -0.373 (SE = 0.272) (-0.373/ 0.272 = -1.96> -1.37 <1.96 and a kurtosis of -0.026 (SE = 0.538) (-0.026/ 0.538 = -1.96> -0.05 <1.96) (SW (78) = 0.977, p= 0.161 indicating a normal distribution.

Descriptive statistics

A few examples on how descriptive and frequency analyses have been carried out.

Gender?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	71	91,0	91,0	91,0
	Female	7	9,0	9,0	100,0
	Total	78	100,0	100,0	

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
What is your age?	78	24	54	33,23	6,149
Valid N (listwise)	78				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
For how many years have you been an entrepreneur?	77	1,00	20,00	4,3961	3,54050
Valid N (listwise)	77				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
NFC_Total	78	1,80	5,00	3,7026	,63552
FI_Total	78	1,80	4,80	3,5231	,65126
Causation_Total	78	2,43	5,00	3,8535	,56442
Effectuation_Total	78	1,14	4,43	2,7967	,74623
Gelfand_Total	78	2,00	5,50	3,6859	,74389
Valid N (listwise)	78				

STEM Discipline?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	59	75,6	78,7	78,7
	No	12	15,4	16,0	94,7
	Both	4	5,1	5,3	100,0
	Total	75	96,2	100,0	
Missing	System	3	3,8		
Total		78	100,0		

Did you have any courses related to entrepreneurship?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	52	66,7	66,7	66,7
	No	26	33,3	33,3	100,0
	Total	78	100,0	100,0	