UNIVERSITY OF TWENTE.

Influence of uncertainty intolerance and entrepreneurial passion on the approach for decision-making in venture creation; causation or effectuation – *The case of South Africa*

Author: Bob van Essen
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands

October 2019

Abstract When starting up a new business, an entrepreneur has to face several challenges. The decisions that have to be made during this process can be divided into two different approaches: causation and effectuation. This study examines the extent to which the decision-making process of entrepreneurs is influenced by the uncertainty intolerance and entrepreneurial passion. To measure this, a research was conducted in which 230 entrepreneurs from South Africa were involved. On average, these entrepreneurs score higher on causation than on effectuation. The results in the research show that passion for inventing and passion for developing both have a positive effect on the causation approach. Besides, the factors of uncertainty intolerance both have a positive effect on a different approach of the decision-making process. First, prospective anxiety positively influences the causation approach. Second, individuals with inhibitory anxiety often choose for an effectuation approach. Moreover, the relationship of prospective anxiety on the causation approach is fully mediated by the factors of entrepreneurial passion. Therefore, it can be concluded that it is possible to describe the variation in the decision-making process in venture creation on uncertainty intolerance and entrepreneurial passion. For future research it is recommended to do a cross-country study to compare the results and to test the results in a larger sample.

Keywords Entrepreneurship, decision-making process, causation, entrepreneurial passion, passion for inventing, passion for founding, passion for developing, uncertainty intolerance, prospective anxiety, inhibitory anxiety.

MSc Business Administration
Entrepreneurship, Innovation and Strategy

First supervisor: Dr. M.R. Stienstra
Second supervisor: Dr. R.P.A. Loohuis

Preface

"Twenty years from now you will be more disappointed by the things that you didn't do than by the ones you did do. So, throw off the bowlines. Sail away from the safe harbour. Catch the trade winds in your sails. Explore. Dream. Discover." – Mark Twain

This quote is central to me on a personal level, as is choosing this subject for my thesis, and choosing the Master Business Administration. The topic of my thesis has given me the unique opportunity to immerse myself more in entrepreneurship in general, but also in entrepreneurship in a totally different culture than mine. As a result, this trip has enriched both my knowledge and my experiences. At the end of my bachelor, I hesitated to start my professional career, or to continue studying and in this way improve my knowledge and make sure that I am even more ready to start my career. The latter option has been chosen. This is because my mindset is like the quote, I do not want to regret things I have not done. That also played an important role for me in choosing to go to a totally different culture to collect data; South Africa.

The process of data collection in South Africa was very unique. Together with my classmate and good friend, Thijs Soer, I travelled that way with one aim in mind: to collect as much useful data as possible. This process went with ups and downs. It was difficult to find the right people to link us to a large number of entrepreneurs. Nevertheless, this trip gave us a great data set, and also very valuable conversations with the South African entrepreneurs. We were able to discuss their business models, exchange experiences about the different cultures and made new friends.

I would like to thank my supervisor, Dr. M.R. Stienstra. First of all, for providing the opportunity to do research in a tremendously interesting topic in a very dynamic culture. Furthermore, for supervising the entire process. At the beginning he helped us a lot with creating the data set and a global plan of approach. After that he provided me with excellent feedback which enabled me to improve my thesis. In addition, I would like to thank Dr. R.P.A. Loohuis for his help and effort in a later stage of my thesis.

I would also like to thank a number of other people. First of all, Thijs Soer, together we had a fantastic experience and we helped each other through the difficult periods during this process. Next, I would like to thank all 230 South African entrepreneurs for completing our survey. I really appreciate the fact that these people took the time to assist in our research. I would also like to thank the entrepreneurs for the interesting conversations we had. Finally, I would like to thank my family and friends for the support they gave me during this process.

Bob van Essen,

Enschede, October 2019

Index

List of tables and figures

List of Tables

List of Figures

1. Introduction

When starting up a new business, an entrepreneur has to face several challenges. Each personality has methods of handling these challenges. When an entrepreneur has determined to take advantage of an opportunity, action must be taken to find different sources that make it possible to create a new venture. Bird (1989) and Brews and Hunt (1999) researched different approaches of entrepreneurial decision-making during new venture creation, it has been concluded that this approach is often based on goal-oriented features. Sarasvathy (2001) describes this approach as causation; a decision-making process in which the final objective is determined, by which means must be found to achieve this purpose. In this approach, commonly considered to be the MBA angle, the method is based on strategy planning, in which activities such as identifying opportunities and business plan development play an important role (Chandler, DeTienne, McKelvie & Mumford, 2011). In contrast, Sarasvathy (2001) has defined a new concept that distinguishes itself from the causation approach; Effectuation, in which the entrepreneur will examine which means are available, in order to obtain potential effects with it (Sarasvathy, 2001). Following this, the theory is studied by other researchers in relation to different concepts (e.g. Brettel et al., 2012, e.g. Roach et al., 2016). A review of the concept by Perry, Chandler & Markova (2012) has examined which previous articles on the concept of effectuation have been written. Previous research shows that much has been studied concerning the definition of effectuation, comparisons have been made with other concepts and the relationship of effectuation/causation with other constructs has been studied. An example of the tested relationships is about effectuation in relation to act in uncertain situations (Wiltbank, Dew, Read, & Sarasvathy, 2006). This describes the decisions to be taken when uncertain situations occur. Following von Gelderen, Frese and Thurik (2000), uncertainty is a concept that is a key element of entrepreneurship. Because entrepreneurs have to deal with uncertainty, they need to take risks in the decision-making process and innovate. This process is influenced by differences in the perceptions of individuals (Shane and Venkataraman, 2000). The willingness to accept risks is an important factor in the choice to embrace entrepreneurial opportunities. Cardon et al., (2009) enhances that passion for entrepreneurial activities coordinates entrepreneurial cognitions and behaviour in order to pursue a goal.

1.1. Background

However, the current research has given little insight into the personal characteristics of the entrepreneur. It is interesting to investigate whether personal characteristics influence the decision-making process. Instead of investigating uncertain situations, the uncertainty of the entrepreneurs themselves can also be investigated. Intolerance of uncertainty is defined by (Dugas, Hedayati, Karavidas, Buhr, Francis and Phillips, 2005) as “a cognitive bias that affects how a person perceives, interprets, and responds to uncertain situations on a cognitive, emotional, and behavioural level”. Carleton, Norton & Asmundson (2007) have developed a scale in which two different types of uncertainty intolerance are distinguished. Firstly, *Prospective Anxiety* which indicates the fear of developments in future events. Secondly, *Inhibitory Anxiety* describes uncertainty that impedes operation or experience. According to McMullen and Shepherd (2006), the role of uncertainty in entrepreneurial action has become a debate between researchers. The first flow focuses primarily upon perceived uncertainty and often discriminates against those who decide to act entrepreneurially as opposed to those who decide to do not as a matter of differences in knowledge (e.g. Busenitz, 1996; Gaglio & Katz, 2001; Kirzner, 1979). To this end, the extent of uncertainty is

seen as the barrier between future entrepreneurs and entrepreneurial action. The second flow emphasizes the will to bear uncertainties and decide to act entrepreneurial and differentiate themselves from those who do not in aspects like attitude, motivation and risk appetite (e.g. Douglas & Shepherd, 2000; Schumpeter, 1934). Taking this into account, the relationship between uncertainty intolerance and the choice for a causation or effectuation approach should be able to explain. In the article by Sarasvathy (2001) it is indicated that the causation process prefers to avoid uncertainties. The focus is on predicting uncertainties. In contrast, the entrepreneurs with the effectuation approach use uncertainties as opportunities. Nevertheless, this relationship may be affected by other concepts.

As mentioned by Utsch and Rauch (2000) Entrepreneurial Passion could help explain why many entrepreneurs persist in the face of difficulties and uncertain outcomes (Utsch and Rauch, 2000). This describes the relationship between uncertainty and the decision-making process. It might be that having a passion for entrepreneurship can affect the relationship between uncertainty and decision making. According to Cardon, Gregoire, Stevens & Patel (2012), the effect of Entrepreneurial Passion on the relationship between uncertainty and entrepreneurial outcomes can be considered as a gap in previous research. They suggest that this gap may be a good angle for future research. Questions can be asked how entrepreneurship passion can contribute to the persistence of entrepreneurs. A review of Cardon, Wincent, Singh and Drnovsek (2009) reveals that different scholars show that entrepreneurial passion positively affects concepts. Examples of these passion traits are pride, enthusiasm and joy which helps entrepreneurs to deal with the emotional process of dealing with entrepreneurial challenges.

1.2. Research Question

This thesis paper investigates the relationship between uncertainty intolerance and entrepreneurial passion and the choice by entrepreneurs for a causation or an effectuation approach.

According to Cardon et al. (2000) is the passion for founding connected with the effectiveness in the creation of a new venture. This type of passion determines how effectively the entrepreneur deals with difficulties, which is likely in the start-up phase of an idea. Through passion, the entrepreneur succeeds in acting more creatively and flexibly in applying their business ideas. This gives the entrepreneurs the feeling that they have everything under control and are prepared for unexpected events (Collewaert, Anseel & Crommelinck, 2016).

The second dimension of entrepreneurial passion, self-identity, is aligned with the set of means drawn up by Sarasvathy (2001) of the entrepreneur with an effectuation approach. The entrepreneur asks himself the following question: Who am I? It examines at an individual level which properties, tastes and abilities the entrepreneur has. This is what an individual does when he remains close to his identity and therefore his passion. This is a driving behaviour in an entrepreneur's entity within the self-concepts (Murnieks & Mosakowski, 2007). Following this, it is plausible to assume that an effectuation entrepreneur acts from his passion.

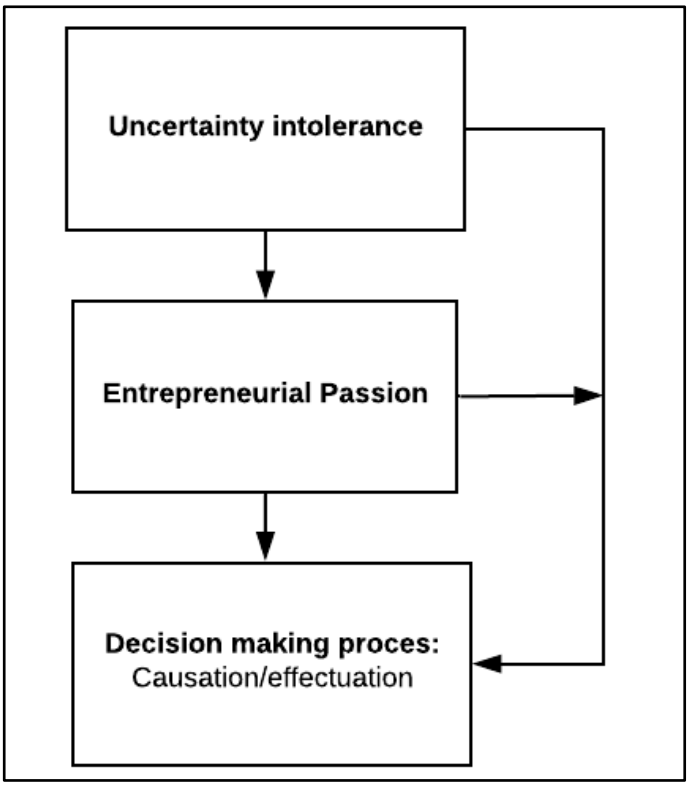
Dugas et al., (2005) suggest that people who score high on uncertainty tolerance are unable to act when facing an uncertain situation. Furthermore, as a result of the intolerance for uncertainty, these people need additional information to make decisions (Metzger et al., 1990). According to (Fong & Tiendens, 2002) is the experience of passion considered as a positive trait, but it does not exclude the possibility that there will be negative effects such as anxiety and fear. Individuals may experience double and conflicting emotions while approaching an issue. It is assumed that

entrepreneurial passion may have an important notion in the expression of cognitive and behavioural traits (Chen et al., 2009). Following Alexander and Onwuegbuzie (2007) it is suggested that passionate individuals can tolerate surprises and unforeseen stress factors more easily. This is due to the willingness of these individuals to engage in activities for what they believe will be an outcome they could satisfy from (Cardon et al., 2012). Passion for an activity can lead to an individual deciding to take action more often. Obstacles tend to be surmounted more often since they are more concerned to develop in the field of that activity. (Cardon et al., 2009). In addition, Baum and Locke (2004) suggest that entrepreneurial passion contribute sometimes to help individuals overcoming certain barriers linked to the creation of new businesses.

Because both the role of entrepreneurial passion in the decision-making process as an independent variable and the influence of the concept as a moderator/mediator are considered, two different research questions are addressed in this study. Firstly, *"To what extent does uncertainty intolerance and entrepreneurial passion influence the approach for decision making in new venture creation; causation or effectuation?".* Secondly, "*to what extent does entrepreneurial passion have a moderating/mediating influence on the relationship between uncertainty intolerance and the decision-making process in new venture creation?"* The relations between the different concepts are summarized in figure 1.

In the first section of this thesis, a theoretical framework is described. It discusses the basic concepts of the study; causation/effectuation, entrepreneurial passion and uncertainty intolerance. At the end of this section, hypotheses are made that, based on the literature, illustrate the relationships between these concepts. After that, an explanation is given about the methodology used for the study. This includes a description of the type of sample the tests that will be carried out. Afterwards, the results of the study were presented. In this chapter, formulated have been tested. Based on these findings, the theoretical and practical implications were composed, and several limitations were given. Finally, a conclusion is reached in order to answer the research question.

Figure 1 - Clarification of the research question



2. Theoretical framework

This chapter goes deeper into the different concepts used in the report, this is carried out through the utilization of previous studies related to the topics.

2.1. Causation or effectuation

The basis of the concepts causation and effectuation has been established by Sarasvathy (2001). By asking what reasons entrepreneurs commence their venture, it appears that this does not always have to be with the logic that the person already knows what type of enterprise exactly is in his or her perception. Sometimes an entrepreneur simply has the idea to make a lot of money, or to contribute towards a more sustainable world, for example. This has led to a distinction being made between two concepts that are both typical of how decisions are made in new venture creation. The concepts are defined as follows: *"Causation processes take a particular effect as given and focus on selecting between means to create that effect. Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means" (Sarasvathy, 2001).* This definition is clarified with a simple example. A cook working in a restaurant may be asked to make a very specific dish. The cook only has to follow a recipe and knows exactly which ingredients are needed to make this dish. Alternatively, a cook can also be asked to prepare a delicious dish and leave the interpretation of this completely to the cook. The cook has to think about the ingredients that are present to determine the possibilities. While the causation approach entrepreneurs are sharply focused on identifying and exploiting opportunities, the effectuation entrepreneurs are looking to create these opportunities instead of finding them (Roach, Ryman and Makani, 2016).

2.1.1. Process of causation and effectuation

First of all, the causation process is explained in more detail. This concept is seen as the MBA-approach and has already been explored preliminary to Sarasvathy's work (Dew, Read, Sarasvathy and Wiltbank, 2009). During the creation of a venture, these entrepreneurs start by determining the goal they want to accomplish, and then they start by determining the means and the market in which they can achieve this. This is regarded as the traditional decision-making process and is inherited from the neo-classical micro-economies. (Chandler et al., 2011). According to Andersson (2011), the process starts by analysing the intended enterprise and the environment in which it will be located. The market in which the company will operate is selected based on an analysis of different markets and an evaluation of different foreign market entry methods. This allows opportunities to be identified and evaluated at an early stage and objectives to be established. Subsequently, a business plan can

Figure 2 - Process of the causation approach based on Sarasvathy (2001;2009)

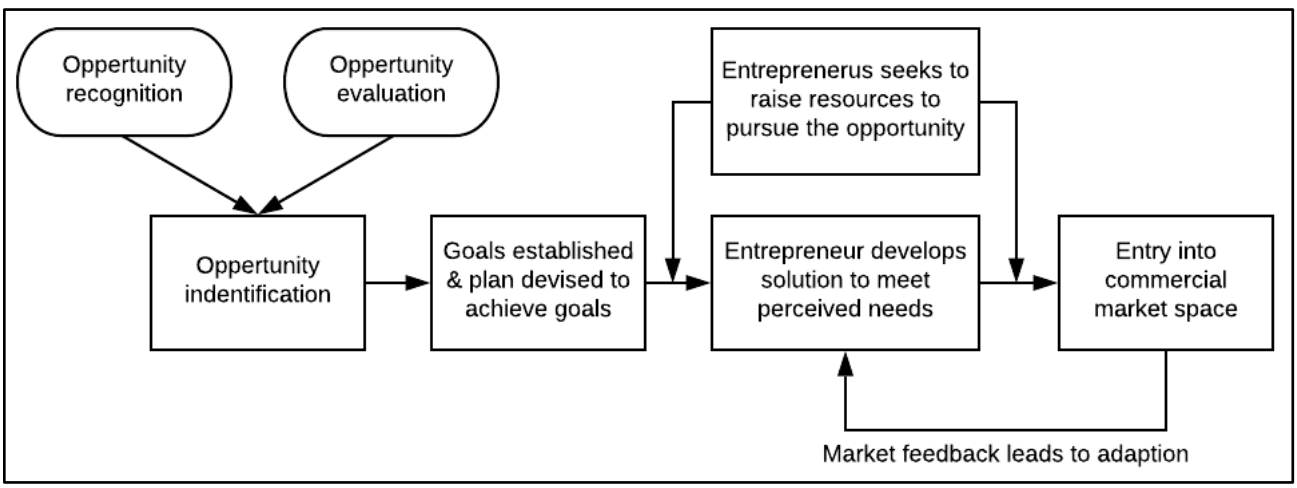
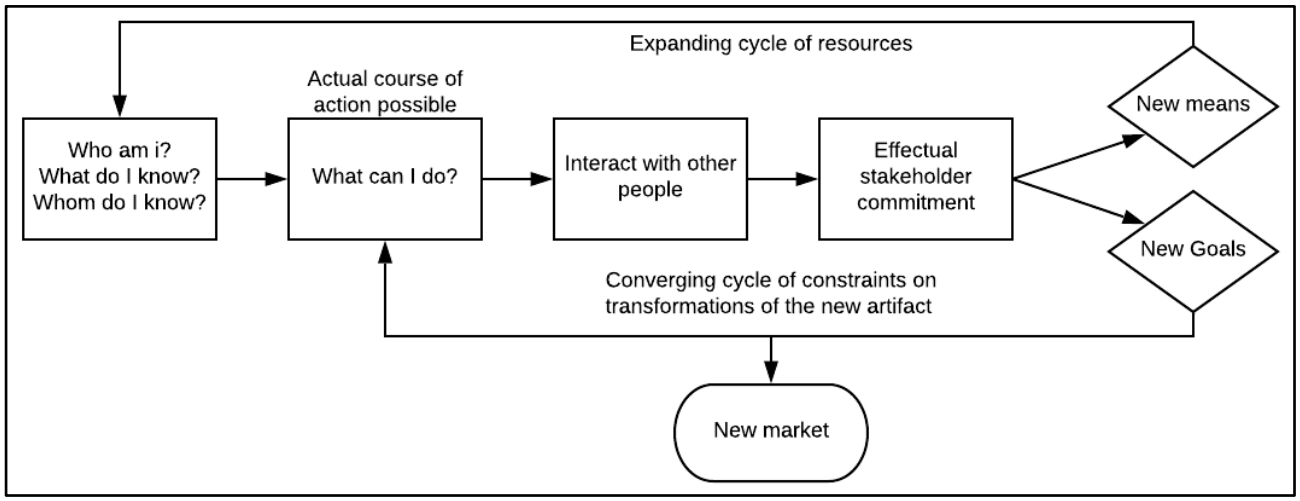


Figure 3 - Process of the effectuation approach based on Sarasvathy (2001;2009)



be based on the insights in order to progress towards this goal (Fisher, 2012). This process is aligned with the classic approach of entrepreneurship (Shah and Tripsas, 2007).

Creating a new business often occurs in an environment that is very uncertain and complex to predict. This makes it difficult for entrepreneurs to recognise opportunities from the outset of the idea (Fisher 2012). As a result, Sarasvathy (2001) introduced the effectuation approach in a decision-making process of new venture creating, to address entrepreneurial practices under those conditions. This approach is more commonly used by entrepreneurs with experience and expertise (Dew et al., 2009). Following Sarasvathy (2001) the process of effectuation starts with three questions: "Who am I?", "What do I know?" and "Whom do I know?". These three questions are also known as the bird in hand principle and cover the means available to the entrepreneur from the outset of the idea (Sarasvathy & Dew, 2005). These questions can be asked in the context of individual level, company level and level of the economy. In this way, all available resources at each level are mapped (Sarasvathy, 2001). Following Andersen (2011), entrepreneurs with this approach do not start to serve on single goal. A method is pursued to create added value based on the available resources and the objectives derived from this (Fisher 2012).

2.1.2. Differences between causation and effectuation

There are distinct differences between an entrepreneur with a causation approach and one with an effectuation method. Sarasvathy (2001) included these differences and restated them in 2009. The differences are reflected in the following five sub-levels; Taking action, risk and resources, attitude towards the market, managing unexpected events and the future. Each of these sub-constructions is measured by a different question with the scale of Alsos et al (2014) for both effectuation and causation. In the remainder of this thesis, causation and effectuation as a whole are discussed. The subconstructs will all be discussed in-depth because this will enable to formulate the relationships between the key concepts more accurately. The differences between causation and effectuation are summarised in Table 1.

A causation entrepreneur is *taking action* based on the establishment of goals to exploit identified opportunities (Sarasvathy 2001). After defining this specific goal for venture creation, the entrepreneur explores possible means in order to achieve this means are sought to achieve that goal in the most efficient way. Under uncertainty, this logic depends on predicting which means and actions are best suited to reach a particular goal (Berends, Jelinek, Reymen & Stultiëns, 2014). In contrast, an effectuation entrepreneur takes all the available means as the starting point and is

Table 1 - Differentiation of causation and effectuation based on Sarasvathy (2001;2009)

Categories of differentiation	Causation process	Effectuation process
Taking action	Based on goals	Based on means
Risk and resources	Risks are taken with the eye on expected returns	Risk taken with losses that are affordable
Attitude towards market	Competitive analysis	Openness for commitments and strategic alliances
Managing unexpected events	Exploiting of pre-existing knowledge	Exploiting unexpected conditions through flexibility and creativity
Future	Predicting an uncertain future	Predicting an uncertain future

seeking potential outcomes that are possible to reach by the use of these means (Wiltbank et al. 2006). According to Johansson & McKelvie (2012) researchers indicates that this means-driven process is characterized by features such as flexibility and collaboration. The entrepreneur has the challenge to explore his own knowledge and network. On this basis, the entrepreneur can determine what is possible with the resources he possesses (Sarasvathy, 2001).

Moreover, the approaches of decision-making in new venture creation are different in the manner how they deal with *risk-taking*. A causation entrepreneur is taking risks based on a set goal upon which all available information that is relevant to achieve that objective is determined and attempts to estimate every outcome of each option (Chandler et al, 2011). As an example, the research of Fiet (2002) about opportunity recognition suggests that choices are determined following a rational process of analysing several possible actions and selecting the option with the highest expected returns. On the other hand, an effectuator will embrace contingencies more than a causal entrepreneur, which is expressed by the fact that he takes more risk than someone with a causal approach. The entrepreneur determines the extent to which losses are affordable and then experiments with as many strategies as possible that are feasible with the means available (Sarasvathy, 2001). Following Chandler et al. (2011) this is because the operations take place in an uncertain environment, so multiple approaches in the market need to be tested before a business model is established.

The third differentiation between the two concepts is reflected in the *attitude of the entrepreneurs towards the market*. The causation approach is defined in an area in which planning is carried out towards a certain goal. By doing so, it also applies a strict competition analysis to protect the knowledge from outsiders (Reymen, Andries, Berends, Mauer, Stephan & Van Burg, 2015). An example of this is the development of comprehensive intellectual property protection strategies, in order to use this as a competitive tool (Chesbrough, 2006). In opposition to that, in accordance to Read et al. (2009), effectuators are open to external partners to participate. Collaborations open up new resources and these stakeholders also reduce the uncertainty with which the entrepreneur has to deal. This is done by establishing strategic alliances and partnerships which might be meaningful for the entrepreneur to make his idea a success. The importance of these phenomena has been discussed in many previous studies (e.g. Eisenhardt and Schoonhoven, 1996; Grant and Baden-Fuller 2004).

2.2. Intolerance of uncertainty

There is a growing interest among researchers in the trait of individuals that relates to (in)tolerance for uncertainty (Boelen and Reijntjes, 2008). Intolerance of uncertainty is defined by Dugas et al. (2005) as "a cognitive

bias that affects how a person perceives, interprets, and responds to uncertain situations on a cognitive, emotional, and behavioural level". People who experience a lot of uncertainty are stressed to think about future events and have trouble to operate in uncertain situations. In addition, these people see uncertainty itself as a bad point (Buhr & Dugas, 2002). Many studies linked the concept of intolerance for uncertainty to worry (Carleton et al., 2007; Buhr & Dugas, 2002). The tolerance of an individual of uncertainty surrounding the ability to re-expose will affect how often they experience worry (Laugesen, Dugas & Buwowski, 2003) and also their anxiety (Greco & Roger, 2003). Carleton et al. (2007) divide two different aspects of the intolerance of uncertainty. Firstly, the *prospective anxiety* indicates the fear of dealing with future events. Secondly, *inhibitory anxiety* represents uncertainty that impedes operation or experiencing new opportunities.

2.2.1. Intolerance of uncertainty and the decision-making process

The concepts of intolerance to uncertainty and worry are associated with difficulties experienced in the decision-making process. For instance, people who worry a lot need more information before they can make their decision. This indicates that they require more evidence that it is the right choice (Tallis, Eysenck, & Mathews, 1991). Furthermore, as a result of the intolerance for uncertainty, these people need additional information to make decisions. More difficulties are experienced in performing tasks that are ambiguous in character (Metzger et al., 1990).

D'zurilla and Goldfried, (1971) identified five stages of the behavioural process in problem-solving; (a) general orientation, (b) Problem definition and formulation, (c) generation of alternative solutions, (d) decision making and (e) verification. These are all aspects that an individual can encounter in an entrepreneurial environment. These five steps are discussed because they provide more insight into the influence that uncertainty intolerance has on the decision-making process. This will improve the link between uncertainty intolerance and the decision-making process in new business creation as described by Sarasvathy (2001;2009). Dugas, Freeston and Ladouceur (1997) linked these five stages to uncertainty intolerance and worry. It was concluded that both concepts have an influence on the stages. Worry and uncertainty intolerance provide a poor problem orientation. Remarkable is that these individual's knowledge of problem orientation is equal to people without the experience of uncertainty (Dugas et al., 1995; Davey 1994). This shows that the worse problem orientation comes from the fear and uncertainty of the persons, instead of a lack of knowledge in that field. The problem orientation is comparable to several categories of the differences in causation and effectuation. Especially with the approaches to unexpected events and the future. Kahneman and Tversky (1974) suggest that the decision-making model does not persist in every situation, for example when the decision entails uncertainty. When uncertainty is involved in a decision-making process, the effectuation approach is especially applicable, this case is trading in markets that do not always exist and opportunities are not recognized but created (Sarasvathy et al., 2003). Following Sarasvathy (2001) is the foundation pillar of decision making under uncertainty the expertise of the entrepreneur.

2.3. Entrepreneurial passion

Passion is seen as a very important key element in entrepreneurship (Cardon et al, 2005). Passion improves creativity and the recognition and exploitation of new opportunities (Baron 2008; Sundararajan & Peters, 2007). The phenomenon has not yet been empirically researched by many scholars in the sense of an individual trait. The relationships that have been tested so far are firstly, the link between conceptualized entrepreneurship passion and in the form of three personality traits with the overall venture growth (Baum, Locke and Smith,

2001). Then, Baum and Lock (2004) continue on the previous work and have carried out an analysis regarding the individual passion for work on enterprise growth. These studies have shown that passion does not directly influence venture growth, but more as a mediator in the way of motivation, goals and self-reflection. At last, Chen et al. (2009) evaluated the relationship between the impact of entrepreneurial passion on the decision-making process of venture capitalist to invest in the enterprise. This showed that the venture capitalists is more affected by facts presented than the passion conveyed by the entrepreneurs.

In addition to these studies, more research has been done into the theory behind entrepreneurial passion. For instance, Cardon et al. (2009) stated that the theory behind the phenomenon is still little discussed. This has resulted in a conceptualisation of the nature of entrepreneurial passion, which was later developed by Cardon et al. (2012), using the previous empirical studies to make the concept more measurable.

2.3.1. Definition Entrepreneurial passion

Initially, Baum and Locke (2004) considered entrepreneurial passion an expression of love for work. Entrepreneurs with love for work face opportunities and challenges with eagerness and zeal. Through this approach, entrepreneurs will be able to work through financial barriers and contribute to bring new products into new markets. Subsequently, the concept of entrepreneurship passion is defined by Chen et al. (2009) as *"an entrepreneur's intense affective state accompanied by cognitive and behavioural manifestations of high personal value"*. Passionate individuals do not only experience intense emotions, but also have extremely active minds, with which they cannot stop thinking about their business venture idea. This passion also serves as the driving force behind taking action. Another definition is given by Cardon et al (2009): *"Consciously accessible intense positive feelings experienced by engagement in entrepreneurial activities associated with roles that are meaningful and salient to the self-identity of the entrepreneur".* This definition is shaped by three different aspects. First, the experience of intense positive feelings. Then, the centrality for these activities for the entrepreneur's self-identity. Finally, the focus of entrepreneurship passion on three different entrepreneurial domains: Inventing new products or services, founding new organizations and developing these organizations. The last definition of entrepreneurial is the most comprehensive, which makes the concept measurable. In this way, this concept is further emphasized.

2.3.2. Dimensions of entrepreneurial passion

The first dimension in entrepreneurial passion is the experience of *intense positive feelings* (Cardon et al., 2012). This phenomenon is central in several scholarly research about passion in entrepreneurship (e.g. Baum and Locke, 2004; Baum et al., 2001; Chen et al., 2009). According to Wincent et al. (2008), passion exists of a deeply experienced positive feeling for an aspect that is major to the entrepreneur and contributes more than the emotions evoked by external stimuli. In this context, the intense feeling is expressed by objects or activities that are very valuable for a person's identity (Cardon et al., 2009). However, following Cardon, Post and Forster (2017) it appears that experiencing intense feelings can sometimes also have a dark side. This can lead to potentially destructive behaviour within a person's financial, career, social life. This could be a consequence of intense feelings of shame due to a venture fail (Smith & McElwee, 2011).

Besides, passion is also referring to intense positive feelings that are consciously accessible to individuals (Cardon et al., 2009). This concept covers that individuals reflect on the intensity of their feeling towards different tasks and activities. In case an individual is excited by an activity, it is not possible to stop thinking and talking about this activity (Chen et

al., 2009). According to Cardon et al. (2012), a researcher is only able to pronounce on relevant entrepreneurial passion measurement, if participants only mention their positive feelings regarding entrepreneurial activities.

The second dimension of entrepreneurial passion is the centrality and meaningfulness of these activities for an *entrepreneur's self-identity.* Vallerand and colleagues (2003) emphasize that passion implies a deep identity connection to object the intense feelings,. Without this, an entrepreneur cannot experience passion. Cardon et al. (2012 found that the relationship between self-identity and concepts as individual commitments, motivations and actions have been included as well in social psychology (Stryker and Burke, 2000) as in entrepreneurship (Gartner, Starr and Bhat, 1999). The identity of an entrepreneur refers to integrated expectations that they have and that are central, characteristic and long-term. This must occur at least in one of the roles in which they act (Burke and Reitzes, 1991). Following Stryker and Burke (2000) the self-identity of an individual is organized arranged, which means that one identity of a person is more important than another. As a result, entrepreneurs are more concerned with the identities that are seen as important, and not with the identity they do not attach importance to (Cardon et al., 2012). Therefore, regarding the domains of entrepreneurial passion, it may be that an entrepreneur has the greatest meaning in developing new products and services, more than the subsequent further development of these products and services (Cardon et al., 2009).

2.3.3. Domains of entrepreneurial passion

The identity of a person with a passion for entrepreneurship is based on the taxonomy of entrepreneurship activities of Gartner et al. (1999) and later applied by Cardon et al. (2009) to entrepreneurial passion and is composed of three role identities. 1) passion inventing new products or services, 2) passion for founding new organizations and 3) developing these organizations beyond their initial survival and successes (Cardon et al., 2009).

First, *Passion for inventing* consists of activities of individuals who are curious and eager to scan the market for new opportunities, and to be able to realise new products or services (Cardon et al., 2009). According to Katila and Ahuja (2002) some entrepreneurs are more common to seek innovative solutions for appearances in the market, and this is seen as an important motivating factor for entrepreneurship. In this case, the validation and confirmation of the identity of the entrepreneur comes from recognizing opportunities more than other aspects. The entrepreneur extracts his energy from the creative angle of inventing and discovering new opportunities or niche markets (Wilson & Stokes, 2005). Some examples of entrepreneurs who are all known for finding and developing new products or services are; Nikola Tesla (e.g. Alternating current and Remote Controls), Howard Head (e.g. laminate skis and oversized tennis rackets) and Steve Jobs (e.g. iPod and iPhone). All these entrepreneurs were able to find a commercial solution for their products (Cardon et al. 2012).

Second, *passion for founding* reflects an entrepreneur who has a passion for activities associated with establishing a venture for commercializing and exploiting the opportunities (Breugst, Domurath, Patzelt and Klaukien, 2012). In addition to this, it includes the allocation of the necessary financial, human and social resources to establish the new company (Cardon et al., 2009). According to Katz and Gartner (1988) entrepreneurs become motivated by having a goal and being able to reach those objectives who manifest themselves in the founding event. They want to do something representative of entrepreneurship. Entrepreneurs who experience a lot of passion in founding a business, are often in line with developing identities that go hand in hand with the venture identity (Cardon et al., 2005).

Westhead and Wright (1988) studied differences among three types of habitual entrepreneurs; Novice, portfolio, and serial founders. The portfolio founder is most in line with the description of passion for founding as specified in Cardon et al. (2009). Portfolio founders keep their original business and establish or buy another business. Therefore, Cardon et al. (2012) suggest that this kind of entrepreneurs will experience high levels of passion for founding.

Lastly, a *passion for developing* relates to the process of growing and developing after the founding of the venture (Cardon et al., 2009). In contrast to entrepreneurs who have a passion for founding and inventing ventures, many entrepreneurs do not get their motivation not by founding, but rather because of the challenge of growing and expanding the company (Cliff, 1988). These individuals use different strategies and management styles than their competitors. They also have a different attitude towards stakeholders. The purpose of this is to maintain and develop the organisation. Entrepreneurs who experience a passion for developing will likely do so in a company they have founded. Nevertheless, this does not have to be the case, it may be that an entrepreneur has a passion to step into a start-up and then develop it further and give it more value (Cardon et al. 2012).

2.4. Hypotheses

The hypotheses and the conceptual model are based on the theoretical framework. In the hypotheses, the decision-making process in new enterprise creation is used as a dependent variable.

2.4.1. Uncertainty intolerance

Carleton et al. (2007) subtracted the scale in two factors, prospective anxiety and inhibitory anxiety. Therefore, the two factors will be tested separately. An individual who experiences a high degree of prospective anxiety experiences difficulties in dealing with future events (Carleton et al., (2007). The focus of an entrepreneur with a causation approach is on predicting uncertainties (Sarasvathy, 2001;2009). In addition, causation entrepreneurs prefer the exploiting of pre-existing knowledge when facing unexpected events. Due to the planned strategy of these entrepreneurs, they react negatively to unexpected events if they had no prior information about expectations of the occurrence (Reyman et al., 2015). Therefore, it is reasonable to suggest that people who score high on prospective anxiety prefer a causation approach.

H1a: There is a significant positive relationship between Prospective Anxiety and the causation approach

Dugas et al. (2005) suggest that people who score high on uncertainty intolerance are unable to act when facing an uncertain situation. These people require more and additional information before any decision can be made (Tallis, Eysenck, & Mathews, 1991). In addition, an individual with a high degree of inhibitory anxiety impedes operation or experiencing new opportunities (Carleton et al., 2007). In comparison with the description of Sarasvathy (2001;2009), there are similarities with the causation approach. It is indicated that the causation process prefers to avoid uncertainties. Therefore, it is reasonable to suggest that people who score high on inhibitory anxiety prefer a causation approach

H1b: There is a significant positive relationship between inhibitory anxiety and the causation approach

The description given in the theoretical framework illustrates that entrepreneurs with an effectuation approach face many uncertainties. Therefore, an entrepreneur with this approach does not avoid taking risks. The outcome of the enterprise idea is not determined during the set-up, this makes it an uncertain process. Following Chandler et al. (2011) this is because the operations take place in an uncertain

environment, so multiple approaches in the market need to be tested before a business model is established. In contrast, people who score high on prospective anxiety, are unable to deal with unexpected events. As a result, it is reasonable to suggest that people with a high feeling of prospective anxiety don't use an effectuation approach

H1c: There is a significant negative relationship between prospective anxiety and the effectuation approach

As described before, an individual with a high degree of inhibitory anxiety blocks operation and experience. They have problems with applying problem-solving skills and require a greater amount of evidence before going ahead (Ladouceur, Talbot, Dugas, 1997). It is therefore probable that people who have no difficulty dealing with uncertainties will be better off dealing with situations in which they do not have the final goal yet. Which can be linked to the effectuation approach.

H1d: There is a significant negative relationship between inhibitory anxiety and the effectuation approach

2.4.2. Entrepreneurial passion

Cardon et al., (2012) recommend that it is most useful to measure the three domains of passion separately. Entrepreneurial passion is likely to have a distinction between passion for inventing, founding and developing. As a result, the hypotheses are based on the three different domains of entrepreneurial passion.

Passion for inventing exists of activities associated with scanning the market for opportunities in venture creation, developing new products or services and working with new prototypes (Cardon et al, 2009). Following Katila and Ahuja (2002), these entrepreneurs are more likely to act in an innovative area and have a deeper search for innovative ideas. Implementing new market ideas is an important motivating factor for these individuals. Subsequent to this, an effectuation entrepreneur has the characteristics to operate in an uncertain environment and seek new market opportunities. Therefore, it is assumed that entrepreneurs with a passion for inventing are more likely to use an effectuation approach.

H2a: There is a significant positive relationship between passion for inventing and the effectuation approach.

Passion for founding concerns activities to assemble the necessary resources to create a new venture (Cardon et al., 2012). These entrepreneurs enjoy the process of founding a venture and have identities that are in line with the venture identity they create. In comparison, effectuation entrepreneurs take all the available means and resources they have as the starting point and seek potential outcomes (Wiltbank et al. 2006). There are three main questions in effectuation; "Who am I?", "What do I know?" and "Whom do I know?". These questions cover the means available to the entrepreneur at the start of the venture idea (Sarasvathy & Dew, 2005). Therefore, it could be stated that people with a high passion for founding are more likely to use an effectuation approach.

H2b: There is a significant positive relationship between passion for founding and the effectuation approach.

Passion for developing is defining entrepreneurs who are passionate about the challenge for growth and expanding after founding a venture (Cardon et al., 2009). Characteristics of these entrepreneurs are the adaption of different strategies for organizational strategies and management styles than their equivalents (Gundry and Welsch, 2001; Smith and Miner, 1983). Furthermore, they try to distinguish themselves through different strategies and management styles in comparison to their competitors. As opposed to addressing the process of new business decision-making this is most similar to the causation approach. These entrepreneurs make a competitive analysis towards the

market. Therefore, it is more likely that entrepreneurs with a high passion for founding use a causation approach.

H2c: There is a significant positive relationship between passion for developing and the causation approach.

2.4.3. Moderator/Mediator

As mentioned by Utsch and Rauch, (2000) Entrepreneurial Passion could help explain why many entrepreneurs persist in the face of difficulties and uncertain outcomes (Utsch and Rauch, 2000). Furthermore, entrepreneurial passion helps to overcome barriers in the decision-making process (Baum and Locke, 2004). Passionate people can deal more easily with surprises and unforeseen stress factors (Alexander and Onwuegbuzie, 2007). Following this, it might be that having a passion for entrepreneurship can influence the relationship between uncertainty and decision making.

H3a: The expected positive relationship between prospective anxiety and the causation approach is moderated by entrepreneurial passion.

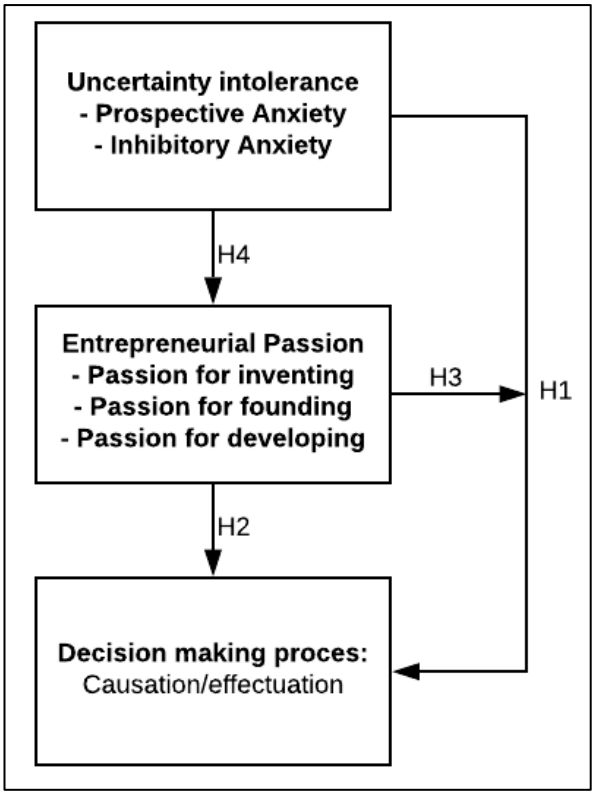
H3B: The expected positive relationship between inhibitory anxiety and the causation approach is moderated by entrepreneurial passion.

However, it is possible that a mediator effect exists between the three concepts. According to (Fong & Tiendens, 2002) is the experience of passion considered as a positive trait, but it does not exclude the possibility that there will be negative effects such as anxiety and fear. Individuals may experience double and conflicting emotions while approaching an issue. As a result, it may be that the entrepreneur experiences uncertainty, which influences his passion. Subsequent to this, the choice for causation is influenced.

H4: The relationship between the factors of uncertainty intolerance and the choice for a decision-making process is mediated by entrepreneurial passion.

The hypotheses are visualized in the conceptual model, presented in figure 4.

Figure 4 - Conceptual model



3. Methodology

This chapter explains the methodology used during the thesis. It describes the sample and which measurement methods were used.

3.1. Sampling

In order to collect data with respect to entrepreneurship in South Africa, a field research was conducted during May, June and July 2019. During this period, targeted searches were made for entrepreneurs who have established a company in South Africa. In order to define entrepreneurship, the definition of Venkataraman (1997) has been used: *"the scholarly examination of how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated, and exploited".* This definition has been adopted because it deals with the opportunities

that are fulfilled by entrepreneurial activities, this is an important aspect of entrepreneurship in South Africa.

Prior to the research, more information regarding entrepreneurship in South Africa was gathered to obtain a better understanding of entrepreneurship in this specific country. South Africa faces numerous economic, political and social challenges, most notable is the massive and rising unemployment rate (Herrington et al., 2010). According to the world bank statistics, this is 27 percent in 2018. These statistics rank the country with the second-highest percentage of the world. The major problem with regard to unemployment is among young people. Consequently, the existence of many entrepreneurial activities in the country in order to stimulate job creation is very important. Following the facts of the Global Entrepreneurship Monitor (2017), the percentage of total entrepreneurial activities of people of 18-64 years is 10,96%. This score is as other African countries, who score an average of 13,68% and the global average of 12,46%. Nevertheless, the established business ownership rate, which indicates the percentage of people of 18-64 years who established a business that actually paid salaries, wages and any other payments for more than 42 months, is very low in comparison to the rest of Africa and even the world. The score of South Africa is 2,15%, the average of Africa is 11,92% and the global average is 8,5%. Besides, the failure rate of South African Entrepreneurs is very high (Fatoki, 2014). This has a negative impact on job creation, economic growth and more equal income distribution in the country. This high failure rate is due to both internal and external factors. For example, internal factors as in a lack of functional skills in planning, organizing and leadership. Or external factors such as the unavailability of a logistics chain, high distribution costs or a lack of financial resources. Therefore, it is interesting to see how South African entrepreneurs relate to the concepts aforementioned in the literature study. Due to the economic, political and social challenges in the country, this will likely cause residents to experience uncertainty, especially because a lot depends on the success or failure of the company. Hence, it is interesting to see how this uncertainty affects the choices that are made in venture creation.

The descriptive statistics of the sample dispersion, adopted in table 2, show that the sample contains significantly more men (75,7%) than woman (24,3%). This is close to the GEM's statistics about South African Entrepreneurship, which indicates a dispersion of 70% man and 30% woman. The mean age of the sample is 34,7. The level of education indicates that 24,8% of the individuals have a lower educational level than a bachelor's degree. This makes it possible to make a comparison between highly educated and less educated people in the additional findings. The number of ventures and the number of employees fluctuate a lot in the sample size. The most entrepreneurs (60,4%) have less than 5 years' experience. A small part (12,6%) has more than 16 years' experience. The main objective of most entrepreneurs in the sample is profit and growth (72,6%). The other entrepreneurs have the objective to sustain themselves or have a socially responsible company.

3.2. Measurement

Existing scales have been used for each variable as a measurement method. This has been done because previous studies have shown that these methods are effective and yield significant results. All these measurements are based on a Likert scale. Besides, a number of control variables have been added to see if different relationships are affected.

3.2.1. Effectuation and Causation

Because Alsos, Clausen and Solvoll (2014) have the same clarification concerning entrepreneurship, this measurement scale has been used. The researchers have based this scale on the five principles of effectuation and

Table 2 - Mean, Standard deviation and frequency of the control variables

Variable	Mean	SD	Subcategories	Frequency	Percentage
Gender			Male	174	75,7%
			Female	56	24,3%
Age	34,71	10,64	18-25	38	16,5%
			26-35	107	46,5%
			36-55	76	33,0%
			55+	9	3,9%
Degree	3,17	1,38	High school	35	15,2%
			Community college	22	9,6%
			Bachelor's degree	107	46,5%
			Honours degree	8	3,5%
			Master's degree	50	21,7%
			Doctorate degree	8	3,5%
Ventures	2,11	1,064	1	83	36,1%
			2	73	31,7%
			3	39	17,0%
			4 or more	35	15,2%
Experience in years		7,59	0-5	139	60,4%
			6-15	62	27,0%
			16 or more	29	12,6%
Study type			Business	93	40,4%
			Non-Business	137	59,6%
Industry type			Primary/secondary sector	92	40%
			Service sector	138	60%
Employees	3,08	1,35	1	33	14,3%
			2	41	17,8%
			3-5	80	34,8%
			6-10	38	16,5%
			11-49	28	12,2%
			50-249	9	3,9%
			250 or more	1	0,4%
Objective			Profit and growth	167	72,6%
			To sustain myself	36	15,7%
			Non-profit	27	11,7%

five principles causation (Sarasvathy, 2001;2009). The ten-item scale is a critical improvement of the existing scale developed by chandler et al. (2009). The researchers find positive correlations between the principles of effectuation, positive correlations between the principles of causation and negative correlations between the principles of causation and effectuation (Alsos, Clausen and Solvoll, 2014). The measurement of the scale is based on a 7-point scale, from totally disagree to totally degree.

3.2.2. Uncertainty intolerance

In order to measure the intolerance of uncertainty, the measurement scale of Carleton et al. (2007) is used. This measurement scale is

based on the 27-item intolerance of uncertainty scale (Freeston et al., 1994). The researchers reduced their version of the scale to a 12-item scale which has very high correlations to the 27-item version. After the reducing process, the researchers found a two-factor structure. This includes prospective anxiety (7 items) and inhibitory Anxiety (5 items). The internal consistency between these two factors is acceptable and the two remained moderately correlated, which is expected when measuring two aspects of one latent variable. Even though the correlation between the two factors is high, measuring the two factors separately provided the best fits tot previous data. This scale retained exemplary internal consistency and correlates perfectly with the original 27-item scale and other related measures of anxiety and worry. The measurement is based on a 5-point scale, where 1 means totally disagree and 5 means totally agree.

3.2.3. Entrepreneurial passion

Measuring entrepreneurial passion is done by means of a scale created by Cardon et al. (2012). Three different aspects of entrepreneurial passion are distinguished so they can be measured separately, being; Passion for founding, passion for developing and passion for inventing. The measurement is based on a 7-point scale, where 1 means totally disagree and 7 totally agree. The scale exists of 13 questions.

3.2.4. Control variables

Several control variables are included in the survey. First of all, some demographic factors were measured, including the age, gender and nationality of origin of the entrepreneur. The nationality is classified into South African (domestic) and foreigner. The study direction is subdivided into business and a non-business study. Following Dew et al., (2009) MBA students prefer the causation approach over the effectuation approach during the decision-making process in the creation of a company by MBA students. This suggests that higher education is positively aligned with the causation approach. Therefore, the highest level of education completed by the entrepreneur was examined. A classification was made between 1; "primary school" and to 6 "doctoral diploma". The division is set up ordinally by which a higher score means a higher education. The study direction is subdivided into business and a non-business study. In this manner, the study is able to indicate differences between MBA students and non-MBA students. Besides, the respondent was asked about the number of companies started, the years of experience as an entrepreneur and the number of employees employed by the ventures. In addition, the sectors in which the entrepreneur has experience were examined. The industry sector is divided into the primary/secondary sector and the service sector. At last, the main objective of the entrepreneur was assessed. A distinction is made between; “non-profit”, “socially responsible enterprise” and “profit and growth”. The variable is designed on an ordinal basis meaning that a higher score indicates that there is a more profitable objective. A clarification with regard to the control variables and their coding is included in appendix B table 1. The control variables are first used to determine the extent to which they affect the regression during hypothesis testing. Subsequently, a number of additional findings are based on the control variables.

3.3. Pre-test analyses

Before the hypotheses can be tested, several pre-test analyses have to be carried out. Firstly, the reliability of the scales was examined. For this purpose, the Cronbach’s alpha was examined for all variables. Following the rules of thumb of George and Mallery (2003) the outcome of the Cronbach’s alpha can be assessed as follows: >8, = Good, >6 = Questionable, >5 = Unacceptable. The variables effectuation (a=,804), uncertainty intolerance (a=,881) and entrepreneurial passion (a=0,895) all show positive results. This indicates that results based on these variables are generalizable. The Cronbach’s alpha of the causation variable (a= ,585) is more concerning. This indicates that the Cronbach’s alpha is poor,

but not unacceptable. The cause that this Cronbach's alpha is low is both because of the low number of items in the scale and because of the poor mean inter-item correlation (Gliem & Gliem, 2003). Table 2 in Appendix D shows that the Cronbach's Alpha could be improved to 0,63 if the third question would be deleted. Nevertheless, the whole scale is used in the following analysis, because the study is based on an existing and proven scale.

3.3.1. Factor analysis

A Kaiser-Meyer- Olkin (KMO) was conducted for each variable to assess to what extent it is appropriate to perform a factor analysis. The results for the causation/effectuation scale show positive results (KMO=.753; Bartlett's test of sphericity = 532.76; p< .001). This means that the Bartlett's test is rejected, and a factor analysis is appropriate to do because we reject that the variables are uncorrelated. The same applies for the uncertainty intolerance (KMO=.888; Bartlett's test of sphericity= 1176,309; p< .001) and entrepreneurial passion (KMO=,860; Bartlett's test of sphericity= 1498,142; p <,001) scales. To conclude, a factor analysis is appropriate to do for each variable. A principal factor analysis is used because the main purpose was to identify underlying dimensions, or factors, that explain the correlations among a set of variables (Osborne et al., 2008). The inter-correlation matrix of the variables, adopted in Appendix C table 12-15, shows that all the questions from the causation scale are significantly correlated, except question three. Based on the eigenvalues (>1), there could be three factors be extracted from the data, this is because question three is a factor apart since there is no correlation with other factors. Nevertheless, an explanatory factor analysis is used because the theory behind the variable makes clear that two factors should be used (Alsos, Clausen and Solvoll, 2014). These factor analysis shows also a very small loading (0,314) for question three on factor 2. Factor 1, which are the underlying domains of the effectuation scale, all score high loadings (>0,52) on factor 1. This is in line with the correlation matrix, because all questions are significantly correlated. For this reason, these variables have been assembled into an average variable and the variables of Causation and Effectuation are used in the following tests.

The factor analysis of the uncertainty analysis shows two components with an Eigenvalue higher than 1. This is in line with the theory of Carleton et al. (2007), in which a distinction is made between Inhibitory Anxiety and Prospective Anxiety. The pattern matrix and structure matrix, attached in appendix XX, shows high loadings for the questions on the specific factor. Therefore, the variables that load high on the factor have been merged into an average variable and the variables Prospective Anxiety and Inhibitory Anxiety are used in the following tests.

The correlation matrix attached in appendix XX shows that all the questions of entrepreneurial passion are significantly correlated. A Principal axis factoring is used because following literature, the number of variables can be reduced to a smaller number of components (Cardon et al., 2012). This factor analysis loads three components with an Eigenvalue above 1. This is in line with the theory, which has a factor for passion for inventing, founding and developing each. The pattern and structure matrix, attached in appendix XX, show high loadings (> 0,567) for every question in a specific factor. As a result, high loading variables on the factor have been merged into an average variable and the variables passion for inventing, passion for founding and passion for developing will be used in the following tests.

3.3.2. Assumptions

Following Myers (1990) five key assumptions have to be met in order to test the hypotheses from the theoretical framework. These assumptions have to be met to be able to perform a proper hierarchical regression analysis. The first assumption implies that in a multiple linear regression, the relationship

between the independent and dependent variables must be linear. This assumption is tested by both a scatterplot of all the independent variables and both independent variables This assumption has been tested by both a scatterplot of all independent variables together with a dependent variable and a scatterplot for each independent variable separately for a dependent variable. Secondly, the multivariate normality must be checked for the dependent variables. For this purpose, the Shapiro Wilk test is highly recommended because of its high power (Ghasemi and Zahediasl, 2012). The dependent variables causation and effectuation both show to be normally distributed. Thirdly, the multicollinearity of the data is checked by the variance inflation factor (VIF). The norm of this assumption is that the VIF factor of all variables needs to be smaller than 5 (Graham, 2003). Appendix E table 2 shows that there is no or little multicollinearity with the variables, so this assumption is met. The fourth assumption requires that there is no or a little autocorrelation in the data. This assumption can be checked by a Durbin-Watson test. Following Savin and White (1977), the values of the Durbin-Watson test can be between zero and four and need to be around two to prove that there is no autocorrelation. Therefore, appendix E table 3 shows that this assumption is met since all the values are around two the final assumption is homoscedasticity. A scatter plot is a suitable method to check whether the data are homoscedastic (Jarque and Bera, 1980). The scatterplot shows that the residues are equal across the regression line. Therefore, the last assumption is met. To conclude, all the five key assumptions of a multiple linear regression are met.

4. Results

This chapter shows the results of the study. Firstly, the descriptive statistics are given. Then, the hypotheses are tested. At last, some additional findings with the control variables are given.

4.1. Descriptive statistics

Table 3 shows that there are no missing values in the data set since every variable has 230 respondents. The complete table, in which the averages of all the questions are treated separately, can be found in table 3 in appendix B. These results show that in line with the factor analysis and reliability analysis, the mean of the causation variable is decreased due to question three. The mean of this question (3,8) is much lower than the other questions of the scale. The South African entrepreneurs in this sample scored higher on the questions of causation (Mean = 5,08) than those of effectuation (Mean = 3,86). The uncertainty scale has a mean of 2,56. This indicates that the average entrepreneur in South Africa is more likely not being very uncertain. Furthermore, the mean of the passion scale is very high (Mean = 6,15). This indicates that the South African entrepreneurs are very passionate about being a founder, inventor and developer of a business. The means of all questions in this scale are very close to the average of the variable.

Table 3 - Minimum, Maximum, Mean and Standard Deviation of measuring variables

Item	N	Min	Max	Mean	SD
Causation	230	2	7	5,08	,895
Effectuation	230	1	7	3,86	1,402
Prospective Anxiety	230	1	5	2,95	,789
Inhibitory Anxiety	230	1	5	2,01	,923
Passion for inventing	230	3,4	7	6,40	,733
Passion for founding	230	1,5	7	6,07	1,055
Passion for developing	230	2,5	7	5,93	1,021

Table 4 - Correlation matrix

		1	2	3	4	5	6	7	8	9	10
1	Causation	-									
2	Effectuation	**-,280****	-								
3	Prospective Anxiety	**,173****	,039	-							
4	Inhibitory Anxiety	,059	**,194****	**,603****	-						
5	Passion for inventing	**,334****	**-,155***	-,026	**-,155***	-					
6	Passion for founding	**,316****	**-,142***	-,047	-0,098	**,501****	-				
7	Passion for developing	**,353****	**-,141***	,01	-0,098	**,485****	**,618****	-			
8	CV_GENDER	,064	**-,149***	-,083	-0,034	**,198****	,099	,033	-		
9	CV_DEGREE	,123	**-,130***	**-,203****	**-,164***	,062	-,003	-,104	,064	-	
10	CV_Employees	**,188****	**-,275****	-,02	**-,144***	**,174****	**,261****	**,262****	,108	,129	-
11	CV_Objective	**-,224****	**,223****	-,107	,025	**-,209****	**-,247****	**-,183****	**-,193****	,002	0,042

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

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

Note: Only the control variables with significant results on causation/effectuation are showed in this matrix

The correlation matrix, adopted in table 4, indicates the correlations between the measured variables and control variables. These results show various significant relationships. Firstly, the relationships of the causation/effectuation are outlined. The causation approach is significantly correlated with prospective anxiety (R=,173, p=<0,01). This indicates that an entrepreneur with anxiety for future events chooses a more planned approach during the establishment of his company. The use of a causation approach is also correlated with all the domains of entrepreneurial passion; passion for inventing (R=,334, p=<0,01), passion for founding (R=,316, p=<0,01) and passion for developing (R=,353, p=<0,01). This aims that the South African entrepreneurs who are very passionate about being a founder, inventor and developer usually use the causation approach. Moreover, the concept of causation is significantly correlated with the number of employees that his company has (R=,188, p=<0,01). So, it seems that the entrepreneurs with a causation approach have more employees working for them. The effectuation approach has significant positive relationships with inhibitory anxiety (R=,194, p=<0,01) and gender (R=,194, p=<1,49). This indicates that an entrepreneur with inhibiting anxiety chooses an approach in which less is planned and more attention is paid to his resources. All the factors of entrepreneurial passion are significant negatively correlated with the effectuation approach; passion for inventing (R=-,155, p=<0,05), passion for founding (R=-,142, p=<0,05) and passion for developing (R=-,141, p=<0,05). It also has negative relations with degree (R=-,130, p=<0,05) and employees (R=-,275, p=<0,01).

4.2. Hypotheses testing

SPSS version 25 was used to test the literature-based hypotheses. A hierarchical multiple regression is performed for each of the dependent variables; causation and effectuation.

Predicting causation from the independent variables.

Table 5 presents to prediction of the causation approach by all the independent variables. Model 1 presents the predicting effect of the

control variables on the causation approach. This indicates that employees (β= ,162; P=< ,05) and objective (β= ,220; P=< ,01) have a positive regression coefficient on the causation approach. The full model of the control variables is statistically significant (R^2=,111; F=2,733; P=<,01). Model 2 of table 5 shows the regression results including the addition of the independent variables. The full model is statistically significant (R^2=,256; F=4,903; P=<,01). Model 2 only shows the significant results of the control variables, which are degree (β= ,165; P=< ,01) and objective (β= ,117; P=< ,05).

The following sector will discuss all the hypotheses with causation as the dependent variable. Each hypothesis related to the causation approach is examined and subsequently accepted or rejected.

H1a describes the expected relationship between prospective anxiety and the causation approach. The results in table 1 model 3 show that there is a positive significant relationship between prospective anxiety and the causation approach (β= ,153; P=< ,05). These results indicate that the literature-based relationship between the two concepts is truly positive. Therefore, H1a is accepted. Moreover, H2a indicates that there should be a positive relationship between inhibitory anxiety and the causation approach. The results in the second model show that the relationship between inhibitory anxiety is indeed positive, but insignificant (β= ,051; P=> ,05). There is no evidence to support the literature-based hypotheses, therefore we reject H1b.

Table 5 - Predicting Causation from the independent variables

	Model 1		Model 2		Model 3	
	β	T	β	T	β	T
Constant		8,698**				
CV_AGE	,084	,89				
CV_GENDER	,014	,211				
CV_NATIONALITY	-,021	-,316				
CV_DEGREE	,108	1,635	**,165****	**2,589**	**,163***	**2,560**
CV_STUDY	,082	1,256				
CV_Ventures	-,084	-1,012				
CV_Experiences	,035	,327				
CV_Employees	**,162***	**2,330**				
CV_Industry	-,027	-,401				
CV_Objective	**,220****	**3,324**	**,117***	**1,812**		
Prospective anxiety			**,153***	**1,959**	,154	1,960
Inhibitory anxiety			,051	,666	,055	0,714
Passion for inventing			**,181***	**2,444**	**,171***	**2,243**
Passion for founding			,071	,871	,091	1,070
Passion for developing			**,205***	**2,524**	**,201***	**2,446**
INT_PassionXProspective					-0,067	-0,956
INT_PassionXInhibitory					0,023	0,328
Summary						
R2	**,111****		**,256****		,259	
F	**2,733****		**4,903****		4,359	
R2 change	**,111****		**,154****		,003	
F-change	**4,022****		**8,329****		,461	

The literature-based hypotheses suggest that two of the factors of entrepreneurial passion, passion for inventing and passion for founding are positive related to the effectuation approach. Remarkable is that the results in table 5 show that passion for inventing is positive significantly related to the causation approach (β=,181; P=< ,05). Moreover, the causation approach also has a positive significant relationship with passion for developing (β=,205; P=< ,05). This finding confirms the relationship that has been established based on the literature. Therefore, H2c is accepted.

In addition to the relationships between the causation approach and the independent variables, the extent to which entrepreneurial passion moderates the relationship between the factors of uncertainty intolerance and causation was also examined. The results are presented in model 3 of table 5. The full model of the independent variables with the addition of two moderators is statistically insignificant (R^2=,259; F=4,359; P=>,05). Likewise, the two added moderators also both have insignificant loadings. The interaction between passion and prospective anxiety is insignificantly negative correlated (β=-,067; P=> ,05) and so is the effect of the interaction between passion inhibitory anxiety (β=-,023; P=> ,05). Therefore, there have enough evidence to reject H3a.

Predicting effectuation from the independent variables.

Table 6 contains the prediction of the effectuation approach by all independent variables by a hierarchical multiple regression. The first model shows the predictive effect of the control variables on the effectuation approach. Model 2 of table 5 shows the regression results including the addition of the independent variables. The full model of control variables predicting the effectuation approach is statistically significant (R^2=,155; F=4,022; P=<,01). This indicates that the total variation of the effectuation approach is determined by the control variables for 15.5%. The results of model 1 show that employees (β=-,245; P=<,01) and objective (β=,220; P=<,01) both have a negative regression coefficient on the effectuation approach.

The next sector will consider all hypotheses with effectuation as a dependent variable. Every hypothesis regarding the effectuation approach is examined and subsequently accepted or rejected. The results of this regression are subtracted in model 2 of table 6. The first noteworthy feature is that the full model of control variables and the addition of the independent variables is statistically insignificant (R^2=,182; F=3,183; P=>,05). Considering to the addition of the independent variables to control variables, employees and objective still have their significance. The first hypothesis regarding effectuation directs the proposed relationship between prospective anxiety and effectuation negative. Looking at the results there is indeed a negative but insignificant relationship (β=-,004; P=> ,05). Therefore, we do not accept the hypothesis H1c. Furthermore, following the literature, there is a proposed negative relationship between inhibitory anxiety and the effectuation approach. But on the contrary, the results show that the relationship between inhibitory anxiety and the effectuation approach has a significantly positive relationship (β=-,193; P=< ,05). This indicates that individuals with inhibitory anxiety are more likely to opt for an effectuation approach. Consequently, there is enough evidence to reject the hypothesis H1d. Moreover, the factors of entrepreneurial passion are discussed. According to the literature, the first two factors of entrepreneurial passion, inventing and founding, are both positively linked to the effectuation approach. The results in table 6 show that passion for inventing has a small negative but insignificant regression on the effectuation approach (β=-,094; P=> ,05). Passion for founding has an insignificant but small positive impact on effectuation (β=-,094; P=> ,05). Consequently, the hypothesis H2b is

rejected. The last factor of entrepreneurial passion, passion for development, is linked to the causation approach by the literature-based hypothesis. This is reinforced by the fact that there is indeed no significant relationship between passion for developing and the effectuation approach.

Furthermore, the moderating effect of entrepreneurial passion on the relationship between prospective and inhibitory anxiety on the effectuation approach was also examined. The results of this regression are given in model 3 of table 6 and is statistically insignificant (R^2=,205; F=3,209; P=>,05). Consequently, it appears that there is no moderating effect of entrepreneurial passion on the relationship between the factors of uncertainty intolerance and the effectuation approach.

Entrepreneurial passion as a mediator between the relationship of uncertainty intolerance and the decision-making process; effectuation/ causation.

A hierarchical multiple regression was performed to test the extent to which the factors of entrepreneurial passion have a mediator effect on the relationships between prospective and inhibitory anxiety on the decision-making process. The results are presented in table 7. Model 1 has been omitted because it does not provide any new information with respect to the previous tables. Looking at the results, model 2 shows that, as with the previous tables, prospective anxiety has a positive significant regression on the causation approach (β=,171; P=<,05). It is interesting to note that when the factors of entrepreneurial passion are added to model 3, prospective anxiety loses its

Table 6 - Predicting Effectuation from the independent variables

	Model 1		Model 2		Model 3	
	β	T	β	T	β	T
Constant		**10,98****		**7,031****		**6,620****
CV_AGE	-,124	-1,346				-
CV_GENDER	-,091	-1,378				
CV_NATIONALITY	-,107	-1,669				
CV_DEGREE	-,109	-1,696				
CV_STUDY	,019	,296				
CV_Ventures	-,041	-,504				
CV_Experiences	,109	1,04				
CV_Employees	**-,245****	**-3,615**	**-,209****	**-2,965**	**-,218****	**-3,117**
CV_Industry	,023	,354				
CV_Objective	**-,185****	**-2,857**	**-,162***	**-2,403**	**-,169***	**-2,524**
Prospective anxiety			-,094	-1,154		
Inhibitory anxiety			**,193***	**2,395**	**,204***	**2,558**
Passion for inventing			-,014	-,186		
Passion for founding			,013	,156		
Passion for developing			-,053	-,629		
INT_PassionXProspective					-,131	-1,818
INT_PassionXInhibitory					-,050	-,694
Summary						
R2	**,155****		,182		,205	
F	**4,022****		3,183		3,209	
R2 change	**,155****		,027		,022	
F-change	**4,022****		1,427		,461	

significance on the causation approach (β=,153; P=>,05). This indicates that the variation in causation devoted by prospective anxiety is actually explained by the factors of entrepreneurial passion. Moreover, the relationship between inhibitory anxiety remains insignificant in both models in table 7. This is similar to the previous results and this indicates that there is no mediating effect of the factors of uncertainty intolerance and the effectuation approach. To summarize, the addition of the factors of entrepreneurial passion is partially mediating the relationship between uncertainty intolerance and the decision-making process in venture creation. Therefore, we partially accept the hypothesis.

4.3. Additional findings

The control variables have allowed several significant relationships to be established with the dependent variables. These significant relationships are further described.

Control variables predicting the causation/effectuation approach

Model 2 in table 4 presents the predicting of the causation approach by the control variables and the other independent variables. This full model is significant (R^2=,256; F=4,903; P=<0,01). The results indicate that there are two significant positive relationships between the control variables and the causation approach. The level of education (degree) and the causation approach indicates that entrepreneurs who use a causation method have a higher level of education (β=,165; P=< 0,01). This is in line

Table 7 - Mediating effect of entrepreneurial passion on the relationship between uncertainty intolerance on the decision-making approach (H4)

	Causation				Effectuation			
	Model 2		Model 3		Model 2		Model 3	
	β	T	β	T	β	T	β	T
Constant		**6,304****		1,018		**9,228**		**7,031**
CV_AGE								
CV_GENDER								
CV_NATIONALITY								
CV_DEGREE	**,143***	2,143	**,165***	2,589				
CV_STUDY								
CV_Ventures								
CV_Experiences								
CV_Employees	**,155***	2,219			**-,219***	-3,221	**-,209****	-2,965
CV_Industry								
CV_Objective	**,197****				**-,170***	-2,622	**-,162***	-2,403
Prospective Anxiety	**,171***	2,065	,153	1,959	-,097	-1,206	-,094	-1,154
Inhibitory anxiety	-,003	-,036	,051	,666	,200	2,53	**,193***	2,395
Passion for inventing			**,181***	**2,444**			-,014	-,186
Passion for founding			,071	,871			,013	,156
Passion for developing			**,205***	**2,524**			-,053	-,629
Summary								
R2	**,137***		**,256****		,180		,182	
F	**2,866****		**4,903****		**4,187****		**3,183****	
R2 change	**,026***		**,119****		**,025***		,002	
F-change	**3,253***		**11,402****		**3,274**		,219	

with the theory of Sarasvathy (2001), who suggest that causation is titled as the MBA approach. Besides, there is a positive relationship between the objective of the entrepreneur and the causation approach (β=,117; P=< 0,05). Since a higher score of objective refers to a higher focus on profitability and growth, these results indicate that an entrepreneur who uses a causation approach has more focus on profit and growth.

Model 2 in table 6 presents the predicting of the effectuation approach by the control variables. This full model is insignificant (R^2=,182; F=3,183; P=>0,05). Nevertheless, the results indicate that there are two significant negative relationships between the control variables and the effectuation approach. The negative relationship between the number of employees and the effectuation approach (β=-,209; P=< ,01) indicates that entrepreneurs who use an effectuation method have fewer employees working for their organizations. Moreover, there is a negative relationship between the objective of the entrepreneur and the causation approach (β=-,162; P=< 0,05). Since a higher score of objective refers to a higher focus on profitability and growth, these results indicate that in an entrepreneur who uses an effectuation approach has less focus on profit and growth.

And more focus on non-profit organizations or socially responsible enterprises.

4.4. Hypothesis overview

The results chapter concludes with an overview of all hypotheses drawn up based on theory. Table 8 shows that 2 of the hypotheses are fully accepted. First of all, the expected positive relationship between prospective anxiety and the causation approach Next, the expected positive relationship between passion for development and the causation approach.

Table 8 - Hypothesis overview

Hypothesized				Results		
H	Predictor	Dependent variable	Direction	βeta	Statistical significance	Hypothesis
1A	Prospective anxiety	Causation	+	,153	Significant (5%)	Accepted
1B	Inhibitory anxiety	Causation	+	,051	Insignificant	Rejected
1C	Prospective anxiety	Effectuation	-	-,094	Insignificant	Rejected
1D	Inhibitory anxiety	Effectuation	-	,193	Significant (5%)	Rejected
2A	Passion for inventing	Effectuation	+	-,014	Insignificant	Rejected
2B	Passion for founding	Effectuation	+	,013	Insignificant	Rejected
2C	Passion for developing	Causation	+	,205	Significant (5%)	Accepted
3A	Interaction passion_prospective	Causation	+/-	-,067	Insignificant	Rejected
3B	Interaction passion_prospective	Causation	+/-	,023	Insignificant	Rejected
4	Mediator Passion	Causation/ Effectuation	+/-			Partially Accepted

5. Conclusion and discussion

This research contributes to the insights that currently exist regarding the decision-making process in business creation. In the literature research, it has been suggested that the decision-making process is influenced by the concepts of uncertainty intolerance and entrepreneurial passion.

5.1. Conclusion

To conclude, the main purpose of this study was to investigate whether the decision-making process in venture creation is influenced by domains of entrepreneurial passion (passion for inventing, passion for founding and passion for developing) and the factors of uncertainty intolerance (prospective anxiety and inhibitory anxiety). Furthermore, this study examined the extent to which the domains of entrepreneurial passion have a moderating/mediating influence in the relationship between uncertainty intolerance and causation/effectuation. This has resulted in the following research questions.

"To what extent does uncertainty intolerance and entrepreneurial passion influence the approach for decision making in venture creation; causation or effectuation?".

"*To what extent does entrepreneurial passion have a moderating/mediating influence on the relationship between uncertainty intolerance and the decision-making process in venture creation?"*

The results of the study show that each of the factors of the uncertainty intolerance scale has a significant impact on another approach in venture creation. Individuals with prospective anxiety choose for an effectuation approach. On the contrary, people with inhibitory anxiety are more used to opt for an effectuation approach. The factors of entrepreneurial passion are no significant predictors of the effectuation approach. The factors passion for founding and passion for developing have a positive influence on the choice for a causation approach. There is no moderating effect of entrepreneurial passion on the relationship between the factors of uncertainty intolerance and the decision-making approach in venture creation. Nevertheless, there is found a significant mediating effect of entrepreneurial passion in the relationship between prospective anxiety and the causation approach. This indicates that the variation in the relationship between the two concepts can be dedicated to the factors of entrepreneurial passion. Due to these new insights, this study contributes to research in entrepreneurship.

5.2. Theoretical implications

The concepts of causation/effectuation, entrepreneurial passion and uncertainty intolerance have been investigated several times before, both theoretically and empirically. However, much more added value can be achieved here. This report juxtaposes the concepts of effectuation and causation, entrepreneurial passion and uncertainty intolerance, which is a unique relationship itself. Nevertheless, several arguments are given as to why this combination has even more implications.

Following Arend et al. (2015) is the concept of effectuation currently underdeveloped as a new perspective on entrepreneurship. They recommend more comparison pieces in order to be able to better understand any possible downsides of effectuation. In addition, the concept is still limited investigated in empirical relationships with other antecedents like the individuals of entrepreneurs (Arend et al. 2015; Chandler et al., 2011; Perry et al., 2011). For example, the concept is related to the actions of entrepreneurs in uncertain situations (Wiltbank et al., 2006; Sarasvathy & Kotha, 2001), but not to the uncertainty of the person himself. This is an interesting perspective when looking at what kind of decisions the person makes while experiencing uncertain characteristics. According to Gartner (1989), there is a need for development in the understanding of personal

traits of entrepreneurs, this should be the focus in the entrepreneurship literature.

This empirical study shows that the uncertainty of the entrepreneur has a significant influence on the decision-making process of the entrepreneur. An interesting point is that each of the uncertainty factors distinguished by Carleton et al. (2007) exerts a positive influence on another aspect of the decision-making process. Prospective anxiety, in which the individual is afraid to with future events is positively linked to the causation approach. inhibitory anxiety reveals that people who impede operation or experience new opportunities are more likely to opt for an effectuation approach. Considering the differentiation of the two concepts causation and effectuation by Sarasvathy (2001) indicate that individuals with prospective anxiety are therefore more inclined to predict the uncertain future. This is in line with the indicated relationship between the concepts based on literature. The positive significant relationship between inhibitory anxiety and effectuation is more difficult to explain. From a theoretical perspective is stated that individuals with an effectuation approach should function in an uncertain environment (Chandler et al., 2011; Perry et al., 2011; Sarasvathy, 2001). Therefore, it is striking that the findings in this research show that entrepreneurs with inhibitory anxiety are more likely to opt for an effectuation approach.

Moreover, the existing empirical research in the field of passion as an emotion in entrepreneurship is still very limited (Cardon et al., 2012). As a result, the development of the concept in relation to other concrete strategies within the business is not yet clear. For instance, the theory lacks to play a significant role in evidence about the role of passion towards goals despite significant obstacles and improving new venture survival and performance (Utsch and Rauch, 2000; Murnieks ,Mosakowski & Cardon, 2014). Improving new venture survival and performance is also an issue in the decision-making process in new venture creation (Sarasvathy, 2001). For this reason, it is interesting to empirically investigate whether the relationship between passion and decision making is actually present. The results show that two domains of entrepreneurial passion, inventing and developing, have a positive significant effect on the causation approach. It was not possible to predict the outcome for effectuation by the domains of passion. Based on the literature, it was assumed, as well as the results show, that passion for developing is positively linked to causation. These individuals are inclined to adopt a planned approach in order to further develop their venture. Contrary to what has been hypothetically identified in the literature, the results of this research show that a passion for inventing has a significant positive influence on the causation approach. People with a passion for inventiveness scan the market for new opportunities and would like to implement new products or services in it (Cardon et al., 2009). This has similarities with the description of the effectuation approach (Sarasvasthy, 2001). Nevertheless, the results show that these entrepreneurs are more likely to choose for the causation approach and use a planned strategy to implement new products and services.

Furthermore, an interesting perspective of an obstacle is the intolerance of uncertainty in relationships with entrepreneurial passion and other concepts, entrepreneurial passion is often assumed as a dependent variable. Chen et al. (2009) have proved that the behaviour of entrepreneurs can be explained by passion. The concepts of entrepreneurial passion and uncertainty intolerance both can be considered individual traits that influence a variety of issues. In this study they are both considered as independent variables on the decision-making process, but the factors of entrepreneurial passion are also regarded as an influence on the relationship on the other two concepts. Not all the passion that an entrepreneur experiences have to be harmonious. Individuals who are

obsessed with entrepreneurship, passion can perhaps be the linkage between the identity of an entrepreneur and his behaviour in entrepreneurship (Murnieks et al., 2014). The results of this research shows that the factors of entrepreneurial passion as a moderator have no significant effect on the relationship between uncertainty intolerance and the decision-making process. Nevertheless, this study reveals significant results for entrepreneurial passion being a mediator in the relationship between prospective anxiety and the causation approach. This indicates that passion indeed can depict a relationship of antecedents in entrepreneurial behaviour.

The last implication is this unique dataset of 230 entrepreneurs from South Africa. These entrepreneurs all differ in characteristics and there is a useful scope of entrepreneurs. This research is the first empirical evidence regarding the concept of effectuation/causation that has been collected from this country. This has headed to the creation of new insights into the geographical area of the concept of the decision-making process and its antecedents.

5.3. Limitations

Even though this research has attempted to produce unbiased results, some limitations need to be respected. First of all, it is difficult to make a statement about entrepreneurship across South Africa based on these results, since the distribution of entrepreneurs across the country was not considered. It is assumed that this is distributed equitably across the country, because the researchers have traveled through different places in the country to reach entrepreneurs. But it needs to be considered carefully before the results are generalized for all South Africans.

Secondly, the reliability analysis reveals that a poor but acceptable Cronbach's alpha (a = ,567) has been obtained for the causation scale. The inter-correlation shows that this is mainly caused by question 3 in the measurement scale. This is the only item that is not correlated with other questions in the scale. Therefore, one has to question whether the causation scale actually measures the initiated construct. Nevertheless, the low Cronbach's Alpha is mainly due to the small scale of 5 items instead of the low inter-relatedness (Tavakol, & Dennick 2011).

5.4. Recommendations for future research

In addition to the new insights provided by this research, several directions for future research are given. First of all, in future research, it may be worthwhile to measure the distribution of entrepreneurs throughout the country. During the field study, the researcher noticed that there are many social differences per region in the country. It will be relevant for future research to take this into account and to examine to what extent this influences the decision-making process of entrepreneurs.

Secondly, it is recommended to measure the antecedents of the decision-making process in this study in a larger sample. This makes it possible to check whether a larger sample continues to give the same significant results or whether additional results are given.

Thirdly, a comparison of the results of this study with the results of similar studies in other countries provides an interesting insight. As mentioned before, the South African culture as a unique one and entrepreneurs are dealing with very different problems that entrepreneurs have elsewhere. Therefore, it is interesting to broaden the research and make comparisons between the decision-making process in different countries, and therefore different cultures, economies and values.

Fourthly, the causation scale has revealed a low Cronbach's Alpha and consequently a low intercorrelation. This shows that the scale is not yet adequately valid. Future research would benefit by considering this and examining how this construct can be improved. This makes the results of the scale more generalizable to the entire population.

5.5. Practical implications

The first practical implication is the new insight into the use of a decision-making method, a causation or effectuation approach, among entrepreneurs in general. The used sample consists of a group of entrepreneurs who differ a lot from characteristics. The results show that a causation approach (M=5,08; SD=,90) is significantly more used than an effectuation approach (M=3,86; SD=1,4) among this data set. This shows that entrepreneurs are generally more likely to opt for a more planned approach. Moreover, the entrepreneurs in this sample score very high on the passion scale (M=6,15; SD=,766). This reveals that the individuals in this sample are very passionate about being an entrepreneur. The entrepreneurs in the sample score in the on average in the middle intolerance of uncertainty scale (M=2,56; SD=,757). This demonstrates the division in the uncertainty experienced by entrepreneurs.

Another practical implication is committed to the entrepreneurs in South Africa. Entrepreneurs in this environment have to face major political and economic difficulties. In a country with the second-largest unemployment factor in the world, entrepreneurs exert a lot of pressure to succeed. Throughout the field research in South Africa, the researcher had the opportunity to discuss with several entrepreneurs about initiating a business in this environment. This has shown that 'apartheid' still has an impact on contemporary activities. The background of individuals in this country influences the opportunities they have. This has commanded entrepreneurs to experience uncertainty, because much depends on the success of the company. This created an additional interest to discuss the decision-making process of these entrepreneurs. In line with the results of the research, the entrepreneurs have shown to be very passionate about their business concept. The entrepreneurs invest a lot of time and effort into their business and really go for their purpose.

The last implication is for entrepreneurship in general. New and existing entrepreneurs can benefit from the theory in this report. Adhering to the conceptual model allows entrepreneurs to identify which factors influence the decision-making process. prospective anxiety causes entrepreneurs to prefer to use a more planned approach. On the other hand, entrepreneurs with inhibitory fear are more likely to go for an effectuation approach. Entrepreneurs can also influence the decision-making process through the extent of passion they have.

References

Alexander, E. S., & Onwuegbuzie, A. J. (2007). Academic procrastination and the role of hope as a coping strategy. *Personality and Individual Differences*, *42*(7), 1301-1310.

Alsos, G. A., Clausen, T. H., & Solvoll, S. (2014). Towards a better measurement scale of causation and effectuation. In *Academy of Management Proceedings* (Vol. 2014, No. 1, p. 13785). Briarcliff Manor, NY 10510: Academy of Management.

Andersson, S. (2011). International entrepreneurship, born globals and the theory of effectuation. *Journal of Small Business and Enterprise Development*, *18*(3), 627-643.

Baron, R. A. (2008). The role of affect in the entrepreneurial process. *Academy of management Review*, *33*(2), 328-340.

Baum, J. R., & Locke, E. A. (2004). The relationship of entrepreneurial traits, skill, and motivation to subsequent venture growth. *Journal of applied psychology*, *89*(4), 587.

Baum, J. R., Locke, E. A., & Smith, K. G. (2001). A multidimensional model of venture growth. *Academy of management journal*, *44*(2), 292-303.

Berends, H., Jelinek, M., Reymen, I., & Stultiëns, R. (2014). Product innovation processes in small firms: Combining entrepreneurial effectuation and managerial causation. *Journal of Product Innovation Management*, *31*(3), 616-635.

Boelen, P. A., & Reijntjes, A. (2009). Intolerance of uncertainty and social anxiety. *Journal of anxiety disorders*, *23*(1), 130-135.

Breugst, N., Domurath, A., Patzelt, H., & Klaukien, A. (2012). Perceptions of entrepreneurial passion and employees' commitment to entrepreneurial ventures. *Entrepreneurship Theory and Practice*, *36*(1), 171-192.

Brews, P. J., & Hunt, M. R. (1999). Learning to plan and planning to learn: Resolving the planning school/learning school debate. *Strategic Management Journal*, *20*(10), 889-913.

Brettel, M., Mauer, R., Engelen, A., & Küpper, D. (2012). Corporate effectuation: Entrepreneurial action and its impact on R&D project performance. *Journal of Business Venturing*, *27*(2), 167-184.

Buhr, K., & Dugas, M. J. (2002). The intolerance of uncertainty scale: psychometric properties of the English version. *Behaviour research and therapy*, *40*(8), 931-945.

Burke, P. J., & Reitzes, D. C. (1991). An identity theory approach to commitment. *Social psychology quarterly*, 239-251.

Busenitz, L. W. (1996). Research on entrepreneurial alertness. *Journal of Small Business Management*, *34*(4), 35.

Cardon, M. S., Gregoire, D. A., Stevens, C. E., & Patel, P. C. (2013). Measuring entrepreneurial passion: Conceptual foundations and scale validation. *Journal of Business Venturing*, *28(3),* 373-396.

Cardon, M. S., Post, C., & Forster, W. R. (2017). Team entrepreneurial passion: Its emergence and influence in new venture teams. *Academy of Management Review*, *42*(2), 283-305.

Cardon, M. S., Wincent, J., Singh, J., & Drnovsek, M. (2009). The nature and experience of entrepreneurial passion. *Academy of management Review*, *34*(3), 511-532.

Cardon, M. S., Zietsma, C., Saparito, P., Matherne, B. P., & Davis, C. (2005). A tale of passion: New insights into entrepreneurship from a parenthood metaphor. *Journal of business venturing*, *20*(1), 23-45.

Carleton, R. N., Norton, M. P. J., & Asmundson, G. J. (2007). Fearing the unknown: A short version of the Intolerance of Uncertainty Scale. *Journal of anxiety disorders*, *21*(1), 105-117.

Chandler, G. N., DeTienne, D. R., McKelvie, A., & Mumford, T. V. (2011). Causation and effectuation processes: A validation study. *Journal of business venturing*, *26*(3), 375-390.

Chen, X. P., Yao, X., & Kotha, S. (2009). Entrepreneur passion and preparedness in business plan presentations: a persuasion analysis of venture capitalists' funding decisions. *Academy of Management journal*, *52*(1), 199-214.

Chesbrough, H. (2006). Open business models: How to thrive in the new innovation landscape. Harvard Business Press.

Cliff, J. E. (1998). Does one size fit all? Exploring the relationship between attitudes toward growth, gender, and business size. *Journal of business venturing*, *13*(6), 523-542.

Collewaert, V., Anseel, F., Crommelinck, M., De Beuckelaer, A., & Vermeire, J. (2016). When passion fades: disentangling the temporal dynamics of entrepreneurial passion for founding. *Journal of Management Studies*, *53*(6), 966-995.

D'zurilla, T. J., & Goldfried, M. R. (1971). Problem solving and behavior modification. *Journal of abnormal psychology*, *78*(1), 107.

Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2009). Effectual versus predictive logics in entrepreneurial decision-making: Differences between experts and novices. *Journal of business venturing*, *24*(4), 287-309.

Douglas, E. J., & Shepherd, D. A. (2000). Entrepreneurship as a utility maximizing response. *Journal of business venturing*, *15*(3), 231-251.

Dugas, M. J., Freeston, M. H., & Ladouceur, R. (1997). Intolerance of uncertainty and problem orientation in worry. *Cognitive therapy and research*, *21*(6), 593-606.

Dugas, M. J., Hedayati, M., Karavidas, A., Buhr, K., Francis, K., & Phillips, N. A. (2005). Intolerance of uncertainty and information processing: Evidence of biased recall and interpretations. *Cognitive Therapy and Research*, *29*(1), 57-70.

Eisenhardt, K. M., & Schoonhoven, C. B. (1996). Resource-based view of strategic alliance formation: Strategic and social effects in entrepreneurial firms. *organization Science*, *7*(2), 136-150.

Fatoki, O. (2014). The causes of the failure of new small and medium enterprises in South Africa. *Mediterranean Journal of Social Sciences*, *5*(20), 922.

Fisher, G. (2012). Effectuation, causation, and bricolage: A behavioural comparison of emerging theories in entrepreneurship research. *Entrepreneurship theory and practice*, *36*(5), 1019-1051.

Fong, C. T., & Tiedens, L. Z. (2002). Dueling experiences and dual ambivalences: Emotional and motivational ambivalence of women in high status positions. *Motivation and Emotion*, *26*(1), 105-121.

Freeston, M. H., Rhéaume, J., Letarte, H., Dugas, M. J., & Ladouceur, R. (1994). Why do people worry? *Personality and individual differences*, *17*(6), 791-802.

Gartner, W. B. (1989). Some suggestions for research on entrepreneurial traits and characteristics. *Entrepreneurship theory and practice*, *14*(1), 27-38.

Gartner, W., Starr, J., & Bhat, S. (1999). Predicting new venture survival: An analysis of "anatomy of a start-up." cases from Inc. Magazine. *Journal of Business Venturing*, *14*(2), 215-232.

Gaglio, C. M., & Katz, J. A. (2001). The psychological basis of opportunity identification: Entrepreneurial alertness. *Small business economics*, *16*(2), 95-111.

Grant, R. M., & Baden-Fuller, C. (2004). A knowledge accessing theory of strategic alliances. *Journal of management studies*, *41*(1), 61-84.

Greco, V., & Roger, D. (2003). Uncertainty, stress, and health. *Personality and Individual differences*, *34*(6), 1057-1068.

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update* (4th ed.). Boston: Allyn & Bacon.

Ghasemi, A., & Zahediasl, S. (2012). Normality tests for statistical analysis: a guide for non-statisticians. *International journal of endocrinology and metabolism*, *10*(2), 486.

Gliem, J. A., & Gliem, R. R. (2003). Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales. Midwest Research-to-Practice Conference in Adult, Continuing, and Community Education.

Graham, M. H. (2003). Confronting multicollinearity in ecological multiple regression. *Ecology*, *84*(11), 2809-2815.

Gundry, L. K., & Welsch, H. P. (2001). The ambitious entrepreneur: High growth strategies of women-owned enterprises. *Journal of business venturing*, *16*(5), 453-470.

Herrington, M., Kew, J., Kew, P., & Monitor, G. E. (2010). *Tracking entrepreneurship in South Africa: A GEM perspective* (pp. 1-174). South Africa: Graduate School of Business, University of Cape Town.

Jarque, C. M., & Bera, A. K. (1980). Efficient tests for normality, homoscedasticity and serial independence of regression residuals. *Economics letters*, *6*(3), 255-259.

Johansson, A., & McKelvie, A. (2012). Unpacking the antecedents of effectuation and causation in a corporate context. *Frontiers of Entrepreneurship Research*, *32*(17), 1.

Katila, R., & Ahuja, G. (2002). Something old, something new: A longitudinal study of search behavior and new product introduction. *Academy of management journal*, *45*(6), 1183-1194.

Katz, J., & Gartner, W. B. (1988). Properties of emerging organizations. *Academy of management review*, *13*(3), 429-441.

Kirzner, I. M. (1979). *Perception, opportunity, and profit: Studies in the theory of entrepreneurship* (pp. 142-143). Chicago: University of Chicago press.

Laugesen, N., Dugas, M. J., & Bukowski, W. M. (2003). Understanding adolescent worry: The application of a cognitive model. *Journal of Abnormal Child Psychology*, *31*(1), 55-64.

Metzger, R. L., Miller, M. L., Cohen, M., Sofka, M., & Borkovec, T. D. (1990). Worry changes decision making: The effect of negative thoughts on cognitive processing. *Journal of Clinical Psychology*, *46*(1), 78-88.

McMullen, J. S., & Shepherd, D. A. (2006). Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management review*, *31*(1), 132-152.

Murnieks, C., & Mosakowski, E. (2007). Who am I? looking inside the 'entrepreneurial identity'.

Murnieks, C. Y., Mosakowski, E., & Cardon, M. S. (2014). Pathways of passion: Identity centrality, passion, and behavior among entrepreneurs. *Journal of Management*, *40*(6), 1583-1606.

Myers, R. H., (1990). *Classical and modern regression with applications* (Vol. 2). Belmont, CA: Duxbury press.

Osborne, J. W., Costello, A. B., & Kellow, J. T. (2008). Best practices in exploratory factor analysis. *Best practices in quantitative methods*, 86-99.

Perry, J. T., Chandler, G. N., & Markova, G. (2012). Entrepreneurial effectuation: a review and suggestions for future research. *Entrepreneurship Theory and Practice*, *36*(4), 837-861.

Reymen, I. M., Andries, P., Berends, H., Mauer, R., Stephan, U., & Van Burg, E. (2015). Understanding dynamics of strategic decision making in venture creation: a process study of effectuation and causation. *Strategic entrepreneurship journal*, *9*(4), 351-379.

Roach, D. C., Ryman, J. A., & Makani, J. (2016). Effectuation, innovation and performance in SMEs: an empirical study. *European Journal of Innovation Management*, *19*(2), 214-238.

Sarasvathy, S. D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of management Review*, *26*(2), 243-263.

Sarasvathy, S. D. (2009). *Effectuation: Elements of entrepreneurial expertise*. Edward Elgar Publishing.

Sarasvathy, S. D., & Dew, N. (2005). New market creation through transformation. *Journal of evolutionary economics*, *15*(5), 533-565.

Sarasvathy, S. D., Dew, N., Velamuri, S. R., & Venkataraman, S. (2003). Three views of entrepreneurial opportunity. In *Handbook of entrepreneurship research* (pp. 141-160). Springer, Boston, MA.

Sarasvathy, S. D., & Kotha, S. (2001). Managing knightian uncertainty in the new economy. *E-Commerce and Entrepreneurship. Greenwich, CT: IAP*, 31-62.

Savin, N. E., & White, K. J. (1977). The Durbin-Watson test for serial correlation with extreme sample sizes or many regressors. *Econometrica: Journal of the Econometric Society*, 1989-1996.

Schumpeter, J. A. (1912). 1934/1983: The Theory of Economic Development (with an Introduction by John E. Elliott). New Brunswick.

Shah, S. K., & Tripsas, M. (2007). The accidental entrepreneur: The emergent and collective process of user entrepreneurship. *Strategic entrepreneurship journal*, *1*(1-2), 123-140.

Smith, N. R., & Miner, J. B. (1983). Type of entrepreneur, type of firm, and managerial motivation: Implications for organizational life cycle theory. *Strategic management journal*, *4*(4), 325-340.

Smith, R., & McElwee, G. (2011). After the fall: developing a conceptual script-based model of shame in narratives of entrepreneurs in crisis!. *International journal of sociology and social policy*, *31*(1/2), 91-109.

Stryker, S., & Burke, P. J. (2000). The past, present, and future of an identity theory. *Social psychology quarterly*, 284-297.

Sundararajan, M., Peters, L., 2007. Role of emotions in the entrepreneur's opportunity recognition process. *Paper Presented at the Academy of Management Conference. Philadelphia, PA*.

Tallis, F., Eysenck, M., & Mathews, A. (1991). Elevated evidence requirements and worry. *Personality and Individual Differences*, *12*(1), 21-27.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education*, *2*, 53.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *science*, *185*(4157), 1124-1131.

Utsch, A., & Rauch, A. (2000). Innovativeness and initiative as mediators between achievement orientation and venture performance. *European journal of work and organizational psychology*, *9*(1), 45-62.

Vallerand, R. J., Blanchard, C., Mageau, G. A., Koestner, R., Ratelle, C., Léonard, M., ... & Marsolais, J. (2003). Les passions de l'ame: on obsessive and harmonious passion. *Journal of personality and social psychology*, *85*(4), 756.

Von Gelderen, M., Frese, M., & Thurik, R. (2000). Strategies, uncertainty and performance of small business startups. *Small Business Economics*, *15*(3), 165-181.

Westhead, P., & Wright, M. (1998). Novice, portfolio, and serial founders: are they different? *Journal of business venturing*, *13*(3), 173-204.

Wilson, N. C., & Stokes, D. (2005). Managing creativity and innovation: The challenge for cultural entrepreneurs. *Journal of small business and enterprise development*, *12*(3), 366-378.

Wiltbank, R., Dew, N., Read, S., & Sarasvathy, S. D. (2006). What to do next? The case for non-predictive strategy. *Strategic management journal*, *27*(10), 981-998.

Wincent, J., Cardon, M. S., Singh, J., & Drnovsek, M. (2008). Entrepreneurial affect: The distinction between emotion and passion. In *Academy of Management Conference. Anaheim, CA*.

Appendices

Appendix A - Items of measurement

Table 1- Appendix A: Instructions, scale anchors, and items for EP's dimensions and domains.

Instructions	Please indicate the extent to which you agree or disagree with each statement.
Scale anchors	1='strongly disagree'; 2='disagree'; 3='neither agree nor disagree'; 4='agree'; 5='strongly agree'. Note: We recommend that scholars using this instrument consider using 7-point or 9-point scales to guard against issues of range restriction. Note: Please see Appendix B for other identity centrality items that could be included in future studies.
Domain and item #	Validated item
IPF-inv1	It is exciting to figure out new ways to solve unmet market needs that can be commercialized.
IPF-inv2	Searching for new ideas for products/services to offer is enjoyable to me.
IPF-inv3	I am motivated to figure out how to make existing products/services better
IPF-inv4	Scanning the environment for new opportunities really excites me.
IC-inv1	Inventing new solutions to problems is an important part of who I am.
IPF-fnd1	Establishing a new company excites me.
IPF-fnd2	Owning my own company energizes me.
IPF-fnd3	Nurturing a new business through its emerging success is enjoyable.
IC-fnd1	Being the founder of a business is an important part of who I am.
IPF-dev1	I really like finding the right people to market my product/service to.
IPF-dev2	Assembling the right people to work for my business is exciting.
IPF-dev3	Pushing my employees and myself to make our company better motivates me.
IC-dev1	Nurturing and growing companies is an important part of who I am.

Table 2 - Appendix A: Scale domain and questions for the IUS-12

Domain	Question
Prospective Anxiety	1. Unforeseen events upset me greatly.
	2. It frustrates me not having all the information I need.
	3. One should always look ahead so as to avoid surprises.
	4. A small, unforeseen event can spoil everything, even with the best of planning.
	5. I always want to know what the future has in store for me.
	6. I can't stand being taken by surprise.
	7. I should be able to organize everything in advance.
Inhibitory Anxiety	
	8. Uncertainty keeps me from living a full life.
	9. When it's time to act, uncertainty paralyses me.
	10. When I am uncertain, I can't function very well.
	11. The smallest doubt can stop me from acting.
	12. I must get away from all uncertain situations.

Appendix B – Descriptive statistics

Table 1 – Appendix B: Clarification of the control variables

Control variable	Clarification
Age	Age of the entrepreneur in years
Gender	Gender of the entrepreneur. 0 *"Female", 1 "Male".*
Nationality	Nationality of the entrepreneur. 0*; "Domestic", 1; "Foreign"*
Degree	Highest finished level of education of the entrepreneur. *1; "High school", 2; "Community college", 3; "Bachelor's degree", 4; "Honours degree", 5; "Master's degree", 6; "Doctorate degree".*
Study	Study type of the Highest finished level of education of the entrepreneur. *0; "Non-Business" 1; "Business"*
Ventures	Amount of ventures started by the entrepreneur
Experience	Total years of experience as an entrepreneur
Employees	Number of employees working for the company started by the entrepreneur. 1; "1", 2; "2", 3; "3-5", 4; "6-10", 5; "11-49", 6; "50-249", 7= "250 or more"
Industry	Industry type in which the entrepreneur operates. Distinguished in 21 separate industries. 0*; "Primary and secondary industry" 2; "Service industry"*
Objective	Main objective of starting an enterprise of the entrepreneur. 1; "Profit and growth", 2; "To sustain myself", 3; "Non-profit and socially responsible oriented objectives".

Table 2 – Appendix B: Mean, Standard deviation and frequency control variables

Variable	Mean	SD	Subcategories	Frequency	Percentage
Gender			Male	174	75,7%
			Female	56	24,3%
Age	34,71	10,64	18-25	38	16,5%
			26-35	107	46,5%
			36-55	76	33,0%
			55+	9	3,9%
Degree	3,17	1,38	High school	35	15,2%
			Community college	22	9,6%
			Bachelor's degree	107	46,5%
			Honours degree	8	3,5%
			Master's degree	50	21,7%
			Doctorate degree	8	3,5%
Ventures	2,11	1,064	1	83	36,1%
			2	73	31,7%
			3	39	17,0%
			4 or more	35	15,2%
Experience in years	7,43	7,59	0-5	139	60,4%
			6-15	62	27,0%
			16 or more	29	12,6%
Study type			Business	93	40,4%
			Non-Business	137	59,6%
Industry type			Primary/secondary sector	92	40%
			Service sector	138	60%
Employees	3,08	1,35	1	33	14,3%
			2	41	17,8%
			3-5	80	34,8%
			6-10	38	16,5%
			11-49	28	12,2%
			50-249	9	3,9%
			250 or more	1	0,4%
Objective			Profit and growth	167	72,6%
			To sustain myself	36	15,7%
			Non-profit	27	11,7%

Table 3 – Appendix B: Minimum, Maximum, Mean and Standard Deviation of measuring variables

Item	N	Min	Max	Mean	SD
Causation	**230**	**2**	**7**	**5,08**	**0,895**
Long-term goals	230	1	7	5,75	1,242
Evaluation of the business' profit potential	230	1	7	5,17	1,652
Not consider short-term opportunities	230	1	7	3,8	1,692
Position based on competitive market	230	1	7	5,58	1,364
Strategic decisions based on competitive market	230	1	7	5,08	1,395
Effectuation	**230**	**1**	**7**	**3,86**	**1,402**
Business based on resources available	230	1	7	3,46	2,003
Investment based on resources	230	1	7	4,54	1,767
Make the path as we go	230	1	7	4,31	1,811
Cooperation based on informal agreements	230	1	7	3,67	1,846
Develop business step-by-step	230	1	7	3,33	1,917
Uncertainty intolerance	**230**	**1**	**4,67**	**2,56**	**0,757**
Unforeseen events upset me greatly	230	1	5	2,41	1,073
Frustrates me not having all the information I need	230	1	5	3,24	1,159
Always look ahead so as to avoid surprises	230	1	5	3,89	0,899
Unforeseen event can spoil everything	230	1	5	2,46	1,220
Want to know what the future has in store	230	1	5	3,04	1,298
I can't stand being taken by surprise	230	1	5	2,43	1,122
I should be able to organize everything in advance	230	1	5	3,19	1,246
Uncertainty keeps me from living a full life	230	1	5	2,32	1,281
When it's time to act, uncertainty paralyses me	230	1	5	1,81	1,076
When I am uncertain, I can't function very well	230	1	5	2,1	1,125
The smallest doubt can stop me from acting.	230	1	5	1,82	0,997
I must get away from all uncertain situations.	230	1	5	2,02	1,215
Entrepreneurial Passion	**230**	**3,38**	**7**	**6,15**	**0,766**
Figure out new ways to solve market needs	230	1	7	6,45	0,978
Searching for new ideas	230	3	7	6,48	0,791
Figure out how to make existing products better	230	3	7	6,39	0,912
Scanning the environment for new opportunities	230	3	7	6,38	0,935
Inventing new solutions to problems	230	1	7	6,31	1,093
Establishing a new company	230	1	7	6,2	1,197
Owning my own company	230	1	7	6,34	1,148
Nurturing a new business	230	2	7	6,23	1,094
Being the founder of a business	230	1	7	5,53	1,748
Finding the right people to market my product	230	1	7	5,85	1,262
Assembling people to work for my business	230	1	7	5,87	1,324
Pushing my employees/me to make company better	230	2	7	6,09	1,068
Nurturing and growing	230	1	7	5,88	1,370

Table 4 - Appendix B: Correlation matrix all variables

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Causation	-															
2	Effectuation	**-,280****	-														
3	Prospective Anxiety	**,173****	,039	-													
4	Inhibitory Anxiety	,059	**,194****	**,603****	-												
5	Passion for inventing	**,334****	**-,155***	-,026	**-,155***	-											
6	Passion for founding	**,316****	**-,142***	-,047	-,098	**,501****	-										
7	Passion for developing	**,353****	**-,141***	,01	-,098	**,485****	**,618****	-									
8	CV_AGE	,097	-,07	,055	,051	,045	**,143***	,084	-								
9	CV_GENDER	,064	**-,149***	-,083	-,034	,198**	,099	,033	-,154*	-							
10	CV_NATIONALITY	-,017	-0,1	-,031	-,007	,047	,001	,012	-0,06	,034	-						
11	CV_DEGREE	,123	**-,130***	**-,203****	**-,164***	,062	-,003	-,104	-,028	,064	**-,146***	-					
12	CV_STUDY	,103	-,021	,088	-,004	,034	**,150***	**,167***	-,045	,096	,014	-,053	-				
13	CV_Ventures	,03	-,111	-,113	-,101	**,223****	**,268****	**,148***	**,265****	**,146***	-,033	-,034	,062	-			
14	CV_Experiences	,071	-,048	-,001	,009	**,169***	**,242****	**,171****	**,697****	0	-,031	-,057	-,012	**,568****	-		
15	CV_Employees	**,188****	-,**275****	-,02	**-,144***	**,174****	**,261****	**,262****	**,175****	,108	-,055	,129	,07	**,352****	**,276****	-	
16	CV_Industry	,002	,019	-,036	-,048	,055	,022	,075	**-,174****	-,029	**-,132***	,129	,112	-,013	-,094	,034	-
17	CV_Objective	**-,224****	**,223****	-,107	,025	**-,209****	**-,247****	**-,183****	,066	**-,193****	-,12	,002	-,121	-,043	0,07	-,042	-,065

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

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

Appendix C - Factor analysis

Table 1 - Appendix C: KMO and Bartlett's Test - Causation/Effectuation

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,753
Bartlett's Test of Sphericity	Approx. Chi-Square	532,676
	df	45
	Sig.	,000

Table 2- Appendix C: Total variance explained - Causation/Effectuation

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	***3,190***	31,898	31,898	2,637	26,366	26,366	2,348
2	***1,647***	16,468	48,366	1,054	10,541	36,907	1,343
3	1,064	10,641	59,007				
4	0,807	8,065	67,072				
5	0,792	7,924	74,996				
6	0,661	6,611	81,608				
7	0,572	5,716	87,324				
8	0,510	5,103	92,427				
9	0,466	4,658	97,084				
10	0,292	2,916	100				

Table 3 - Appendix C: Factor matrix - Effectuation/Causation

Question	Factor	
	1	2
	Effectuation	Causation
CAUS1	-0,267	**0,385**
CAUS2	-0,079	**0,488**
CAUS3	-0,135	**0,134**
CAUS4	0,017	**0,702**
CAUS5	-0,136	**0,606**
EFF1	**0,721**	-0,072
EFF2	**0,523**	-0,153
EFF3	**0,723**	-0,06
EFF4	**0,584**	-0,125
EFF5	**0,759**	-0,176

Extraction Method: Principal Axis Factoring.

Rotation Method: Varimax with Kaiser Normalization.

a. rotation converged in 3 iterations

Table 4 – Appendix C: KMO and Bartlett's Test – Uncertainty intolerance

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,888
Bartlett's Test of Sphericity	Approx. Chi-Square	1176,309
	df	66
	Sig.	,000

Table 5 – Appendix C: Total variance explained – Uncertainty intolerance

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	**5,289**	44,074	44,074	4,808	40,064	40,064	4,076
2	**1,56**	13	57,074	1,071	8,924	48,988	3,596
3	0,923	7,69	64,764				
4	0,731	6,095	70,859				
5	0,656	5,466	76,325				
6	0,561	4,672	80,997				
7	0,474	3,952	84,948				
8	0,467	3,888	88,837				
9	0,399	3,323	92,16				
10	0,382	3,187	95,347				
11	0,322	2,682	98,028				
12	0,237	1,972	100				

Extraction Method: Principal Axis Factoring.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 6 – Appendix C: Pattern matrix – Uncertainty intolerance

	Factor	
Question	1	2
	Inhibitory Anxiety	Prospective Anxiety
PROSP1	0,322	0,402
PROSP2	0,059	0,530
PROSP3	-0,108	0,561
PROSP4	0,290	0,455
PROSP5	0,084	0,710
PROSP6	0,352	0,427
PROSP7	-0,083	0,704
INHIB1	0,490	0,374

INHIB2	0,905	-0,115
INHIB3	0,766	0,021
INHIB4	0,799	-0,077
INHIB5	0,599	0,225

Extraction Method: Principal Axis Factoring
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 6 iterations

Table 7 – Appendix C: Structure matrix – Uncertainty intolerance

Question	Factor 1 Inhibitory Anxiety	Factor 2 Prospective Anxiety
PROSP1		***0,558***
PROSP2		***0,559***
PROSP3		***0,508***
PROSP4		***0,596***
PROSP5		***0,750***
PROSP6		***0,598***
PROSP7		***0,664***
INHIB1	***0,672***	
INHIB2	***0,850***	
INHIB3	***0,776***	
INHIB4	***0,762***	
INHIB5	***0,708***	

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

Table 8 – Appendix C: KMO and Bartlett's Test – Entrepreneurial Passion

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,860
Bartlett's Test of Sphericity	Approx. Chi-Square	1498,142
	df	78
	Sig.	,000

Table 9 – Appendix C: Total variance explained – Entrepreneurial passion

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	5,775	44,426	44,426	5,344	41,106	41,106	4,136
2	1,607	12,364	56,79	1,177	9,051	50,157	3,975
3	1,150	8,848	65,638	0,753	5,790	55,947	3,850
4	0,869	6,682	72,321				
5	0,715	5,503	77,823				
6	0,575	4,426	82,249				
7	0,526	4,047	86,296				
8	0,402	3,091	89,386				
9	0,33	2,542	91,928				
10	0,295	2,267	94,195				
11	0,272	2,094	96,289				
12	0,257	1,974	98,263				
13	0,226	1,737	100				

Extraction Method: Principal Component Analysis.
a When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 10 – Appendix C: Pattern matrix – Entrepreneurial passion

Question	Factor 1 Passion for founding	2 Passion for inventing	3 Passion for developing
EP_INV1	0,156	***0,476***	0,022
EP_INV2	0,074	***0,753***	0,005
EP_INV3	-0,089	***0,777***	0,032
EP_INV4	0,067	***0,698***	0,099
EP_INV5	-0,035	***0,745***	-0,063
EP_FND1	***0,711***	0,080	-0,015
EP_FND2	***0,860***	-0,045	-0,076
EP_FND3	***0,629***	0,078	0,131
EP_FND4	***0,640***	0,027	0,086
EP_DEV1	0,061	0,020	***0,655***
EP_DEV2	-0,011	-0,087	***0,918***
EP_DEV3	-0,044	0,159	***0,673***
EP_DEV4	0,386	0,021	***0,431***

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
b. Rotation converged in 7 iterations

Table 11 - Appendix C: Structure matrix - Entrepreneurial Passion

Question	Factor 1 Passion for founding	2 Passion for inventing	3 Passion for developing
EP_INV1	0,415	***0,567***	0,347
EP_INV2	0,466	***0,794***	0,418
EP_INV3	0,332	***0,747***	0,360
EP_INV4	0,486	***0,781***	0,480
EP_INV5	0,312	***0,696***	0,281
EP_FND1	***0,743***	0,440	0,446
EP_FND2	***0,792***	0,362	0,413
EP_FND3	***0,747***	0,467	0,543
EP_FND4	***0,705***	0,399	0,479
EP_DEV1	0,460	0,372	***0,701***
EP_DEV2	0,490	0,358	***0,870***
EP_DEV3	0,437	0,466	***0,725***
EP_DEV4	0,653	0,432	***0,671***

Extraction Method: Principal Axis Factoring.
Rotation Method: Oblimin with Kaiser Normalization.

Factor analysis – Item correlations

Table 12 – Appendix C: Item correlation Causation

		1	2	3	4
1	CAUS1	–			
2	CAUS2	,279**	–		
3	CAUS3	0,121	0,078	–	
4	CAUS4	,218**	,335**	0,063	–
5	CAUS5	,274**	,261**	0,116	,457**

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

Table 13 – Appendix C: Item correlation Effectuation

		1	2	3	4
1	EFF1	-			
2	EFF2	,428**	-		
3	EFF3	,532**	,395**	-	
4	EFF4	,327**	,331**	,477**	-
5	EFF5	,624**	,407**	,485**	,501**

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

Table 14 – Appendix C: Item correlation uncertainty

		1	2	3	4	5	6	7	8	9	10	11
1	PROSP1	–										
2	PROSP2	,461**	–									
3	PROSP3	,193**	,277**	–								
4	PROSP4	,512**	,305**	,246**	–							
5	PROSP5	,376**	,414**	,450**	,445**	–						
6	PROSP6	,512**	,360**	,204**	,487**	,431**	–					
7	PROSP7	,267**	,364**	,335**	,373**	,543**	,362**	–				
8	INHIB1	,425**	,334**	,335**	,432**	,454**	,518**	,394**	–			
9	INHIB2	,366**	,211**	0,095	,355**	,350**	,440**	,173**	,541**	–		
10	INHIB3	,350**	,280**	,158*	,385**	,365**	,379**	,230**	,561**	,718**	–	
11	INHIB4	,412**	,233**	0,085	,372**	,300**	,373**	,129*	,444**	,661**	,568**	–
12	INHIB5	,406**	,236**	,214**	,457**	,423**	,485**	,321**	,605**	,531**	,542**	,561**

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

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

Table 15- Appendix C: Item correlation Entrepreneurial passion

		1	2	3	4	5	6	7	8	9	10	11	12
1	EP_INV1	-											
2	EP_INV2	,665**	-										
3	EP_INV3	,334**	,553**	-									
4	EP_INV4	,442**	,595**	,568**	-								
5	EP_INV5	,285**	,483**	,614**	,579**	-							
6	EP_FND1	,317**	,366**	,254**	,502**	,263**	-						
7	EP_FND2	,308**	,306**	,262**	,318**	,221**	,644**	-					
8	EP_FND3	,366**	,419**	,297**	,444**	,280**	,563**	,575**	-				
9	EP_FND4	,306**	,367**	,302**	,301**	,256**	,462**	,557**	,513**	-			
10	EP_DEV1	,259**	,290**	,296**	,337**	,252**	,294**	,360**	,457**	,348**	-		
11	EP_DEV2	,293**	,320**	,229**	,395**	,172**	,418**	,347**	,442**	,333**	,626**	-	
12	EP_DEV3	,300**	,398**	,385**	,428**	,241**	,338**	,320**	,360**	,365**	,493**	,626**	-
13	EP_DEV4	,268**	,358**	,295**	,400**	,308**	,453**	,398**	,551**	,655**	,475**	,546**	,512**

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

Appendix D – Reliability analysis

Table 1 – Appendix D: Cronbach Alpha test

	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Causation	0,567	0,585	5
Effectuation	0,805	0,804	5
Uncertainty intolerance	0,882	0,881	12
Entrepreneurial passion	0,888	0,895	13

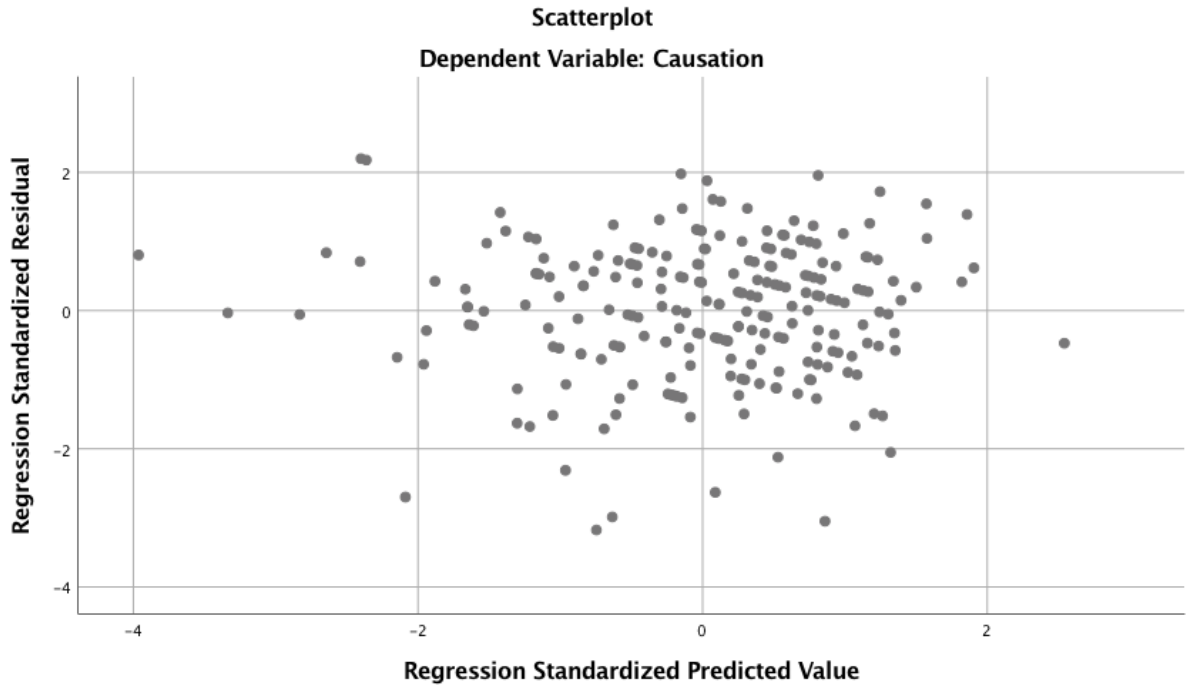
Table 2 – Appendix D: Item total statistics

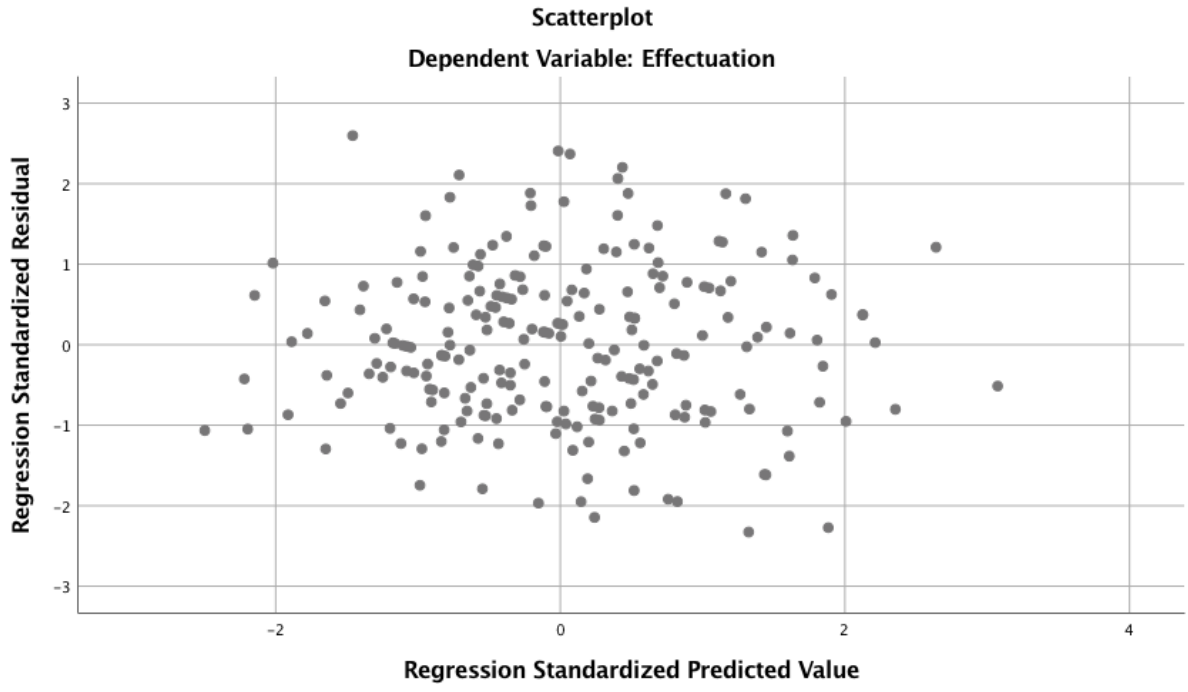
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Causation					
CAUS1	19,63	15,125	0,346	0,13	0,505
CAUS2	20,2	12,984	0,361	0,164	0,49
CAUS3	21,58	15,362	0,135	0,023	**0,632**
CAUS4	19,8	13,872	0,421	0,261	0,461
CAUS5	20,3	13,624	0,431	0,251	0,453
Effectuation					
EFF1	15,86	31,032	0,632	0,482	0,754
EFF2	14,78	35,545	0,497	0,25	0,794
EFF3	15,01	32,917	0,623	0,403	0,757
EFF4	15,64	34,423	0,522	0,337	0,788
EFF5	15,98	31,013	0,677	0,499	0,739
Uncertainty					
PROSP1	28,31	70,723	0,59	0,444	0,872
PROSP2	27,49	71,91	0,472	0,325	0,879
PROSP3	26,84	76,127	0,357	0,259	0,883
PROSP4	28,27	68,818	0,604	0,412	0,871
PROSP5	27,68	67,423	0,63	0,488	0,869
PROSP6	28,3	69,423	0,634	0,448	0,869
PROSP7	27,53	70,896	0,48	0,377	0,879
INHIB1	28,41	66,225	0,703	0,543	0,864
INHIB2	28,91	70,35	0,611	0,64	0,871
INHIB3	28,63	69,535	0,625	0,585	0,87
INHIB4	28,9	71,938	0,567	0,527	0,873
INHIB5	28,71	67,771	0,664	0,525	0,867
Entrepreneurial passion					
EP_INV1	73,55	89,218	0,49	0,468	0,884
EP_INV2	73,52	89,36	0,617	0,618	0,881
EP_INV3	73,61	89,418	0,52	0,519	0,883
EP_INV4	73,61	87,147	0,641	0,593	0,878
EP_INV5	73,68	88,602	0,458	0,483	0,886
EP_FND1	73,8	84,239	0,616	0,563	0,878
EP_FND2	73,66	85,283	0,595	0,559	0,879
EP_FND3	73,77	84,423	0,676	0,527	0,876
EP_FND4	74,47	77,473	0,608	0,558	0,883
EP_DEV1	74,14	84,438	0,568	0,474	0,881
EP_DEV2	74,12	82,963	0,601	0,589	0,879
EP_DEV3	73,9	86,165	0,601	0,498	0,879

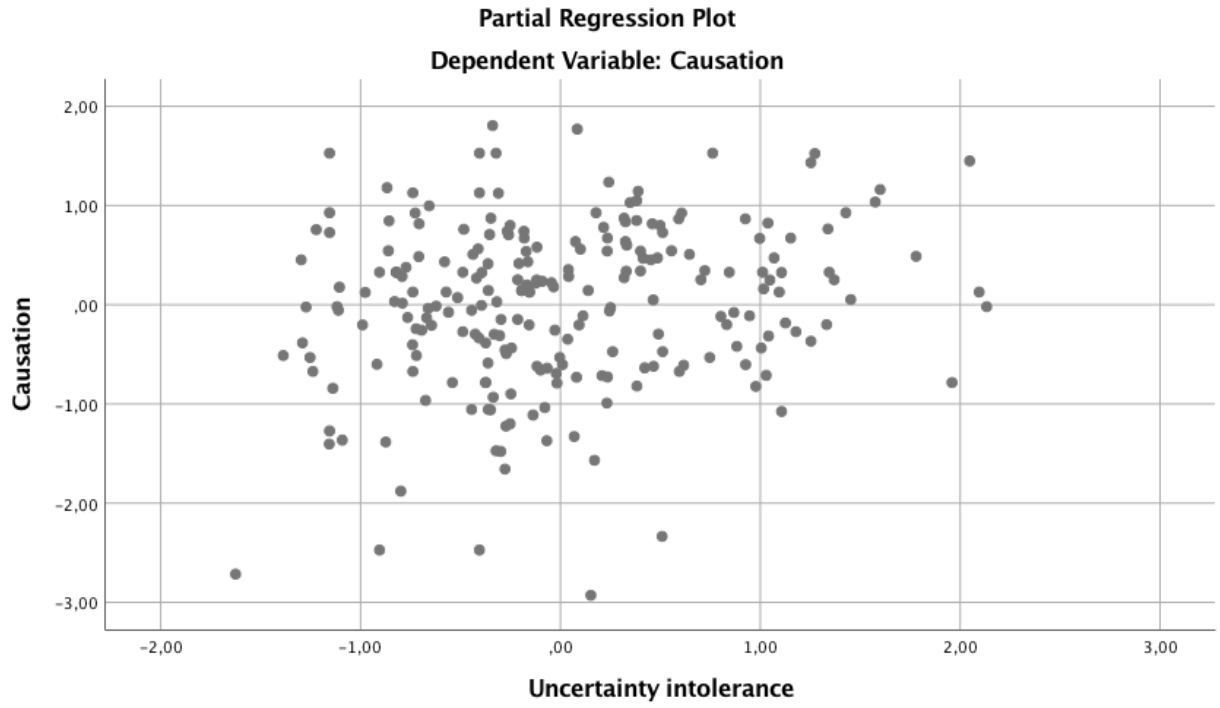
Appendix E: Assumption testing linear regression

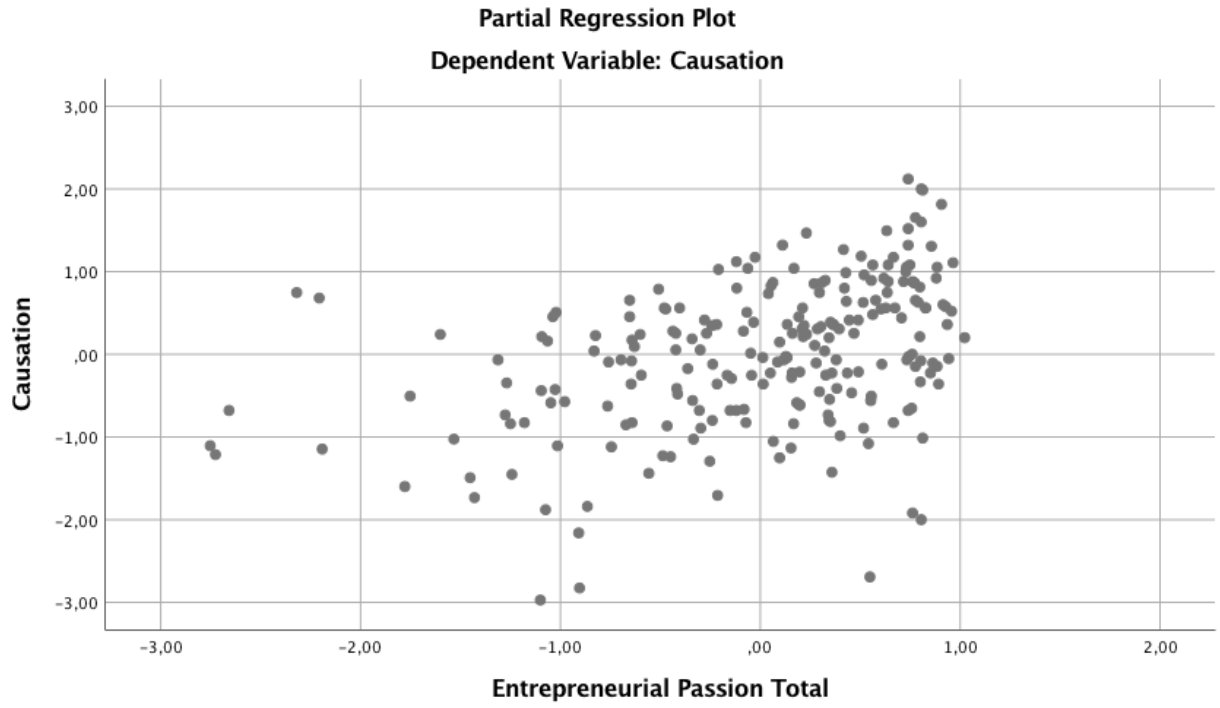
Assumption 1: Linear regression

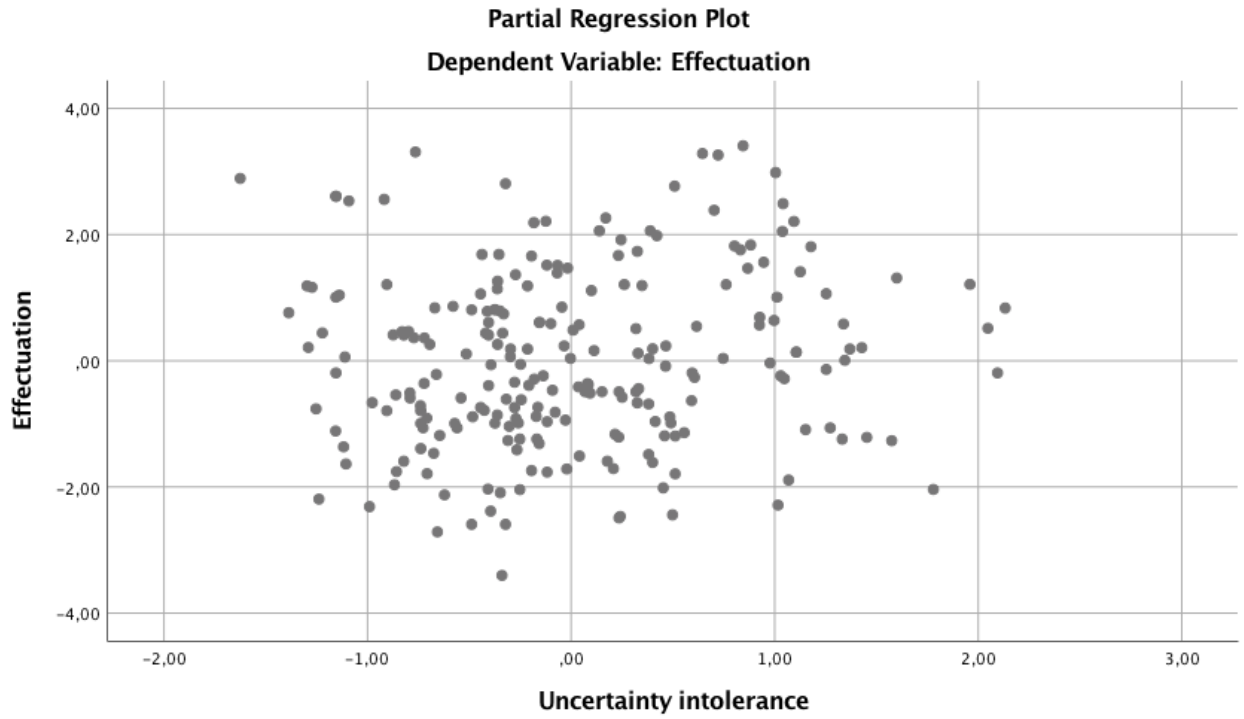
The linear regression between the independent and the dependent variables need to be linear.

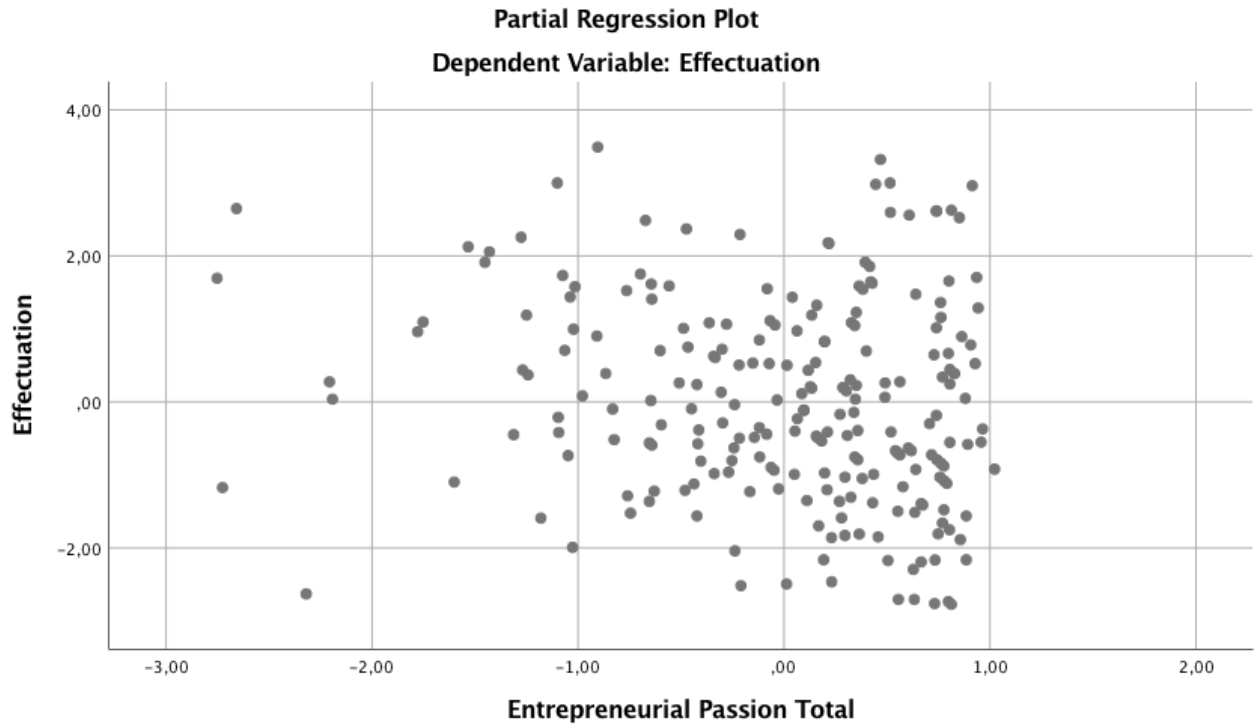





Partial Regression Plot
Dependent Variable: Causation
Causation
2,00
1,00
,00
-1,00
-2,00
-3,00
-2,00
-1,00
,00
1,00
2,00
3,00
Uncertainty intolerance


Partial Regression Plot
Dependent Variable: Causation
Causation
3,00
2,00
1,00
,00
-1,00
-2,00
-3,00
-3,00
-2,00
-1,00
,00
1,00
2,00
Entrepreneurial Passion Total


Partial Regression Plot
Dependent Variable: Effectuation
Effectuation
4,00
2,00
,00
-2,00
-4,00
-2,00
-1,00
,00
1,00
2,00
3,00
Uncertainty intolerance


Partial Regression Plot
Dependent Variable: Effectuation
Effectuation
4,00
2,00
,00
-2,00
-3,00
-2,00
-1,00
,00
1,00
2,00
Entrepreneurial Passion Total

Assumption 2: Multivariate normality

Multiple regression assumes that the residuals are normally distributed

Table 1 – Appendix E: Test of normality

		Causation	Effectuation	Uncertainty intolerance	Entrepreneurial Passion
N	Valid	230	230	230	230
	Missing	0	0	0	0
Skewness		-0,507	0,229	0,445	-1,206
Std. Error of Skewness		0,160	0,160	0,160	0,160
Kurtosis		0,523	-0,531	-0,204	1,524
Std. Error of Kurtosis		0,320	0,320	0,320	0,320
Shapiro wilk		0,980	0,983	0,978	0,894
Sig		,002	,008	,001	,000

Assumption 3: Multicollinearity

VIF should be smaller than 5.

Table 2 – Appendix E: Collinearity statistics

	Causation		Effectuation	
	Collinearity Statistics			
	Tolerance	VIF	Tolerance	VIF
CV1AGE	0,454	2,204	0,454	2,204
CV2GENDER	0,850	1,177	0,850	1,177
CV3NATIONALITY	0,930	1,075	0,930	1,075
CV4DEGREE	0,858	1,165	0,858	1,165
CV5STUDY	0,919	1,089	0,919	1,089
CV6Ventures	0,566	1,766	0,566	1,766
CV7Experiences	0,343	2,919	0,343	2,919
CV8Employees	0,771	1,296	0,771	1,296
CV9Indusrty	0,904	1,106	0,904	1,106
CV10Objective	0,839	1,191	0,839	1,191
Prospective Anxiety	0,571	1,752	0,571	1,752
Inhibitory Anxiety	0,590	1,696	0,590	1,696
Passion for inventing	0,632	1,582	0,632	1,582
Passion for founding	0,518	1,929	0,518	1,929
Passion for developing	0,529	1,889	0,529	1,889

Assumption 4: Little or no autocorrelation

Values can be around 0 and 4. Values around 2 indicates there is no autocorrelation.

Table 3 – Appendix E: Durbin-Watson test

	Dependent variable	
Independent variable	Causation	Effectuation
Inhibitory Anxiety	2,008	1,958
Prospective Anxiety	2,013	1,963
Passion for inventing	2,027	2,022
Passion for founding	1,974	1,992
Passion for developing	2,002	1,967

Assumption 5: Homoscedastic of data

The scatterplot shows that the residues are equal across the regression line.