Study about the effect of entrepreneurial passion on entrepreneurs' decision-making

Author: Nora Yigit
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands

ABSTRACT,

A little is researched about the relationship between entrepreneurial passion and entrepreneurs' decision-making. In this thesis, a research is done about the relationship between the three domains of entrepreneurial passion (passion for inventing, passion for founding and passion for developing) and the two types of entrepreneurs' decision-making (causation and effectuation). Two types of measurement for our variables were combined in a survey that was send to Dutch entrepreneurs. The data is collected and the set consists of 102 Dutch entrepreneurs. In the results for the factor analysis is seen that a third and unknown factor is involved. The conclusion, according to the results, was that two of the three domains of entrepreneurial passion don't have any relation with causation or effectuation. There is only significant evidence found for a positive relationship between passion for developing and causation.

Graduation Committee members:
Dr. M.R. Stienstra
Dr. I. Skute

Keywords

Effectuation, Entrepreneurial Passion, passion for inventing, founding, and developing, causation, entrepreneurship, decision-making

1. INTRODUCTION

1.1 Background

From an early age, all conversations at my home or at family events have been about entrepreneurship. I was born in a true entrepreneurial family and this is evident in my DNA. I have carried my passion for entrepreneurship with me from a young age. I started my entrepreneurial career in high school by selling cans of drinks in the schoolyard. Now I am a freelancer and I do everything related to digital marketing. I am continuously looking for new possibilities and try to turn it into reality as soon as possible.

An entrepreneur is always seen as someone that starts a company. This definition is correct, but it is more than that. Schumpeter (1965) defined "entrepreneurs as individuals who exploit market opportunity through technical and/or organizational innovation" In today's world, entrepreneurship is more important than ever. This is because of the rapidly evolving global markets.

1.2 Dependent variable

The general definition of decision-making is aimed at creating a venture throughout the process of finding and exploiting opportunities. According to Eckhardt & Shane (2003, p336), there is a difference between entrepreneurial and non-entrepreneurial decision-making. In case of non-entrepreneurial decision-making, the resources across previously developed opportunities are defined. In the entrepreneurial decision-making process, new, undetected or underutilized opportunities are created or detected. It is crucial to understand how entrepreneurs take actions and behave (Chandler, DeTienne, McKelvie & Mumford, 2011). Our aim is to explore how entrepreneurs make decisions to create or to recognize opportunities and under what conditions each mode prevails (Sarasvathy, 2001).

When looking at the entrepreneurial decision-making process, Sarasvathy (2001) defines two different approaches: effectuation and causation. The causation approach is well known as the 'traditional' goal approach. Causation is a planned strategy approach where the focus lies on planning and predictions to achieve the pre-specified end-state. Effectuation is the opposite of that. Effectuation relies on the principles of experimentation affordable loss, and on using means at the immediate disposal of the entrepreneur to achieve imagined ends (Sarasvathy, 2001). There is a huge different between the two approaches, but they have in common that both have the same aspiration or goal, which is creating a venture or opportunity exploitation (Sarasvathy, 2001a). Both approaches can occur simultaneously, which means that the use of both is not mutually exclusive (Saravathy, 2001)

The decision-making process is diverse and multiple factors are influencing this process. The factors are: experience, skills, life-style, preference and cognitive style (Riding & Pearson, 1994). In this research, the influence of the cognitive style, entrepreneurial passion, on entrepreneurs' decision-making is researched.

1.3 Research gap

According to Cardon et al, 2009, Entrepreneurial passion plays an important role in entrepreneurship, but theoretical understanding of what it is and what it does is lacking. This research will help to understand the theory of the entrepreneurial passion by executing a quantitative research. This matches with the vision of Grégoire and Cherchem, 2020, that future research should be done on quantitative measurement of effectuation. Perry et al, 2012, called that there should be more research on effectuation in decision-making. Since the research will focus on causation as well as effectuation, we will respond on this call. Student Nicolette van Pagée of the University of Twente executed a research about the influence of passion on decision-making. In her research, the sample size (27 respondents) of the Dutch population was too small to provide significant results. In this research, the sample size of the Dutch population will be bigger (approximately 50-60 respondents) with the aim to provide significant results.

1.4 Research question

In order to extend existing literature, fill the research gaps and provide a deeper understanding of the effect of entrepreneurial passion on entrepreneurial decision-making, the following research question has been formulated:

"To what extent does entrepreneurial passion have impact on causation and effectuation in entrepreneurs' decision-making?"

1.5 Independent variable

Over the years, entrepreneurial passion gained more attention (Amabile, 1997), passion is seen as essential for the entrepreneur, because it can stimulate creativity and recognition of new information patterns. These contribute to the detection of opportunities (Baron, 2008). Passion is also seen as a driving force for executing entrepreneurial activities (Murnieks, 2007). The passion of an entrepreneur can give him/her a extra boost to continue or to persevere (Vallerand et al., 2007). Cardon et al. (2003) defines three domains of passion: passion for founding, passion for inventing and passion for developing.

2. THEORETICAL FRAMEWORK AND HYPOTHESIS

In this chapter, the different concepts used in the report are explained using previous studies related to the topics.

2.1 Entrepreneurial passion

There are three main streams when looking at the different theories of passions. The first theory, from Vallerand et al. (2003), says that there are two types of passion: harmonious passion and obsessive passion. The second theory about passion is about 'passion for work' (Baum et al. 2001). In this research, these streams of passion are not used, since these are broad definitions and are not specified for entrepreneurial activities.

The third stream is proposed by Cardon (2009). According to Cardon (2009), entrepreneurial passion is an intense, positive feeling toward venture activities, and it develops as a reaction to a distant but desired state of the venture. Passion is highly significant for the well-being of entrepreneurs and is a strong force derived from the evaluation of future ventures (Cardon et al., 2005). So it is likely that passion will influence the choices in the decision-making process of an entrepreneur when heading toward achieving a highly significant outcome.

The stream of Cardon et al. (2009) doesn't only focus on the feelings of entrepreneurs towards activities, but also about the centrality of these activities to the entrepreneurs' identity. Entrepreneurial passion consists of three domains: passion for inventing, passion for founding and passion for developing (Cardon et al., 2013).

2.1.1 Passion for inventing

The first domain, according to Cardon et al. (2013), is passion for inventing. In this domain, all activities that are related to identifying opportunities, developing new products and services and working with new prototypes are included. This is done by scanning the environment to recognize problems and needs of customers. The entrepreneurs that has a passion for inventing, enjoy seeking for new opportunities and inventing new solutions to important needs and problems (Cardon et al., 2013).

2.1.2 Passion for founding

The second domain is passion for founding. In this domain, the entrepreneur has a passion for activity related to establishing a venture for commercial use and exploiting the opportunities (Breugst et al., 2012). An entrepreneur that has a high passion for founding, is called a 'habitual entrepreneur'. In most cases, this type of entrepreneur is more experienced by setting up a new business, because of the multiple business he/she already set up (Cardon et al., 2013).

2.1.3 Passion for developing

The third domain, passion for developing, is the passion to grow and expand a company after a venture is founded (Cardon et al., 2013). It is possible that entrepreneurs doesn't experience the first two passions, inventing or founding, but have a high passion for growing and expanding a venture (Cliff, 1998). The founder of a venture tend to experience more passion for developing, but it is also possible that entrepreneurs develop an existing venture (Cardon et al., 2013). An entrepreneur that has passion for developing, focuses on the positive feelings that he/she receives when growing a business (De Mol et al., 2020).

2.2 Decision-making

There are two different approaches of entrepreneurial decision-making: causation and effectuation.

When we are talking about causality, there is a planning strategy approach and the effects are dependent, which means that the actions of the entrepreneur is in line with the planned strategy to achieve a particular goal (Sarasvathy, 2001). Effectuation is the opposite of causation, since there is not a particular goal or strategy to achieve the goal when starting the process (Chandler et al., 2011). Instead of goals, the effectuation approach uses a set of means. The taken actions are based on this set of means (Sarasvathy, 2001). According to Alsos et al. (2014), there is a positive relationship between the effectuation approach and uncertainty. So in an uncertain environment, the effectuation approach is preferred. The causation approach has a negative relation to uncertainty (Alsos et al., 2014).

The following example clearly explains the two approaches. Imagine that you bought a closet from a furniture store. You can decide to follow the handbook when building the closet or you can choose to take a risk and to improvise. If you decide to follow the handbook step by step, you chose for the causation approach. The uncertainty that the closet won't look like the picture is low. If you take the risk and decide to put the closet together by just using your own knowledge, there is a higher risk for failure.

Not always is it needed to make a choice for an approach. Sarasvathy (2001) stated that both approaches can occur simultaneously in the reasoning of a human. However, she issues that the essential agent of entrepreneurship an effectuator is. Sarasvathy uses five different metaphors (see table 1) to explain the differences of the approaches and the corresponding behaviours of the types of entrepreneurs that belong to the approaches.

Table 1: Effectual versus causal approaches to network-building (Sarasvathy, 2001)

Effectual principle	Corresponding effectual networking actions	Corresponding causal networking actions
Bird-in-hand **Starting with one's means** **(Taking action, based on what you have readily available: who you are, what you know and who you know**	Starting with people one knows (one of the three Ws)	Invoking dormant ties and seeking referrals or resources (Vissa, 2012) attending events/conferences (Engel et al., 2017)
Crazy quilt **(Forming partnerships with people and organisations willing to make a genuine commitment to jointly cocreating the future – product, firm, market)**	Responding to and working with self-selected stakeholders: people who are interested in being a part of the entrepreneur's venture/idea will likely make efforts to reach out	Working with carefully selected partners who have the potential to provide resources such as talent, finance or advice (Larson and Starr, 1993) Purposively deepening relationships with firms that do or can provide resources (Larson and Starr, 1993)
Affordable loss ***Setting affordable loss*** **(Evaluating opportunities based on whether the downside is acceptable, rather than on the attractiveness of the predicted upside)**	Pursuing a relationship knowing well the down side of pursuing the relationship	Calculating the potential upside in each relationship and pursuing these accordingly (Vissa and Bhagavatula, 2012) Culling/weakening relations that are not providing the necessary resources (Vissa and Bhagavatula, 2012)
Lemonade ***Leverage contingencies*** **(Embracing surprises that arise from uncertain situations, remaining flexible rather than tethered to existing goals)**	Reviving old acquaintances or approaching new ones met serendipitously who can help	Cold-calling on potential resource providers Taking planned actions to preserve ties that can provide resources (Hallen and Eisenhardt, 2012)
Pilot-in-the-plane ***Non-predictive control*** **Future is nether found nor predicted but, rather, made**	Persuading others to be a part of one's activity or provide requisite resources	Planning and strategizing carefully vis-à-vis actions that can help generate resources (Engel et al, 2017; Hallen and Eisenhardt, 2012)

2.2.1 Basis for taking action: Means vs goals

The first principle of Sarasvathy (2001), also known as the bird in hand principle, describes the mean that are available to entrepreneurs. In doing so, you examine which skills, characteristics and other resources you already have as an entrepreneur, but also who you know with additional resources (Sarasvathy 2001). According to Sarasvathy (2001), the bird in hand principle therefore concerns three categories of means: who I am, what I know and whom I know. The first category concerns the traits, abilities and tastes of an entrepreneur. The second category, 'What I know' describes the knowledge, expertise and experience of the entrepreneur. 'Whom I know' refers to entrepreneurs' personal network. According to Dew et al. (2009), in case of effectuation, an entrepreneur takes action basis on the set of means it has. The entrepreneur has a growth oriented and goals based vision. Contrary to the effectual process, causal process of thorough planning and subsequent execution Sarasvathy, 2008b). Causation processes are goal oriented, and there is a desire for achieving the goals and end states that are defined at the start (Sarasvathy 2001). Causation focuses on the goals instead of the means.

2.2.2 Affordable loss principle: Affordable loss vs Expected returns

The affordable loss principle (Sarasvathy, 2001) issues that an entrepreneur's perception is not always based on means. Also the risk perception of entrepreneurs influence the decisions by creating a new venture (Sarasvathy, 2001). In a effectuation approach, the focus point is minimizing losses instead of focusing on expected return (Read et al., 2009). This gives the effectuator the freedom to experiment with different strategies. When looking at the causal approach, the decisions that are made are based on a strategy that helps to achieve the highest maximizing returns (Sarasvathy, 2001)

2.2.3 Lemonade principle: Contingencies vs Preexisting knowledge

The third principle, which is called the lemonade principle, shows that there are two different ways of reacting in case of unexpected changes. The principle posits that entrepreneurs that follow an effectual process would embrace contingencies and surprises (Sarasvathy, 2009). The famous saying: when life gives you lemons, make lemonade applies in case of an effectual approach. As an effectuator, you have to see surprises as opportunities (Smolka et al., 2016). In case of a causation approach, the response it completely different. The entrepreneur would try to avoid contingencies by careful planning and risk avoiding behaviour (Sarasvathy & Dew, 2005).

2.2.4 Crazy-quilt principle: Pre-commitment vs Competitive analysis

The fourth principle of Sarasvathy (2009) is called the crazy-quilt principle. This principle issues that in an effectual approach, strategic alliances and partnerships are built through engaging with a wide variety of people that will possibly contribute to the venture, which is part of pre-commitments. A competitive analysis is often seen as part of causality. This is mainly explained by the fact that uncertainties are reduced and there is a focus on identifying strategies of competitors to assess strength of weaknesses compared to your brand (Sarasvathy, Kumar, York & Bhagavatula, 2014).

2.2.5 Pilot-in-the-plane: Control vs Prediction

The last principle is the pilot-in-the-plane principle (Sarasvathy, 2009). This principle is focusing on coping with unknown aspects in the environment where two different approaches can be used: control and prediction. Control is associated with the effectual approach. The effectuator suggests that predictions about the future don't have to be made if one can control it (Sarasvathy, 2001). This means, in the latter case, that you should act as the pilot of a company and focus on the aspects that can be controlled within the environment. Causal entrepreneurs focus on the predictable part of the uncertain future (Sarasvathy, 2001). In case of causation, an entrepreneur tries to forecast the future in order to get grip on the unknown.

2.3 Hypotheses

To answer the research question of the thesis, three sub questions are formulated in the form of hypotheses. These hypotheses contains the variables entrepreneurial passion and entrepreneurs' decision-making. A distinguish is made between the three different types of passion (inventing, founding, developing) and the two approach for decision-making (effectuation and causation). The hypotheses are constructed for each entrepreneurial passion domain respectively.

Theory states that the two approaches for decision-making are not mutually exclusive, which means that both approaches can be applicable to a certain situation (Alsos et al., 2014). In this research, the results will be presented in a way that it either effectuation or causation, so it's considered as mutually exclusive. Nevertheless, it should be noted that this does not immediately rule out the possibility that there could be no overlap between effectuation and causation.

2.3.1 Passion for inventing and effectuation

Entrepreneurs that have a passion for invention likes to explore opportunities and experiment with potential products and services (Cardon et al., 2013). These are activities that are in line with the effectual approach. Entrepreneurs that behave according to the causal approach tries to avoid contingencies by careful planning and risk avoiding behaviour. So it is likely that entrepreneurs who have a passion for inventing tend to exploit contingencies. The first hypotheses is:

H1: An entrepreneur who is passionate about inventing is more likely to tend towards the effectual approach of decision-making.

2.3.1 Passion for founding and causality

Cardon et al. (2013) states that entrepreneurs who have passion for founding businesses tend to focus on collecting financial, human and social resources. These resources are most of the time not available to the entrepreneur. These have to be collected externally. To do so, goals have to be set that the entrepreneur want to reach when founding a new venture. According to these goals, the resources should be collected that are needed to fulfill the goals. Since goals are set up instead of means, it gives the following hypothesis:

H2: An entrepreneur who is passionate about founding is more likely to tend towards the causal approach of decision-making.

2.3.1 Passion for developing and causality

Entrepreneurs who are passionate about developing businesses focus on optimizing marketing activities , finding investors to secure capital and minimizing cost by efficient and effective

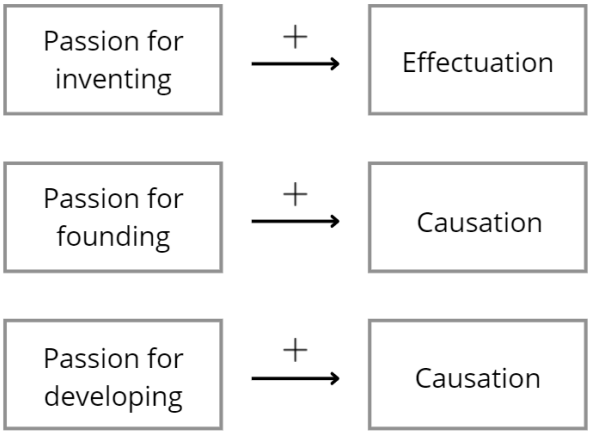
planning and control (Cardon et al., 2013). When looking at this theory, we could state that an effectual approach that focuses on affordable losses is not preferable. Based on the affordable loss principle, an effectuator does not focus on the potential losses and the causal approach makes decisions according to the strategy of expected returns. This leads to the following hypothesis:

H3: An entrepreneur who is passionate about developing is more likely to tend towards the causal approach of decision-making.

2.4 Conceptual framework

The following framework (figure 2) is created according to the three hypothesis.

Figure 1: Conceptual framework



3. METHODOLOGY

In this part of the thesis is the method of research explained. In this part, the sample and the way the research will be executed is illustrated.

3.1 Sample

The sample of this research will consists of a dataset composed of entrepreneurs in the Netherlands. 102 responses from Dutch entrepreneurs are collected for this research. The survey is spread on various social media platforms, such as LinkedIn, Facebook and WhatsApp, so it is hard to say how many entrepreneurs were approached. The survey collection had a duration of 2,5 weeks and a reminder was sent after a week. To make sure that only entrepreneurs will fill in the survey, the first questions is: 'are you an entrepreneur?' All of the respondents answered this question with 'yes'. So in the sake of the reliability of this research, we can assume that only entrepreneurs anticipated in the survey.

The sample consists of 67 males (65,7%) and 34 females (33,3%). The mean for the control variable age is 35.4 years, whereas the youngest participant were 17 years old. The average years of experience is 8,5.

3.2 Method

In this research, empirical data is collected using a quantitative research. A survey is send to multiple Dutch entrepreneurs to research the relationship between the two variables: entrepreneurial passion and decision-making. In the beginning of the research, there was a possibility that an existing dataset is used, if there weren't 100 or more responses collected. So the survey for the Dutch entrepreneurs used the same techniques (questions and scale rankings) as the existing dataset.

3.2.1 Passion

Cardon et al. (2013) designed a valid instrument to measure entrepreneurial passion. The instrument consists of scale with 12 items that measures the intense positive feelings and 3 items for the identity centrality. Two items did not meet the criteria, so a list of 13 items is used in this research for measuring entrepreneurial passion. The remaining 13 items measure the three different domains of entrepreneurial passion, which are inventing, founding and developing. The 13 items used in this research are shown in table 25.

A 7-point Likert scale is used to answer the questions regarding entrepreneurial passion. The scale starts with a = strongly disagree and the last point is 7 = strongly agree. Cardon et al. (2013) prefers using a 7-point Likert scale because is guard against issues of range restriction. Also, a benefit of the 7-point Likert scale in comparison with for example a 4-point Likert scale, is that a 'neutral' answer can be chosen, and not only a 'positive' or 'negative' answer.

3.2.2 Causation and effectuation

To measure the relationship between the different domains of entrepreneurial passion on the two approaches of decision-making, the measuring instrument of Alsos et al. (2014) is used. The original set of this instrument consists of 27 items. For this research, a selection of 10 items is made to measure effectuation and causation. The 10 items consists of five items regarding causation and five items regarding effectuation and the principles of the approaches (see 2.2).

This set of items is questioned using a 7-point Likert scale, that has a ranking from 1 (strongly disagree) to 7 (strongly agree).

3.3 Analysis

The collected data had to be translated in a way that conclusions can be made. To do so, SPSS (version 25) is used. The first step in the analysis is to check whether the data is normally distributed or not. This is done by a Shapiro Wilk test. When the test has a significant outcome, is it assumed that the data is normally distributed ($p < 0.05$). After this test, a Kaiser-Meyer-Olkin test is executed to determine the sampling adequacy of data that are to be used for the Factor Analysis, whereas a value greater than 0,5 is considered as significant (Bartlett, 1950). With a significant value, we can proceed to an exploratory factor analysis. This analysis is executed in order to meet the criteria that concerns the validity, reliability and consistency of the variables in the research. Also, the analysis checks whether the scales match with the corresponding components. In order to check the internal consistency between the variables in the research, the Cronbach's Alpha is calculated, whereas a value of 0,70 or greater is preferable (Taber, 2017). The last steps in the analysis are executing a correlation and regression analysis. The correlation is calculate for all the different variables used in the research. The regression analysis is used to check whether there is a relationship between the two variables entrepreneurial passion and decision-making.

4. Results

4.1 Normality

The survey responses are collected and analyzed using SPSS. First, the normality of the data has to be researched. A Shapiro Wilk Test is used to check the normality of the collected data. As shown in table 5, the variables causation and effectuation has a p-value that is higher than our alpha (0,05). This means that the null hypothesis can't be rejected and that these two variables are normal distributed. The variables regarding entrepreneurial passion have a value $p < 0,05$, which means that the null hypothesis can be rejected, so these three variables are not normally distributed.

4.2 Scale validation

4.2.1 Factor analysis

Before executing a factor analysis, the Kaiser-Meyer-Olkin Test (KMO) has to be done. We can proceed with the factor analysis if the KMO value is greater than 0,5. Table 16 shows that there value of 0,676 for the 10 items of the two variables effectuation and causation. The KMO value for the 13 items for entrepreneurial passion is 0,832 (see Table 13). This means that our data is appropriate to use for the factor analysis. Subsequently, scree plots are created for the two variables and show (see figure 2 and 3) that both scales are plotted above the line with eigenvalue 1. This means that there seem to be another component included in the scale besides causation and effectuation. To check the present of a third value, the factor analysis is executed on the on the base of eigenvalue 1. For the analysis, each of the individual variables exceeded the cut-off value of 0,45 suggested by Hair et al. (2006). The results for the factor analysis are shown in table 2. Almost all the items regarding causation load into component 2. Only the item 'pre-existing knowledge' loads in component 3 with a value of 0,862. All the items for effectuation loads perfectly into component 1. Table 2 shows the results of the factor analysis for the items of the variable entrepreneurial passion. When looking at the items of passion for inventing, most of the items load in component 1. There is one item that only loads in component 3 and there is one item that loads in component 1 as well as in component 3. This item won't be discarded from the research, because it is assumed by the designers to use these items for measuring entrepreneurial. The items for passion for founding fits perfectly into component 2. Table 2 shows that 3 of the 4 items that concern passion for developing load into component 2. There is 1 item that loads in component 1

4.2.2 Cronbach's Alpha

The Cronbach's alpha is the last measurement that is used in this research for the reliability of the measurement scales. The alphas are shown in tables 6-10. The alpha for the 5 items regarding passion for inventing is 0,786. Passion for founding has an alpha of 0,754 and passion for developing scored an alpha of 0,689. The alpha for effectuation is 0,730 and causation scored an alpha of 0,625. The items that scored an alpha greater than 0,7 are considered as internal consistent. The items that scored lower than the 0,7 are passion for developing and causation.

.

Table 2: Rotated Component Matrix

	Component		
	1	2	3
Causation1 Goal-oriented		.663	
Causation2 Expected returns		.634	
Causation3 Pre-existing knowledge			.862
Causation4 Competitive analysis		.667	
Causation5 Uncertain future		.654	
Effectuation1 Means-oriented	.600		
Effectuation2 Affordable loss	.718		
Effectuation3 Contingencies	.711		
Effectuation4 Commitments	.676		
Effectuation5 Unpredictable future	.700		
EP1inv			.826
EP2inv	.663		.457
EP3inv	.806		
EP4inv	.717		
EP5inv	.685		
EP6fnd		.587	
EP7fnd		.538	
EP8fnd		.727	

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.[a]

a. Rotation converged in 6 iterations.

4.3 Correlation

Since not all variables are normally distributed, the Spearman Rank-Order test is used. The results of the correlation analysis are shown in table 3. The three types of passion have a significant positive relationship (0,219, 0,258 and 0,444) with causation. For passion for inventing there seems to be a significant positive relationship with passion for founding (0,477) and passion for developing (0,443). The table shows that there is a significant positive relationship between passion for founding and passion for developing (0,544).

Table 3: Correlations

	1	2	3	4
Passion for Inventing				
Passion for Founding	.477**			
Passion for Developing	.443**	.544**		
Causation	.219*	.258**	.444**	
Effectuation	-.067	.091	-.002	-.130

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

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

4.4 Regression

4.4.1 Causation

To see what the relationship between is between our variables, a regression analysis is executed (see table 4) Two different models are made. Model 1 is a regression that includes all the control variables. Model 2 is a regression that includes all the control variables and the independent variables in our research: the three types of entrepreneurial passion. When looking at model 2, it shows a R^2 of 0,269, which means that 26,9% of the variance of causation is accounted by the whole model. The regression has a significant F-value, since $p < 0,05$. This means that the independent variables in the regression reliably predict the dependent variable. The regression table shows a variance inflation factor (VIF) below 10, which means that the dependent variables are not highly correlated to each other.

Table 4: Regression Results

Variables	**Model 1**	**Model 2**
(Constant)	4.737	2.153
Control variables		
Age	.003	.005
Gender (Dummy)	.392	.329
Ventures	-.133	-.132
Experience	-.007	-0.010
Employees	.080	.067
Bachelor (Dummy)	.073	.020
Master (Dummy)	.398	.244
Doctorate Degree (Dummy)	-.349	-.104
Honours Degree (Dummy)	-.234	.293
Industry (Dummy)	.276	-.273
Independent Variables		
Passion_Inventing		.087
Passion_Founding		.026
Passion_Developing		.341*
Fit Statistics		
Adjusted R-squared	.047	.171
F-value	1.544	2.736*
Highest VIF	2.647	2.749

*. Regression is significant at 0,05 level

4.4.2 Effectuation

For our other dependent variable, effectuation, the same is done as for causation (see tables 22-24). Two models are created with all the control variables in model 1 and model 2 consists of all the control variables and the three types of entrepreneurial passion. The R^2 less than the regression for the dependent variable causation (11% for model 2). Also, the F-value is not significant, since $p > 0,05$, meaning that the prediction of the independent variables on the dependent variable is not reliable. The regression table shows a VIF below 10, which means that there is no multicollinearity.

4.5 Hypotheses testing

4.5.1 Hypothesis 1

The first hypothesis of this research is: 'An entrepreneur who is passionate about inventing is more likely to tend towards the effectual approach of decision-making'. The results of the regression (table 4) show that there is a β of -0,055. There is no significant relationship between passion for inventing and effectuation, since $p > 0,05$ (0,673). There is no evidence to support hypothesis 1 and therefore the hypothesis will be rejected.

4.5.2 Hypothesis 2

Table X shows that there is a β of 0,030 and a p-value of 0,826 for the relation between passion for founding and causation. No significant evidence is found to confirm the hypothesis, because of a lack of significance between the two variables ($p > 0,05$). So the hypothesis 'An entrepreneur who is passionate about founding is more likely to tend towards the causal approach of decision-making' will be rejected.

4.5.3 Hypothesis 3

The results for the regression show that there is a positive significant relationship between passion for developing and causation ($\beta = 0,346$; $p = 0,14$). This means that significant evidence is found to not reject the hypothesis. Therefore, the hypothesis 'An entrepreneur who is passionate about developing is more likely to tend towards the causal approach of decision-making' won't be rejected.

5. DISCUSSION

In the discussion an elaboration is given about the results of this research. A questionnaire that consists of Dutch entrepreneurs is used to collect data that is used for this research. No other criteria were set up, other than being a Dutch entrepreneur. The questionnaire was set up using the scale of Alsos et al. (2014) and Cardon et al. (2012). The results retrieved from the translated data using SPSS differs from the theory. The theory that is used when creating the three hypothesis is by Cardon et al. (2013). Three hypothesis regarding the three domains of entrepreneurial passion on effectuation and decision-making were set up and the results show that only one of these hypothesis can be supported with significant evidence.

In line with the theory, passion for developing has a positive effect on using the causal approach. This means that Dutch entrepreneurs who are passionate about developing uses a plan to manage employees to work more efficient rather than managing employees with no clear vision. This can be caused by the suggestion that effectuation decreases if the number of employees increases.

The other hypothesis, that there is a relationship between passion for inventing and effectuation is rejected. No significant evidence is found to support this hypothesis. When looking at the correlation, it shows that there is a correlation between passion for inventing and causation instead of effectuation. This is surprising, since theory states that entrepreneurs who are passionate of inventing should use a effectual approach. Apparently, entrepreneurs that have a passion for inventing prefer finding new existing opportunities instead of creating them by themselves.

Furthermore, the hypothesis that suggests a relation between passion for founding and causation is rejected. There was no significant relation found in the research to support this hypothesis. Alsos et al. (2014) states that effectuation is positively related to high perceived uncertainty. When founding a business, there are a lot of uncertainties and you have to be flexible instead of sticking to a plan (Brinckmann et al. (2010). This can cause the lack of relation between passion for founding and causation.

5.1 Limitations and critics

The first limitation is the Cronbach's Alpha for some of our variables. Causation and passion for developing have a Cronbach's Alpha below the desired score of 0,7. The low score can be explained by having a small scale (Field, 2009), since the Alsos Scale (2014) consists of a total of 10 items, where 5 items represent causation. The same applies to passion for developing, where the scale of Cardon et al. (2013) is used. The scale contains only 4 items for passion for developing.

In order to collect data for this research, multiple social media platforms are used. This can cause an internet-bias or a situation where only a certain type of entrepreneur participated in this research. These are entrepreneurs who are active on social media platforms, such as LinkedIn and Facebook. This can result in a sample that does not reflect the population of the Netherlands.

The dataset that is used in this research is collected by myself. The sample consists of 102 Dutch entrepreneurs and besides the fact that it is an achievement to collect this amount of responses in such a short time slot, the dataset does not reflect the whole population of the Netherlands (1,9 million companies (CBS, 2020)).

5.2 Recommendations for future research

The sample of this research were Dutch entrepreneurs. Since the data collection was done by online platforms (WhatsApp, Facebook and LinkedIn), the survey was filled in by entrepreneurs with different characteristics. The inhabitants of the different regions in The Netherlands has different characteristics. The mentality in entrepreneurship of Dutch entrepreneurs in the West of The Netherlands differs from entrepreneurs that live in the East. In this research, it is not known were the respondents came from. In future research, it would be interesting to see if the relationship between the two variables differ in the different regions of The Netherlands.

Furthermore, in this research, no significant evidence was found for two of the three hypothesis. For future research, it is recommended to use a bigger sample. It would be interesting to see if a bigger sample can cause additional results.

6. CONCLUSION

The aim for this research was to answer the research question:

"To what extent does entrepreneurial passion have impact on causation and effectuation in entrepreneurs' decision-making?"

In order to execute this research, entrepreneurial passion was split up into the three different domains (passion for inventing, passion for founding and passion for developing). Also, three different hypothesis were created using existing theory. Every hypothesis contains a domain of entrepreneurial passion and the corresponding approach of decision-making according to the theory. This research is a combination of two different questionnaires: the scale of Alsos et al. (2014) and another scale-based instrument, which is designed by Cardon et al. (2013). The first questionnaire is used to measure effectuation and causation and the second questionnaire is meant for measuring entrepreneurial passion.

First, the variables were checked on validity by using Cronbach's Alpha and factor analysis. Afterwards, a correlation and regression analysis is executed. Only one of the three hypothesis was not rejected, which means that there was no significant evidence found for two of the three hypothesis. This means that, according to our research, there is no relation between passion for inventing and effectuation and passion for founding and causation. The hypothesis that is not rejected states that there is a relation between passion for developing and causation.

7. REFERENCES

Alsos, G. A., Clausen, T. H., & Solvoll, S. (2014). Towards a better measurement scale of causation and effectuation. Academy of Management Proceedings,

Amabile, T. M. (1997). Entrepreneurial creativity through motivational synergy. The Journal of Creative Behavior, 31(1), 18-26.

Baum, J.R., Locke, E.A. & Smith, K.G. (2001). A multidimensional model of venture growth. Academy of Management Journal 44, 292–303

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

Bartlett, M.S. (1950). Tests of significance in factor analysis. British Journal of Mathematical and Statistical Psychology, 3(2), 77-85.

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

Brinckmann, J., Grichnik, D., & Kapsa, D. (2010). Should entrepreneurs plan or just storm the castle? A metaanalysis on contextual factors impacting the business planning–performance relationship in small firms. Journal of business Venturing, 25(1), 24-40.

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

CBS. (2020, 18 december). Hoeveel bedrijven telt Nederland? - Nederland in cijfers 2020. Hoeveel bedrijven telt Nederland? - Nederland in cijfers 2020 | CBS. Retrieved on 20 June 2022, of https://longreads.cbs.nl/nederland-in-cijfers-2020/hoeveel-bedrijven-telt-nederland/

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. https://doi.org/10.1016/j.jbusvent.2009.10.006

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.

Field, A. (2009). Discovering Statistics Using SPSS. London: Discovering Statistics Using SPSS. 3rd Edition.

de Mol, E., Cardon, M. S & Khapova, S. N. . (2020). When Entrepreneurial Passion Backfires. Harvard Business Review.

Eckhardt, J. T., & Shane, S. A. (2003). Opportunities and Entrepreneurship. Journal of Management, 29(3), 333–349. https://doi.org/10.1177/014920630302900304

Grégoire, D. A., & Cherchem, N. (2020). A structured literature review and suggestions for future effectuation research. Small Business Economics, 54(3), 621-639.

Murnieks, C. (2007). Who Am I? Looking inside the 'entrepreneurial identity'. Babson College Entrepreneurship Research Conference 2007. https://ssrn.com/abstract=1064901

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.

Sarasvathy, S. D. (2001a). Causation and Effectuation: Toward a Theoretical Shift from Economic Inevit...: The Academy of Management Review, 4/1/2001, Vol. 26, Issue 2, 26(2), 243–263. https://doi.org/10.5465/AMR.2001.4378020

Sarasvathy, S. D. (2001b). Effectual Reasoning in Entrepreneurial Decision Making: Existence and Bounds. Academy of Management Proceedings, 2001(1), D1–D6. https://doi.org/10.5465/apbpp.2001.6133065

Sarasvathy, S.D., Kumar, K., York, J.G. & Bhagavatula, S. (2014). An Effectual Approach to International Entrepreneurship: Overlaps, Challenges, and Provocative Possibilities. Entrepreneurship Theory and Practice, 38(1), 71-93.

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, 533-565.

Schumpeter J. A. (1965). Economic Theory and Entrepreneurial History. In: Aitken HG (ed) Explorations in enterprise. Harvard University Press, Cambridge, MA

Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. Research in Science Education, 48(6), 1273-1296.

Riding, R.J. & Pearson, F. (1994). The relationship between cognitive style and intelligence. Educational Psychology 14(4):413-424

Vallerand, R. J., Mageau, G. A., Ratelle, C., Leonard, M., Blanchard, C., Koestner, R., & Gagne, M. (2003). Les passions de l'ame: On obsessive and harmonious passion. Journal of Personality and Social Psychology, 85, 756– 767

Vallerand, R. J., Salvy, S. J., Mageau, G. A., Elliot, A. J., Denis, P. L., Grouzet, F. M., & Blanchard, C. (2007). On the role of passion in performance. Journal of personality, 75(3), 505-534.

APPENDIX

Normality of variables

Table 5: Tests of Normality

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Causation	.122	102	.001	.977	102	.066
Effectuation	.078	102	.138	.987	102	.394
Passion_developing	.125	102	.000	.925	102	.000
Passion_founding	.151	102	.000	.890	102	.000
Passion_inventing	.148	102	.000	.855	102	.000

a. Lilliefors Significance Correction

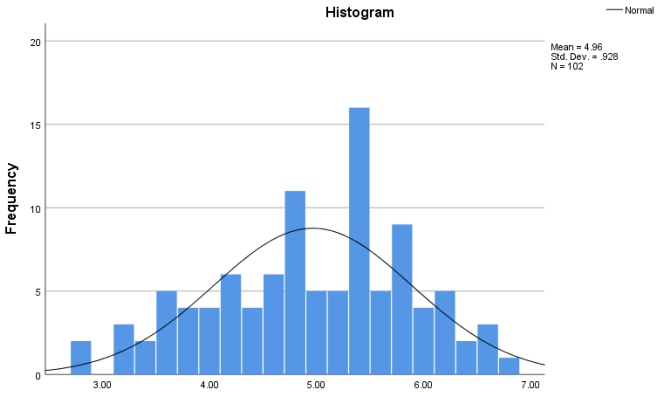


Figure 1a: Normality Histogram Causation

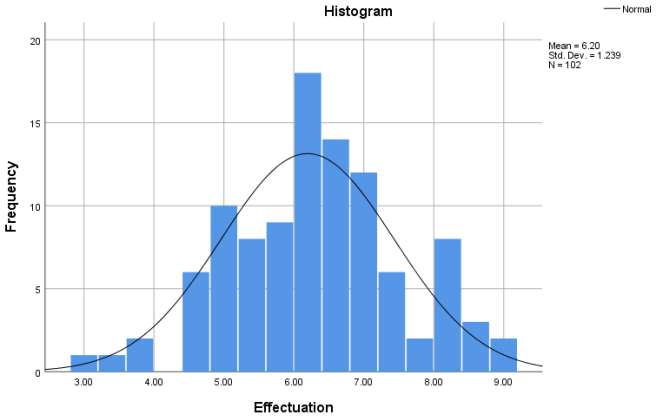


Figure 1b: Normality Histogram Effectuation

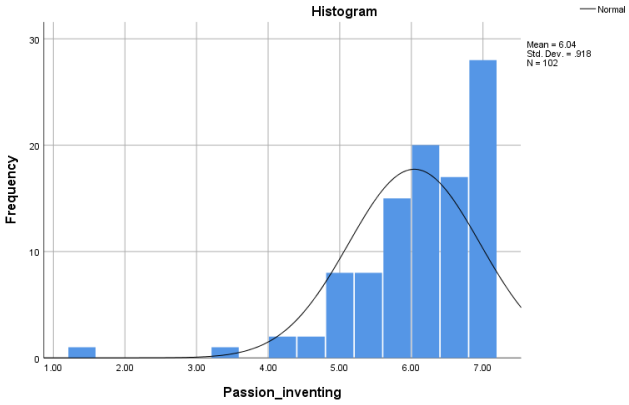


Figure 1c: Normality Histogram Passion for Inventing

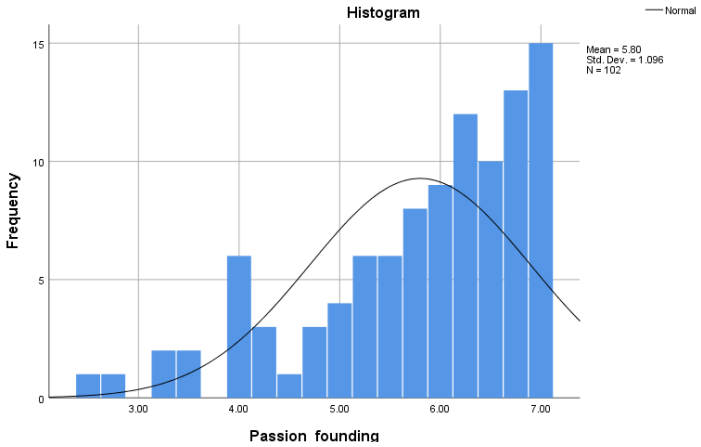


Figure 1d: Normality Histogram Passion for Founding

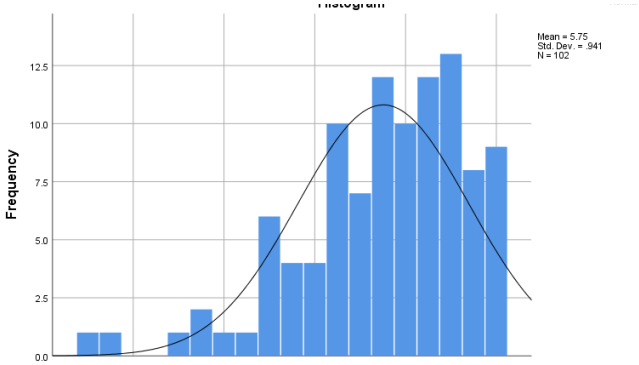


Figure 1c: Normality Histogram Passion for Developing

Reliability analysis

Table 6: Reliability Analysis Causation

Reliability Statistics

Cronbach's Alpha	N of Items
.625	5

Table 7: Reliability Analysis Effectuation

Reliability Statistics

Cronbach's Alpha	N of Items
.730	5

Table 8: Reliability Analysis Passion for Inventing

Reliability Statistics

Cronbach's Alpha	N of Items
.786	5

Table 9: Reliability Analysis Passion for Founding

Reliability Statistics

Cronbach's Alpha	N of Items
.754	4

Table 10: Reliability Analysis Passion for Developing

Reliability Statistics

Cronbach's Alpha	N of Items
.689	4

Factor analysis entrepreneurial passion

Table 11: Correlation Matrix Entrepreneurial Passion

Correlation Matrix[a]

		EP1inv EP1inv	EP2inv EP2inv	EP3inv EP3inv	EP4inv EP4inv	EP5inv EP5inv	EP6fnd EP6fnd	EP7fnd EP7fnd	EP8fnd EP8fnd	EP9fnd EP9fnd	EP10dev EP10dev	EP11dev EP11dev	EP12dev EP12dev	EP13dev EP13dev
Correlation	EP1inv EP1inv	1.000	.432	.217	.378	.228	.393	.031	.230	.382	.251	.310	.071	-.015
	EP2inv EP2inv	.432	1.000	.445	.681	.476	.400	.243	.289	.385	.470	.439	.197	.275
	EP3inv EP3inv	.217	.445	1.000	.476	.426	.311	.377	.103	.157	.400	.333	.307	.146
	EP4inv EP4inv	.378	.681	.476	1.000	.511	.409	.226	.231	.390	.521	.453	.199	.334
	EP5inv EP5inv	.228	.476	.426	.511	1.000	.209	.227	.191	.247	.281	.249	.228	.201
	EP6fnd EP6fnd	.393	.400	.311	.409	.209	1.000	.449	.365	.543	.374	.431	.138	.482
	EP7fnd EP7fnd	.031	.243	.377	.226	.227	.449	1.000	.324	.365	.326	.257	.252	.268
	EP8fnd EP8fnd	.230	.289	.103	.231	.191	.365	.324	1.000	.571	.181	.278	.341	.395
	EP9fnd EP9fnd	.382	.385	.157	.390	.247	.543	.365	.571	1.000	.281	.492	.344	.499
	EP10dev EP10dev	.251	.470	.400	.521	.281	.374	.326	.181	.281	1.000	.485	.247	.311
	EP11dev EP11dev	.310	.439	.333	.453	.249	.431	.257	.278	.492	.485	1.000	.343	.420
	EP12dev EP12dev	.071	.197	.307	.199	.228	.138	.252	.341	.344	.247	.343	1.000	.355
	EP13dev EP13dev	-.015	.275	.146	.334	.201	.482	.268	.395	.499	.311	.420	.355	1.000
Sig. (1-tailed)	EP1inv EP1inv		.000	.014	.000	.011	.000	.379	.010	.000	.006	.001	.238	.440
	EP2inv EP2inv	.000		.000	.000	.000	.000	.007	.002	.000	.000	.000	.024	.003
	EP3inv EP3inv	.014	.000		.000	.000	.001	.000	.152	.058	.000	.000	.001	.071
	EP4inv EP4inv	.000	.000	.000		.000	.000	.011	.010	.000	.000	.000	.023	.000
	EP5inv EP5inv	.011	.000	.000	.000		.018	.011	.028	.006	.002	.006	.011	.021
	EP6fnd EP6fnd	.000	.000	.001	.000	.018		.000	.000	.000	.000	.000	.083	.000
	EP7fnd EP7fnd	.379	.007	.000	.011	.011	.000		.000	.000	.000	.005	.005	.003
	EP8fnd EP8fnd	.010	.002	.152	.010	.028	.000	.000		.000	.034	.002	.000	.000
	EP9fnd EP9fnd	.000	.000	.058	.000	.006	.000	.000	.000		.002	.000	.000	.000
	EP10dev EP10dev	.006	.000	.000	.000	.002	.000	.000	.034	.002		.000	.006	.001
	EP11dev EP11dev	.001	.000	.000	.000	.006	.000	.005	.002	.000	.000		.000	.000
	EP12dev EP12dev	.238	.024	.001	.023	.011	.083	.005	.000	.000	.006	.000		.000
	EP13dev EP13dev	.440	.003	.071	.000	.021	.000	.003	.000	.000	.001	.000	.000	

a. Determinant = .006

Table 13: KMO and Bartlett's Test - Entrepreneurial Passion

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.832
Bartlett's Test of Sphericity	Approx. Chi-Square	490.132
	df	78
	Sig.	.000

Table 12: Rotated Component Matrix

	Component		
	1	2	3
EP1inv EP1inv			.826
EP2inv EP2inv	.663		.457
EP3inv EP3inv	.806		
EP4inv EP4inv	.717		
EP5inv EP5inv	.685		
EP6fnd EP6fnd		.587	
EP7fnd EP7fnd		.538	
EP8fnd EP8fnd		.727	
EP9fnd EP9fnd		.760	
EP10dev EP10dev	.630		
EP11dev EP11dev		.495	
EP12dev EP12dev		.551	
EP13dev EP13dev		.750	

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

a. Rotation converged in 5 iterations.

Table 14: 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	% of Variance	Cumulative %
1	5.015	38.574	38.574	5.015	38.574	38.574	3.030	23.309	23.309
2	1.534	11.801	50.375	1.534	11.801	50.375	3.028	23.291	46.600
3	1.168	8.987	59.362	1.168	8.987	59.362	1.659	12.762	59.362
4	.912	7.016	66.378						
5	.863	6.641	73.019						
6	.762	5.860	78.879						
7	.563	4.331	83.210						
8	.481	3.703	86.913						
9	.442	3.398	90.311						
10	.393	3.021	93.332						
11	.331	2.549	95.881						
12	.280	2.151	98.032						
13	.256	1.968	100.000						

Extraction Method: Principal Component Analysis.

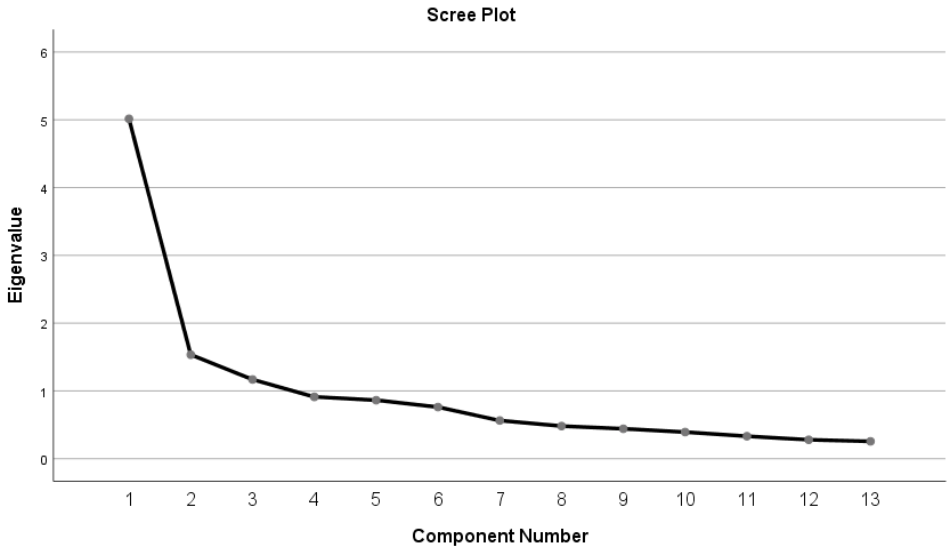


Figure 2: Scree plot - Entrepreneurial Passion

Factor analysis effectuation and causation

Table 16: KMO and Bartlett's Test - Causation and Effectuation

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.676
Bartlett's Test of Sphericity	Approx. Chi-Square	194.195
	df	45
	Sig.	.000

Table 15: Rotated Component Matrix

	Component		
	1	2	3
Causation1 Goal-oriented		.663	
Causation2 Expected returns		.634	
Causation3 Pre-existing knowledge			.862
Causation4 Competitive analysis		.667	
Causation5 Uncertain future		.654	
Effectuation1 Means-oriented	.600		
Effectuation2 Affordable loss	.718		
Effectuation3 Contingencies	.711		
Effectuation4 Commitments	.676		
Effectuation5 Unpredictable future	.700		

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

a. Rotation converged in 6 iterations.

Table 17: Total Variance Explained - Causation and Effectuation

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.699	26.988	26.988	2.699	26.988	26.988	2.449	24.491	24.491
2	1.885	18.846	45.833	1.885	18.846	45.833	1.918	19.181	43.671
3	1.083	10.827	56.660	1.083	10.827	56.660	1.299	12.989	56.660
4	.958	9.576	66.237						
5	.823	8.231	74.467						
6	.664	6.643	81.111						
7	.545	5.453	86.564						
8	.534	5.338	91.902						
9	.465	4.648	96.550						
10	.345	3.450	100.000						

Extraction Method: Principal Component Analysis.

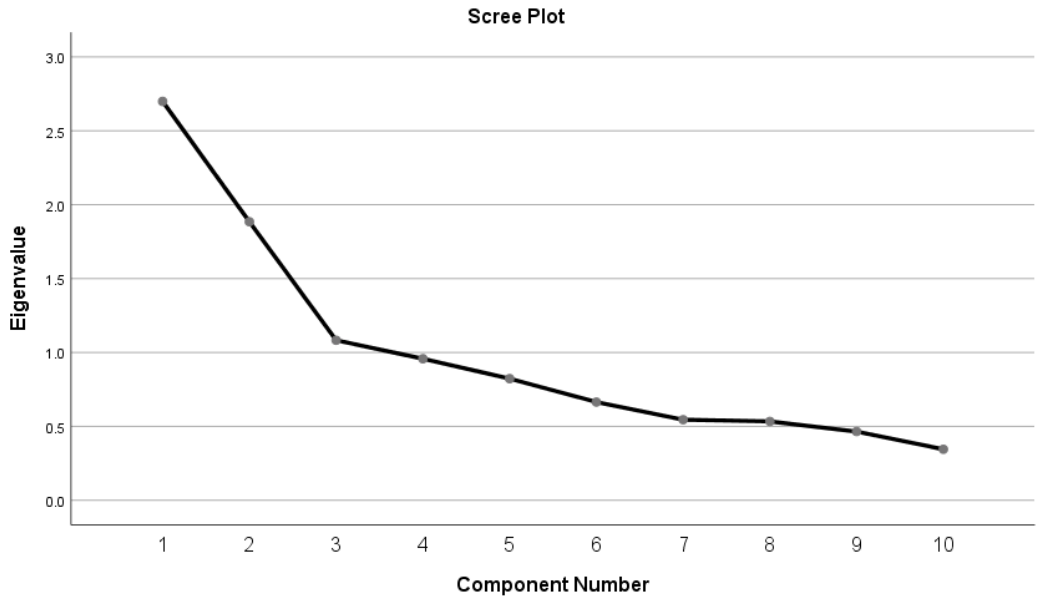


Figure 3: Scree plot - Causation and Effectuation

Correlation analysis

Table 18: Correlation Results

			Passion_Inventing	Passion_Founding	Passion_Developing	Causation	Effectuation
Spearman's rho	Passion_Inventing	Correlation Coefficient	1.000	.477**	.443**	.219*	-.067
		Sig. (2-tailed)	.	.000	.000	.027	.507
		N	102	102	102	102	102
	Passion_Founding	Correlation Coefficient	.477**	1.000	.544**	.258**	.091
		Sig. (2-tailed)	.000	.	.000	.009	.364
		N	102	102	102	102	102
	Passion_Developing	Correlation Coefficient	.443**	.544**	1.000	.444**	-.002
		Sig. (2-tailed)	.000	.000	.	.000	.980
		N	102	102	102	102	102
	Causation	Correlation Coefficient	.219*	.258**	.444**	1.000	-.130
		Sig. (2-tailed)	.027	.009	.000	.	.192
		N	102	102	102	102	102
	Effectuation	Correlation Coefficient	-.067	.091	-.002	-.130	1.000
		Sig. (2-tailed)	.507	.364	.980	.192	.
		N	102	102	102	102	102

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

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

Regression causation

Table 19: Model Summary - Causation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.308[a]	.095	-.005	.93022
2	.506[b]	.256	.146	.85784

a. Predictors: (Constant), Dummy_Male Male, Age CV_Age, Dummy_Doctoratedegree DoctorateDegree, Dummy_Honoursdegree HonoursDegree, Dummy_Bachelor Bachelor, Employees CV_number_of_Employees, Dummy_tertiairy Tertriairy, Dummy_Master Master, Ventures CV_Ventures_started, Experience CV_Experience_years

b. Predictors: (Constant), Dummy_Male Male, Age CV_Age, Dummy_Doctoratedegree DoctorateDegree, Dummy_Honoursdegree HonoursDegree, Dummy_Bachelor Bachelor, Employees CV_number_of_Employees, Dummy_tertiairy Tertriairy, Dummy_Master Master, Ventures CV_Ventures_started, Experience CV_Experience_years, Passion_Inventing, Passion_Developing, Passion_Founding

Table 20: ANOVA Table - Causation

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.251	10	.825	.953	.489[b]
	Residual	78.742	91	.865		
	Total	86.993	101			
2	Regression	22.235	13	1.710	2.324	.010[c]
	Residual	64.758	88	.736		
	Total	86.993	101			

a. Dependent Variable: Causation

b. Predictors: (Constant), Dummy_Male Male, Age CV_Age, Dummy_Doctoratedegree DoctorateDegree, Dummy_Honoursdegree HonoursDegree, Dummy_Bachelor Bachelor, Employees CV_number_of_Employees, Dummy_tertiairy Tertriairy, Dummy_Master Master, Ventures CV_Ventures_started, Experience CV_Experience_years

c. Predictors: (Constant), Dummy_Male Male, Age CV_Age, Dummy_Doctoratedegree DoctorateDegree, Dummy_Honoursdegree HonoursDegree, Dummy_Bachelor Bachelor, Employees CV_number_of_Employees, Dummy_tertiairy Tertriairy, Dummy_Master Master, Ventures CV_Ventures_started, Experience CV_Experience_years, Passion_Inventing, Passion_Developing, Passion_Founding

Table 21: Coefficients Regression - Causation

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	4.737	.413		11.464	.000		
	Age CV_Age	.003	.010	.039	.268	.790	.466	2.147
	Ventures CV_Ventures_started	-.133	.123	-.144	-1.083	.281	.566	1.766
	Experience CV_Experience_years	-.007	.018	-.064	-.396	.693	.378	2.647
	Employees CV_number_of_Employees	.080	.068	.144	1.162	.248	.647	1.546
	Dummy_Bachelor Bachelor	.073	.225	.039	.324	.746	.674	1.483
	Dummy_Master Master	.398	.275	.180	1.449	.151	.645	1.552
	Dummy_Doctoratedegree DoctorateDegree	-.349	.958	-.037	-.364	.717	.952	1.050
	Dummy_tertiairy Tertriairy	-.276	.198	-.148	-1.392	.167	.878	1.139
	Dummy_Honoursdegree HonoursDegree	-.234	.724	-.035	-.323	.747	.842	1.188
	Dummy_Male Male	.392	.216	.202	1.818	.072	.808	1.237
2	(Constant)	2.153	.727		2.960	.004		
	Age CV_Age	.005	.010	.067	.494	.622	.461	2.167
	Ventures CV_Ventures_started	-.132	.114	-.142	-1.156	.251	.561	1.781
	Experience CV_Experience_years	-.010	.017	-.093	-.607	.545	.364	2.749
	Employees CV_number_of_Employees	.067	.064	.121	1.051	.296	.635	1.574
	Dummy_Bachelor Bachelor	.020	.210	.011	.095	.924	.659	1.517
	Dummy_Master Master	.244	.274	.110	.888	.377	.550	1.819
	Dummy_Doctoratedegree DoctorateDegree	-.104	.902	-.011	-.115	.908	.914	1.094
	Dummy_tertiairy Tertriairy	-.237	.193	-.127	-1.228	.223	.791	1.264
	Dummy_Honoursdegree HonoursDegree	.293	.686	.044	.428	.670	.798	1.254
	Dummy_Male Male	.329	.200	.169	1.642	.104	.797	1.254
	Passion_Inventing	.087	.121	.086	.721	.473	.593	1.687
	Passion_Founding	.026	.117	.030	.220	.826	.445	2.245
	Passion_Developing	.341	.135	.346	2.517	.014	.448	2.232

a. Dependent Variable: Causation

Regression effectuation

Table 22: Model Summary - Effectuation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.315[a]	.099	.000	1.23866
2	.332[b]	.110	-.022	1.25195

a. Predictors: (Constant), Dummy_Male Male, Age CV_Age, Dummy_Doctoratedegree DoctorateDegree, Dummy_Honoursdegree HonoursDegree, Dummy_Bachelor Bachelor, Employees CV_number_of_Employees, Dummy_tertiairy Tertriairy, Dummy_Master Master, Ventures CV_Ventures_started, Experience CV_Experience_years

b. Predictors: (Constant), Dummy_Male Male, Age CV_Age, Dummy_Doctoratedegree DoctorateDegree, Dummy_Honoursdegree HonoursDegree, Dummy_Bachelor Bachelor, Employees CV_number_of_Employees, Dummy_tertiairy Tertriairy, Dummy_Master Master, Ventures CV_Ventures_started, Experience CV_Experience_years, Passion_Inventing, Passion_Developing, Passion_Founding

Table 23: ANOVA Table - Effectuation

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.340	10	1.534	1.000	.450[b]
	Residual	139.619	91	1.534		
	Total	154.958	101			
2	Regression	17.030	13	1.310	.836	.622[c]
	Residual	137.928	88	1.567		
	Total	154.958	101			

a. Dependent Variable: Effectuation

b. Predictors: (Constant), Dummy_Male Male, Age CV_Age, Dummy_Doctoratedegree DoctorateDegree, Dummy_Honoursdegree HonoursDegree, Dummy_Bachelor Bachelor, Employees CV_number_of_Employees, Dummy_tertiairy Tertriairy, Dummy_Master Master, Ventures CV_Ventures_started, Experience CV_Experience_years

c. Predictors: (Constant), Dummy_Male Male, Age CV_Age, Dummy_Doctoratedegree DoctorateDegree, Dummy_Honoursdegree HonoursDegree, Dummy_Bachelor Bachelor, Employees CV_number_of_Employees, Dummy_tertiairy Tertriairy, Dummy_Master Master, Ventures CV_Ventures_started, Experience CV_Experience_years, Passion_Inventing, Passion_Developing, Passion_Founding

Table 24: Coefficients Regression - Effectuation

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	7.142	.550		12.980	.000		
	Age CV_Age	-.020	.014	-.208	-1.425	.158	.466	2.147
	Ventures CV_Ventures_started	-.072	.164	-.058	-.437	.663	.566	1.766
	Experience CV_Experience_years	.017	.024	.111	.686	.494	.378	2.647
	Employees CV_number_of_Employees	-.080	.091	-.108	-.875	.384	.647	1.546
	Dummy_Bachelor Bachelor	.064	.300	.026	.212	.832	.674	1.483
	Dummy_Master Master	-.416	.366	-.141	-1.138	.258	.645	1.552
	Dummy_Doctoratedegree DoctorateDegree	.878	1.276	.070	.688	.493	.952	1.050
	Dummy_tertiairy Tertriairy	.206	.264	.083	.778	.439	.878	1.139
	Dummy_Honoursdegree HonoursDegree	-.393	.964	-.044	-.408	.684	.842	1.188
	Dummy_Male Male	-.153	.287	-.059	-.534	.595	.808	1.237
2	(Constant)	6.613	1.062		6.229	.000		
	Age CV_Age	-.019	.014	-.204	-1.375	.173	.461	2.167
	Ventures CV_Ventures_started	-.082	.167	-.066	-.495	.622	.561	1.781
	Experience CV_Experience_years	.019	.025	.124	.746	.458	.364	2.749
	Employees CV_number_of_Employees	-.091	.093	-.124	-.981	.329	.635	1.574
	Dummy_Bachelor Bachelor	.082	.307	.033	.266	.790	.659	1.517
	Dummy_Master Master	-.350	.400	-.119	-.874	.384	.550	1.819
	Dummy_Doctoratedegree DoctorateDegree	.832	1.316	.067	.632	.529	.914	1.094
	Dummy_tertiairy Tertriairy	.210	.281	.084	.747	.457	.791	1.264
	Dummy_Honoursdegree HonoursDegree	-.178	1.001	-.020	-.178	.859	.798	1.254
	Dummy_Male Male	-.171	.292	-.066	-.586	.559	.797	1.254
	Passion_Inventing	-.075	.176	-.055	-.424	.673	.593	1.687
	Passion_Founding	.112	.170	.099	.657	.513	.445	2.245
	Passion_Developing	.058	.198	.044	.293	.770	.448	2.232

a. Dependent Variable: Effectuation

Table 25: Scale of Cardon

1	EP1inv	It is exciting to figure out new ways to solve unmet market needs that can be commercialized.
2	EP2inv	Searching for new ideas for products/services to offer is enjoyable to me.
3	EP3inv	I am motivated to figure out how to make existing products/services better.
4	EP4inv	Scanning the environment for new opportunities really excites me.
5	EP5inv	Inventing new solutions to problems is an important part of who I am.
6	EP6fnd	Establishing a new company excites me.
7	EP7fnd	Owning my own company excites me.
8	EP8fnd	Nurturing a new business through its emerging success is enjoyable.
9	EP9fnd	Being the founder of a business is an important part of who I am.
10	EP10dev	I really like finding the right people to market my product/service to.
11	EP11dev	Assembling the right people to work for my business is exciting.
12	EP12dev	Pushing my employees and myself to make our company better motivates me.
13	EP13dev	Nurturing and growing companies is an important part of who I am.