

# The Impact of an Entrepreneur's Cognitive Style on Strategy – using Effectuation

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## ABSTRACT,

*Entrepreneurship enables the effective use of limited resources, the creation of jobs, knowledge transfers, and innovation. To understand entrepreneurship and its emergence further, this paper focuses on the entrepreneurs themselves. Hereby, the aim is to investigate the extent to which the cognitive style of an entrepreneur influences the choice between effectual or causal strategy. Cognition research enables a deeper understanding of preferences for different types of learning, knowledge gathering, information processing, and decision making. This field of research is transferred to Sarasvathy's prominent research on the entrepreneurial strategies of effectuation and causation. Effectuation assumes that goals are created based upon available means, whereas causation assumes that means are selected to attain goals. Within this qualitative research, semi-structured interviews were conducted. The outcomes of the interviews reveal that both, causation and effectuation, were used by the entrepreneurs independently of their cognitive style. Furthermore, a preference for the use of effectuation was found among the interviewed entrepreneurs. Looking at the cognitive style of the entrepreneurs, an intuitive cognitive style was more prominent among this sample.*

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## Keywords

Entrepreneurship, Effectuation, Causation, Cognitive Style, Intuition, Analysis

# 1. INTRODUCTION

Entrepreneurship is “the practice of starting new organizations or revitalizing mature organizations, particularly new businesses generally in response to identified opportunities” (Onuoha, 2007, pp. 20-32). Furthermore, entrepreneurs are defined “as individuals who exploit market opportunity through technical and/ or organizational innovation” (Schumpeter, 1965, p. 723).

Entrepreneurship can enable the effective use of limited resources, the creation of jobs, knowledge transfers, and innovation. Therefore, entrepreneurship is a key contributor to sustained economic growth and within an organization it leads to competitive advantage (Meyer & Jongh, 2018) (Johnston, Andersen, Davidge-Pitts, & Ostensen-Saunders, 2010). To understand entrepreneurship and its emergence further, it is important to be aware of the actions and behaviors of entrepreneurs (Chandler, DeTienne, Kelvie, & Mumford, 2011). Throughout the years, researchers have started to focus on the entrepreneur himself (Hermes, 2016).

In the psychology literature, the concept of cognitive style is widely known as a determinant of individual behavior and recently received much attention in entrepreneurship research (Hermes, 2016; J. Kickul, L. Gundry, S. Barbosa, & Whitcanack, 2009). Cognitive style can be defined as “consistent individual differences in preferred ways of organizing and processing information and experience” (Allinson & Hayes, 1996, p. 119). Hereby, the most widely recognized distinction is between analysis and intuition. It was found that cognition gives a pathway towards which decisions entrepreneurs take (J. Kickul et al., 2009).

Now with the new field of emerging strategies, Sarasvathy’s research is more prominent. Her research describes two approaches to new venture creation. These two approaches are effectuation and causation. Sarasvathy’s research points out an alternative logic of decision-making under uncertainty, namely effectuation, that contrasts with well-known models based on a causal logic (Sarasvathy, 2008).

Causation “is consistent with planned strategy approaches. The planning and analysis required by such models assume conditions in which the distribution of outcomes in a group is predictable through calculation or statistical inference” (Chandler et al., 2011, p. 376). Hereby, the actions which are taken are based upon a predetermined goal (Agogue, Lundqvist, & Middleton, 2015).

Effectuation is “consistent with emergent strategy and includes a selection of alternatives based on loss affordability, flexibility, and experimentation” (Chandler et al., 2011, pp. 375-390). Added to that, it begins with a given set of means instead of a specified goal (Sarasvathy, 2008).

Sarasvathy (2008, p.18) states that the approach “entrepreneurs use influences how they formulate problems, what alternatives they perceive and generate, which constraints they accept, reject, and/or manipulate and how, and why they need certain criteria rather than others in fabricating and implementing new solutions”.

Within this research, it is investigated whether there are connections between the cognitive style of an entrepreneur and their use of effectuation and causation.

## 1.1 Research Gap

Arend et. al have criticized the theory of effectuation by labeling it “a proposed new theory of entrepreneurship, with insufficient empirical testing and critical analysis” (2015, p. 1). Furthermore, Arend et. al (2015) have advised to conduct further research on

why effectuation is used and to draw a connection between existing theories. This has been underlined by Chandler et. al (2011), who suggested exploring relationships between effectuation and other theories.

To date, there has been quite some research done on the theory of cognitive style, in particular analysis and intuition. Hereby, analytical thinking refers to the left brain orientation and favors a structured approach to problem-solving (Allinson & Hayes, 1996). Whereas, intuitive thinking refers to the right brain orientation and prefers an open-ended approach to problem-solving. Literature has highlighted that entrepreneurs tend to exhibit an intuitive thinking style (Allinson & Hayes, 2012). As an individual’s cognitive style influences the process of venture development, researching its effect on the entrepreneurial strategy is needed.

The role of this study is to assess the impact of cognitive style on the choice of an effectual or causal strategy (see Figure 1 - Concept for this research). This helps to understand the entrepreneurial processes and behaviors further.

Thus, the research question in this study is: “**To what extent does the cognitive style of an entrepreneur influence the choice between effectual or causal strategy?**”.

To answer the research question, two propositions are formulated. These propositions expect a relation between an individual’s cognitive style and their preference for either effectuation or causation.

The first proposition states that “*An entrepreneur with an analytical cognitive style prefers the use of a causal strategy*” (proposition 1). This connection is expected as a person who thinks analytically, is confident in planning and evaluating opportunities, but is rather insecure about the recognition of opportunities (J. Kickul et al., 2009). Therefore, a person with an analytical cognitive style is expected to prefer causation as this is consistent with planned strategy approaches (Sarasvathy, 2008).

The second proposition states that “*An entrepreneur with an intuitive cognitive style prefers the use of an effectual strategy*” (proposition 2). This connection is expected as a person who thinks intuitively is more confident in recognizing an entrepreneurial opportunity, but less confident in their ability to evaluate the opportunity. The preferred use of effectuation by entrepreneurs with an intuitive cognitive style is expected, as effectuation is a more flexible emergent strategy.

In order to help the reader understand the principles of effectual-causal decision-making and the intuitive-analytical cognitive styles, the next section describes the theoretical framework of both concepts. Thereafter, the methodology used in this paper is outlined. To answer the research question, data were gathered through interviews. The results are presented, discussed, and concluded in the subsequent sections.

# 2. THEORETICAL FRAMEWORK

This study builds upon the theories of effectuation and cognitive style. In the following chapter, these theories are explained in detail. Thereafter, the research framework is clarified.

## 2.1 Effectuation and Causation

**Effectuation theory** emerged from entrepreneurship research and identifies two logics of decision making. These decision-making logics are causation and effectuation.

The **causal** logic begins with an effect to be created and focuses on selecting means to create that effect. This infers that the goal is determined in advance before the means are defined to achieve

that goal. Causation is defined as “*consistent with planned strategy approaches. The planning and analysis required by such models assume conditions in which the distribution of outcomes in a group is predictable through calculation or statistical inference*” (Chandler et al., 2011, p. 376). The causal logic is the one that people are familiar with. It is the one, students use for example in MBA (Master of Business Administration) classrooms and includes methods such as make-versus-buy decisions, choosing the target market with the highest potential return, or picking a portfolio with the lowest risk.

**Effectuation** is the contrary of causation. It begins with given means and focuses on selecting between possible effects that can be created with that set of means (Sarasvathy, 2001). It is defined as “*consistent with emergent strategy and includes a selection of alternatives based on loss affordability, flexibility, and experimentation*” (Chandler et al., 2011, pp. 375-390). It is assumed, that using an effectual approach is more effective in uncertain situations.

In the following example, the opposed logics are clarified further. Imagine you are going to cook dinner. You can pick a meal from a book full of recipes and buy the ingredients needed for it. Then you cook the meal and it is ready. This is a process of causation. It begins with a given end goal, the meal, and focuses on finding the means needed to achieve this goal. Another way would be that you look around your kitchen and collect possible ingredients for cooking a meal. Hereby, you also have to think about possible meals. This is a process of effectuation. It begins with given ingredients (given means) and focuses on exploiting the opportunities that can be made with them (Sarasvathy, 2001).

It is stated that, empirically, entrepreneurs use both logics of action. Their use of effectuation or causation is related to the entrepreneur’s level of expertise and the venture’s life cycle. Expert entrepreneurs prefer effectuation over causation in the early stages of a new venture (Sarasvathy, 2008). In theory, it makes sense to analyze causal and effectual approaches as a strict dichotomy (Sarasvathy, 2008).

**Five principles** that differentiate the two logics, have been created and are concluded in Table 1. They are further introduced in the following section.

**Table 1**

**Five principles of Effectuation and Causation**

Dimension	Causation	Effectuation
Bird-in-Hand Principle	Goal-oriented approach	Means-based approach
Affordable-Loss Principle	Focus on expected returns	Focus on affordable loss
Crazy-Quilt Principle	Competitive analyses	Pre-commitment with stakeholders
Lemonade Principle	Exploiting contingencies	Exploiting pre-existing knowledge
Pilot-in-the-Plane Principle	Predicting the uncertain future	Controlling the unpredictable future

**Firstly**, there is the principle of being **means- versus goal-driven**. The effectual logic is means-driven, versus the causal logic, which is goal-driven. The means-driven logic highlights that something new is created with existing means rather than discovering new ways to achieve given goals.

**Secondly**, there is the differentiation between ‘**Affordable loss**’ and ‘**Expected returns**’. The causal approach focuses on selecting the best strategies for the purpose of maximizing potential returns. On the contrary, the effectuation approach predetermines how much potential loss can be accepted and focuses on experimenting with various strategies to gain more options in the future.

The **third** principle is the differentiation between ‘**Strategic alliances**’ and ‘**Competitive analyses**’. Hereby, the causal logic focuses on the competition and its detailed analyses. The effectual logic prefers strategic alliances and cooperations with stakeholders.

The **fourth** principle differentiates between ‘**Exploitation of contingencies**’ and ‘**Exploitation of preexisting knowledge**’. Entrepreneurs using the causal approach would focus on preexisting knowledge. Hereby, they consistently acquire resources according to their predetermined plan and navigate their way to its realization despite the challenges encountered. On the opposite hand, effectual entrepreneurs focus on exploiting contingencies. They take advantage of the challenges encountered by trying to have them work for them rather than against them. Hereby, they are open to changes in their plans as a result of unexpected contingencies.

The **fifth** principle differentiates between ‘**Controlling an unpredictable future**’ and ‘**Predicting an uncertain future**’. The causal approach follows the logic of: “To the extent that we can predict the future, we can control it” (Sarasvathy, 2001, p. 251). Therefore, the causal principle is focusing on the predictable facets of an uncertain future. Whereas the effectual approach has the logic: “To the extent that we can control the future, we do not need to predict it” and focuses on the controllable facets of an unpredictable future (Sarasvathy, 2001, p. 251).

These principles are relevant for this research as they are used to categorize the findings of the interviews on effectuation and causation. Hereby, the findings on effectuation and causation are discussed along these five principles. This enables the exploration of all aspects of effectuation along the two logics.

## 2.2 Cognitive Style

After introducing the concepts of effectuation and causation and its principles, a closer look is taken at the concept of cognitive style.

**Cognitive style** can be defined as “*consistent individual differences in preferred ways of organizing and processing information and experience*” (Sadler-Smith, 2001, p. 610). It is stable over time, bipolar, and describes different rather than better thinking processes (J. Kickul et al., 2009). Hereby, psychologists from various beliefs have proposed two fundamental differences, namely analysis and intuition (Heier, 1996).

**Analytical thinking** refers to the left-brain orientation and favors a structured approach to problem-solving. It uses an ordered and linear way of thinking when processing information (Allinson & Hayes, 1996). Furthermore, analytical thinkers prefer logic and following specific norms and guidelines (Hermes, 2016). During the process of new venture creation, it was found that individuals with an analytical thinking style rely on linear, sequential processing of information that enables them the evaluation of information and planning (J. Kickul et al., 2009).

**Intuitive thinking** refers to the right brain orientation and prefers an open-ended approach to problem-solving. Intuitive thinkers prefer fewer rules and regulations and less commitment

(Allinson & Hayes, 1996). Furthermore, intuitive individuals “discover opportunities by observing cues or signals through unfamiliar and unorganized information that is processed in a synthetic and holistic manner” (J. Kickul et al., 2009, p. 441).

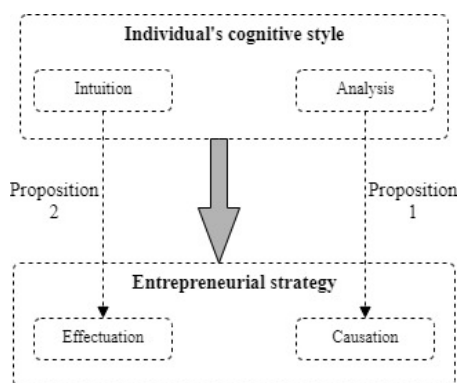
It was found that individuals’ cognitive preference for analysis or intuition influences their preference for different types of learning, knowledge gathering, information processing, decision making, and their perception of their entrepreneurial self-efficacy in their intentions to create a new venture’ (J. Kickul et al., 2009).

## 2.3 Research Framework

The research framework is developed and concludes the reviewed literature concepts.

The variables within this research are the cognitive style of the entrepreneur and their strategy. Looking at their cognitive style, they either have a preference for analytical or intuitive thinking. For looking at their strategy, the theory of effectuation and causation is applied. It is researched whether there is a relation between an individual’s cognitive style and their preference for either effectuation or causation. Figure 1 visualizes the concept of this research.

Furthermore, the control variables “gender, age, education (highest educational degree), experience as an entrepreneur (in years), company industry, and the number of organizations that the participant has launched” are utilized.



**Figure 1 - Concept for this research**

## 3. METHODOLOGY

After explaining the relevant theories within this research, the following chapter contains the sample, the variables, and the method of analysis that are used within this study.

### 3.1 Sample

The sample consists of eight participants. Interviewed were people who founded at least one company. The focus on entrepreneurs is needed to compare their strategy and thus to research the impact of cognitive style on their differences in strategy. Within this research, the focus lies on German entrepreneurs. This focus arises through the advantage provided by the author’s nationality and geographical position. Therefore, the results of this research will gain further insights to the understanding of entrepreneurs in Germany. In total 25 entrepreneurs from various industries were contacted. Eight of those accepted the interview offer which makes a response rate of around 32%.

In Appendix B, an overview of the sample demographics can be seen. Hereby, the company details and personal information are removed due to confidentiality reasons. Concluding, seven out of eight interviewees are male, one interviewee is female, the average age of the interviewees is 43, the average number of companies founded is 1.75, the average number of employees of their ventures is 66, and the average experience they have as entrepreneurs is 11 years. The interviews took place between 30.09.2021 and 25.10.2021.

### 3.2 Methods

This research falls into the category of qualitative research. This type of research was chosen to gain a rich amount of feedback from a range of different entrepreneurs. Hereby, semi-structured interviews were conducted to collect primary data information. The use of semi-structured interviews with its guiding interview protocol was chosen as it enables the exploration of new developments during the interview and to deviate from the set interview questions (Blog, 2020). The guiding interview protocol consists of four different sections.

The first section is about the **demographics of the participant** and the second section is about the **demographics of the founded company**. Information about these demographics was already obtained beforehand and was completed by asking for the missing information during the interviews. The questions about the demographics of the person and the company were used to collect the information about the control variables.

The second section is about the **cognitive style of the participant**. Hereby, the concepts of intuition and analysis were explained to the participant so that the participant had enough knowledge about these concepts to classify his/her cognitive style to either intuition or analysis. The concepts were explained based on previous literature by Allinson & Hayes. Their literature was chosen due to its great contribution to the cognition literature. After explaining the concepts, the participants were asked whether they think they are more intuitive or analytical.

The third section is about the **strategy of the entrepreneur, using effectuation**. The questions about the strategy were collected from existing research and in close relationship to the theoretical framework of effectuation and causation. Each of the concepts of effectuation and causation was explored by the questions. Hereby, elements of the literature were translated to interview questions so that insights about which approach the interviewed entrepreneurs are leaning towards, could be gained. The literature of Sarasvathy and the scales of Brettel, Mauer, Engelen, Küpper; Alsos, Clausen, Solvoll; and Chandler, DeTienne, McKelvie, Mumford were used as a base. Their articles were chosen as they contributed greatly to the literature of effectuation and proposed measurement scales for effectuation. Appendix A shows each section of the interview and its questions.

The interviews were mainly held in person. One interview was held online, via Microsoft Teams, due to the geographical difference between the interviewee and the interviewer. The interviews were conducted in German as the interviewers native language is German. This supports a higher quality of the conversation as language barriers are minimized. Furthermore, all interviews, except one, were audio-recorded after the permission from the interviewee to do so was received. The recordings of the interviews are available via the author of this paper. The interview, in which the permission to record the audio was not given, was recorded by taking notes. Before the interview, the purpose of this study was described. Hereby, terms like effectuation or causation were not named to guarantee non-biased answers. The interviews lasted on average 26 minutes.

### 3.3 Analyses

Due to the time constraints on this research, a profound analysis through coding techniques is not possible. Therefore, the materials were analyzed by looking through the recordings/notes of the conducted interviews. Hereby, patterns were identified and the data obtained from the interview was assigned to concepts of previous literature which are outlined in the literature part of this paper. This method of analysis is described as content analysis. It is defined as: *“An interpretive and naturalistic approach. It is both observational and narrative in nature and relies less on the experimental elements normally associated with scientific research (reliability, validity and generalizability)”* (Health, 2019). Thereby, the answers of the entrepreneurs could be analyzed and categorized to the entrepreneur's preference for cognition and their choice of effectuation or causation. Their preference in effectuation or causation was further divided among the principles of effectuation which are introduced in the literature section. This is done to gain a more detailed understanding of the entrepreneur's use of effectuation and causation.

Within the following section, the gathered data is presented. Firstly, the findings on effectuation and causation and then the data on analysis and intuition is presented. Thereafter, the results are summarized and hereupon a look at the control variables is taken. To get a concluding, visualized impression of the gathered data, Appendix C contains an overview of the results.

## 4. RESULTS

### 4.1 Effectuation and Causation

In this section, the findings on effectuation and causation are discussed along the five principles of effectuation.

Coming to the principle of being **means- versus goal-driven**, seven out of the eight entrepreneurs state that existing means, especially their network, skills, and background, were extremely important at the beginning of starting their company (obtained from interview question 1). These given means were the baseline for starting their company. Thus, based on this preference for the means-driven dimension, the strategy of these entrepreneurs is assigned to an effectual one. The other entrepreneur, participant 6, states that given means were only secondary and developed over time while the business itself developed (obtained from interview question 1). This statement can be classified towards a goal-driven approach and thus indicates a causal strategy.

Next, a look at the principles of **‘Affordable loss’** and **‘Expected returns’** is taken. Hereby, participants 1, 2, 4, 5, and 8 stated that they did not lend money and invested what was available to them (obtained from interview question 2). Thus, they are assigned to use the affordable loss principle and therefore apply a rather effectual strategy. Entrepreneurs 3, 6, and 7 lent money based on the decision that this was necessary to develop the business further in regard to maximizing potential returns. They are looking at expected returns and can be categorized towards the causal strategy.

Next, a look at the principles of **‘Strategic alliances’** and **‘Competitive analyses’** is taken. Hereby, entrepreneurs 1, 2, 3, and 4 are assigned towards a preference for strategic alliances and a rejection of competitive analyses (obtained from interview questions 3 and 7). For example, participant 1 stated that he formed partnerships with other companies to receive orders and participant 4 explained that his business was very integrated with other organizations. Participants 5, 6, and 7 stated that they did not form strategic alliances with other organizations when they were starting their venture. On further inquiry, they outlined that

this was just not necessary in their case. Furthermore, they stated that they did not analyze their competitors. For example, participant 7 clearly expressed his antipathy for competitive analyses. As participants 5, 6, and 7 did not form strategic alliances, because they did not have a need for that, and as they are not analyzing the market for competitors, they are assigned towards a rather effectual strategy. Participant 8 can be assigned towards using a causal strategy. He did analyze the competitive market in order to build his strategy on setting his business apart from what is already on the market, furthermore, he stated that he did not form any alliances.

Looking at the principles **‘Exploitation of contingencies’** and **‘Exploitation of preexisting knowledge’**, a preference for using an effectual approach is observable. Almost all entrepreneurs (1-7) did not have a fixed plan or end goal (looking at interview question 4). They rather stayed flexible and responded to their environment (obtained from interview questions 4 and 5). For example, participant 6 outlined that he did not have a plan and also did not know where the “journey ends”. Furthermore, he stated that he just started without having a goal in mind. Added to that, for example, entrepreneur 7 explains that you just have to start doing and that you cannot always make a plan, indicating his preference for an effectual approach. This attitude is joined by almost all other entrepreneurs, except from entrepreneur 8 (looking at interview question 4). Entrepreneur 8, on the other hand, had a clear goal in mind, which was a café with cakes. Furthermore, he had specific ideas in mind about the cakes and other articles he would offer and added that his strategy was strictly following this goal. Following this plan, despite challenges arising around him, indicates his preference for the exploitation of preexisting knowledge, and thus pointing towards a causal strategy.

Looking at the principles **‘Controlling an unpredictable future’** and **‘Predicting an uncertain future’**, a preference for using an effectual approach is observable. Hereby, all entrepreneurs, except participant 4, stated that they did not use predicting models (obtained from interview question 8). For example, participant 1 stated that he only used predicting models when it was asked for by the bank and that he does not see any advantage of using predictive models.

### 4.2 Analysis and Intuition

After outlining the results of the interviews about the part of their strategy, this section displays the interview results about the cognitive styles of the entrepreneurs.

In the first three interviews with participants 1, 2, and 3, different interview questions to determine their cognitive style, than during the following interviews, were used. During these three interviews, questions in order to determine their cognitive style were asked. Hereby, I carefully had to distill the elements which I was looking for since the operationalization was not optimal. Thus, it was decided that in line with what my supervisor said, that it is more beneficial to ask directly which cognitive style the participants would assign themselves. This leads to more immediately focused answers of the participants and a clearer classification of the participant's cognitive style.

Participant 1 is assigned towards a rather analytical cognitive style, as he states that he rather thinks strategically without focusing on his gut feeling. Looking at participant 2, he is assigned as rather intuitive as he stated that he trusts his gut feeling a lot and does not use stepwise plans but rather starts straight on. Participant 3 can be assigned to a more intuitive person as he mentioned that he is the more creative entity and works without stepwise plans. Furthermore, he stated that he trusts his gut feeling a lot.

Participants 4 and 8 claimed that they are analytical thinkers. Participants 5, 6, and 7 stated that they are intuitive thinkers, whereby participant 7 even underlined the use of trusting his gut feeling while decision-making.

### 4.3 Summarized results

In Appendix C an overview of the results can be seen. Hereby, the participant, their cognitive style, and their choice between effectuation and causation between the different principles are shown.

Within this study, it is observable that the participants are predominantly intuitive. Three out of the eight participants have an analytical cognitive style, whereas the other five participants possess an intuitive cognitive style. Looking at the use of effectuation, there is a clear preference for using an effectual strategy observable as effectuation outweighs the use of causation among the principles.

However, there is no connection among the cognitive style of the entrepreneurs and their use of effectuation or causation observable. For example, participant 1 has an analytical cognitive style but uses effectuation among all principles. Added to that, a couple of participants with an intuitive cognitive style are using causation among some principles. For example, participant 3 has an intuitive cognitive style but uses causation among the principle of Affordable loss vs. expected return.

Based on the results, a look at the propositions is taken. The first proposition states that *“An entrepreneur with an analytical cognitive style prefers the use of a causal strategy”* (proposition 1). Three participants have an analytical cognitive style and they are preferring the use of effectuation among the principles. Thus, this proposition is rejected.

The second proposition states that *“An entrepreneur with an intuitive cognitive style prefers the use of an effectual strategy”* (proposition 2). The results suggest that this proposition can be approved as participants with an intuitive cognitive style use effectuation predominately. However, considering the outcome of proposition 1, I am aware that also the participants with an analytical cognitive style prefer effectuation. This indicates that the interviewed entrepreneurs, independent of their cognitive style, prefer effectuation over causation. Therefore, proposition 2 is rejected.

### 4.4 Control variables

After being aware that the interviewed entrepreneurs show a clear preference for using an effectual strategy, we will look at the control variables.

Within this research, the control variables “gender, age, education (highest educational degree), experience as an entrepreneur (in ages), company industry, and the number of organizations that the participant has launched” are utilized. As the participants differ among their control variables, but match in their preference for effectuation, it can be concluded that there is no impact of the control variables on the use of effectuation or causation.

To consider the control variables in more depth, a closer look is taken on the deviant use of causation among some dimensions by a few entrepreneurs. Hereby, it was carefully inspected whether the deviant use of causation might be due to the control variables. The outcomes are presented as following.

Looking at the dimension of ‘Affordable loss’ and ‘Expected return’, it is observable that participants 3, 6, and 7 prefer causation. They based their investment decisions on the principle of expected return and borrowed money. Hereby, it is noticeable that participants 6 and 7 are active in industries where capital-intensive machinery is needed, namely car workshops and

mechanical engineering. Being active in these high capital-intensive industries, might involve the need to lend money. This indicates that their choice of strategy might be impacted by the industry they are in.

Added to that, looking at the dimensions of ‘Controlling an unpredictable future’ and ‘Predicting an uncertain future’, only participant 4 is applying a causal strategy. He was active in the event industry and stated that he was using predictive models, for example, for estimating how many guests will join the events. These kinds of predictions might be a necessity in the event industry as they enable the effective planning of events. For example, by predicting the number of guests that will join an event, the location and the catering can be prepared effectively. Therefore, the company industry might impact his use of causation among this dimension.

Concluding, only the control variable ‘company industry’ might have influenced the use of effectuation or causation.

The findings of the research are discussed in the following section.

## 5. DISCUSSION

This study investigates the impact of an entrepreneur’s cognitive style on the choice between an effectual or causal strategy. Due to the impact of cognition on the decision-making of entrepreneurs (J. Kickul et al., 2009), a connection between cognition and the prominent research of Sarasvathy was expected.

Hereby, it was presumed that an entrepreneur with an analytical cognitive style prefers the use of a causal strategy because a person who thinks analytically is confident in planning and evaluating opportunities, but is rather insecure about the recognition of opportunities (J. Kickul et al., 2009). Furthermore, it was expected that an entrepreneur with an intuitive cognitive style prefers the use of an effectual strategy because a person who thinks intuitively is more confident in recognizing an entrepreneurial opportunity but less confident in their ability to evaluate the opportunity. Both expectations are rejected by the results. The findings of this research show a tendency, independent of the cognitive style, towards the use of effectuation.

Additionally, the results show that some entrepreneurs use a combination of both, effectuation and causation. This is observable as these entrepreneurs use a different strategy among the dimensions. This finding is underlined by previous literature. J. Kickul et al. (2009, p. 9) state that switching from one decision-making logic to the other can be a benefit for the venture. The reason for that is, that hereby the entrepreneur can select the decision-making logic that fits the situation the best, depending on the uncertainty level surrounding the decision to be made.

Furthermore, this research found that 5 out of the 8 interviewed entrepreneurs pursue an intuitive cognitive style. This predominant presence of intuitive entrepreneurs within this study aligns with the findings of previous literature. Hereby, Armstrong and Hird (2009, p. 426) state that entrepreneurs are more intuitive and less analytical than non-entrepreneurs. Further literature joins this statement. For example, Allinson and Hayes (2012, p. 23) allude to previous research that outlines the idea that intuition is a necessary quality for individuals operating in an environment which is characterized by incomplete information, time pressure, ambiguity, and uncertainty. An environment which entrepreneurs often face.

This study contributes to the literature around the areas of entrepreneurship, effectuation, and cognitive style. Hereby, the

concepts of cognitive style and effectuation, which both are researched within the area of entrepreneurship, were transferred together.

## 5.1 Limitations

This study, similar to other studies on cognition and entrepreneurial strategy, has a number of limitations. First of all, the Covid-19 pandemic hindered the research. Several entrepreneurs to whom I reached out, denied the interview as they were busy with the consequences of the Covid-19 pandemic.

Secondly, conducting qualitative research using semi-structured interviews is time-consuming. As this research is limited in time, only eight interviews were held. In order to increase the quality of future research by drawing conclusions from a larger sample, it is suggested for future research to expand the sample size.

Thirdly, the selection of entrepreneurs might be biased as entrepreneurs which are within the author's network were more likely to accept the interview request. This might have been the case due to the impact of the Covid-19 pandemic. So that, mostly entrepreneurs from the western area of Germany were interviewed. This can impact the research due to cultural influences on the entrepreneurs. For future research, it is suggested to conduct further research on entrepreneurs from more diverse backgrounds.

Fourthly, the interview responses of the entrepreneurs might be biased. Their own perceptions about themselves or about what is socially desirable might have impacted their responses.

Fourthly, in qualitative research it is unavoidable that the researcher brings their bias to the research by, for example, bringing in their personal beliefs and experiences. Thus, for future research it is suggested to use triangulation, an approach to mitigate this bias. Hereby, multiple data sources are used to enhance the reliability of the study (Fusch, Fusch, & Ness, 2018).

Lastly, due to the limitations on this research, not all factors that could possibly impact the use of effectuation or causation could be included. As there might be other factors influencing the entrepreneurial strategy, it is suggested for future research to investigate additional factors that are likely to impact an entrepreneurs' use of effectuation or causation. Hereby, future research is advised to include the company's industry as a variable to find further information on its impact on the use of effectuation or causation. This is advised as assumptions about the company's industry and its impact on the entrepreneurial strategy developed within this research. Expanding the research by including other factors that are likely to impact the entrepreneurial strategy will further enlighten the understanding of the entrepreneurial processes and behaviors. This is underlined by Arend et al. (2015), stating that the competitive landscape needs to be specified further to enlighten the theory of effectuation even more.

## 6. CONCLUSION

This paper attempts to make a contribution to the theory of effectuation by establishing a link between an entrepreneur's cognitive style and the use of effectuation. The analysis aims to answer the research question **"To what extent does the cognitive style of an entrepreneur influence the choice between an effectual or causal strategy?"**.

As mentioned in the summarized results part, the overall tendency of the interviewed entrepreneurs is the preference for effectuation. This preference is independent of the entrepreneur's cognitive style as both, analytical and intuitive participants, showed a preference for an effectual strategy. Therefore, it can be concluded that the cognitive style of the entrepreneur does not

influence the choice between an effectual or causal strategy. There is no connection found between the concept of cognitive style and the choice of an effectual or causal strategy.

## 7. ACKNOWLEDGMENTS

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## **9. APPENDIX**

### **9.1 Appendix A**

#### **Interview protocol**

#### **Questions about demographics & other data related to the person (Can partly be collected beforehand)**

##### **About the person:**

- Gender
- Age
- Nationality
- Highest educational qualification acquired
- How much experience in terms of years do they have as an entrepreneur
- How many companies have they started

##### **About the company:**

- In which sector does/ did the company operate
- Age of company (when was it founded)
- Size of company in number of employees

#### **Questions about cognitive style: Intuition – Analysis**

Concepts of intuition and analysis were explained to the participant. Being aware of the concepts, the participant was asked directly what they think about their cognitive style

#### **Questions about Strategy:**

1. To what extent did you rely on resources that you already possessed (e.g., skills, knowledge, materials) when starting the company?
2. When starting the company, what was your opinion on investing money from banks or other outside institutions?
3. When you started, did you form partnerships? If so, what were the reasons to form these partnerships?
4. Did you start with a plan with a long-term goal to avoid risks or were you open for these without a plan in mind? (How did you react to potential threats/ setbacks?)
5. Did you have a clear long-term goal that you followed when starting the company? To what extent was your strategy following this goal?
6. How were decisions, about how much to invest in a project, made?
7. To what extent did you analyze the competitive markets? Were you looking for competitors or people who had resources that you did not have/ needed?



8. When you started the company, to what extent did you use predicting models (e.g., market analysis)? What was the reason for using predicting models?

## 9.2 Appendix B

### Sample demographics

Participant	Gender	Age	Education	Experience as entrepreneur in years	Number of companies founded*	Company industry	Age of company in years	Number of employees
1	M	47	Apprenticeship as industrial manager	11	4	IT Consulting	11	82
2	M	46	Vocational baccalaureate diploma in the field of mechanical engineering	11	4	IT Consulting	11	82
3	M	27	Completion of compulsory basic secondary schooling	1	1	CBD, retail	1	4
4	M	51	Bachelor in the field of business	10	1	Event	10	7
5	F	23	Abitur	3	1	Service, cosmetic	2	1
6	M	32	Trained automotive mechanic	5	1	Car workshop	5	3
7	M	71	Master in Metal Craft	46	1	Pumps, Mechanical engineering	46	340
8	M	47	Education as a qualified cook	3	1	Gastronomy	3	10

\* excluding subsidiaries

### 9.3 Appendix C

#### Overview of results

Participant	Cognitive style	Means- vs. goal-driven	Affordable loss vs. expected returns	Strategic alliances vs. competitive analyses	Exploitation of contingencies vs. exploitation of preexisting knowledge	Controlling an unpredictable future vs. predicting an uncertain future
1	analytical	E	E	E	E	E
2	intuitive	E	E	E	E	E
3	intuitive	E	C	E	E	E
4	analytical	E	E	E	E	C
5	intuitive	E	E	E	E	E
6	intuitive	C	C	E	E	E
7	intuitive	E	C	E	E	E
8	analytical	E	E	C	C	E