

# **Causation and effectuation vs. analysis and intuition: conceptual parallels in the context of entrepreneurial decision-making**

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**In the past years there has always been the reoccurring phenomenon of reinventing something that had already been successfully researched. Open innovation, for example, is a term created by Henry Chesbrough referring to the use of both internal and external knowledge to improve internal innovation. Nothing new, yet a term that is used in business books until now. It is the phenomenon that organizations are constantly seeking for new answers to old problems. This study aims at analyzing this concerning Sarasvathy's work of causation and effectuation comparing it with Allinson and Hayes' earlier work of analysis and intuition in order to determine whether their terms have been replaced by allegedly "new" innovative terms of Sarasvathy having the same meaning after all. Results indeed show parallels in their terms and definitions. However, the terms diverge in terms of their application and use. Furthermore, the phenomenon in general seems to be underlaying a deep cognitive and behavioral approach that lacks in evidence but in return opens doors for further research.**

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## **Keywords**

Cognitive Style Index, effectuation, causation, analysis, intuition, entrepreneurship, decision-making process

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## 1. INTRODUCTION

Nowadays, we gather information about innovations through every possible marketing channel available. Particularly television commercials, advertisements, and viral marketing show us the new technologies and products in abundance. This is the outcome of the Entrepreneurial Revolution, a term used by Kuratko (2007). He describes it as the “powerful emergence of entrepreneurial activity in the world” which has reached its peak in the past three decades. Hence, it is obvious that entrepreneurship, the process of starting a venture, has gained a lot of attention from researchers who still case the elements and components of entrepreneurship but also have started to focus on the person behind the success stories: the entrepreneur himself. There is high public interest in not only how entrepreneurs contribute to economic growth through their attitude towards leadership, management and innovation but also in what ways their mindsets lead to certain entrepreneurial behaviors, particularly those of decision-making when creating a new venture. Researchers such as Kickul, Gundry, Barbosa and Whitcanack (2009) argue that “individuals’ cognitive preference for analysis or intuition influences their perception and assessment of their entrepreneurial self-efficacy in their intentions to create a new venture”. These cognitive preferences – also called cognitive styles – can be defined as “consistent individual differences in preferred ways of organizing and processing information and experience” (Messick, 1976)” and have gotten much attention and a growing interest by researchers particularly the past years. Allinson and Hayes (2012) define cognitive styles as “an individual’s preferred way of gathering, processing and evaluating data [...] that guide our behavior”. Consequently, an entrepreneur’s cognitive style unfolds a certain behavior when creating a venture. Since there is evidence that knowing your own cognitive style is of value in various managerial processes (Allinson & Hayes, 2012), the major problem facing researchers though was that it lacked valid and reliable assessment instruments determining an individual’s cognitive style. Hence, they developed a psychometric measure called the Cognitive Style Index (CSI) – a tool determining an analytical or a rather intuitive behavior of the respondent and probably every supporter of the CSI or any other instruments assessing cognitive styles would agree that knowing the own style is a valuable virtue of successful entrepreneurship. Apart from that, Schweiger (1983) points out that for the conduct of particular managerial activities some cognitive styles were more appropriate than others.

While behavior covers many dimensions, one is particularly important when executing entrepreneurial activities: decision-making. Irrespective of whether the entrepreneur starts a new venture from scratch or whether he commissions a new in-house project as a result of internationalization for example, the entrepreneur is going to be faced with many major decisions vital for the success of the entrepreneurial task. In this regard, Sarasvathy (2001) called out two new terms: causation and effectuation – two opposing logics describing decision-making heuristics based on two possible choices: creating a particular effect by choosing between means (causation) or choosing one of many possible effects created through a given set of means (effectuation). This means that causation is consistent with planned strategy approaches and involves opportunity recognition and developing business plans. Effectuation, on the other hand, is consistent with emergent strategy. It involves alternatives that are based on affordable loss, flexibility and experimentation (Chandler et. al, 2011).

In her work Sarasvathy presents a decision model for entrepreneurs that involves an effectuation logic, rather than a causation one, and shows its use in the entrepreneurial process. Addressing

herself to the task, she was one of the first researchers to revive the relation between cognitive styles and entrepreneurial decision-making. The idea behind these new terms was that research assumes that opportunities are found by entrepreneurs (McMullen and Shepherd, 2006), whereas in reality – as claimed by Knight (1921) – entrepreneurship is undertaken in uncertain environments.

Consequently, this naturally raises the question what Sarasvathy’s terms and the works by Allinson and Hayes (1988, 1996, 2011, and 2012) have in common, or rather, where their differences lay for neither researcher is relating to one another in their works. Yet the domain of application primarily seems to be the same. This sounds like a common phenomenon that has occurred many times in the past already. Henry Chesbrough (2003), for example, created a big fuss shaping the term “open innovation” – a management idea referring to the use of both internal and external knowledge sources in order to exploit innovation. The management idea behind open innovation is that companies have a hard time staying competitive when relying solely on their own resources. This is nothing new actually. Instead, this idea had been known for years. Researchers, such as Tidd, Pavitt and Bessant (1997) argue that “organizations are constantly seeking for new answers to old problems”. Hence, abandoned management ideas are often eradicated and replaced by allegedly ‘new’ innovative visions on organizing.

To date, there have been quite some research done on causation and effectuation already. There have been experimental studies, such as the think-aloud studies by Dew, Read, Sarasvathy and Wiltbank (2009) as well as field studies concerning qualitative data, such as those of Harting (2004) or Sarasvathy and Kotha (2001). Furthermore, Dew, Read, Sarasvathy and Wiltbank (2009) measured prediction and control aspects of effectuation and Chandler, DeTienne, McKelvie and Mumford (2011) conducted empirical research focusing on validated measures of both causation and effectuation. With my work, I wish to engage into another angle and enlighten the relation between Sarasvathy’s terms with that of Allinson and Hayes. An interesting, yet untouched topic even though – according to Dew, Read, Sarasvathy and Wiltbank (2009) – the theoretical foundations of effectuation lie in cognitive science. I will review what intention of use they had in mind and if the domain of use is as intended by the authors. This way, I hope to be able to conclude whether this falls under the explained phenomenon or whether the terms represent different concepts after all. The paper proceeds as follows: In section 2, I will provide a conceptual framework by reviewing literature on the disputed terms (entrepreneurship, analytics and intuition as well as effectuation and causation). It is important to use a common denominator when it comes to the definition of terms used in my work, especially when it comes to terms like “entrepreneurship”, of which you can find many different definitions on in the world wide web or even business books and important literature. As Sarasvathy uses her terms in the field of entrepreneurship, a clear definition needs to be made in order to proceed with my work. In section 3, I explain the domain the authors claim their terms should be used for, including Sarasvathy’s (2001) decision model and the CSI created by Allinson and Hayes (2012). Section 4 describes the similarities and differences between their assertions. And finally, section 5 outlines the limitations and possibilities for future research.

## 2. CONCEPTUAL FRAMEWORK

### 2.1 Entrepreneurship

The study of entrepreneurship is vast nowadays. Researching entrepreneurship or its related phenomena, one has to be sensible of the fact that entrepreneurship has no clear definition but is defined differently in numerous studies. Additionally, one has to

consider that entrepreneurial tasks are defined differently as well. One pioneer of the various definitions of an entrepreneur is Mill (1848) who defined it by distinguishing it from regular management as per its features, such as risk bearing. Later, this thought led Schumpeter (1934) to his argument that due to the entrepreneurs' different views towards risk-taking, they would also differ in terms of their emphasis on innovation. Further, McClelland (1961) argued that the definition should focus on the responsibilities of an entrepreneur and his decision-making. As Schumpeter's definition comes close to what Collins, Hanges and Locke (2009) describe as "the idea of growth and creation of a new business opportunity where one did not exist previously", most researchers identify entrepreneurs as individuals who initiate and guide the process of new venture creation (Shane & Venkataramann, 2000). Consequently, unlike thought by many self-employed individuals, many researchers would argue that they are not entrepreneurs but simply small business owners. This is because small business owners are simply owners who do not necessarily meet the criteria of risk-taking or the aim of corporate growth. Their aim rather lies in professional freedom and being your own boss. Consequently, in this paper, I shall use the definition by Shane and Venkataramann (2000). Their definition equals that of Sarasvathy who researches in the field of new venture creation.

Many publications literatures deal with the consequences of new venture creation. However, looking at these I like to emphasize that there is the need for comparative studies, which investigate not only what entrepreneurship is about but also the attributes forming the entrepreneur himself. Often, I assume, researchers, such as George and Zahra (2002) admittedly incorporate the power of culture but neglect the importance of the individuals' cognitive styles that form a certain behavior and trigger different attitudes towards decision-making.

## 2.2 Analysis and intuition

Nickerson, Perkins and Smith (1985) describe the elements of consciousness as analytic, deductive, rigorous, constrained, formal and critical and the other as synthetic, inductive, expansive, unconstrained, divergent, informal, diffuse and creative. Others refer to right brain and left brain thinking. Characteristics of the right brain orientation would be immediate judgement based on feelings whereas those of the left brain orientation would be judgement based on reasoning. Allinson and Hayes (2012) simplify these elements just as analytic and intuitive behavior. They discovered that analytic thinkers show a noticeable orientation towards careful routines with a high structural degree and strong logical characteristics. Moreover, analysts use to follow specific bureaucratic norms and guidelines. Intuitive thinkers, on the other hand, prefer a rather flexible handling of this matter by seeking opportunities, being open to change and by being more activity-oriented in general. Hence, those with an intuitive style favor less rules and regulations, and less commitment. A relation towards an individual's tolerance of ambiguity can also be found as Acedo and Florin (2007) have discovered.

As a consequence, Allinson and Hayes designed the CSI as a valid and reliable assessment instrument for this matter. (See section 3.2)

## 2.3 Causation and effectuation

Causation and effectuation are two alternative approaches for entrepreneurs to use in the development process of their venture (Sarasvathy, 2001). Causation processes go back to the last century, are consistent with planned strategy approaches (Ansoff, 1988; Brews and Hunt, 1999; Minzberg, 1978) and underlay conditions of predictable outcomes through calculation or statistical inference (Sarasvathy, 2001). Entrepreneurs using causation processes first define their objectives, then search for opportunities

in well-developed industries (Fiet, 2002). According to Drucker (1998) those entrepreneurs seek to maximize expected returns. They state that a search process results in an opportunity detection defining alternatives from which that with the highest expected return is chosen. All in all, the causal approach in venturing follows a clear path and is predefined to a large extent where entrepreneurs with superior search and implementation skills perform most proficiently (Caplan, 1999).

Effectuation processes, however, are consistent with emergent or non-predictive strategies (Wiltbank et al., 2006). Being confronted by the third type of Knightian uncertainty – an unpredictable future, or as Sarasvathy (2009) calls it a "future that was not only unknown, but unknowable even in principle" – it is impossible to calculate returns or draw statistical inferences. Consequently, according to Kalinic, Sarasvathy and Forza (2014) entrepreneurs use the affordable loss principle – an estimation about what a decision-maker is able to put at risk and what he is willing to lose in order to follow a course of action, or particularly in order to plunge into entrepreneurship. Furthermore, he stays flexible and open to changes as the future is yet to be shaped and depends on alliances with the entrepreneur's stakeholders. Compensiously, entrepreneurs using effectual logic start a new venture with regard to their available means, while their objective stays flexible. It is a path- and stakeholder-dependent process. On the other hand, entrepreneurs following causal reasoning tend to focus on the maximization of expected returns. They have a clear goal in mind and pick the means necessary to reach their objective. Causal logic is a goal-driven and resource-dependent process. Entrepreneurs following causal logic base their decisions on information available to the entrepreneurs' control for opportunities are given but not created.

Actually, we encounter effectual and causal decision heuristics in daily life. Imagine a cooking process. Choosing a menu in advance and then shopping and cooking the meal is a causal process whereas the process of effectuation focuses on the available ingredients and accordingly chooses the menu. In her work, Sarasvathy (2009) uses metaphors to explain the terms, which should finally put the last pieces together. In the example of the jigsaw puzzle (causation) the entrepreneur has to take an existing market opportunity and uses resources to create a competitive advantage. All pieces of the world are present but must be recognized. The other metaphor is a patchwork quilt (effectuation) and the entrepreneur's task is to experiment and stay flexible in order to develop an opportunity. This approach requires human action and involves a world that is yet to be shaped.

Consequently, to summarize, Sarasvathy (2001) defines the two terms as such: "Causation processes take a particular effect as given and focus on selecting between means to create that effect. Effectuation processes take a set of means as given and focus on selecting between possible effects that can be created with that set of means."

In order to compare the works, it is necessary to find a number of other authors who use the mentioned terms in their works. Then I will try to draw conclusions to what extent the terms are used as espoused by the original author.

## 3. INTENTION OF USE

### 3.1 Causation and effectuation

There are two possible motives of an entrepreneur to pursue. Option one would be an entrepreneur who has a clear entrepreneurial goal and knows exactly what type of company he wants to create. In this case, he might use existing theories that have been proven to lead to success. Furthermore, he could use market research and use successful strategies to enter a particular market.

In a scenario like this, the entrepreneur preselects a particular effect and causation processes usually are a better fit to that because they are “excellent at exploiting knowledge” (Sarasvathy, 2001).

However, the more widespread background behind entrepreneurship is the desire to make above-average money, to be one’s own boss or simply to disseminate an interesting idea. In this case, markets are often emerging or even nonexistent. So how do entrepreneurs make decisions when goals are nonexistent or may have to be changed due to external interferences? In that case the effectuation process fits best as it is excellent at exploiting contingencies. According to Sarasvathy (2001), “effectuation allows the entrepreneur to create one or more several possible effects irrespective of the generalized end goal”. This allows the entrepreneur to use arising contingencies for his definition of goals. According to Sarasvathy (2001, 2008), the greater the uncertainty, the greater the likelihood that entrepreneurs use effectuation processes. Furthermore, the entrepreneur selects alternatives based on loss affordability, maintains flexibility, favors experimentation and exerts control over the future by getting commitment from stakeholders. Generally, effectuation should be used on three different levels (Sarasvathy, 2001):

- 1) At the level of the economy: Birch (1987) and Shane (1995) argue that entrepreneurial activity has influenced both job creation and increases in real per capita income. Hence, governments encourage entrepreneurs who start a new venture. This seems like a costly sport knowing that according to the National Venture Capital Association the expected success rate for new ventures is very low (Sarasvathy, 2001). Consequently, an effectuation approach focusing on reducing uncertainties can be useful because if effectual entrepreneurs fail, they will fail early. This would lead to lower costs altogether.
- 2) At the level of the market or industry: Getting a first-mover advantage calls for entrepreneurial activity. However, venturing in a non-existing market requires different strategies than those needed to enter an existing one. Consequently, the effectuation approach should be used on this level since it is proven to be the better approach dealing with uncertainty.
- 3) At the level of the firm: Sarasvathy (2001) argues that successful firms “in their early stages are more likely to have focused on forming alliances and partnerships than on other types of competitive strategies”.

Nonetheless, Sarasvathy (2001) stresses out that the idea of starting an own business alone is “not a necessary starting point for effectuation processes” because sometimes companies arise by ‘coincidence’ as an opportunity arises. As an example, there are companies, such as Lexus that use a mixed approach of both effectual and causal logic. When I watched a documentary about the automobile company Lexus from Japan, I realized a strong connection to Sarasvathy’s work. Lexus’ senior technician convinced the executive board to develop a sports car because he saw a market that was not ladled out yet – a true causal approach. However, carbon fiber technology was a novelty that Lexus had no knowledge of using it. The executive board agreed on a fixed amount of money available in order to pursue that goal. The senior technician had to build a team of Lexus’ finest engineers and faced many difficult decisions that required effectual reasoning as he was left in an unknown environment given a defined set of resources. Depending on the level of foreign market uncertainty and its propensity to base the decisions on the affordable loss principle rather than on the return on investment calculation, this became the era of the Lexus LFA.

As you can see, new venture creation may follow both causation and effectuation processes. Some entrepreneurs use the causation approach identifying opportunities, managing their resources and then achieving competitive advantage, whereas others experiment, decide according to the affordable loss principle and stay flexible. Sarasvathy (2001), and Chandler, DeTienne, McKelvie and Mumford (2011) have already addressed that future research has to be conducted in order to determine when each approach is more appropriate. Hence, effectuation is not a “better” process. On the contrary, an entrepreneur who has a clear goal should probably prefer using causation processes than effectuation.

### 3.2 Analysis and intuition

As mentioned above, Allinson and Hayes have created the CSI as a measurement instrument for their terms. The authors claim that their index could be used to identify and determine a person’s cognitive style.

The CSI is a psychometric measure created by Allinson and Hayes in 1996. It contains 38 questions of which each answer rated using a 3-point scale (true; uncertain; false). The results then determine an analytical or rather intuitive behavior. As an individual has a preference for a way of thinking or mode of behavior, his or her cognitive style could fall at any point on the scale of the CSI. Hence, those respondents whose answers are positioned towards the extremes would tend to favor one mode of thought (either analytical or intuitive) while excluding the respective other mode of thought, whereas positioning in the middle would assume that the respondent would tend to favor both analysis and intuition in their decision making processes. Consequently, one can say that the more analytical an individual, the less intuitive he or she behaves and the other way around.

Respondents are asked to choose whether they feel the statement is true or false about them, or whether they are uncertain about it. It is important that they do not take much time for each item but give their first reaction. Items of the CSI are worded in different ways so that in about half of them a response of “true” indicates an analytical orientation and the response of “false” an intuitive one, and vice versa. The closer the respondent’s score to the maximum of 76 points, the more analytical he or she is. The closer his or her score to zero, the more intuitive the individual behaves (see table below).

SCORING POINTS			
RESPONSE	KEY	Analytic items	Intuitive items
True	T	2	0
Uncertain	?	1	1
False	F	0	2

Allinson and Hayes (2012) define five different cognitive styles identified by a CSI result: Intuitive, quasi-intuitive, adaptive, quasi-analytic and analytic (see table below).

Style	Score range
Intuitive	0 – 28
Quasi-Intuitive	29 – 38
Adaptive	39 – 45
Quasi-Analytic	46 – 52
Analytic	53 – 76

Obviously, this assessment instrument is only useful when it is reliable in its nature. Reliability concerns the extent to which the

measurement is unaffected by random influences. Validity on the other hand is the extent to which the measurement measures what it is supposed to measure. Allinson and Hayes (2011) say that internal consistency – the degree of inter-correlation between the items – is the important type of reliability that matters. While Cronbach (1951) suggests the widely used alpha coefficient as the indicator of internal consistency, Nunnally (1978) suggests the alpha coefficient to be 0.7 or higher. Therefore, Allinson and Hayes (2012) looked at more than 100 studies of which 88% met or exceeded the alpha coefficient of 0.7. The 12% where the criterion was not met, the respondents were from countries where English was not the native language. Consequently, there is a high probability that misunderstanding several items of the CSI led to the failure of meeting the required alpha value. Having a mean alpha of 0.84 in the samples of  $n > 100$ , one can argue that there is evidence that the CSI is a reliable measure. However, to be certain, the temporal stability was tested as well by retesting on another occasion for four of the samples using the same group of people. All four groups reached a higher alpha than 0.7.

There is also evidence of construct validity. Allinson and Hayes compared genders, job levels, organizations and job functions in the same organization and scored exactly what previous studies had produced as results. Validity is indicated by “items loading onto a single factor in most previous studies, and significant correlations with scores on the Myers-Briggs Type Indicator, various personality dimensions and job level” (Allinson & Hayes, 2011).

Concluding, they say that subjects scoring high on analysis appear likely to favor a work setting that is oriented towards careful and structured routines. Those scoring high on intuition, however, prefer an activity-oriented setting, providing opportunities for new relationships and are flexible and open to change.

What does this tell us about analysis and intuition?

- Firstly, Allinson and Hayes do not argue that in entrepreneurship, for example, intuitive behavior fits best. According to them, one first has to find out one’s own cognitive style and then has to work with the result.
- They claim that the CSI was designed to be used “primarily with managerial and professional groups, but has also been applied successfully with students and non-managerial employees” (2012).
- Earlier in 1994 they cite evidence of the cognitive style value in relation to personnel selection, career guidance, task design, team composition, conflict management, and training and development. But also in their manual (2011) they suggest the CSI to be used for improving the following: person-job fit, the effectiveness of training, team composition, interpersonal relationships within teams and task performance of both individuals and teams. They claim that in structured tasks, for example, teams need to use analytic thinking, but “where there is a mismatch, the individual or some or all team members may fail [...] and this will undermine performance” (Allinson & Hayes, 2012).

## 4. RESULTS

### 4.1 Causation and effectuation

Interesting for the comparison of the works of Sarasvathy, and Allinson and Hayes is the use of their terms. In their study Dew, Read, Sarasvathy and Wiltbank (2009) used the think-aloud practice aiming at identifying causation and/or effectuation processes in their study’s participants’ decision-making heuristics. They asked experts – founders of multiple companies and proven superior performance – and MBA students to think through decisions in building a new venture. Both experts and students were

given the exact same task and faced the same problems and information. They had to think aloud as they made decisions in order to solve the given problems. The participants’ think-aloud protocols were analyzed and resulted in “dramatic differences in the way the two groups framed the decision problems” (Dew et al., 2009). Their study showed that MBA students used the causation approach by following textbook procedures and by trying to “strive for means and causal paths that would direct them toward the pre-selected goals” (Dew et al., 2009), whereas expert entrepreneurs not only ignored those aforementioned procedures but even argued against them. They clearly used the effectuation approach since they sometimes changed their initial goals, for example. Obviously, there is a huge contrast between those two groups in terms of decision-making heuristics, despite the fact that also MBA students had a “well-defined logical frame”, which simply opposed the one of expert entrepreneurs. Hence, entrepreneurs become experts by doing and doing and doing (Greeno and Simon, 1984) and thus make their decisions based on experience (Nielsen and Nielsen, 2011).

Furthermore, Kalinic, Sarasvathy and Forza (2014) have reviewed international entrepreneurship literature finding parallels to the effectuation approach as a strategy for internationalization. In their study they discuss the effect of effectual decision-making on the internationalization process and conclude that effectuation approaches find a better use in internationalization processes. They identified companies that internationalized production and where the entrepreneur himself played a crucial role in the internationalization process. They worked out that there was a high degree of uncertainty and the entrepreneur did not have a predefined internationalization plan. Results show that “the interaction with people [...] re-defined the initial goals in all companies” (Kalinic et al., 2014). However, Kalinic, Sarasvathy and Forza (2014) support their claim not only by their study results but also by international entrepreneurship literature, which has indicated that entrepreneurs often carry out unplanned internationalization – expand activities beyond national borders without having a fixed plan (Chandra et al., 2009; Crick & Spence, 2005). Moreover, Aharoni, Tihanyi and Connelly (2011) find that entrepreneurs apply unexpected lines of reasoning according to the affordable loss principle instead of maximizing returns. Generally, the level of foreign market uncertainty is high. Thus, for unplanned internationalization, or as I like to call it the “just get started” process, the effectuation approach seems to be the better fit. Jones, Coviello and Tang (2011), for example, argue that opportunities abroad can be created by entrepreneurs. A growing number supports this claim (e.g. Figueira-de-Lemos et al., 2011; Frishammar and Andersson, 2009; Spence and Crick, 2006).

Moreover, Read, Song and Smit (2009) conducted a meta-analysis summarizing data on 9897 new ventures studying the relationship between the effectual approach and entrepreneurial performance. They found that most principles of effectuation are positively related with new venture performance.

As to simplify the results, take a look at the table below:

Author(s)	Study	Result
Dew et al (2009)	Think-aloud	Dramatic differences in framing decision problems
Kalinic et al (2014)	Effect of effectuation on internationalization	Interaction with people re-defines initialgoals

Read et al (2009)	Meta-analysis	Effectuation is positively related to new venture performance
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## 4.2 Analysis and intuition

According to Allinson and Hayes (2011), there is evidence that a good fit between cognitive style and cognitive demands of a job will facilitate the development of competencies necessary for effective performance. Driver (1987) supports their claim. He found that top management jobs require multi-channel attention patterns, which are most effectively performed by managers who have the cognitive style suitable for these tasks and fast-tracking work environment. Robertson (1985) supports his claim. He argues that some people are simply not fit for this kind of position because they do not match the cognitive requirements. Instead, they start cognitive narrowing when under pressure, for example. Furthermore, Allinson and Hayes argue that the knowledge of one's own cognitive style can influence one's job preference and hence the CSI can be used for career counselling. Driver (1987) and Robertson (1985) conclude that the CSI could support career counsellors in altering and modifying a job holder's cognitive style in such a way that it fits better to their job. He also suggests that IT systems should be designed in a way that an operator has the option to select between operating modes in order to match their particular cognitive style. Messick (1984) supports these theories as well. He argues that people can shift their cognitive style in order to perform a particular task. Rush and More (1991) even go further by suggesting that the CSI could be used to train people modify their cognitive style. They found that "those with intuitive cognitive styles were successfully taught to gain access to the restructuring skills brought to problem solving situations by analytics.

As to simplify the results, take a look at the table below:

Author(s)	Result
Driver (1987)	Person-cognitive style-fit enhances managers' performance
Robertson (1985)	Cognitive narrowing is a result of a missing match with cognitive requirements
Messick (1984)	People can shift CS in order to perform a task
Rush and More (1991)	CSI can be used to modify one's cognitive style

## 5. CONCLUSION DISCUSSION AND FURTHER RESEARCH

Looking at the few results that can be found in serious literature and researches, parallels can be found. However, there is a clear distinction between the two works of Sarasvathy and Allinson and Hayes: While effectuation and causation solely focus on entrepreneurship in terms of running a new venture, Allinson and Hayes' intuition and analysis are repeatedly mentioned together

with their CSI used to rather enhance and improve one's decision-making and/or personal skills instead of the venturing process. It is obvious that the CSI can indeed be used to identify one's personal strengths in decision-making and understand how the individual solves certain assignments. This knowledge can in turn be used when opening a new venture. However, my study has shown that Sarasvathy and others have proven that there is no perfect solution when it comes to entrepreneurship. Depending on the objective and the means available either effectuation or causation processes can be a preferred option for the entrepreneur. Knowing your CSI results hence can support you in the decision whether one is perfectly matched to pursue one's objective or not – nothing more. Consequently, Sarasvathy and Allinson and Hayes have indeed discussed terms with different meanings.

More interesting though is the enlightenment of the terms' coexistence. Is it the increasing importance of certain business decisions that drive researchers to redefine already-in-use-practices? Or why have researchers such as Chesbrough become so famous in their field of study despite the fact that his breakthrough was not a new thing in how to be entrepreneurial? This is an area that has not been thoroughly researched. However, van Heusinkveld addressed the impact of growing management knowledge on organizational practices. He researched why some business ideas failed to develop and grow, whereas nearly same ideas later in time gained widespread managerial popularity. Bendix (1956), for example, found that old ideas simply get rephrased in other languages that sounded more time-appropriate. The same thing happened when Lean Manufacturing/Production was brought to life despite the fact that it was a business activity well-established in the early twentieths. Sometimes businesses use techniques associated with a fashionable management idea. However, the language may no longer be in vogue in terms of management publications (Guillén, 1994). Benders and Heusinkveld (2012) investigated on this matter. Their study shows that "elements of a fashion's initial linguistic package can be assimilated into the organization's language system, in spite of the fact that the initial concept may no longer be in vogue". This in turn can lead to a permanent immunity for specific solutions. Hence, they argue this led to avoiding specific words and terms and opened doors for new fashions in order to overcome that barrier.

I see potential in further studies analyzing whether causation and effectuation, and analysis and intuition are limited in their intentional applications or whether Sarasvathy's approaches can also be used for team performance improvements, for example. Furthermore, concerning the phenomenon discussed in this study, I suggest researching on national culture and the education system of a country. I assume that countries with a low-level education system lack in upholding fashions during their development process as globalization spreads foreign fashions that are alike and will prevail over their own. Furthermore, certain fashions may prevail in an Asian country, for example, where its national culture is influenced by Western countries.

Furthermore, future research can be done in the field of combining causation and effectuation as well as analysis and intuition among each other. As shown earlier in my study, Sarasvathy claims that there is no general "better than" solution. Sometimes even a combination of causation and effectuation is the best way to go. Syagga (2012) argues the same for analysis and intuition, saying that "individuals should be encouraged to use both analytic cognitive style and intuitive cognitive style in decision making for optimum results." Consequently, there is much space for future research, investigating on when a combination of both is beneficial, for example.

## 6. LIMITATIONS

As I have mentioned already, the determination of an individual's CSI can be helpful when being an entrepreneur as it shows you whether a business plan matches one's preferred decision-making processes. However, since there has not been any relevant research done comparing the two works of Sarasvathy and Allinson and Hayes including a combination of both works, there is space for future research in doing so. It can be interesting and also supportive for entrepreneurs to know, whether knowing one's own CSI result is indeed an indicator for the success of becoming an entrepreneur. Imagine, you wish to pursue a long-lasting dream of yours, which is opening an ice café. You have a clearly determined business objective, the financials to start the venture and there is nothing "new" in this idea. My research has shown, that in this case the causation process would be the better way to pursue this dream. However, the CSI result would show that you are quite an intuitively thinking person not acting analytic in your decisions but desist from that instead. Regarding the financial investment and the risk of failing – would you not like to know whether this combination is condemned to end in a failure or whether there is absolutely no cohesion between this information? Obviously, an entrepreneur would like to eliminate any risk that can be eliminated.

Concerning the phenomenon of reoccurring fashions, the intra-organizational evolution of management ideas remains quite unexplored. As Benders and Heusinkveld (2012) put it: Longitudinal case studies and surveys, but also ethnographic approaches are still under-utilized in this field, but can, in addition to present research approaches, provide valuable clues both for the important but under-researched questions such as the changing long-term cognitive and behavioral impact of management ideas in organizational practice.

## 7. REFERENCES

- Acedo, F. J., & Florin, J. (2007). Understanding the risk perception of strategic opportunities: a tripartite model. *Strategic Change*, 16(3), 97-116.
- Aharoni, Y., Tihanyi, L., & Connelly, B. L. (2011). Managerial decision-making in international business: A forty-five-year retrospective. *Journal of World Business*, 46(2), 135-142.
- Allinson, C. W., & Hayes, J. (1988). Cultural differences in the learning styles of managers. *Management International Review*, 75-80.
- Allinson, C. W., & Hayes, J. (1996). The cognitive style index: A measure of intuition-analysis for organizational research. *Journal of Management studies* 33(1), 119-135.
- Allinson, C. W., & Hayes, J. (2011). Cross-national differences in cognitive style: implications for management. *International Journal of Human Resource Management*, 11(1), 161-170.
- Allinson, C., & Hayes, J. (2012). *The Cognitive Style Index*. Pearson.
- Ansoff, H. I., & McDonnell, E. J. (1988). *The new corporate strategy*. John Wiley & Sons Inc.
- Bendix, R. (1956). *Work and Authority in Industry: Ideologies of Management in the Course of Industrialization*. Wiley.
- Birch, D. G. (1987). Job creation in America: How our smallest companies put the most people to work. *University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship*.
- Brews, P. J., & Hunt, M. R. (1999). Learning to plan and planning to learn: Resolving the planning school/learning school debate. *Strategic Management Journal*, 20(10), 889-913.
- Caplan, B. (1999). The Austrian search for realistic foundations. *Southern Economic Journal*, 823-838.
- 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.
- Chandra, Y., Styles, C., & Wilkinson, I. (2009). The recognition of first time international entrepreneurial opportunities: Evidence from firms in knowledge-based industries. *International Marketing Review*, 26(1), 30-61.
- Chesbrough, H. W. (2006). *Open innovation: The new imperative for creating and profiting from technology*. Harvard Business Press.
- Collins, C. J., Hanges, P. J., & Locke, E. A. (2004). The relationship of achievement motivation to entrepreneurial behavior: A meta-analysis. *Human performance*, 17(1), 95-117.
- Crick, D., & Spence, M. (2005). The internationalisation of 'high performing' UK high-tech SMEs: a study of planned and unplanned strategies. *International business review*, 14(2), 167-185.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *psychometrika*, 16(3), 297-334.
- Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2009). Effectual versus predictive logics in entrepreneurial decision-making: Differences between experts and novices. *Journal of business venturing*, 24(4), 287-309.
- Driver, M. J. (1987). Cognitive psychology: An interactionist view. *Handbook of organisational behavior*, Englewood Cliffs, NJ: Prentice Hall, 62-83.
- Drucker, P. F. (1984). The discipline of innovation. *Harvard business review*, 63(3), 67-72.
- Fiet, J. O. (2002). *The systematic search for entrepreneurial discoveries*. ABC-CLIO.
- Figueira-de-Lemos, F., Johanson, J., & Vahlne, J. E. (2011). Risk management in the internationalization process of the firm: A note on the Uppsala model. *Journal of World Business*, 46(2), 143-153.
- Frishammar, J., & Andersson, S. (2009). The overestimated role of strategic orientations for international performance in smaller firms. *Journal of International Entrepreneurship*, 7(1), 57-77.
- George, G., & Zahra, S. A. (2002). Culture and its consequences for entrepreneurship. *Entrepreneurship: Theory and Practice*, 26(4), 5-9.
- Greeno, J. G., & Simon, H. A. (1984). *Problem Solving and Reasoning* (No. UPITT/LRDC/ONR/APS-14). PITTSBURGH UNIV PA LEARNING RESEARCH AND DEVELOPMENT CENTER.
- Guillén, M. F. (1994). *Models of management: Work, authority, and organization in a comparative perspective*. University of Chicago Press.
- Harting, T. (2004). Entrepreneurial effectuation in a corporate setting: the case of Circuit City's Carmax unit. In *Babson Kauffman Entrepreneurship Research Conference, Glasgow, Scotland*.
- Hayes, J., & Allinson, C. W. (1994). Cognitive style and its relevance for management practice. *British Journal of Management*, 5(1), 53-71.
- Heusinkveld, S., & Benders, J. (2012). On sedimentation in management fashion: an institutional perspective. *Journal of organizational change management*, 25(1), 121-142.
- Jones, M. V., Coviello, N., & Tang, Y. K. (2011). International entrepreneurship research (1989-2009): a domain ontology and thematic analysis. *Journal of business venturing*, 26(6), 632-659.

- Kalinic, I., Sarasvathy, S. D., & Forza, C. (2014). 'Expect the unexpected': Implications of effectual logic on the internationalization process. *International Business Review*, 23(3), 635-647.
- Kickul, J., Gundry, L. K., Barbosa, S. D., & Whitcanack, L. (2009). Intuition versus analysis? Testing differential models of cognitive style on entrepreneurial self-efficacy and the new venture creation process. *Entrepreneurship Theory and Practice*, 33(2), 439-453
- Knight, F. (1921). Risk, uncertainty, and profit. Houghton Mifflin. New York.
- Kuratko, D. F. (2007). Entrepreneurial leadership in the 21st century. *Journal of Leadership and Organizational Studies*, 13(4), 1.
- Lynch, D. (1986). Is the brain stuff still the right (or left) stuff? *Training & Development Journal*.
- McClelland, D. C. (1961). *The achieving society*. Princeton.
- McMullen, J. S., & Shepherd, D. A. (2006). Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management review*, 31(1), 132-152.
- Messick, S. (1976). Personality consistencies in cognition and creativity. *Individuality in learning*, 4, 22.
- Messick, S. (1984). The nature of cognitive styles: Problems and promise in educational practice. *Educational psychologist*, 19(2), 59-74.
- Mill, J. S. (1848). *Principles of political economy: with some of their applications to social philosophy*. Little and Brown.
- Mintzberg, H. (1978). Patterns in strategy formation. *Management science*, 24(9), 934-948.
- Nickerson, R. S., Perkins, D. N., & Smith, E. E. (1985). *The teaching of thinking*. Hillsdale.
- Nielsen, B. B., & Nielsen, S. (2011). The role of top management team international orientation in international strategic decision-making: The choice of foreign entry mode. *Journal of World Business*, 46(2), 185-193.
- Nunnally, J. (1978). *Psychometric theory*. McGraw-Hill.
- Read, S., Song, M., & Smit, W. (2009). A meta-analytic review of effectuation and venture performance. *Journal of Business Venturing*, 24(6), 573-587.
- Robertson, I. T. (1985). Human information-processing strategies and style. *Behaviour & Information Technology*, 4(1), 19-29.
- Rush, G. M., & Moore, D. M. (1991). Effects of restructuring training and cognitive style. *Educational psychology*, 11(3-4), 309-321.
- Sarasvathy, S. D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of management Review*, 26(2), 243-263.
- Sarasvathy, S. D. (2009). *Effectuation: Elements of entrepreneurial expertise*. Edward Elgar Publishing.
- Sarasvathy, S., & Kotha, S. (2001). MANAGING KNIGHTIAN UNCERTAINTY IN THE NEW ECONOMY. *E-commerce and Entrepreneurship*, 1, 31.
- Shane, S. (1995, August). Is the independent entrepreneurial firm a valuable organizational form?. In *Academy of Management Proceedings* (Vol. 1995, No. 1, pp. 110-113). Academy of Management.
- Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of management review*, 25(1), 217-226.
- Schumpeter, J. A. (1934). *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle* (Vol. 55). Transaction publishers.
- Schweiger, D. M. (1983). Measuring managers' minds: A critical reply to Robey and Taggart. *Academy of Management Review*, 8(1), 143-151.
- Spence, M., & Crick, D. (2006). A comparative investigation into the internationalisation of Canadian and UK high-tech SMEs. *International Marketing Review*, 23(5), 524-548.
- Syagga, L. (2012). *Intuitive Cognitive Style and Biases in Decision Making* (Doctoral dissertation, Eastern Mediterranean University (EMU)).
- Tidd, J., Pavitt, K., & Bessant, J. (2001). *Managing innovation* (Vol. 3). Chichester: Wiley.
- Wiltbank, R., Dew, N., Read, S., & Sarasvathy, S. D. (2006). What to do next? The case for non-predictive strategy. *Strategic management journal*, 27(10), 981-998.