Effectuation and Foresight – an exploratory study of the implicit links between the two concepts

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A B S T R A C T

The concept of effectuation as known in the literature on entrepreneurship aims to explain how entrepreneurs build projects in situations of high uncertainty. In the effectual process, entrepreneurs reject any attempt to predict or forecast the future which would allow them to define their new ventures. Instead, they concentrate on building the future through their action and interaction with the different actors in their environment. The same attitude towards the future can be found in the literature on foresight. However, until now, these two concepts have not been brought together. The proposed paper is based on an exploratory study. Through a review of the literature on both effectuation and foresight, we aim to shed some light on the implicit links between the two concepts: cognition and networks. In addition, through a series of semi-conducted interviews with both entrepreneurs and some leading figures from the field of foresight, we explore this relationship more deeply. The results from the interviews suggest new approaches that could further strengthen the relationship between effectuation and foresight. This study opens a number of new perspectives for building foresight approaches that would be more adapted for entrepreneurs, notably in the initial stages of the development of their projects, as well as some possibilities for possible future research developments.

Keywords: Foresight; Effectuation; Entrepreneurship; Cognition; Networks.

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1. Introduction

Since publication of the seminal paper of Sarasvathy (2001a), effectuation has become a concept of growing interest among researchers (Chandler et al., 2011; Fisher, 2012; Perry et al., 2012). The concept originated as an answer to the question how firms come into existence in nascent or even non-existent markets (Sarasvathy, 1997). Creating a firm in an environment of high uncertainty (Sarasvathy, 1997) demands a certain thinking and decision-making process. Therefore, pursuing a non-existent market requires a specific attitude towards uncertainty, i.e. the future.

In her research works, Sarasvathy demonstrates that in the absence of pre-determined goals, the entrepreneurs qualified as experts[1] reject any attempt to predict the uncertain future. In fact, expert entrepreneurs see the future as an open space, left to be discovered and constructed. Thus, they tend to explore possible alternatives through their actions by relying on their "means" which include their personality (who they are), their knowledge and experience (what they know) and the social networks they are part of (whom they know) (Sarasvathy, 2001b). Proceeding in this way, effectual entrepreneurs create the effects which arise as they move forward by exploring the information through interaction and negotiation with third parties. This way, their benefit is twofold. They learn through interaction with other actors by confronting their initial perceptions with the perceptions with other individuals. This interaction allows them to see entirely different sets of alternatives or possible courses of action (Dew et al., 2009). At the same time, they extend their existing social networks and even seek to build mutual commitment with other individuals within the network. Thanks to this people-dependent logic, effectual entrepreneurs seek to control the future by acting upon it instead of predicting it.

Furthermore, prediction as well as forecasting are affiliated to futures studies, a research field dedicated to the study of the future (Coates, 2010). Therefore, it appears at first sight that this discipline (and its related fields such as futurology and foresight) stands in opposition to effectual logic in their approach to the future. However, after a thorough review of the literature on different approaches to the future, we found evidence that contradicts such a conclusion as well as that there are observable links between effectuation and foresight.

[1] Sarasvathy defines expert entrepreneurs by relying on the traditional research on expertise (Foley and Hart, 1992; Ericsson, 2006)

The researchers in the field of futures studies are unanimous in the statement that approaches to the future have evolved since their birth in the mid-1900 (Hatem, 1993; Dator, 1998; Godet, 2007; Keenan et al., 2003; Miles, 2010; Martin, 2010; Coates, 2010; Godet, 2010; Durance, 2010; Andersen and Andersen, 2014; Bas and Guillo, 2015; Rohrbeck et al., 2015). The main shift is the emergence of an approach which made a definite separation from prediction and forecasting. In order to distinguish them from the last two approaches, the concept of foresight was established.

The contemporary research directions on foresight are unanimous about its nature. It is detached from any form of prediction and considers the future to be open and a space that can be built (Berger, 1959; Godet, 2007; 2010; Durance, 2010; Bas and Guillo, 2015).

Drawing from this growing body of research, we propose that there are potential positive links between effectuation and foresight. Our work is entirely exploratory and its purpose is to highlight the links between the two concepts.

Therefore, our research questions are posed as follows:

What is the theoretical nature of the links between effectuation and foresight? Drawing from both futurists' and entrepreneurs' experience, in what way can existing foresight tools and methods contribute to the enhancement of the effectual process?

With regard to the nature of our questions, we opted for a review of the literature on effectuation and foresight as well as a methodology based on exploratory interviews. Four out of eleven interviews were conducted with four entrepreneurs in Alsace, France and seven others with international futurists. The data analysis was done manually. We decided to code separately the interviews conducted with futurists from those that were performed with entrepreneurs. After analysing both groups of interviews separately, we used the findings to compare them and contrast in the discussion section. In both analyses, we followed the approach of Gioia et al. (2012).

The article proceeds as follows. The first section of this article is dedicated to the theoretical framework, which we divided in four parts. We first review the literature on effectuation theory along with the elements inherent to effectuation. Next, we give an introduction to the concept of foresight, from its origins to its use in contemporary research. Finally, we develop the implicit links with effectuation. Section 2 describes our methodology. We explain our methodological and epistemological approach, the way the data were collected and analysed. In addition, we give a brief description of the profiles of all informants. Section 3 describes our main results. First, we

develop the findings that emerged from the interviews with futurists and entrepreneurs. In the section 4, we discuss our findings by closing the loop with theoretical framework. Finally, we give a conclusion and outline the limitations of the research design and the implications for further research.

2. Theoretical framework

In this first section, we shall attempt to analyse the links between effectuation and foresight by structuring the findings in the literature. First, we shall develop the concept of effectuation by focusing our analysis on the works of Sarasvathy in order to determine the principle characteristics and key elements. Next, we shall present the concept of foresight and reveal the implicit links with the theory of effectuation.

2.1. The effectuation concept

The following sections dedicated to effectuation theory are organised as follows. The first section goes through Sarasvathy's concept of the pre-firm and her definition of the entrepreneurial process (2.1.1). The next section (2.1.2) will be dedicated to the structuring elements of effectuation such as attitude towards the future, cognition and networks which could be the bridging points between effectuation and foresight.

2.1.1. The concept of the pre-firm

Since publication of the seminal paper of Sarasvathy (2001a), effectuation has become a concept of growing interest among researchers (Chandler et al., 2011; Fisher, 2012; Perry et al., 2012). For almost two decades, the development of effectuation has produced a paradigmatic shift in the way we understand how entrepreneurs learn, solve problems, make decisions and build artefacts (Sarasvathy, 2001a; 2001b; Sarasvathy and Kotha, 2001; Sarasvathy et al., 2003; Dew et al., 2009; Read and Sarasvathy, 2012). The concept originated as an answer to the question how firms come into existence in nascent or even non-existent markets (Sarasvathy, 1997). Creating a firm in such an environment of high uncertainty (Knight, 1921) presumes the absence of pre-existent, predefined goals. The central question concerns the economic mechanism that leads to

the discovery of new demand. As an answer, Sarasvathy proposes the concept of the ***pre-firm***. In a nutshell, it is the process of transformation of an idea into a firm (Sarasvathy, 1997). The author argues that every firm goes through the process of pre-firm whether it fails or succeeds. This process includes a set of decisions that give birth to ***"non-adaptive consequences"*** (Gould, 1980).

The entrepreneurial process involves four interconnected decision domains such as resources, stakeholders, environment and the entrepreneur himself. While the first three decision domains are linked to the theories of the firm, the forth one is unique to the concept of the pre-firm (Sarasvathy, 1997). The issues that an entrepreneur deals with are the future trajectory of the firm, the relationship between himself and other stakeholders and firm differentiation with regards to the environment (Sarasvathy, 1997).

This last domain of decisions has become a starting point from which Sarasvathy initiated the study of the cognitive profile of expert entrepreneurs in order to understand "what makes entrepreneurs entrepreneurial". This study will result in a new concept known as effectuation. In her research study she interviewed 30 US entrepreneurs, all successful in their respective industries (bio-tech, steel, semi-conductors…). What emerged from that study is that all entrepreneurs had a specific form of rationality, notably in the first stage of pre-firm (Sarasvathy, 1997). This sort of particular reasoning, Sarasvathy named ***"effectual"***.

In order to bring it into light, she compared effectual reasoning to causal reasoning (Sarasvathy, 2001a; 2001b). What defines causation is predictive reasoning. A person that reasons in the causal way will start from a predetermined goal and a given set of means which they will use to look for the most optimal alternative to achieve this goal. Effectual reasoning demands imagination, creativity and risk-taking (Sarasvathy, 2001a).

2.2.The effectual process

Effectual entrepreneur (Sarasvathy, 2001a; 2001b; Dew et al., 2009) begins with three categories of means: (1) Who they are – which involves their personal traits, their tastes and abilities; (2) What they know – this includes their knowledge acquired through education, training, expertise, and also experience; and, (3) Whom they know – this means their social and professional networks. Aware of these means, the entrepreneur will start imagining and implementing possible, alternative effects that can be created with the mentioned means. This process takes place without

previous thorough planning. Even if there must be some kind of plans, they are very flexible and can be easily changed and reconfigured. Even without a specific plan, effectual entrepreneurs always aspire to having a strong and a meaningful vision which they can share with the various stakeholders who will contribute to the project. Thanks to this kind of process, certain emerging effects can eventually merge with desirable goals (Sarasvathy, 2001a).

The structuring elements of the effectual process, Sarasvathy calls 'principles'. One principle of effectual rationality is the emphasis on affordable loss rather than on expected return, as is the case in causation (Sarasvathy, 2001a; 2001b). Instead of targeting segments of the market with the highest potential return, entrepreneurs will try to find ways to achieve market penetration with the minimum amount of loss of resources. For this reason, many of them will try to sell their product even before it is finished. Selling a product in its initial stage creates a possibility for entrepreneurs to get in contact with their potential users. Thus, they open themselves to various markets in which they can end up and sometimes they even manage to create a whole new market (Sarasvathy, 2001a).

Another principle of effectuation focuses on building strategic partnerships. Given the fact that entrepreneurs do not assume the existence of a predetermined market, doing competitive analysis does not make any sense (Sarasvathy, 2001a). Instead, they will try to find people or organizations with whom they can build partnerships. By engaging a critical mass of stakeholders and bringing them on board, entrepreneurs create for themselves greater chances to enter an existing market or to build a whole new market (Sarasvathy, 2001a; 2001b).

These structuring elements of the effectual process were studied by Chandler and his colleagues in 2011. The findings from their research indicate that effectuation is a construct which is built from several dimensions. Some of these dimensions correspond to the principles in Sarasvathy's work. For instance, the dimension of affordable loss is confirmed as being part of the effectual process. However, the study of Chandler and his colleagues indicate that there are two additional dimensions: flexibility and experimentation. The latter dimension is positively correlated to uncertainty.

2.3. Attitude towards uncertainty, cognition and networks

2.3.1. Attitude towards uncertainty

The experimental dimension of effectuation contains an underlying logic that clearly distinguishes effectuation from causation. Causation concentrates its efforts on predicting aspects of an uncertain future (Sarasvathy, 2001a; 2001b). Therefore, the logic that underlies causal processes is: "To the extent that we can predict the future, we can control it" (Sarasvathy, 2001a; p.6). In contrast to that, effectuation by its nature opposes any sort of predictions and forecasts (Sarasvathy, 2001b; Dew et al., 2009) and uses the following logic: "To the extent that we can control the future, we do not need to predict it" (Sarasvathy, 2001a; p.6).

Therefore, our major understanding on how effectual entrepreneurs process information and make decisions as well as the importance they give to building networks cannot be studied without a previous explanation of the attitude an effectual entrepreneur has towards uncertainty, based on people's beliefs about possibility of predicting and controlling (Wiltbank et al., 2006).

A lack of control over social events is what causes uncertainty. This is a state of limited knowledge (Sarasvathy, 2001b) where it is impossible to precisely determine the existing state, a future outcome, or more than one possible outcome. In these situations of imperfect and/or unknown information, it is not possible to predict the future, goals are not immediately apparent and there is no autonomous environment that might serve as the definitive selection mechanism (Sarasvathy, 2001b).

Sarasvathy gives a solution to this problem through effectuation (Sarasvathy and Kotha, 2001). As effectual logic is focused on the controllable aspects of an unpredictable future, it means that the future can be shaped and therefore, can have any distribution we choose to give it (Sarasvathy and Kotha, 2001). In the centre of this logic is human action as the predominant factor that builds and shapes the future (Sarasvathy, 2001a). Therefore, we can conclude that in effectuation, action is the starting point, and this reflects in the experimental dimension of effectuation determined by Chandler et al. (2011). In this way, action becomes a tool of knowledge acquisition and contributes to the enlargement of the existing knowledge base.

2.3.2. Effectuation and cognition

In their paper on effectual versus predictive logic in entrepreneurial decision-making, Dew et al. (2009) examine the behaviour and decision-making of students of an MBA programme on one

side and expert entrepreneurs on the other. They noticed that expert entrepreneurs were more likely to think holistically about the business than MBA students (Dew et al., 2009). This means that they tackled the given problem by focusing on how to build the venture as a whole.

Previous studies in the expertise literature have shown that experts have a larger mental database of actual experiences than novices and they, additionally, have better access to it (Chase and Simon, 1973; Simon and Simon, 1978; Anderson, 1981; Camerer and Johnson, 1991; Bedard and Chi, 1992; Shanteau, 1992; VanLehn, 1996, Feltovitch et al., 2006, Dew et al., 2009). Less proficient individuals are limited when accessing relevant knowledge because their short-term memory is overloaded by the problem situation they face (Feltovich et al., 2006). The larger knowledge base and superior retrieval abilities of experts allow them to reason analogically when confronted with a problem. Analogical reasoning is made possible by the fact that solutions to previous problems are stored in memory and these solutions are matched to new problems, which can then be resolved (Buchanan et al., 2006). However, effectual entrepreneurs seem to have certain psychological traits which keep their expertise dynamic (Sarasvathy et al., 2003).

2.4. Networks: collective learning and dealing with uncertainty

Given the fact that an effectual entrepreneur will reject any kind of prediction and will explore information by himself (Dew et al., 2009), the interaction with his strong and weak ties (Granovetter, 1973; 1982) will keep the entrepreneur's means open to changes (Sarasvathy et al., 2003). It is through interaction and negotiation with third parties that the entrepreneur will benefit from a diversity of knowledge (Sarasvathy et al., 2003). By confronting their previous knowledge and initial perception of the problem to the perception of other individuals, they bring about changes to their cognitive map and alter the problem space (Dunegan, 1993). Thus, getting insight on other individuals' cognitive frames with which they perceive alternative problems and solutions, allows them to see entirely different sets of alternatives or possible courses of action (Dew et al., 2009).

In effectual processes, through the expansion of networks of human alliances and engagement of various stakeholders, effectual entrepreneurs not only co-create new information which can lead them to new opportunities, but also feed their own individual perceptions and beliefs thus co-

creating new cognitive frameworks (Sarasvathy, 2001b; Dew et al., 2009; Read and Sarasvathy, 2012).

Building and expanding networks also play an important role in shaping and controlling the future of high uncertainty (Knight, 1921; Sarasvathy, 2001a; 2001b; Sarasvathy et al., 2003). Unlike causal logic which is effect dependent, effectual logic is people dependent (Sarasvathy, 2001a). Therefore, in effectual reasoning markets are not pre-existent, but are rather seen as a community of a critical mass of stakeholders who transform together the fruits of human imagination into artefacts (Sarasvathy, 2001a). Thus, effectual entrepreneurs will look for strategic alliances and pre-commitments from stakeholders with the aim of reducing and/or eliminating uncertainty (Sarasvathy, 2001b). The principle of effectual logic is to favour building partnerships even before defining the exact product markets and other goals of the venture. In this way, the effectual entrepreneur enables those involved to determine the goals to be pursued. This in turn establishes which markets the venture will enter or possibly end up creating (Dew et al., 2009). Through co-creation expert entrepreneurs learn to control the uncertainties of creating new firms, products and markets (Read and Sarasvathy, 2012).

2.5. The implicit links between foresight and effectuation

In the following sections, we seek to explore the links between foresight and effectuation. As a first step, we shall look back again at the idea of uncertainty, with an emphasis on the proactive nature of foresight. Then, we shall explore the role of networks in foresight as well as its participatory side. The final section will be dedicated to the cognitive dimension of foresight and how through that dimension foresight can strengthen the effectual process.

2.5.1. Proactivity as an attitude towards uncertainty

In scientific work, foresight is seen as a way to minimize risk and uncertainty (Paliokaité and Pačesa, 2015), to reduce bounded rationality (Kaivo-oja, 2006) and to help organisations to prepare for challenges by discussing alternative futures (Paliokaité and Pačesa, 2015).

From 2000 onwards, the concept of foresight started being more clearly differentiated from other future-oriented approaches such as forecasting and future-planning (Tsoukas and Shepherd, 2004; van der Heijden et al., 2002; Schwarz, 2008, Vecchiato, 2015). In the literature there is a definite separation between foresight and prediction, even between foresight and forecasting, which entirely changes the attitude foresight has towards the future and therefore the uncertainty.

In the beginning, with forecasting tools, the future was seen as something that can be controlled because it can be predicted (Martin, 2010). This way of thinking came from the supremacy natural sciences had over social sciences. However, the social events that brought about radical changes and left a strong impact on human kind, such as the arrival of the Internet, were not obtained from forecasting techniques, but came as the results of human action, i.e. as the result of ***"proactive reading of uncertainty"*** (Bas and Guillo, 2015; p.279).

The future is not predetermined, but to be constructed and therefore it implies human action. If there is one way to "predict" the future then it would be through present actions. Only those actions can produce a future (Berger, 1959; Bas and Guillo, 2015). We can see that in foresight activities there is a tendency similar to the ones in the effectual process with regard to approaching the future through action.

This position is typical for the French school of foresight, ***la prospective***. Introduced by Godet (1993) it is precisely proactivity which can help us "survive" in the complex environment which is defined by a high level of uncertainty. The pillars of ***la prospective*** according to Berger are the capacity to take a step back, followed by imagination, team spirit, risk-taking spirit and the awareness that the future is not determined, but to be constructed (Durance, 2010).

The element of proactivity in foresight does not deny that the absence of uncertainty cannot be achieved. Instead it attempts to ***"soften uncertainty through the capacity to act upon reality by means of innovative actions"*** (Bas and Guillo, 2015; p.279). This stance is in line with the spirit of effectual process because here, foresight not only involves the exploration of various possibilities of future, but creates one through action expressed in the building of artefacts.

This shared attitude towards the future points to a strong epistemological connection between effectuation and foresight. Effectuation as a concept draws its philosophical foundations from pragmatism (Sarasvathy, 2001a; 2008). In the effectual process, the underlying logic is that it is impossible to predict the future and that it is contingent on human action. Since the future is unpredictable, effectual entrepreneurs will rely on previously acquired knowledge and on knowledge of the relevant stakeholders to help them to imagine the different alternative effects that could define their new venture. Accordingly, they establish a number of hypotheses which they then test through experimental practice. This logic of abduction underlies the doctrine of pragmatism (Peirce, 1903).

On the other hand, foresight approaches represent an important shift away from positivist quantitative approaches to the future such as those using mathematics-based methods (Bas and Guillo, 2015; van der Duin et al., 2014). The role of these methods was to give accurate predictions on the impact of science and technology on society (Andersen and Andersen, 2014; Bas and Guillo, 2015). The foresight school represented a response to the failure to predict the 1970s crisis, the rise of more segmented markets, high customization levels and the hyper-specialization of knowledge.

It is both the proactive nature of foresight that includes the importance of the impact of human action on the future (Berger, 1959; Bas and Guillo, 2015), as well as the epistemic stance that there are shared constructions of the future, that reveal a pragmatic side to foresight (Giaoutzi and Sapio, 2013) thus making effectuation and foresight converge towards a somewhat similar epistemological level.

2.5.2. The participative side of foresight and the importance of networks

It was only after 1970 with the linkage to innovation model (Andersen and Andersen, 2014) that foresight started being perceived as stage where important network connections can be made (Keenan et al., 2003), first inside the organization and afterwards by expanding to external shareholders (NGOs, consumer groups, …). It is the awareness of the social impact on innovation that has liberated foresight from the quantitative dictate of forecasting (Dator, 1998). This period was inspired by foresight activities in Japan which involved a widening of the circle actors who

could be considered relevant, as was expressed in the use of various bottom-up processes. (Martin, 1995; Cuhls and Kuwahara, 1994; Miles, 2010).

From the time that the term ***fully-fledged foresight*** was proposed to describe the wide scope of foresight and its definite separation from forecasting techniques, participatory orientation has become an inseparable part of foresight.

Contemporary futures research highlights to what extent collaborative approach of foresight methods in companies is important, most notably for the exploration of new business fields and corporate innovativeness (Rohrbeck and Gemünden, 2011; Heger and Rohrbeck, 2012; van der Duin et al., 2014). In the case of Deutsche Telekom, it was established how foresight workshops could be used in the open innovation process, where external and internal knowledge were combined and then transformed into commercialized outcomes (van der Duin et al., 2014). It was proposed that the branch of foresight which should be developed for this purpose in organizations should be named ***networked foresight*** (van der Duin et al., 2014).

In practice, foresight units should be conceived to maintain close relationships with diverse networks in the business environment, both internal and external, such as partners in different departments, but also external experts, knowledge workers and various actors from different domains (Ruff, 2015).

Another example of this participatory dimension is given by the FUTURLAB, the foresight laboratory of the University of Alicante (Spain) through a newly developed foresight method named FLUX 3D[2] (Bas and Guillo, 2015). This method advocates a more active, direct and continuous relationship between citizens and organizations (Bas and Guillo, 2015). The idea of this tool is to open processes of reflection about the future to a wider range of actors.

Another, more traditional method which is also known for its participatory nature is the scenario method. Actually, the objective of the scenario method is to engage all relevant stakeholders that could be concerned with a particular project and to bring them together in the process of exploration of potential future images around the project (Godet, 2007). There is no doubt that aside from the purpose to explore and to bring to light future opportunities, foresight has another purpose, which is to bring and engage different actors and to build networks around

[2] FLUX stands for Forward Looking User Experience

problems in order to incite them to action (Berger, 1959; Godet, 2007; Andersen and Andersen, 2014).

2.5.3. Foresight and cognition

On the basis of the analysis of one hundred articles, Rohrbeck points out that individual and collective cognition represent one of four major topics of the discipline (Rohrbeck and al., 2015). This basic shift brought with it a certain number of papers on the impact of foresight in the creation of knowledge and representations of participants by using in particular the classical model of Nonaka and Takeuchi (Uotila and Melkas, 2005; Dufva and Ahlqvist, 2015), cognitive approaches of learning (Bootz, 2005) with a focus on the impact of scenarios (Glick et al., 2012; Haeffner et al., 2012; Rhisiart et al., 2015) or certain technologies (Boe-Lillegraven and Monterde, 2015). The scenario method in particular has been studied in research papers and it has been viewed as a way of double loop learning (Argyris and Schön, 1978), i.e. a way to explore new knowledge and to enrich not only organizational knowledge, but also individual representations (Bootz, 2005; 2008).

In the following paragraph, we shall first discuss systems thinking and its impact on developing holistic thinking inherent to effectual entrepreneurs. Next, we shall tackle the process of learning in foresight which we believe can strengthen effectuation reasoning.

2.5.4. Holistic and systems thinking

Foresight as a study of long-term phenomena is considered global, multidisciplinary and with a systemic inspiration (Gonod, 1996; De Jouvenel, 1993). Therefore, it involves the capacity to project into the uncertain, to interfere in non-deterministic systems, to understand the phenomena in a global and interdisciplinary manner (taking into account the economic, technical, political, sociological, psychological and other factors). The purpose of foresight modeling is not to simulate the operation of the system, as in the case of the analytical models, but to transcribe a mode of reasoning, to model knowledge in order to understand the phenomenon that it studies as a whole, trying at the same time to understand the purpose, elements, and the relationships between the elements and the mechanisms that bring about evolution (Bootz, 2005). This corresponds to the

famous principle of the French school of foresight which is ***"seeing far, wide and deep"*** (Berger 1959, p.218).

By its nature, foresight thinking requires systems thinking (Kaivo-oja, 2006; Rohrbeck et al., 2015). And, ***"systems thinking requires the ability to synthesize or integrate elements rather than breaking them into parts for the purpose of analysis"*** (Kaivo-oja, 2006; p.19). The links between systems and holistic thinking have already been made in theory, where it has been shown that systems thinking facilitates the holistic approach (Rubenstein-Montano et al., 2001).

2.5.5. Impact on cognition through learning

As for the impact of foresight on cognition explored in literature, strong links between strategic foresight and learning have been established, notably in organisational learning (Bootz, 2010). This impact comes both from foresight "attitude" and "activity" (Bootz, 2010). While foresight attitude affects the decision-maker's frame of analysis by widening it, foresight activity develops interactive learning through the mobilization of various actors in collective processes.

Through its focus on cognitive dimension of anticipation, the foresight attitude contributes to a cognitive process which enables an individual to adjust their perceptions in order to create new possibilities of action. Actually, what it does is that it pushes decision-makers to question their existing knowledge and their own frames of reference which results in abandoning the paradigms that were previously dominant (Baumard,1996). Thus the cognitive virtues of anticipation nurtured in foresight attitude are paradigm mobility, questioning and the enrichment of representations (Bootz, 2010).

It has been proven that foresight activity promotes collective forms of learning based on the cognitive virtues of foresight attitude aforementioned (Bootz, 2010). There are two approaches in foresight activity, the first stemming from strategic practice, used as an educational exercise for decision-makers, as was done at Shell Corporation (Van der Heijden and Schwartz, 1996; De Geus, 2001) and the second being the more participative approach, such as it was practiced by strategic foresight (Godet, 2007).

The first approach serves decision-makers to build the images of the future which will affect their existing mental map, stimulate their intuition (Boe-Lillegraven and Monterde, 2015) and

develop their understanding of the world (Schwartz, 1993). The scenario method serves here also as a good communication tool which helps participants reach a common language (Bootz, 2010).

The second approach insists on collective mobilization of actors at all levels around a common reflection on future issues (Godet, 2007). A former CEO of the French Electric Company (EDF) argues that through collective, shared reading of context, a consensus around a global vision of the future is built. This way, foresight brings another cognitive virtue: sense-making, which facilitates the appropriation of a strategy (Godet, 2007). From all the above said, we may conclude that foresight attitude and activity can support effectuation in the process of co-creation of information, meaning and vision of an entrepreneurial project.

2.6.Synthesis

Since its definite separation from forecasting, foresight research and its practices have changed the way of dealing with uncertainty. Thanks to this shift, uncertainty is no longer subject to prediction, but has become a "friendly" space where the future is constructed through human representations of the world and through action. This is in line with the prerogative of effectual reasoning according to which the future does not have to be predicted as it is controlled. And this control is conducted not only through the action of one individual, an entrepreneur, but is rather co-created with various stakeholders that could have an impact on entrepreneurial projects and therefore their environment.

Thanks to its participatory side, foresight can support entrepreneurial activity in bringing together stakeholders, either by creating networks or through various newly developed approaches and methods and it can help them build together vision, beliefs and projects and learn how to speak a common language. Thus, it feeds the last of the three means an effectual entrepreneur uses in building artefacts. Moreover, foresight can also contribute to the foundations of effectual thinking by bringing a systemic, holistic perspective around a project. Finally, it can contribute to the entrepreneur's cognition by enlarging his or her perceptions, vision and knowledge (Table 1).

Table 1

Synthesis of the implicit links between effectuation and foresight

	Attitude towards the uncertainty	**Cognition**	**Networks**
Effectuation	The effectuator proceeds without any certainties about the existence of a market for his or her products (Sarasvathy, 2001a).	Expert entrepreneurs were more likely to think holistically about the business (Dew et al., 2009).	The effectual logic is people dependent (Sarasvathy, 2001a).
	The future is unpredictable, goals are not clearly known and there is no independent environment that serves as the ultimate selection mechanism (Sarasvathy, 2001b).	Through expansion of human alliances effectual entrepreneurs feed their own individual perceptions (Sarasvathy, 2001b; Dew et al., 2009; Read and Sarasvathy, 2012).	The principle of effectual logic is to favour building partnerships even before clarifying what exactly the product-market are going to be (Dew et al., 2009).
Foresight	The future is not predetermined, but to be constructed and therefore it implies human action.	Long-term phenomena are considered global, multidisciplinary, and with systemic inspiration (Gonod, 1996; De Jouvenel, 1993).	Open processes of reflection about the future to a wider range of actors (Bas and Guillo, 2015).
	Foresight not only understands the exploration of various possibilities of the future, but creates one through action.	Pushes decision-makers to question their existing knowledge and their own frames of reference (Baumard, 1996).	Bring and engage different actors to build networks around problems in order to incite them to an action (Berger, 1959; Godet, 2007).
Links	*The future is not predictable and it is created through action*	*Holistic thinking and interaction learning*	*Collaboration through networks to face uncertainty and support cognitive process*

3. **Methodology**

3.1. Research design

In order to provide an answer for the different dimensions of our framing question, notably the complexity of the phenomena studied, such as cognition, attitude towards uncertainty and future, we adopted a constructivist position through a qualitative approach (Guba and Lincoln, 1994). In

this approach, we tend to present, explain and understand the mentioned phenomena, through an in-depth literature review and then, through a series of exploratory interviews we conducted. By confronting the established and emerging theories from foresight and effectuation literature with the practice of futurist on one side and the experience of entrepreneurs on the other, we seek to build plausible representations in order to stimulate questions and reflection. The objective of our project is twofold and corresponds to the qualitative and constructivist approach in research. On the one hand, we tend to contribute by giving an emerging theoretical result (Glaser and Strauss, 1967) and on the other hand, to help practicing futurists to become aware of the implicit links that could improve their practices.

In our approach, we proceeded in two phases. As a first step, we conducted a series of interviews with various experts in foresight and *la prospective* in France, but also in Europe and across the Atlantic. These were accompanied by a series of interviews with four entrepreneurs in France. This approach helped us explore different methods and tools used by researchers and practitioners in the field of foresight thus giving us an insight on their vision of the nature of foresight and its applicability in entrepreneurial contexts.

3.2. Data collection

The data we collected was gathered through a series of exploratory interviews. The reason why we opted for this type of interview is because of the exploratory nature of our research work. For futurist practitioners we used an interview guide which served as a support to the principal themes from the literature review, such as cognition, participatory nature and networks, attitude towards the future, action as well as tools and approaches that are used in foresight practice. Moreover, we also conducted interviews with certain entrepreneurs in France. The reason why we chose to limit our research to French entrepreneurs is because we had an easier access to local entrepreneurs. At the same time, they are at the center of our research. We focused our analysis mostly on entrepreneurs whose project is at the startup level. Our intention was to determine first whether they used effectual processes in their projects and whether they utilized some kind of long-term reasoning. If that was the case, we tried to explore for what purpose. Finally, we try to explore their needs in terms of foresight.

Our main objective was to determine whether some foresight approaches could fit into the entrepreneurial process of building products or, failing that, to understand the relationship between foresight and effectuation through the intermediary concepts that we have found in our theoretical framework (cognitive dimension, network, uncertainty).

3.2.1. Interviews

The data collection through interviews was carried out in the time period late April – mid-May 2016. In this period, 11 interviews were conducted in total. Four of them were conducted with entrepreneurs from Alsace, France while the other 5 interviews were conducted with 3 prospectivists from France, 1 interview with one futurologist from France and 3 interviews with international futurists, all experts in their fields. Most of the interviews with futurists were performed over the telephone because of the geographical distance[3]. Only one interview with an entrepreneur was conducted over the phone. The rest were done in person. The interviews were designed to last 45 to 60 minutes. They were all recorded after which we immediately proceeded to verbatim transcription.

3.2.2. Selection and profiles of the informants

The selection of the informants in the field of forward-thinking was based on a wide sample of practices. Through literature review, we were able to learn more about different practices in France and abroad. The informants were selected on the basis of their experience in the foresight field as scientific researchers, but also as practitioners.

Regarding the profiles of the entrepreneurs, we selected them in accordance with the stage of maturity of their projects. As we explained above, we looked for projects in the startup stage in order to understand the way they had proceeded in starting their entrepreneurial activity. Below, we describe the profiles of both futurists and entrepreneurs in detail and we present a table with an

[3] The interview with Professor Kaivo-oja was conducted via the Skype application while the interviews with Professor Dator and Professor Bas were conducted through e-mail correspondence.

overall presentation of the informants, type of data collection and duration of the interviews (see Table 2).

Table 2

List of informants

	Profiles	**Data collection**	**Duration**
Geneviève Bouché Futurologue	Ph.D. in organizational sciences with a specialization in Futurology at Paris Dauphine. She co-founded Dauphine Business Angels. Today, she works as a mentor for startupers in the digital field.	Telephone interview	1h24
Marc Mousli Prospectiviste	Economist and prospectivist. He worked as a consultant in *la prospective* with M. Godet as well as a lecturer at CNAM (Conservatoire National des Arts et Métiers). He created the "Café de la prospective" in 2011.	Telephone interview	1h00
Philippe Durance Prospectiviste	Professor at CNAM and researcher at the Interdisciplinary research laboratory in sciences of action. He is also a Chair-holder of the Prospective and Sustainable Development Chair at CNAM.	Telephone interview	40min
Vincent Pacini Prospectiviste	Associate professor at CNAM in prospective applied to the action of territories and networks. He is also researcher and consultant in the field of *la prospective*. He is also entrepreneur.	Telephone interview	30min 43min
James Dator Futurist	Professor and the Director of the Hawaii Research Center for Futures Studies, He is also a former President of the World Futures Studies Federation. The fields of his research, lectures and consulting activities are the futures of governance, education, tourism, and space.	Correspondence via email	/
Jari Kaivo-oja Futurist	Associate professor at the Faculty of Sciences, University of Helsinki and the Faculty of Social Sciences, University of Lapland. He was also a Research Director at Finland Futures Research Center.	Skype interview	1h00
Enric Bas Futurist	Director of FUTURLAB, the Foresight Laboratory at the University of Alicante (Spain). Executive Board Member of the European Futurist Club, the Millenium Project and the World Futures Studies Federation.	Correspondence via email	/
Philippe Kuhn Entrepreneur and business angel	Entrepreneur and member of business angels in Strasbourg (France). In 2007, he created a structure for young entrepreneurs. He's also one of the founders of a entrepreneurship program at the EM Strasbourg.	Interview in person	1h00
Adeline Schwander Entrepreneur	Entrepreneur and consultant in social innovation. In 2014, she founded "Mille et Une", an umbrella concept which gathers consultants from various fields.	Interview in person	1h00
Rémy Perla Entrepreneur	Founder and CEO of the start-up "Crealettres" based in Strasbourg, France and was the award winner of the event Start-up Weekend Strasbourg in 2012.	Interview in person	45min
Martine Zussy Entrepreneur	Co-founder of the project "Heynergie" (Mulhouse, France) which aim is to reduce costs and environmental risks related to the consumption of energy.	Telephone interview	45min

3.3.Data analysis

The data analysis was done manually. We decided to code separately the interviews conducted with futurists from those that were performed with entrepreneurs. After analysing both groups of interviews separately, we used the findings to compare them and contrast in the discussion section. In both analyses, we followed the approach of Gioia et al. (2012).

To transform raw data into categories, we coded each interview separately on the basis of words "in vivo" and sentences used by informants. In the initial stage, we identified a multitude of informants' terms and concepts (first-order concepts: Gioia et al., 2012), which correspond to the notion of "open coding" (Strauss and Corbin, 1998). In this early stage, we remained faithful to the informants' terms and concepts. Next, we started looking for the relationships between the categories, which corresponds to the concept of "axial coding" (Strauss and Corbin, 1998). This helped us to divide certain categories by their contrasting nature and some of them were merged into the emerging labels known as the second-order themes (Gioia et al., 2012). Those were conceived as more general labels that encompass the first-order concepts. For instance, first-order concepts which explicitly showed a distinction and opposition in foresight approaches were grouped under the second-order themes "shift in the French foresight school" and "new" approaches in foresight (Figure 1). We proceeded the same way for the categories showing the perception entrepreneurs have of foresight and the way they use the techniques.

During both the initial and second stage of analysis, we did a constant comparison between the data. Finally, we grouped the second-order themes into the aggregate dimensions according to the sense in patterns. For instance, the themes such as "shift in the French foresight school" and "new approaches in foresight" clearly indicate that there has been a shift in foresight practices. For this reason, we merged them into one aggregate dimension which is "Evolution in foresight approaches". We did the same for the themes indicating clearly the cognitive dimension of foresight.

In order to gain more confidence in our findings, we also performed the investigator triangulation in which another researcher followed the same approach in the analysis of the data. The two analyses were subsequently compared.

Our findings are structured as follows. We first present the findings from the analysis of the data collected from the interviews with the futurists. The aggregate dimensions are explained

through the emergent themes. Next, we follow the same structure for the data collected from the interviews with the entrepreneurs.

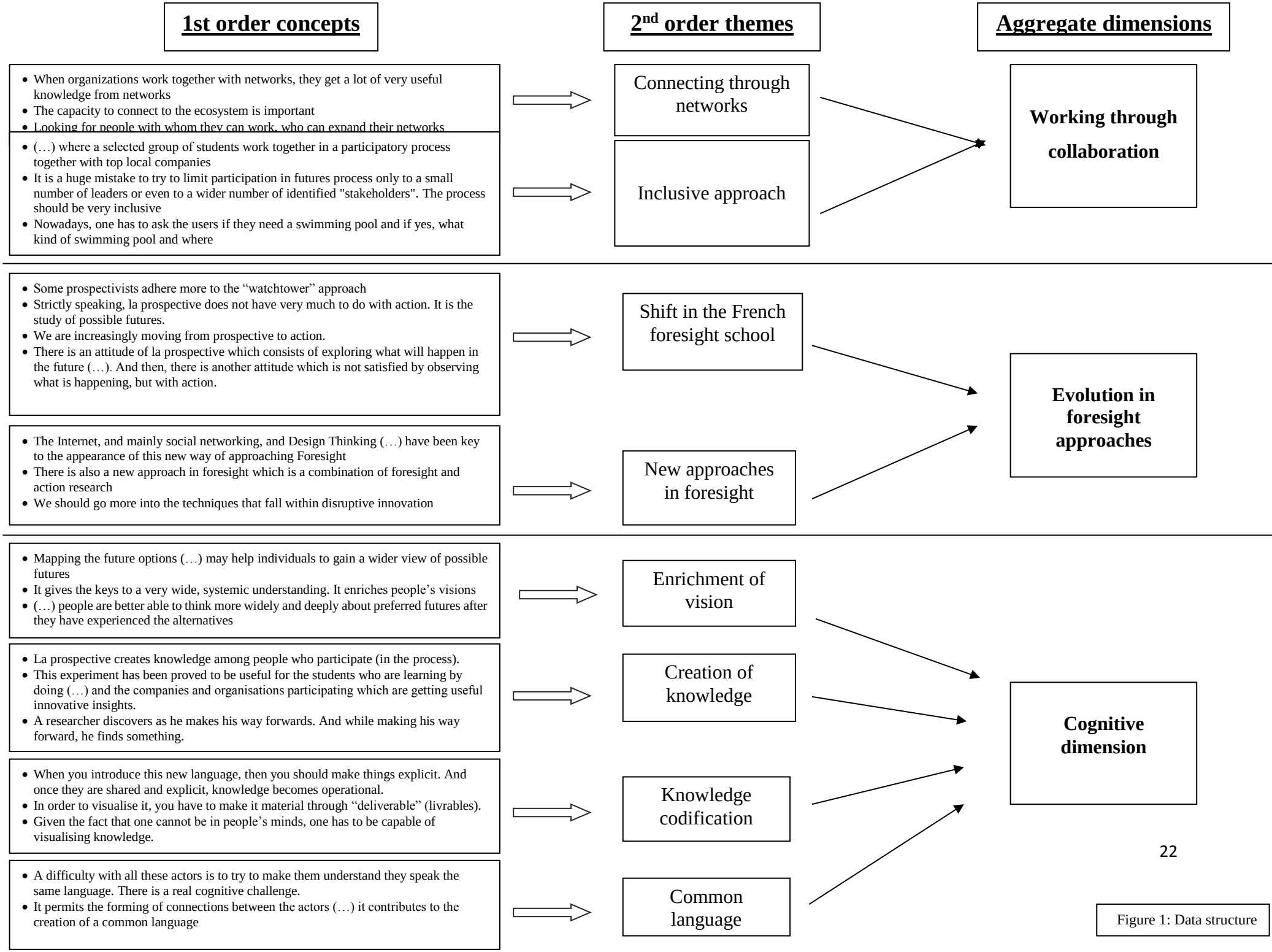

Figure 1: Data structure

4. **Findings**

4.1.Findings from interviews with futurists

What was revealed from the analysis of the data collected from the interviews with futurists is that the attitudes towards the future and therefore the approaches used in foresight have changed and are still changing. Moreover, given the fact that the majority of our informants are "prospectivists", futurists of the French foresight school – la prospective, the interviews with them brought forth the evidence that there has been an important shift in this school, a shift from traditionally used approaches to nascent practices. These categories gave us two major themes – "Shift in French foresight school" and "New approaches". From their titles it is clear that they indicate an evolution in foresight approaches which is what we called the aggregate dimension in which we merged these two themes.

The second aggregate dimension entitled "Working through collaboration" merges two themes which are "Connecting through networks" and "Inclusive approach". These two themes gather the categories which give the evidence of a strong participatory aspect and an important cognitive aspect on those who participate in foresight activities. The importance of the concept of networks, but also the testimony of new methods and approaches that are more inclusive and more bottom up were brought forward.

Many other categories that emerged from our research revealed the different ways people involved in foresight activities learn. These first order categories produced four secondary themes, which describe different elements of cognition such as "Enrichment of vision", "Creation of knowledge", "Knowledge codification" and "Common language". We decided to merge these themes into one aggregate dimension we called "Cognitive dimension".

4.1.1. Evolution in foresight approaches

What was revealed from the interviews with futurists is that the approaches used in foresight have changed and are still changing. The aggregate dimension "Evolution in foresight approaches" gave us two major themes – "Shift in French foresight school" and "New approaches".

Shift in the French foresight school

From the terms and phrases uttered by the informants it became clear that there have been two approaches in French foresight school, one of which is more theoretical, philosophical the other is more proactive and action oriented. Durance sees *la prospective* as *"an attitude, (...) a philosophy, a method and finally a discourse on the future".* For Mousli, teaching foresight means teaching its *"philosophy"* and methods. Pacini considers *"la prospective done through the scenario method – permits a forward outlook, but as a narrative tale. And this is not something that leads to action"*. Truth to be told, the French foresight school is also famous for the introduction of the concept of proactivity which implies action. For Pacini there is a tendency in *la prospective* to *"increasingly move from prospective to action"* by *"turning away from strategy"* due to a more complex and transversal system in which organizations operate. According to him, the proactive dimension of foresight has not been sufficiently developed in the traditional "toolbox" of the French foresight school. He believes that new techniques should be introduced to provoke "disruptive innovation" through experimentation. In his approach, he often incites his clients to work on projects that are not defined. *"The object we are going to create will develop progressively. It does not exist at the beginning of reflection. It is clear that we are in effectuation"*.

New approaches in foresight

A new branch in foresight under the name of "Creative Futures" developed by Bas and Guillo shows *"a more open, flexible and bottom-up way of identifying and evaluating future options"*. Bas explains this shift: *"The Internet, and mainly social networking, and Design Thinking have been the sparks that triggered this new way of approaching Foresight"*. There is also "*a new approach in foresight which is the combination of foresight and action research, such as it is developed by Frank Ruff at Daimler's*" (Kaivo-oja). Another novelty introduced to these new approaches in foresight is experimentation. For example, the new foresight tool FLUX-3D *"was originally conceived as a simple way (a checklist) of evaluating and re-designing prototypes according to user experience and expectancies"*. Both Bas and Kaivo-oja have been working on a foresight approach which aims to help organisations develop their innovativeness. For Kaivo-oja, organisations need to have *foresight assets* in order to innovate

in a disruptive, even radical way. As we saw, the French foresight school seems to be taking the same turn, notably through the practices of Pacini.

What comes out from these findings is that there are two approaches that co-exist nowadays in the French foresight school. One is the more theoretical, philosophical. The second one tends to develop the attitude of proactivity that should incite people to action and experimentation. Moreover, in new approaches we can see a clear link between foresight and innovation.

4.1.2. Working through collaboration

This second aggregate dimension includes both the networked side of foresight approaches and the inclusive approaches whose characteristic is a bottom-up approach.

Connecting through networks

The French foresight school has always boasted a participatory aspect. *"One of the rules of the attitude of la prospective is to be based on the diversity of human perspectives, experiences and therefore to explore entirely the network"* (Durance). One of the methods which is very much used in la prospective is *"workshops of la prospective"* where *"the people who work in groups have to be sufficiently representative in order to make it participatory"*. In foresight activities performed in organizations, it has been observed that *"when organisations work together with networks, they get a lot of very useful knowledge"* (Kaivo-oja). For this reason, one of the pillars of foresight such as it is suggested by Kaivo-oja is to do some networking analysis in order to have an idea who the important stakeholders are for an organization. One concrete example of how foresight can contribute to the creation of networks among stakeholders is a tool, recently developed by Pacini, called "Panoramap", whose objective is to connect stakeholders via an application with other stakeholders *"What is important is the connections a firm has with its ecosystem. The more those connections are coherent, adjusted, adapted, the more it will have opportunities to develop. The more it is in opposition and stays out of its ecosystem, the more they will clash, and it can disappear"*.

Inclusive approach

About the importance of the participatory side in foresight, Dator says *"Everyone who will be impacted by the "plan" that results from a futures process should be part of the futures*

process. It is a huge mistake to try to limit participation in a futures process only to a small number of leaders or even to a broader number of identified "stakeholders". The process should be very broad". Pacini explains that in any kind of action there is always one person that orders the action and another that executes, but if the one that should benefit from the action is not integrated, then the project will not work.

This inclusive approach is also very much developed in the work of Bas and Guillo. Their tool FLUX-3D is based on design thinking and works by including users in the evaluation and design of prototypes. This tool helps *"choose the prototypes with higher potential according to users' experience and expectancies"*. One of the projects Bas and Guillo launched in 2014 was a venture called "The GYM Project". The idea of this project was to be *"a kind of "Open Social Innovation Ecosystem" where a selected group of international students work together in a participatory process together with top local companies"*. This project included not only students, but also researchers and teachers, who helped in the process.

The collaborative side of foresight is not something new in foresight, in particular in the French school of foresight. However, the inclusive approach such as it is notably described by Bas might appear to be a novelty. By its nature, it is more human-centred and includes a wider public; for instance, students or users that will evaluate the designed projects.

4.1.3. Cognitive dimension

The cognitive dimension of foresight consists of four themes: "enrichment of vision", "creation of knowledge", "knowledge codification" and "common language".

Enrichment of vision

What all approaches in foresight have in common, thanks to their explorative nature, is the capacity to widen the vision of the future for those who participate in these approaches. Both foresight and futurology have a systemic way of thinking, which *"gives the key to a global and very systemic comprehension of the environment"* (Durance). In the scenario method, people explore *"the points of view and experiences of the others thus enrichening their own vision"* (Durance). For Dator, *"people are better able to think more widely and deeply about preferred futures after they have experienced the alternatives than they would be without that experience*". According to Bas, working with map trends, weak signals and unexpected events

helps create maps of possible future options. This can help decrease uncertainty because it gives information which widens individuals' vision about possible futures and makes them ask the right questions. For Pacini, in order to enrich one's vision, one has to be able not only to see *"far, wide and deep"*, but to be able to look "elsewhere", i.e. a whole new vision.

Creation of knowledge, knowledge codification and common language

In the case of "The GYM Project", the organisations can refresh their insights, thanks to the students' ideas. *"This experiment has been proved to be useful both for the students (who are learning by doing) and organisations participating (which are getting useful innovative insights coming from a supportive pool of millennials who provide fresh and creative ideas)"* (Bas). This is also the case for FLUX-3D method. Bas and Guillo draw creativity from the human-centric approach. According to Durance, *la prospective* creates knowledge. It does not only contribute to organisational learning, but also to *"the creation of individual knowledge"*. In his practice, he witnessed *"enlargement of knowledge and understanding"*. Mousli argues that while doing the scenario method, *"one should build beforehand a so-called "prospective basis" and that basis is the accumulation of knowledge"*. Pacini argues that *la prospective* brings new knowledge through reflexion, but also through action, through *"confrontation with problems"*.

Another result is that knowledge creation is not only the final output of the foresight approach (scenarios), but is present throughout the whole approach, as a result of the structuring of collective reflexion. However, some emphasise the necessity of codifying knowledge in order to guide the process of collective reflexion and build a common language between different actors. For Pacini, this common language can be built through *"deliverable"*.

All informants share the same opinion on the cognitive dimension of foresight. Through participation in foresight activities, individuals and therefore the group as well benefit from new knowledge by widening their vision, the way they perceive things. At the same time, foresight practices contribute to the creation of codified knowledge by building tangible objects which contribute to a common language.

4.2. Findings from interviews with entrepreneurs

4.2.1. Entrepreneurs' attitude towards foresight

While analyzing the data collected from the interviews with the entrepreneurs, it became clear that the most frequently repeated categories concerned the way entrepreneurs use forward thinking, but also the way they perceive foresight and how they use it in their projects. At the same time, certain statements expressed particular needs in terms of forward thinking. These themes showed a similar pattern which points out the attitude entrepreneurs have towards foresight. This is also the first aggregate dimension that we present.

Use of foresight

All informants are familiar with the French foresight school. When asked whether they know what *la prospective* is, the terms that were given in answers were *"possible futures"*, *"desirable futures"* and *"weak signals"*. Two of four informants have already used la prospective in their activities. In her intrapreneurial activity, Zussy created a newsletter of *la prospective* for entrepreneurs. In her work, Schwander combine the methods of foresight with other tools. When asked in which cases it can be used, she replied: *"In the first stage, you will use it to create new ideas. It is the exploration stage. In the second, foresight can be used to create those pockets of start-ups that bring innovation within sustainability. In the third stage, there can be a weak signal and in the last one you find a way out"*. Even without concrete foresight tools and methods, the informants showed that they use some kind of forward-thinking, without structure, more as something that seems natural to them. *"As someone who is a computer scientist, I follow the evolution of the digital world and what springs from the work of Facebook. It is inspiring to see what can be done and how we can build the future."* (Perla). In his activity, Kuhn uses observation and exploration of the future. *"I spend a lot of time discovering things, exploring the future".*

Perception of foresight

What emerged is entrepreneurs perceive foresight as related to theory, some kind of ideology and very often as a term that is unknown among people: *"Nobody will talk to you about foresight. They will say "strategy", "innovation", "monitoring", "benchmarking", (...) As such, foresight is reserved for the academic world."* (Schwander). In her explanation why she decided to create a newsletter of *la prospective*, Zussy said: *"I had a network of people who worked on the vision of the future and I realized that the ideology didn't speak to a certain*

number of entrepreneurs. They needed the examples". Although Perla likes to imagine various possibilities, he stops himself in when looking into the future. *"I like to imagine all possible cases. (…) I try not to propel myself too far forward. Otherwise, it causes anxiety"*. The understanding the interviewed entrepreneurs have on foresight is quite vague and they have a tendency to consider it a scientific or academic field which is far from concrete practices.

Needs in terms of forward-thinking

Schwander is convinced that an entrepreneur needs foresight: *"Because even when you try to rely on yourself, on your network, you'll still be working on weak signals and never on strong signals. You'll be working all the time in innovation, in foresight"*. The reason why Zussy created a newsletter of *la prospective* was because she detected a certain need among entrepreneurs to take a step back and widen their field of vision. *"My entrepreneurs kept their noses to the ground; they would often miss out the things which could have had a quite direct impact on their activities in the future"*. From his experience, Kuhn says that any entrepreneur needs to explore the future to a certain extent: *"You cannot free yourself from this, at least not if you want to convince your banker. You have to present to him a bearable future. (…) Before you create the future, you have to imagine it"*.

This aggregate dimension reveals that French entrepreneurs use some kind of forward-thinking for their projects, but they do it occasionally and without following precise methods. But they feel that some kind of forward-thinking is necessary in their activities. Nevertheless, there are obstacles that prevent the adoption of foresight approaches, notably a certain lack of knowledge or a perception of it as a discipline that is too theoretical.

4.2.2. Effectual dimension

The second and the last aggregate dimension includes three themes. The first is the theme we called "networks" revealing that entrepreneurs will seek to build new networks or join existing ones in order to benefit from them, notably in terms of learning. The second theme reveals how entrepreneurs learn and it is named "Collaborative learning". The last theme of this aggregate dimension contains the categories that reveal how entrepreneurs proceed in building their venture, how they reason and develop ideas. We gathered all these categories under the

name of "Reasoning in building ventures". Given the fact that these three themes bear the elements of the effectual process, we named this aggregate dimension "Effectual dimension".

Networks

A shared habit of all informants is that they either build networks to seek information and learn. Networks may bring not only valuable information, but also specialized training for entrepreneurs who start their venture and still do not have all the necessary skills in their startups. *"Everything that "The Family"*[4] *has been doing since 2014, didn't exist before. If we had created our firm before, we would have done nothing. I was lucky to have created it at the moment when they started to deliver knowledge"* (Perla). Beside specialized knowledge, networks are spaces where entrepreneurs can share their experiences and vision. *"I bring them my network, I put people together and I bring them a different vision from the one the founders of the company have"* (Kuhn). In order to put entrepreneurs together, Schwander will even organise events reserved for them. *"I organise a lot of events. I'll first put them in touch with each other"*. Moreover, building a network of people or integrating an existing one can be crucial for an entrepreneurial project. It can support the project, shape it and make it grow. Meeting people and building her network was a milestone for Zussy's project. *"We need to raise money and we meet Guilhem Chéron who founded "La Ruche qui dit oui". And he falls for our product and he opens his network to us"*.

Collective learning

As an entrepreneur himself and a business angel, Kuhn thinks that entrepreneurs should be advised by experienced entrepreneurs, or by key people for their project. He brings them new knowledge from various fields: *"For example, how to communicate, how to make a business model, how long it takes to develop a product, (...) knowledge that I acquired through my work"*. Perla learned a lot thanks to the accelerator "The Family". *"They try to explain in which direction things are moving here and in the United States. I learn a lot and it gives long-term vision, in which direction to go"*. Learning in interaction with other people allows entrepreneurs to acquire knowledge in various fields. In her work, Schwander will use people and their

[4] "The Family" is a French accelerator based in Paris whose objective is to educate the French startup ecosystem. To learn more, please check: http://www.thefamily.co/

diversity in order to create a situation which can incite collective learning. *"The principle of a collaborative workshop is to bring forth collective intelligence".*

Reasoning in building ventures

For Schwander, diversity is important because it generates ideas which are not dominant but it may also be a source of weak signals. This is exactly how entrepreneurs who she calls innovators reason and proceed in building their ventures. They will always try to look amongst the intermediaries of the systems in order to create niche markets. Moreover, it seems that in building their ventures, entrepreneurs are often guided by a hunch, intuition, the opportunities they spot on the road *"I went to my network of entrepreneurs to see what I can bring to them. And every time an entrepreneur would evoke the same need, I would tell myself that I have to create an offer. I created my services step by step"* (Zussy). Even the decisions entrepreneurs take seem to be more a result of the opportunities or the obstacles they meet. *"Each time, I had the impression that it wasn't so much the case of me deciding on my own. Each time, there would be someone who would pull me and tell me this is not good, you have to get back on track"* (Zussy). Perla share the same idea when he claims that *"We have a tendency to go where one should not go*.

This aggregate dimension reveals the elements of the effectual process. All interviewed entrepreneurs started their first project by grasping an emerging opportunity. They all proceed in the same way by leaning on their previous knowledge, people they know, building networks and meeting people from whom they can learn more about the topic that interests them.

5. **Discussion**

5.1. Effectuation and foresight : creating knowledge and building networks

Our findings from the interviews conducted with entrepreneurs confirmed that all the informants followed the effectual process in building their ventures. They all began with the three categories of means, such as they are described by Sarasvathy (2001a). Interviewed entrepreneurs build their networks either through meeting other individuals that could play a key role in their projects or by integrating existing networks. Thus, networks become for them a great source of new information, new ideas and a space where they can acquire knowledge. Moreover, through networks, entrepreneurs build support for the development of their ventures.

These findings are in line with the literature on effectuation which confirms that thanks to the interactions with people from networks, including the communities they create around their projects, entrepreneurs can gain insight into the different possible opportunities they can explore (Sarasvathy, 2001a; Dew et al., 2009).

In order to benefit from networks, especially in terms of knowledge, entrepreneurs tend to participate in different training courses and workshops which are organised for them. Thus, networks become for them a learning space where they benefit from the diversity of knowledge of the various actors involved (Sarasvathy et al., 2003). Confronting their previous knowledge with the knowledge and perceptions of other individuals, allows entrepreneurs to see different sets of actions they can take in the process of building their ventures. This corresponds to the idea of the co-creation of new cognitive frames (Sarasvathy, 2001b; Dew et al., 2009). The results that emerged from the interviews with futurists reflect the findings existent in the literature, according to which foresight activities have a participative nature and as such one of their purposes is to bring together the actors at all levels around a common reflection on future issues (Bas and Guillo, 2015; Godet, 2007; van der Duin et al., 2014, Ruff, 2015). Thanks to this participative nature, foresight activities contribute to the enrichment of perceptions in individuals who participate in foresight practices. These results are in line with the literature which stresses that foresight is a collaborative way of learning which feeds individual representations (Bootz, 2005; 2008). Therefore, we can conclude that foresight co-creates new cognitive frames and as such may be used to strengthen the effectual process.

In the French foresight school, a method which is called *workshops of la prospective* can be very inspiring for entrepreneurs in terms of the structuring of networks and their exploitation. Moreover, a new tool recently developed in the French foresight school called "Panoramap" could offer to entrepreneurs to visualise and virtually create their ecosystem, to localise the material and human resources they could need and develop their action plan.

However, what emerged from the findings is that foresight activities can reinforce the creation of knowledge by inciting people to visualise their ideas and materialise them by manufacturing tangible objects that once produced codified knowledge. Moreover, these tangible objects contribute to the creation of a common language which will also reinforce the engagement of all the actors in the network (Bootz, 2010). In this way, we may conclude that foresight activities can strengthen the effectual process by giving the tools to entrepreneurs with which to work on the engagement of communities through the creation of material objects that can represent a transmitter of a common language.

One of the elements that emerge from our literature review is the notion of uncertainty which does not appear in the findings from the interviews. The dimension of uncertainty does appear occasionally in the data, but not as a structuring dimension. For futurists, uncertainty seems to be an obvious dimension since they deal with it in their daily practice.

In the case of entrepreneurs, two possible explanations for this lack could be given. First, the entrepreneurs' attitude towards uncertainty was expressed in their attitude towards the future as well as the methods and tools they use to explore and construct the future.

The second possible explanation is that uncertainty is perceived by entrepreneurs as a too obvious context in which they always have to operate. This dimension seems to be somewhat transformed in the way the entrepreneurs deal with the situations they do not master such as choosing paths no one else has taken or relying on intuition and not on previously conducted thorough research.

5.2. Foresight : a means of building systems thinking in effectual entrepreneurs and of taking into account weak signals

The results from the interviews performed with entrepreneurs revealed that expert entrepreneurs have a systemic way of thinking. As they reason, they will tend to explore various alternatives and seek to develop ideas that are not dominant relying more on weak signals. Thus, an expert entrepreneur has the tendency to work more on the interface of the established systems, which will lead him to create niche markets. The systemic picture is notably developed through interaction with people from their networks. This allows entrepreneurs to build a holistic view of their ecosystem. The literature review revealed that systems thinking facilitates holistic approach (Rubenstein-Montano et al., 2001). In literature on expertise, experts tend to observe a problem holistically (Gitomer, 1988; Klein, 1998; Sonnentag et al., 2006). The findings of the study on expert entrepreneurs conducted by Dew and colleagues (2009) indicate that the observed expert entrepreneurs expressed this tendency in their comments about their understanding of the global nature of a given issue.

On the other hand, the results from the interviews with futurists confirmed the systemic nature of foresight (Gonod, 1996; De Jouvenel, 1993). This approach leads individuals to make connections between the elements and mechanisms of phenomena and to understand how they function as a whole (Bootz, 2005; Kaivo-oja, 2006; Rohrbeck et al., 2015). Therefore, foresight

activities could teach entrepreneurs how to think in a systemic manner, thus strengthening effectual reasoning.

In addition, the results confirmed that entrepreneurs would use networks also as a source of specific information called "weak signals". This concept is known in foresight literature as *"information on potential change of a system toward an unknown direction*" (Mendonça et al., 2004; p. 205). In foresight activities weak signals have real importance (Mendonça et al., 2004; Hiltunen, 2008) and are used in a methodology known as "wild cards" (Mendonça et al., 2004). Entrepreneurs who explicitly said they were using or looking for weak signals confirmed that they sought this information inside the networks of people. These statements support our findings in the literature that networks are an important source of this kind of information (Julien et al., 2004).

Everything indicates to us that the weak signal analysis as a foresight method could help entrepreneurs to better understand the dynamics of their environment and to make better decisions about the direction in which they should develop their venture.

5.3. New approaches in foresight more in line with the effectual process but little known by entrepreneurs

The interrogated entrepreneurs confirmed that they have questions about the future and that they use some kind of forward-thinking. Thus, they confirm that they explore various opportunities through observation, detection of the key factors which could have an impact on society (weak signals). However, most of them deny using foresight activities, as they perceive it as a discipline which is too theoretical. Some of them even avoid saying they use the practices of *la prospective* in their activities because the term is not widely used. This perception probably comes from the philosophical background of the discipline which was born in France from the reflexion of great thinkers (Berger, De Jouvenel, Massé) and which was considered more as a philosophical discipline than a science of action (Durance, 2010). However, our findings highlight evidence of an emergent shift inside the French foresight school.

On one side, the results confirm the existence of one branch of *la prospective* as a theoretical and academic discipline, which is often compared to philosophy (Berger, 1959), with structured and formalized methods such as they were developed in "The Toolbox" (Godet, 2007). On the other side, the concept of proactivity seems to be the underlying element of the nascent approach of this school. And while the "traditional" standpoints in *la prospective* separate this discipline from any kind of experimentation and innovation processes, the new approach,

introduced and typically practiced by Vincent Pacini, embraces experimentation and innovation by placing them at the core of foresight activities. This result is not echoed in the literature on foresight and as such can be an interesting element to be studied in futures research. And it is precisely this approach that might strengthen the effectual process by inciting individuals and organisations to explore the future through their actions, through experimentation in building concrete products. Other new approaches in foresight, whose existence is confirmed in our findings, represent the same effort to change the nature of foresight and make it more actionable (Bas and Guillo, 2015; Ruff, 2015).

Another result from our study shows that these new approaches along with the emergent approach in the French school of foresight reinforce the participative side of foresight and the importance it gives to the building of networks already existent in the French foresight school (Berger, 1959; Godet, 2007). Moreover, they all point to the importance of the diversity of groups in foresight practices already expressed in the literature (Ruff, 2015). However, what has not been so well developed in the literature, besides the proposed FLUX-3D method of Bas and Guillo (2015) and the approach of Frank Ruff (2015), are the bottom-up approaches which are more human-centered and open to a wider public than previously done in foresight activities. Globally, it appears that new approaches in foresight which are more oriented towards experimentation, action and innovation meet the needs of effectual entrepreneurs. These approaches can be used to enhance the experimental dimension of effectuation (Chandler et al., 2011).

However, entrepreneurs still have a traditional vision of foresight. Therefore, we suggest that some activities which would raise awareness of these approaches should be implemented if we wish to establish stronger relationships between foresight and entrepreneurs. Moreover, these new approaches should also be explored in depth in order to entice practitioners and researchers in foresight to create more foresight approaches that could affect the development of effectual processes.

In summary, the present study provides evidence of an existing interplay between effectuation and foresight through two interrelated dimensions: networks and cognitive aspects. These two dimensions are intertwined through the following concepts: proactivity, experimentation, systems thinking, weak signals, common language and knowledge creation (Figure 2).

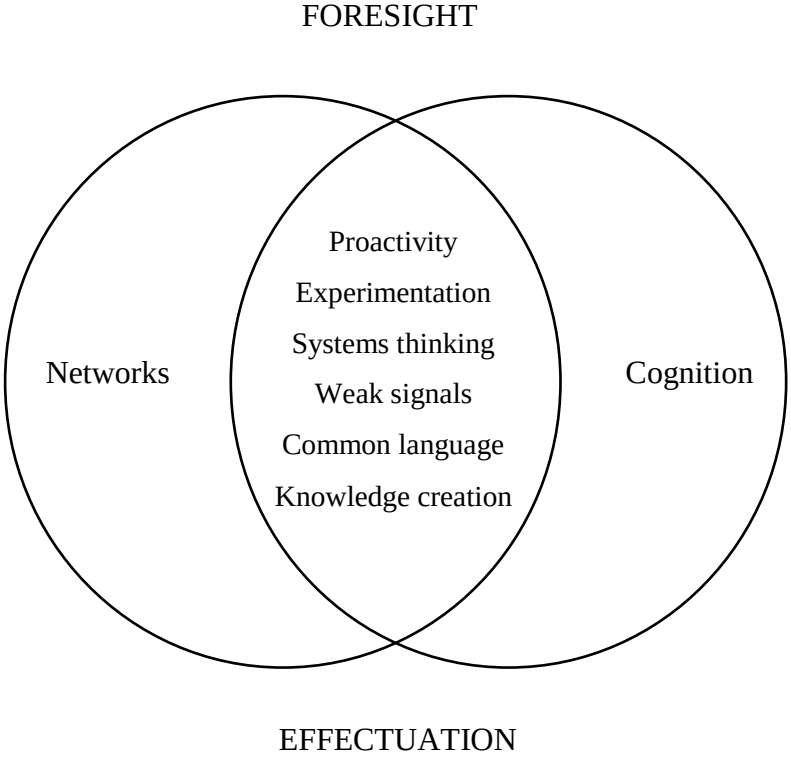

Figure 2: Model of the links between foresight and effectuation

6. **Conclusion**

The findings of our study provide some significant insights. Part of the results are consistent with Sarasvathy's view that effectual entrepreneurs proceed in building their ventures by relying on their means; specifically, on their knowledge and experience and on networks they build as they move forward. The results also confirm that entrepreneurs use networks to explore information, acquire knowledge and look for support for their projects.

On the other hand, the results show that in some foresight activities the same process is followed, i.e. that foresight activities spur the creation of networks which serve as learning spaces where participants are able to explore possible alternatives for their actions, acquire new ideas and knowledge. In addition, foresight activities reinforce the creation of knowledge through the codification of knowledge which contributes to the creation of a common language among the actors. This way, foresight can also be used as a communication tool which could enhance the engagement of all the actors in the network. This could be of a special importance for entrepreneurs who seek to involve third parties in their projects. The interplay between

effectuation and foresight is thus fundamentally realized through two interrelated dimensions: networks and cognitive aspects. This result emerging from the review of the literature is confirmed by the statements of the actors in the field.

Furthermore, our findings have confirmed that entrepreneurs use networks to explore a specific sort of information called *weak signals*. This is a familiar concept and it is used increasingly in foresight practices. It becomes apparent that foresight can become a useful method for entrepreneurs to learn how to manage networks and weak signals they get from the networks.

The results from the interviews performed with entrepreneurs also revealed that expert entrepreneurs do have a systemic way of thinking. On the other hand, our results provided evidence that foresight nurtures systems thinking. Consequently, we believe that foresight activities could teach entrepreneurs how to think in a systemic manner, thus strengthening effectual reasoning. Furthermore, the results provided evidence of the existence of new approaches based on experimentation, which support this process to an even greater extent. These new approaches not only permit and develop systems thinking, which is inherent both to futurists and effectual entrepreneurs, but thanks to their methods based on experimentation allow another form of learning; namely, learning through doing, i.e. through action. This has seldom been studied in the literature on foresight and therefore, it represents an interesting dimension to be explored. Finally, our study also points to a lack of knowledge in entrepreneurs about the new approaches in foresight and to their limited perception of foresight as a discipline which is overly theoretical and therefore not suitable for their needs. Besides these results, our article brings first and foremost a review of literature which has not been done until now and which sheds light on the links between effectuation and foresight. Thus, not only is this relationship established, but a whole new picture of foresight and its unrevealed possibilities were presented.

There are several limitations of the present research design. Given the fact that among the informants the representatives of the French foresight school outnumbered the rest, it may be interesting to broaden the study by expanding the number of informants who follow other approaches. By doing so, it could provide us a broader vision of foresight practices and possible shifts that are happening in foresight approaches in their respective countries. Another point worth mentioning is that we centred our study exclusively around French entrepreneurs. It may be interesting to conduct a comparative study with entrepreneurs from other countries in order to enhance the rigor of the study. Given the non-representative sample of the interviewed

futurists and entrepreneurs, we cannot claim the results are generally applicable. However, they provide an initial insight into an issue which has been neglected up to now.

In this article, we set out to investigate the implicit links between effectuation and the foresight theory and whether and to what extent foresight activities could strengthen and contribute to the development of the effectual process. Those links were first drawn from an in-depth review of the literature in effectuation theory and foresight and then compared with empirical findings. Once established, the proposed links open a new perspective for research in both foresight and effectuation. The results showed the existence of implicit links between foresight activities and the development and strengthening of effectual reasoning in entrepreneurs.

We believe that further exploration of these new approaches could stimulate both researchers and practitioners to create methods that could be more suitable for entrepreneurs. Given the fact that our findings established a positive relationship between foresight and effectuation and brought evidence that certain foresight activities could contribute to the development of the effectual process, we propose an examination of foresight approaches as one possible answer to Sarasvathy's question: What should be taught to students in MBA programs in entrepreneurship?

Finally, our study reveals another interesting point and that is the need to reconsider the established foresight practices. The standpoints of Bas and Pacini provide certain indications that the established relationship between foresight and effectuation could work the other way around, i.e. that the effectual approach could also impact foresight activities and help futurist to consider their practices. To achieve this, it would be important first to get a deeper understanding of the reasoning behind effectuation. If we stick to the study on the dimensions of effectuation conducted by Chandler et al. (2011), we would suggest that futurists should include in their practices an experimental dimension and incite participants to action by starting from the available means. We believe that such an approach which is oriented towards building the future through small steps in the present could lead to some interesting insights which would not emerge in current approaches. Such a perspective could inspire researchers and practitioners in foresight approaches to re-examine the future nature and use of foresight.

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