Exploring the process through which entrepreneurial intention is generated within academic researchers’ minds

A case study in Umeå Institute of Design in Sweden

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Abstract

Academic entrepreneurship is a rather recent development and there is a growing interest in both the research as well as the practice of this social phenomenon. So far, most of the relevant literature has focused mainly on market-oriented occurrences without taking into account the so-called supply-side perspective of entrepreneurship, meaning the entrepreneurial agency of academics. In this context, we have decided to explore the creation of academic spinoffs - one of the aspects of academic entrepreneurship – under the spectrum of capacities, skills and perceptions of academic researchers. The aim of our study is to explore the process through which entrepreneurial intention is born in academic researchers’ minds by conducting a case study research within Umeå Institute of Design in Sweden. Building upon the theory of planned behavior, as well as using the theories of human and social capital as a basis for our analysis, we provide the reader with some valuable feedback on the specific elements that take part in this procedure as well as their interrelations. In addition, this study includes significant implications for policy makers and prepares the ground for further research in this field.

Key words: Academic entrepreneurship, academic spinoffs, academic researchers, theory of planned behavior, human capital theory, social capital theory
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1. Introduction

Entrepreneurship has been brought up into discussion indicating its advantages in economy, society and entrepreneurs themselves. Since both authors are here in pursuit of higher education at a master’s level, we wonder how entrepreneurship can connect with the higher level of education. According to Shane, academic entrepreneurship is being defined as the scientists who become entrepreneurs and by using their inventions and scientific knowledge are in a general seek to gain profit from the market. This effect has been proved crucial to the economic development and social wealth (Shane, 2004).

After critically reviewing the relevant literature available, there are many possible ways of conducting research within the field of academic entrepreneurship, for example from the demand-side of academic entrepreneurship. Yet, there is not much research done on the drivers of intentions for academic researchers to become entrepreneurially active (Goethner, Obschonka, Silbereisen, & Cantner, 2011). In accordance with our interests, contribution of the findings to the research field and the possibility of execution, we decided to focus especially on how academic researchers get the intention of becoming entrepreneurs at first place. This has led us to our research question of how entrepreneurial intention is generated in academic researchers’ minds.

People would not just come up with the idea of becoming entrepreneurs all of a sudden, especially, if they are researchers with a promising future professional career within academia. There must be a comprehensive explanation for it. To connect with entrepreneurship, Ajzen’s theory of planned behavior (TPB), developed in 1991, is mentioned mostly. By getting deep into a further exploration of this theory, we decided to apply it as a basic tool of our theoretical framework for the examination of the process through which entrepreneurial intention is generated among academic researchers.

Other than the theory of planned behavior, in accordance with higher education involvement, we selected human capital theory as our supporting examination basis. Higher education is recognized as a way to acquire assets through education. Human capital theory explains how and what should be regarded as asset under the situation where researchers start developing the intention to become entrepreneurs. Educational background in relation to skills as well as previous experiences in business-related activities could also be examined under the spectrum of the human capital theory (Madsen, Neergaard, & Ulhoi, 2003). Further discussion is made in the theoretical part of the literature review.

Social capital, or networks, is another theory which has emerged and been discussed intensively during the last years. Doing business is not only about companies, investments or assets anymore. Many are the times that problems can only be solved by networking leverages. The most often heard sentence used in business would be “I know someone who knows someone that could fix this problem.” This refers to the presence of networks, which is called as social capital (Markman & Baron, 2003). Yet, networks are not only about solving problems. The core of networks is that the social, either formal or informal, relationships can bring benefits to the actors that are recognized as assets in the future or when in use. Insider information is another example of the benefits from having networks, as some information is restricted within a specific group and, therefore, outsiders have no access to it.
By using as our point of departure the theory of planned behavior and human as well as social capital theory, we have selected elements of perception, networks, motivation and intention to be the foundation of our tentative theoretical framework. The reasons why we have opted for these elements, instead of others mentioned in the theories, are explained later on in the respective section of the literature review concerning our theoretical framework.

In order for us to gain a deeper insight into how researchers generate the intention of becoming entrepreneurs, we have decided to take a qualitative research approach. Through interviewing selected academics we attempt to investigate the drivers of academic entrepreneurial intention.

Interviewees are selected from the Institute of Design in Umeå University. The reasons why we have opted for the Institute of Design instead of other departments within Umeå University are the following: firstly, there is no previous research conducted in this field; secondly, the number of the faculty staff in the Institute of Design is relatively small, that is to say 30 members, and since the number of our interviewees is also small that would facilitate the representativeness of their replies; lastly, we happen to have access to some of the faculty members so as to ensure that we can find suitable respondents. For us, as business students completing our master’s degree in the field of entrepreneurship, it looked rather appealing to us to examine the viewpoints and share the experiences of academics that have no business-related educational background. Such an option seemed to us quite intriguing in order to gain a deeper understanding of the process through which academic entrepreneurial intention is born and go further than the likely effect of business education on an academic researcher who intends to engage in entrepreneurial activities so as to commercialize his research.

Furthermore, the design industry is constantly growing and the Institute of Design in Umeå University has been ranked as one of the best design schools worldwide. Therefore, it is of great interest to conduct a research within its premises and pave the way for future research in this promising field. There are also findings showing that the development of the Design industry will be beneficial to the society as well as the economy (Housing, 2003). Recently, design has been regarded as a way to make companies more competitive and help them achieve their business goals (Choi, Cooper, Lim, & Evans, 2011). Therefore, we believe it would be beneficial to the authors and the readers to know more about the how the intention of entrepreneurship is generated within the promising design industry.

The link of our research to the theories analyzed in our literature review section has an inductive perspective as the theoretical framework employed simply facilitates our prior understanding and does not dictate a strict logic of specific hypotheses testing. The replies of our interviewees are meant to contribute to our understanding of the process through which academic entrepreneurial intention is generated and formulate a more precise view of this procedure.

Constructionist approach concerning our ontological considerations is consistent with the issue at hand, where the respective elements forming the generation process are investigated as parts of a socially constructed reality. Moreover, our interpretivist stance, regarding our epistemological assumptions, supports to a great extent the exploration of our respondents’ perceptions and our in-depth understanding of how they end up wanting to become academic entrepreneurs.
1.1. Problem Identification

Entrepreneurship has recently been described as a new “industry” with close ties to higher education (McGowan, Sijde, & Kirby, 2008). Academic entrepreneurship, in specific, appears to be a rather controversial issue as the pursuit of revenues by public-sector institutions can be viewed as an erosion of the social contract between higher education and the state (Anderseck, 2004). Much literature has been presented dealing with this subject. However, a great deal of previous research has focused mainly on market-oriented phenomena (Washburn, 2005) failing to take into consideration the so-called supply-side perspective of entrepreneurship (Lachmann, 1970), which acknowledges the entrepreneurial agency of individuals and can create opportunities for higher education scholars to thoroughly explore the independent agendas of entrepreneurially-minded academics, students and administrators (Mars & Rios-Aguilar, 2010, p. 456).

In short, we would argue that what is needed is for research on academic entrepreneurship to change direction and examine this social phenomenon under the spectrum of capacities, skills and perceptions of its actors. By examining the generators of academic entrepreneurial intention (AEI) and gaining a deeper understanding of this process, we will be able to reach useful conclusions that can pave the way for further research on this subject.

1.2. Purpose

By drawing upon theories which derive from both the entrepreneurial and the psychological field of research, and more specifically the cognitive area, this paper attempts to offer an in-depth understanding of the mechanism through which academic entrepreneurial intention (AEI) is generated. Therefore it is a process study.

The reason why we have opted for scientists becoming entrepreneurs is the fact that the emergence and constant growth of academic entrepreneurship is an issue, which seems more appealing to research compared to the primary term of entrepreneurship. Academic entrepreneurship constitutes a rather recent development in the entrepreneurship field (Mars & Rios-Aguilar, 2010, p. 442) and it would also be more contributing if we attempted to provide a more in-depth insight into those elements that generate such social phenomena. The qualitative approach of our research ensures a deeper understanding of the mechanisms through which the initial intention, of engaging in entrepreneurial activity, is generated in academic researchers’ minds.

We would like to examine the decision process and find out how academic entrepreneurial intention is born. The research question of this paper is how entrepreneurial intention is generated in academic researchers’ minds?

1.3. Structure of Thesis

Our study begins with a literature review on the social sciences field, including economic, managerial as well as psychological literature in order to define the terms that we employ in the following sections of our paper.

Therefore, the first section of chapter 2 introduces the phenomenon of the emergence of academic entrepreneurship by examining the trends in knowledge production, the gradual intensification of the ties between academia and the industry as well as the
strong presence of spinoffs in the contemporary academy. We then examine academic spinoffs more in detail as we refer to the opportunities created as well as the challenges posed in relation to the founding of spinoff firms by academic researchers. The fourth section of the literature review explores the theoretical background, which constitutes the main basis for our empirical analysis and discussion afterwards.

In the third chapter, we introduce the framework of our research methodology. After presenting the procedure through which we ended up with our research topic, we analyze both the ontological and epistemological assumptions on which our study is based. These considerations also provide the basis for our qualitative research strategy which is analyzed afterwards. Then, we explain the reason why we have taken an inductive stance concerning the link of our research to theory and make a detailed description of our research design and technique. We also explain how we performed our sampling, how we handled our sources and make an analysis of the quality criteria as well as the limitations of our research. Our ethical considerations are demonstrated in the last section of chapter 3.

Chapter 4 constitutes the empirical section of our study, which shows our findings from the semi-structured interviews that we conducted with four academics within the Design School of Umeå University. After presenting the educational background of each of our respondents, we focus on how human capital, social capital, perceptions and motivations form the process through which academic entrepreneurial intention is born.

Chapter 5 includes the analysis of our interview data in relation to the theories presented in the literature review. Here we move on to another level of analysis by comparing the answers of our interviewees and identifying themes where their points of view are either similar or differentiated somehow. We, then, argue on them by employing, at the same time, our relevant theoretical framework.

Chapter 6 concludes our research by summarizing the findings of this study, indicating possible implications and providing suggestions for further research in this field.
2. Literature Review

Certain developments concerning the way in which knowledge production has been handled throughout the years, as well as tendencies regarding the intensification of ties between academia and the industry, have resulted in the occurrence of a phenomenon, where academics take on their roles as entrepreneurs in their effort to commercialize the findings of their research.

The transition from a strictly disciplinary knowledge context with no explicit applications within the industry to a broader, “socially distributed” knowledge (Gibbons et al., 1994), which can and should be applicable within the industry, in order to boost the economies and create innovative products, is a phenomenon that characteristically illustrates such a development. Furthermore, the emergence of the theory on triple helix model has resulted in hybrid formations linking academia to the industry (Etzkowitz & Viale, 2010). As a result, there has been a shift towards an academic capitalist knowledge/learning regime, where new networks have emerged, as for instance academic spinoffs (Slaughter & Rhoades, 2004). Mainly, there have been observed five major ways in which academic entrepreneurship is expressed and the fifth of them refers to the firm startups realized by academic researchers, so that the latter manage to commercialize the results of their research (Laukkonen, 2003). In our study, we focus on this specific aspect of academic entrepreneurship, that is to say academic spinoffs, in order to gain a deeper insight into this area and investigate the procedure that takes place in order for academic entrepreneurial intention to be born.

Academic spinoffs provide various benefits to the universities apart from the obvious reason of research funding. They also help the industry in many ways such as providing access to talented individuals and interesting research findings. Moreover, academic spinoffs also have positive effects on society, in general, by encouraging local economic development through the generation of jobs, encouraging investment in the development of university technology and imposing highly localized economic influence (Shane, 2004).

Academics' intention to become entrepreneurs can be studied with the help of psychological studies, and more specifically under the spectrum of the theory of planned behavior (TPB) (Ajzen, 1991), where attitude towards a behavior, subjective norms as well as perceived behavioral control are significant determinants of one's intention to perform a certain behavior. Additionally, the theory on human capital (Madsen, Neergaard, & Ulhoi, 2003) can help us identify the role that educational background, business skills as well as previous entrepreneurial experience can play during the generation process of academic entrepreneurial intention (AEI). Last but not least, the various theories on social capital and the importance of social networking can also assist us in examining another significant element within this process.

By taking all the above into consideration, we have attempted to roughly illustrate this process, so that we can use this model as an initial basis for the formulation of our questions during our data collection.

2.1. The Emergence of Academic Entrepreneurship

Gibbons et al. have highlighted the transition from a traditional type of knowledge, called “Mode 1”, which is created within a “disciplinary and primarily cognitive
context”, to “Mode 2” knowledge, which is generated in “broader, transdisciplinary social and economic contexts” (Gibbons et al., 1994, p. 1). More specifically, Mode 1 is discipline-based and distinguishes what is purely theoretical from what is applied within other areas of knowledge, such as engineering sciences (Gibbons et al., 1994, p. 19). On the other hand, Mode 2 goes back and forth between the fundamental and the applied, that is to say the theoretical and the practical aspect of knowledge (Gibbons et al., 1994, p. 19). In the latter case, knowledge is characterized as “socially distributed” as its production gets disseminated throughout society and research becomes applied (Gibbons et al., 1994, p. 4).

In specific, Mode 2 has been attributed some characteristics, which are quality control, context of application, heterogeneity and organizational diversity, and transdisciplinarity (Gibbons et al., 1994). Firstly, quality control is performed by scientists formulating explicitly the problems on which they intend to work, when pursuing funding, using methods which follow the social and technical norms of their disciplines and reporting their findings to their peers according to prescribed modes of communication”. Secondly, the knowledge production within a context of application implies that knowledge is intended to be useful to industry, government or society in general; it is always produced under constant negotiation and it will not be produced until the interests of the various actors are included and satisfied. Thirdly, knowledge production is heterogeneous as regards the capabilities and experience that people bring to it. Moreover, as flexibility and response time are essential in Mode 2, new and various organizational forms have been established in order to tackle these issues. Lastly, transdisciplinarity expresses a “movement beyond disciplinary structures in the constitution of the intellectual agenda, in the manner in which resources are deployed, and in the ways in which research is organized, results communicated and the outcome evaluated”. This means that the boundaries of disciplines become fuzzier and new research areas, such as biotechnology, emerge bringing together experts with different educational backgrounds (Gibbons et al., 1994, p. 147).

This transdisciplinarity in knowledge production is also pinpointed by Etzkowitz, who emphasizes on the polyvalence of knowledge and, by employing a “triple helix” model, explains the process through which a third academic revolution is taking place (Etzkowitz & Viale, 2010). More specifically, a shift from univalent to a polyvalent type of knowledge has taken place. The term “polyvalent” characterizes the type of knowledge that is at the same time theoretical and practical in contrast to “univalent” (Etzkowitz & Viale, 2010, p. 596). This phenomenon has, in turn, facilitated the collapse of barriers between academia and industry leading to a situation where “knowledge, institutions, organization and roles evolve from pure-bred to hybrid, specialization to integration and separation to synthesis” (Etzkowitz & Viale, 2010, p. 596).

In this context, through the leadership and cooperation of individuals from universities, industry and government, the “triple helix” model applies, where all three institutional spheres participate in the birth of hybrid institutions, such as university research centers adopting industrial models of research management as well as start-up firms embodying academic, industrial and government elements rather than a pure business model (Etzkowitz & Viale, 2010, pp. 601-602).

Furthermore, a major contribution to the understanding of the tendencies regarding knowledge production is that of Slaughter and Rhoades, who observed the emergence of the academic capitalist knowledge/learning regime in the beginning of the 21st century
The two authors argue that there is a tendency towards academic capitalism, which “focuses on networks – new circuits of knowledge, interstitial organizational emergence, networks that intermediate between public and private sector, extended managerial capacity – that link institutions as well as faculty members and students to the new economy” (Slaughter & Rhoades, 2004, p. 15). These new circuits of knowledge as well as interstitial organizations are highly relevant to the aspect of academic entrepreneurship, which we have chosen to work with, in our research paper. Patenting has paved the way to the creation of new circuits of knowledge, such as sponsored research and firm spinoffs where universities hold equity and faculties hold administrative positions (Shane, 2004, p. 311). Interstitial organizations, as for example technology transfer offices (TTOs), promote academic entrepreneurship through the creation of social and political networks that help organizational units to be entrepreneurially-active in a more effective way (Shane, 2004, p. 314).

Generally, academic entrepreneurship can take various forms and be expressed in many ways. Yet, we can categorize the following five main types of academic entrepreneurship, as they seem to occur quite often (Laukkanen, Exploring academic entrepreneurship: Drivers and tensions of university-based business, 2003, p. 374): the first type refers to large-scale science, meaning the formation of large research groups and laboratories working on large-scale projects and pursuing the funding of the research (“grantmanship”); the second type is related to the achievement of a higher income for the academics by supplementing it with consultancy services; thirdly, joint research projects or even business ventures are a quite common phenomenon, where the industry initiates, funds and manages research in cooperation with academic institutions; patenting can be regarded as a fourth type of academic entrepreneurship, as through that academic scientists search for commercially applicable results; finally, academic researchers also get directly involved in the commercialization of their research by founding their own spinoffs.

Shane defines academic entrepreneurship as closely related to academic spinoffs including only firms based on intellectual property, that is to say patent protection, created at a university (Shane, 2004). In our study, we use the above definition as a basis for our understanding of the process through which entrepreneurial intention is born within academics’ minds.

2.2. Academic Spinoffs

It is a fact that in some disciplines, as for instance in computer sciences, scientific knowledge and applied knowledge are almost identical and this provides an ideal starting point for spinoffs from given universities (Anderseck, 2004, p. 194). Thanks to academic entrepreneurship, scientists have managed to secure the required funding for their research from alternative sources (Bercovitz & Feldmann, 2006). The research costs include, among others, the costs of PhD students, postdocs, administration, travel and conferences participation (Hansson & Monsted, 2008, p. 653). Crespo and Dridi mention that “the creation of spin-offs is a means to acquiring resources which are lacking in a highly competitive peer-reviewed context” (Crespo & Dridi, 2007, p. 79). It is noteworthy that most European funding is tied to collaborative networks of researchers across both national and university-industry boundaries making thus the demand for co-funding a challenging task for the traditional university structure (Hansson & Monsted, 2008, p. 653). Shane also points out that, partly, the reason why establishing a university spinoff is an efficient way of raising money for research is that
the process of getting a large amount of funding for research bears close resemblance to the respective process in the case that the funding comes from a granting agency (Shane, 2004, p. 28).

It is also notable that university spinoffs allow faculty to supplement their salaries with equity in their very own companies and this enables universities provide a financial mechanism to recruit as well as retain faculty staff (Matkin, 1990).

Furthermore, spinoffs can serve as effective vehicles for commercializing uncertain, early stage university technologies that otherwise would remain unlicensed (Shane, 2004). As a study conducted by Thursby and Thursby has shown, one of the two most significant reasons why large, established companies do not license university technology is the early stage of the development of the invention (Thursby & Thursby, 2002). Sometimes, another reason might be that this technology involves tacit knowledge and, thus, requires additional inventor involvement in order to be successfully commercialized (Shane, 2004, p. 37).

Moreover, Richter’s work suggests that interaction with university spinoffs provides faculty with knowledge about starting companies that is useful in educating students for an increasingly entrepreneurship-intensive environment when it comes to scientifically trained people (Richter, 1986). In addition, according to a study there is a fusion of both direct and indirect knowledge transfer as MBA students preparing a business plan link with TTOs and academic founders of businesses (Wright, Piva, Mosey, & Lockett, 2009, p. 579).

As for the opportunities that academic entrepreneurship can offer to the industry, these are various. The Organization for Economic Co-operation and Development mentions in brief that the benefits, which industry can get from this collaboration, include access to new scientific knowledge, established networks and problem-solving capabilities (OECD, 2000, p. 17).

Moreover, firms increasingly desire a more collaborative relationship with academic scientists, where the professor becomes involved in helping set the strategic direction of the company as opposed to simply handing over the technology (Etzkowitz, 2000).

University spinoffs also encourage local economic development by generating jobs, especially for people with a high educational background, encouraging investment in the development of university technology and imposing highly localized economic influence (Shane, 2004, p. 20). At this point, it is worth to mention that spinoffs often have a catalytic impact on the establishment of geographic clusters of new companies in certain technologies (Shane, 2004, p. 23). The creation of science and technology parks (Adams, Chiang, & Katara, 2001) as well as incubators around higher educational institutions (Salvador, 2011) is typical of this situation. In addition, Audretsch et al. have argued that new knowledge- and technological-based firms have a higher propensity to locate close to universities, presumably to facilitate access to knowledge spillovers (Audretsch, Lehmann, & Warning, 2005). Lastly, as Laukkanen has stated - citing Camagni and Malecki -, “location of research itself can be important for creating and sustaining an innovative region, i.e. one capable of endogenous self-renewal and growth” (Laukkanen, 2003, p. 373).

Yet, commercial activities, patenting and spin-off company formation require faculty efforts beyond conception stage ideas, which are likely to divert faculty attention from
their role in academic research and teaching, but there are four strategies through which scientists can try to balance their tasks (Göktepe-Hulten, 2010, p. 532). First, inventors can be selective in their research, teaching and patenting activities. Second, they can delegate some of the research tasks to other members of their research group. Thirdly, they are mostly at liberty to arrange their employment contracts, as they work part-time in the firms. Lastly, they act in a way that makes patenting a by-product of research and teaching.

At this point, it would be useful to present the definition of the term called “boundary work”, which expresses the active agency role of scientists in drawing and redrawing the boundaries of their work to defend their autonomy and secure resources in pursuit of professional goals (Gieryn, 1983). This term has also been employed to reflect the strategies that scientists use to defend the content of their work (Lamont & Molnar, 2002, pp. 177-178). Lam’s work applies the concept of boundary work by drawing attention to its inner, socio-cognitive dimension in relation to scientists’ professional role identities and presents four orientations for those role identities as well as varied strategies of boundary work in order for those types of role identities to defend, maintain or negotiate their positions (Lam, 2010).

Type I scientists, the traditional ones, are concerned that private interests may undermine the objectivity of research and pose moral threats to science (Lam, 2010, p. 320). Type II scientists, the traditional hybrid ones, adopt an adaptive strategy towards those recent developments as they recognize some need for collaboration with the industry, by maintaining collaborative links with discontinuous involvement in some commercial activities (Lam, 2010, p. 321). It is very interesting that this ambivalence, that Type II scientists show, can be considered a strategy of self-protection as it allows them to create “provisional selves” as temporary solutions to experiment with new roles (Ibarra, 1999, p. 765). Type III scientists, that is to say entrepreneurial hybrids, see patenting and company formation as mechanisms that enable them to have control over knowledge exploitation, protecting thus the integrity of science, rather than a vehicle for plain profit-making (Lam, 2010, p. 326). Last but not least, Type IV scientists, the entrepreneurial ones, attack and dismiss the traditional model of academic science and these practices lead to tension and risks jeopardizing their acceptance by academic colleagues (Lam, 2010, p. 331).

Another challenge for academic entrepreneurship is the fact that patent laws and regulations, although they provide incentives for commercial activities, sometimes constrain the behavior of scientists (Göktepe-Hulten, 2010, p. 526). It is a fact that there has been an ongoing debate in Sweden, and in most OECD countries to shift ownership from individual scientists to universities (Göktepe-Hulten, 2010, p. 526).

### 2.3. Theoretical Framework

As discussed previously, there are various types of academic entrepreneurs with different drivers and intentions. In this study we will focus on those that commercialize their research directly by founding their own academic spinoffs. Since involving in academic spinoffs also has some hazardous effects regarding the two role identities between academia and business, it shall not be an impulsive decision for an academic researcher. Therefore, a way for us to investigate this type of behavior is to apply Ajzen’s theory of planned behavior (TPB) in order to examine the underlying intention. In TPB theory, attitudes, subjective norms and perceived behavioral control are the main elements analyzed. TPB indicates that those who perceive the control over
entrepreneurial behavior tend to form strong intentions toward academic entrepreneurship (Ajzen, 1988).

Additionally, in previous research related to academic entrepreneurship, there were some other theories discussed such as the human capital and the social capital theory, where other elements are examined. In specific, scientists’ human capital refers to business skills, patenting and previous entrepreneurial experience, expertise in applied fields and the completion of a higher-education degree. Social capital, on the other hand, refers to the relationship or, otherwise called, linkages, individuals involved in the industry (Goethner, Obschonka, Silbereisen, & Cantner, 2011). Human capital provides superior cognitive abilities to individuals for starting their own business while social capital indicates one’s social networks and the ability to use resources outside networks (Goethner, Obschonka, Silbereisen, & Cantner, 2011).

The process of human decision is rather complicated. Consequently, the process through which academics decide on becoming entrepreneurs is complicated as well. In this section, we are going to analyze the theories mentioned above. Yet, because of the time and resource limitation, we will not be able to exam all the elements of the theories mentioned above in relation to academic entrepreneurship.

During the analysis of the theories, we select the elements that we believe to be influential and form our own model of examining the process of academic researchers’ decision to realize a spinoff. In this section, we will first introduce TPB, human capital and social capital theory; then we will explain why we have selected certain elements instead of others and how we have come up with this tentative model.

2.3.1. Theory of Planned Behavior (TPB)

Ajzen’s TPB is the psychological framework of decision process; this theory helps to understand why human and social capital is crucial to entrepreneurial activities (Goethner, Obschonka, Silbereisen, & Cantner, 2011). TPB provides us with three elements that determine people’s intention to perform behavior. As mentioned earlier, entrepreneurial activities are not impulsive; intention leads to a plan of getting entrepreneurially active.

These are the attitude towards a specific behavior, subjective norms and perceived behavioral control. **Attitude** reflects one’s positive or negative evaluation of the behavior. It is showed that scientists are more likely to dedicate time and effort to entrepreneurship if they favor entrepreneurial activities and the related commercial usage of scientific knowledge. **Subjective norms** represent the pressure of either engaging or not engaging in a particular behavior; the pressure is performed by a specific and behaviorally relevant reference group. Therefore, in our study workplace peers constitute an important reference group for academic entrepreneurs. **Perceived behavioral control** mainly refers to the levels of difficulty for successfully conducting a behavior. Only when scientists perceive that they have strong control over academic entrepreneurial activities, they are more likely to take action. Also, obtaining a PhD degree shows positive perception of entrepreneurial control, which implies that high education is positively related to perceived behavioral control (Goethner, Obschonka, Silbereisen, & Cantner, 2011).

According to TPB, attitudes towards behavior, subjective norms concerning the behavior and the perceived behavioral control together can help to determine intentions
of behavior. As a result, entrepreneurial intentions are influenced by attitudes towards initiating a start-up, subjective norms related to entrepreneurial activities and perceived behavioral control of starting a new venture (Ajzen, 1991).

Of course, other than the elements discussed in TPB, there are some others, such as personal variables, experience and situational elements that we should take into consideration. Personal variables are demographics and personality traits; experience means prior entrepreneurial experience; situational elements refer to the accessibility to financial support (Gird & Bagraim, 2008). Ajzen also states that scientists’ human and social capital could be influential to academic entrepreneurial intentions (AEI) by affecting attitudes, subjective norms and perceived control of behavior (Ajzen, 1991) & (Ajzen, 1988).

Apart from the theory of planned behavior examined above, there are also other theories relevant to the elements influencing academic entrepreneurial intention. Therefore, in the following sections we are going to introduce the theories of human capital and social capital.

2.3.2. Human Capital

Entrepreneurs are generally seen as extreme types of people who hold positive sense of being “exceptional individuals”. They are different from others because of some features of their personality and behavior; for example, the need of achievement, the power of control and the tendency of risk-seeking. However, one’s decision to become an entrepreneur does not solely depend on some personal traits. Personality may be part of the human capital and part of the reason why one chooses to engage in entrepreneurial activities, but it is certainly not the most significant one (Madsen, Neergaard, & Ulhoi, 2003).

Gender, age and race are also considered parts of human capital. Yet, those attributes cannot be altered or enhanced over time. Skills, on the other hand, can be improved through prior experience and continuous maintenance. Although, gender, age and race still form the basis upon which human capital develops, we will not discuss about this part of human capital in our research as these features cannot be changed and, therefore, improved over time (Madsen, Neergaard, & Ulhoi, 2003).

Acquired work experience and educational background contribute to one’s cultivation, which is considered an important part of human capital (Madsen, Neergaard, & Ulhoi, 2003). Moreover, education and experience may have influence on entrepreneurship and the success of entrepreneurial ventures (Honig, 1998).

In general, human capital can be divided into specific and general human capital (Madsen, Neergaard, & Ulhoi, 2003). There are various definitions for it. Some define specific human capital as entrepreneurs’ education and professional experience while general human capital refers to socio-demographic traits. Others see experience and education as general human capital if they are not specifically related to business and entrepreneurial activities (Madsen, Neergaard, & Ulhoi, 2003). No matter what, education and experience are considered as parts of human capital. Based on this statement we perform our analysis later on.
2.3.3. Social Capital and Networks

The core of social capital theory is that networks of relationships are considered a valuable resource while conducting social affairs. Networking provides its members with collective-owned capital which, in turn, is beneficial for them. (Bourdieu, 1986) Several studies have shown that entrepreneurs with wide social contacts get sufficient social capital, which can contribute to resource acquisition (Pohja, 2009). Social capital, like physical and human capital, could also facilitate productive activities (Coleman J. S., 1988). Social capital also refers to the weak ties or the bridge ties, which are more contributive to information, and other resources, than strong ties (Granovetter, 1973).

To sum up all the above, the definition of social capital is that it consists of networks, norms, relationships and values that form the actor’s social relations and society’s social interaction (Pohja, 2009). In other words, social capital is the sum of actual and potential resources embedded in the networks. It is available and derived from the relational networks composed by social or individual units (Nahapiet & Ghoshal, 1998) Social capital can appear in various forms, such as connection, financial support and information. The information form of social capital is essential, especially to entrepreneurial opportunities (Shane & Venkataraman, 2000).

Social capital consists of horizontal and vertical networking, which is also called linkage. The key function of social capital linkage is the capacity to gain access to resources, ideas and information. Social capital supports behavior through interaction of both vertical and horizontal networking (Pohja, 2009). If a scientist knows who is the right person to provide him with information, contacts and funding, this means that he possesses social capital. That is to say, social capital assists entrepreneurs to access contacts, and build on them, and good reputation (Markman & Baron, 2003).

The social capital of academics is normally restricted to a limited scientific research category (Mosey & Wright, 2007). Academics tend to have strong connections within the fields while having loose or weak ties outside (Granovetter, 1973). Yet, weak ties could lead to bridge of social capital between academic and industrial actors (Adler & Kwon, 2002). Moreover, weak ties could develop into strong ties as time passes by and turn into relationships based on mutual trust, which enables the access to resources (Mayer & Schoorman, 1993).

There are two common characteristics of social capital. The first is that they all include some aspect of the social structure. Second, they all make the action of individuals within the structure easier (Coleman J. S., 1990). In simpler words, whom you know affects what you know; therefore, it affects what you do.

To sum up, social capital is the collective power of each individual of the relationship network. It mostly provides information, but it could also be considered as a form of connection and funding. For academics, weak ties are common outside their research fields and are as beneficial as bridging networking.

Network ties provide access to resources and this is the fundamental proposition of social capital theory (Nahapiet & Ghoshal, 1998). There are three plots of network structure: density, connectivity and hierarchy. These features are associated with flexibility and the exchangeability of information through their impact and accessibility to the network members (Krackhardt, 1989).

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Knowing other entrepreneurs could be seen as a form of networking and it is positively and significantly related to being a nascent entrepreneur (Arenius & Minniti, 2005). The positive effects could be due to the resource availability or to the ease and comfort of knowing someone in a similar situation. The comfort can reduce anxiety and uncertainty and, as a result, it has positive effects on scientists’ involvement in entrepreneurship.

Furthermore, entrepreneurs with networks consisting of many contacts, for example, extensive social networks, can respond to environmental opportunities better and acquire resources needed more easily in order to run the business (Dubini & Aldrich, 1991). Networks can also be the structural dimension of social capital which represents the overall connections between actors (Carolis, Litzky, & Eddleston, 2009). Given the existence of a rich network, individuals are well-connected with numerous social and professional relationships and are more likely to experience success when starting new ventures (Carolis, Litzky, & Eddleston, 2009).

In conclusion, both social capital and networking are beneficial for scientists in order to start a career as academic entrepreneurs. It is obvious that networking and social capital overlap in various ways. Yet, according to the definition given above, networking should be regarded as part of the social capital. Social capital refers to more general ideas, such as norms, relationships, values and networks. Therefore, network, on the other hand, is more specific. It represents the linkage between different individuals. In other words, network can be illustrated as lines between individuals; many lines form a net. Social capital represents the 3D connection of individuals.

To sum up the related theories discussed here, a table is provided below. The core points are stated. The linkage with our tentative theoretical framework is also shortly explained here. In the next section, the tentative theoretical framework as well as the way in which we have selected the specific elements is presented.
Table 1. Summary of Theoretical Background

<table>
<thead>
<tr>
<th>Theory</th>
<th>Core Points of the theory</th>
<th>Selected Points</th>
<th>Connection with Tentative Theoretical Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory of Planned Behavior (TPB)</td>
<td>• Attitudes</td>
<td>• Attitudes</td>
<td>✓ If researchers hold a positive attitude towards academic spinoffs, it is highly possible that he or she will be involved in the activity. This could be connected to the perception of how one sees the academic spinoffs as well as the recognized opportunity.</td>
</tr>
<tr>
<td></td>
<td>• Subjective Norms</td>
<td>• Subjective Norms</td>
<td>✓ The subjective norm here refers to peers’ attitude towards one being involved in academic spinoffs. If the environment in the academic institute is supportive, it could be an external motivation for one to become an entrepreneur. Also, supportive colleagues could be recognized as social capital.</td>
</tr>
<tr>
<td></td>
<td>• Perceived Behavioral Control</td>
<td>• Perceived Behavioral Control</td>
<td>✓ Perceived behavioral control is based on one’s skills, both academic- and business-related. Sufficient skills could lead to higher perceived behavioral control and thus increase one’s intention of being an academic entrepreneur.</td>
</tr>
<tr>
<td></td>
<td>• Personal Variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Situational Elements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Capital</td>
<td>• Personality</td>
<td>• Acquired Work Experience</td>
<td>✓ Acquired work experience is an important element of one’s both formal and informal network formation. Also, previous work experience helps with the accumulation of business and academic knowledge.</td>
</tr>
<tr>
<td></td>
<td>• Gender</td>
<td>• Educational background</td>
<td>✓ Education is the basis of one’s knowledge, which is, in turn, linked to one’s skills. We expect that the educational background will influence one’s skill and this will affect the perceived behavioral control in the TPB.</td>
</tr>
<tr>
<td></td>
<td>• Age</td>
<td></td>
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<tr>
<td></td>
<td>• Race</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Acquired Work Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Educational background</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Capital / Network</td>
<td>• Collective-owned Capital</td>
<td>• Collective-owned Capital</td>
<td>✓ Networking, or social capital, is based on the social relationships between the social actors involved and it can provide resources. Those benefits are not available if one is not in the network. For the actual and potential resources, one could have higher perceived capability, which leads to higher levels of perceived behavioral control. As one might recognize more opportunities within the network, there could be collective-owned opportunity available.</td>
</tr>
<tr>
<td></td>
<td>• Weak Tie/ Bridge Tie</td>
<td>• Actual and Potential Resources Embedded</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Actual and Potential Resources Embedded</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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2.3.4. Tentative Theoretical Framework

As mentioned before, here we employ the theory of planned behavior, human capital theory and social capital theory in order to examine the decision process of academic researchers to start their own academic spinoff. However, it is not possible and feasible to examine all the elements in the theories mentioned. As a consequence, during the discussion and examination, we decided to select those elements that are more applicable to the decision process mentioned above.

In the theory of planned behavior, there are three main elements: attitude towards a performed behavior, subjective norms and perceived behavioral control; other elements such as personal variables, experience and situational elements also have an impact on decision making. The three main elements together are influential to the intention of decision process. Therefore, we intend to examine them all during our data collection process. Personal variables and situational elements vary according to different cases; therefore, we tend to focus partly on them during our research. Human capital theory will be used in order for us to examine some personal variables while social capital theory and networking will assist us in examining situational elements. In this study, experience refers to previous entrepreneurial experience.

Human capital, as previously mentioned, comprises of personality, gender, age, race, skill, acquired work experience and educational background. Personality is important to one’s decision making. Yet, it seems more suitable as an object of psychology research rather than business research. In addition, personality is too complicated to examine in such a short time and varies from person. Consequently, we decided not to include personality in our elements of examination. Gender, age and race, as stated previously, cannot be altered; in this case, they are not suitable and not so much related to the decision process of academics to become entrepreneurs. Skills, acquired work experience and educational background, on the other hand, should be included in our research. As for scientists, educational background is influential to the skills in their professions. Therefore, we assume that education will have effect on professional skills. Acquired work experience will be discussed together with previous entrepreneurial experience, which is mentioned in the theory of planned behavior (TPB).

Social capital, or networks or the so-called relational capital, is proved to be influential to the illusion of control (Carolis, Litzky, & Eddleston, 2009) which is positively related to the TPB’s feature of perceived behavioral control. Therefore, networks could be seen as positively influencing academic researchers’ decision to become entrepreneurs. Another research also shows that knowing entrepreneurship-related advice is available, which indicates the involvement of networks, attributes to scientist’s perceived efficiency with respect to starting an entrepreneurial career (Goethner, Obschonka, Silbereisen, & Cantner, 2011). Consequently, we will examine the effects of networks on the decision-making process of academic entrepreneurs.

On the basis of TPB, human capital theory and social capital theory, we added motivation and perception to form our tentative theoretical framework for the process through which academic researchers decide to engage in entrepreneurial activities. This is presented as follows.
Figure 1. Tentative Theoretical Framework

According to the TPB, there are three elements that influence people’s decision to perform behavior; these are the attitude towards a performed behavior, social norms and perceived behavioral control. Especially attitudes and perceived behavioral control are crucial when an academic researcher decides on engaging in entrepreneurially-related behavior. As for the social norms, we believe that they are related to the social capital and networking. Therefore, if the reference group holds positive feeling about academics’ involvement in entrepreneurship, it is likely that they will develop an intention to get involved in entrepreneurial activities. TPB mainly focuses on the perceptual part of this whole decision process. When making entrepreneurial decisions, subjective perceptions are more important than objective expectations of success (Sternberg & Wennekers, 2005). Since intention is the last stage of the decision making process, we have chosen all three elements mentioned in the TPB for our tentative theoretical framework, that is to say one’s attitude towards involving in an academic spinoff, perceived behavioral control over becoming an academic entrepreneur and the social norms, here referring to peers’ attitude towards one becoming an academic entrepreneur.

Other than perception, we believe one’s motivation such as, desire for wealth, desire to bring technology into practice, desire for independence, career cycles, university status and entrepreneurial experience (Shane, 2004) are also essential to the intention of an academic to become an entrepreneur. In this sense, we consider motivation as an element that has an impact on this whole procedure. One can be motivated to engage in academic spinoffs in various ways. The ones mentioned will be the basis for our research. However, according to the technique of semi-structured interviews, that we employ here, other incentives are also likely to appear as a result of our interviewees’ replies. At this point, we should highlight that, since our research focuses specifically on academic spinoffs, we have not expanded into a thorough analysis of motivation theory, but, instead, we have chosen to put emphasis on those motivational aspects that are considered mostly related to our research interest.
Networking has effects on both motivation and perception. Social capital is formed by vertical and horizontal networks which support people’s behavior (Pohja, 2009). Networks can provide information, resources and funding to individuals who intend to start their own business and this can be considered under the spectrum of perception. The access to entrepreneurial networks, for example industrial cooperation partners and promotion agencies, represents both higher levels of entrepreneurial attitudes and perceptional control (Goethner, Obschonka, Silbereisen, & Cantner, 2011). These networks provide scientists with business-related information and resources, and this fact is positively related to the sense of control (Goethner, Obschonka, Silbereisen, & Cantner, 2011). In this way, TPB’s perceived behavioral control will increase and this will positively influence intention. When people belong to a network consisting of entrepreneurs, it is highly possible that they will be motivated by seeing those entrepreneurs increase their wealth or realizing any other kind of achievement. These are also considered positive effects on motivation.

In the perceptual part, we intend to examine elements, such as opportunity recognition, perceived control of entrepreneurial behavior, fear of failure and tolerance of ambiguity. Moreover, we will examine other elements such as opportunity cost, perceived capabilities and perceived peer pressure. Perceived peer pressure could be influenced by national culture or institutional culture.

Perceived control of entrepreneurial behavior could be influenced by entrepreneurial experience, educational skill and business skill. Thus, we include skill as the cause of perception. Skills can be affected by experience or education. Previous research has shown that people with a high educational level tend to identify entrepreneurial opportunities more in comparison to those with low (Sternberg & Wennekers, 2005). According to the TPB, people with higher education background also tend to perceive that they have more control over behavior.

In conclusion, it derives from the theories that there are various reasons affecting one’s decision of becoming an academic entrepreneur. By putting together and combining the TPB, human capital theory and social capital theory, our tentative theoretical framework regarding the generation process of academic entrepreneurial intention contains elements of education, skill, network, motivation, perception and intention. Education affects skill while skill is influential to one’s perception which could all be related to the perceived behavioral control. Networks, at the same time, affect both one’s perception and motivation regarding decision making. The possible reason could be that knowing people who are entrepreneurs works as a motivation for one to pursue the same. Additionally, by belonging to networks more opportunities seem to be available because of insider information. Motivation and perception together affect one’s intention of decision making. Therefore, we have formed our tentative theoretical framework as illustrated in figure 1.

2.4. Summary

In chapter 2, we begin with the analysis of how the development of knowledge production throughout the years has resulted in the emergence of academic entrepreneurship. Theories such as “Mode 2” knowledge, “triple helix” and “academic capitalist knowledge/learning regime” are examined and provide the basis for the understanding of how academic spinoffs became reality.
In the second section of this chapter, academic spinoffs are further analyzed and we also present some opportunities as well as challenges that relate to this phenomenon.

The third section of chapter 2 consists of our main theoretical framework. The theory on human capital refers to the knowledge and skills of individuals, the theory on social capital relates to networking, either informal or formal, and the theory of planned behavior provides us with an understanding of how perceptions affect the intention of an individual to engage in a behavior. After taking all the above into consideration we attempt to illustrate the process through which entrepreneurial intention is generated in academic scientists’ minds.

According to the tentative theoretical framework, we expect education influences skills which has positive effects on one’s perception. The elements of perception here would be the ones mentioned previously section of tentative theoretical framework. Yet, those elements could either have positive or negative effects on one’s intention. Therefore, we would like to examine the relation between perception and intention to see whether it is positive or not. In the tentative model, we anticipate networks have positive effects on both perception and motivation. This is mentioned in the literature reviewing saying that there is a growing trend of academic capitalism that focuses on networks. Besides, it has effects on two other elements in the tentative model. Therefore, during the interview, we would like to collect information about networks, either formal or informal ones. As for motivation, we assume all motivation elements would have positive effects on one’s intention of becoming academic entrepreneur.

Regarding the characteristics of our research, qualitative research is applied in order to collect in-depth data. Methodology of our research would be discussed in the next section. We anticipate data collected from the interviews would support our tentative theoretical framework as the important elements when examine how researchers’ minds generate the intention of involving in academic spinoffs. The theoretical framework investigated in the literature review can serve both as guidance while preparing our interview guide for the data collection and as a useful tool for the analysis of our data collected later on. Yet, since people’s decision process is rather complicated, there could be many other elements that involve in the process. Moreover, as we discussed in the previous section, because of the time and resources limitation, some factors are not included in our tentative model. Thus, even with this tentative model, we should also consider the possibility that interview results would not entirely support our tentative model and need some adjustments.
3. Methodology

3.1. Choice of Subject

Both authors of this paper are master students of the entrepreneurship program and, as such, are quite interested in exploring phenomena that are related to this area of research. We both have previous working experience, so we know to a great extent what the real world of business looks like. On the other hand, academia is a place where we have spent many years of our lives trying to build a more solid theoretical background and gain a deeper knowledge of our field.

Taking the above into consideration, it looked rather appealing to us to examine the combination of these two worlds under the spectrum of academic entrepreneurship and, more specifically, academic spin-offs. Of course, as business students and because of this subject’s nature, it would be predictable that we chose to conduct our research within the school of business. However, it was quite intriguing for us to work on a research carried out within the Institute of Design here in Umeå University, so that we get insight into academics having an educational background other than business and understand the process through which academic entrepreneurial intention is born inside these people. The initial contrast between the traditionally conservative world of academia and the opportunistic sense of entrepreneurial activity has been our primary motivation for carrying out this study.

3.2. Ontological and Epistemological Assumptions

Ontology in research philosophy refers to the way reality is viewed by the researcher (Bryman & Bell, 2007, p. 22). In qualitative research, as in our case, there is the dominant idea that realities are multiple (Creswell, 2007, p. 16). This stance can be explained through the emphasis put on the subjectivity of reality, since the social world is believed to be the outcome of social interaction and perceptions of its actors, and, in this sense, it is viewed more like a system of relationships and actions (David & Sutton, 2011, p. 86). Thus, reality can take multiple forms counting as many as the views of social actors. It is therefore understood that our ontological assumption in this research would be constructionism, which represents the notion that reality is socially constructed implying that its foundations are “shared meanings and coordinated actions of rational actors” (David & Sutton, 2011, p. 78). In this context, our research is based on the perceptions of reality that each, of the researchers interviewed, has. This means that academic entrepreneurial intention and the process through which it is generated within their minds is given a subjective meaning and is part of a socially constructed truth.

As far as our epistemological considerations are concerned, these are established on interpretivism. Epistemology generally reflects the procedure to be followed and the principles that should govern the study of reality (Bryman & Bell, 2007, p. 16) Interpretivism dictates that the researcher shall study humans by respecting their distinctiveness as opposed to the objects studied by the natural sciences and, as a consequence, it also puts great emphasis on the subjective meaning of social action (Bryman & Bell, 2007, p. 19). A fundamental characteristic of interpretivism is the fact that the researcher “adopts an empathetic stance”, which means that he/she aims at understanding the social world from the viewpoint of social actors, who participate in it (Saunders, Lewis, & Thornhill, 2009, p. 116).
As already mentioned in previous sections, through this research we aim at exploring the process through which academic entrepreneurial intention is generated in the minds of the researchers within the Design School and what could be the drivers or hindrances for such an intention. In order to do so, we have also examined some perceptual variables of our participants. The tradition of phenomenology, which goes hand in hand with our research philosophy, argues that the way humans think about themselves is essential to what they truly are and, since humans are conscious beings, their consciousness creates their reality (David & Sutton, 2011, p. 89).

3.3. Scientific Approach

In order for us to explore our subject and achieve the purpose of our research, we went through the following procedure; firstly, we provide an overview of how the phenomenon of academic entrepreneurship has emerged and evolved throughout the years focusing then more specifically on academic spinoffs. Secondly, we examine theories related to human and social capital as well as perceptions and how they can affect human behavior and, consequently, academic entrepreneurial intention. Thirdly, through our semi-structured interviews with senior and young researchers, we explore the process through which academic entrepreneurial intention is born and try to identify elements that might serve either as drivers or as hindrances throughout this procedure. Finally, we analyze our data collected and conclude by providing, at the same time, some recommendations for further research in this field.

Generally, there are two approaches when linking theory to research and these are deduction and induction (Bryman & Bell, 2007, pp. 11-12). The deductive approach has as a starting point a solid theoretical background from which hypotheses are deduced and then tested with the help of the data collected (Bryman & Bell, 2007, p. 11). On the other hand, inductive approach goes the other way round as the researcher uses the data collected in order to reach more abstract units of information and build a new theory or extend an existing one based on the information that he has gathered (Creswell, 2007, p. 38). This can be achieved by working back and forth between the database and the themes but also by having an interactive collaboration with the participants of the research in a way that they can have the opportunity to form the themes that emerge from the procedure (Creswell, 2007, p. 39).

In our case, although we have been studying certain theories from the beginning, we have not defined a strict framework according to which hypotheses could be tested. On the contrary, our intentions have been rather exploratory leaving an open field where our respondents directed us to the formulation of our research questions through an iterative process. Due to this fact, our research is characterized as inductive regarding its relation to theory.

3.4. Research Strategy

In this paper, we follow a qualitative research strategy, as it is consistent with our ontological and epistemological considerations. According to Denzin and Lincoln, “qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them” (Denzin & Lincoln, 2005, p. 3). This definition describes very well the steps that we have taken in order to find answers to our research problem. We have collected our data within the natural setting of our interviewees, that is to say the Design School in Umeå, we have
focused on the meaning that our participants have brought to the research and we have given an interpretation of them. Of course, as Creswell indicates, our interpretation is always associated with our own background, context and prior understandings, and, for this reason, the readers of our research can interpret our study in a different way and, therefore, we end up with the basic principle of our ontological position that there are multiple realities, as there are multiple views (Creswell, 2007, p. 39).

At this point, we should highlight that two of the main preoccupations in qualitative research are the emphasis on context and on process (Bryman & Bell, 2007, p. 418). First of all, the contextual understanding of social behavior when it comes to researchers within the Design School of the university has a great significance for academic entrepreneurial intention, which is our topic (Bryman & Bell, 2007, p. 418). Furthermore, as qualitative research “tends to view social life in terms of processes where different elements of the social system interconnect”, this perspective could not be more suitable for our exploration of the process through which academic entrepreneurial intention is generated (Bryman & Bell, 2007, p. 418).

3.5. Critical Review

During the process of our literature search, we mainly used the resources provided by Umeå University, as for instance Album, Business Source Premier and so forth, in order to access scientific books and articles that were relevant to our research interest. In addition, the fact that our data were retrieved by such trusted sources and databases containing top-rated peer-reviewed journals and books that are also cited in other researchers’ works has ensured the quality and credibility of our material.

Both of us are master students with a specialization in entrepreneurship and, therefore, we are rather familiarized with most of the specific topics that are examined in our study. Our bachelor degrees are also in business studies, as well as sociology, and we have both acquired valuable knowledge through our previous working experience in finance, marketing, sales and management. As a consequence, we can say that we are experienced in critically evaluating the resources that were used for our research.

Some key words that have been used while searching for sources are the following: “Academic” and “Entrepreneurship”, “Academic” and “Spinoff”, “Corporate” and “Entrepreneurial”, “Entrepreneurial” and “Intention”.

3.6. Research Design and Technique

The research design employed in this study is a collective within-site case study of researchers within the Design School of Umeå University. Generally, case studies aim at investigating specific cases in depth and, since we conduct a qualitative research with an inductive approach regarding its link to theory, our case study tends to be more exploratory and descriptive (David & Sutton, 2011, pp. 165-166).

As already mentioned above, the stance that we have taken regarding our research strategy is qualitative after taking into consideration our ontological as well as epistemological assumptions. Since qualitative research by its nature leaves a high degree of openness when it comes to the structuring of the research questions as well as the interview questions, the data collection method which seemed to us most suitable was semi-structured interviewing (David & Sutton, 2011, p. 102). This means that we have used an interview guide (see Appendix I) consisting of questions related to specific
topics sometimes changing the order in which they were addressed and also posing other questions that emerged from the replies of our interviewees.

In specific, the first questions in our interview guide are rather general relating to the educational background of our interviewees, their patenting and entrepreneurial experience as well as their business skills. The next set of questions is associated with the business network of our respondents, whether formal or informal. Then, the questions that follow explore the perceptual aspect of our research and the interview guide ends with a direct question concerning the intention of our participants to become academic entrepreneurs.

According to Bryman and Bell, there are two major types of interviewing in qualitative research and these are unstructured and semi-structured interviews (Bryman & Bell, 2007, p. 474), yet, there are two specific reasons why we have opted for the latter choice. First of all, right from the beginning of our research we have had a rather specific focus on some aspects and the only way for us to address these issues while interviewing our participants would be to structure somehow our interview questions (Bryman & Bell, 2007, p. 479). Secondly, this research has been carried out and put into paper by two researchers and, as a result, we chose semi-structured interviews in order to ensure a satisfying degree of comparability regarding the interviewing style (Bryman & Bell, 2007, p. 480). To put in a nutshell, this data collection method has enabled us to both analyze the specific issues about which we were concerned and also leave space to our respondents to reflect and put their own meanings and priorities to the matters discussed. This brilliant combination has served, to a great extent, the purpose of our qualitative study.

Our primary concern has been to pose our questions in a neutral way so that we do not influence our interviewees’ answers and, thus, contaminate our research. In this way, we ensured, in the best possible way, that our participants will provide us with their own thoughts, perceptions and meanings and contribute to our approach. However, we should also keep in mind that there might be a possibility that our participants were affected by our presence and that, in some cases, might have felt pressured to reply to our answers. The interviews were held in quiet places, such as the researchers’ offices or classrooms within the Design School, so that our respondents would not get distracted or feel reluctant to answer freely due to the presence of other people. All our interviewees were quite relaxed, willing to answer to any of our questions and did not have any time pressure that could have affected their answers.

3.7. Respondent Selection

Our interviewees have been selected with the use of non-probability sampling and more specifically purposive or theoretical sampling, as it is also known, and this means that our participants have been selected according to our own knowledge and opinion on who would be the most appropriate for the examination of our research topic (David & Sutton, 2011, p. 232). However, in some cases we made use of snowball sampling, where a researcher we were interviewing recommended us other researchers that could be part of our sample (David & Sutton, 2011, p. 232).

In general, our sample can be characterized as rather qualified for the purposes of our research, since all our respondents, except for one, have received design-related education at a higher level and have participated in research projects in the past or are currently taking part in such projects.
3.8. Research Analysis

Our analysis starts with the coding of the data collected through the semi-structured interviews with young and senior researchers within the Design School. By selecting words or terms, mentioned by interviewees, that could be either included in the same context or compared with each other, we were able to reduce the amount of data to be examined and focus mainly on what we felt would be significant (David & Sutton, 2011, p. 339). At a first level, we have employed summary codes in order to realize a preliminary scanning of our data in terms of general characteristics and afterwards we used the so-called pattern codes so as to identify specific themes and investigate their relationships with each other within this content or with particular summary code characteristics (David & Sutton, 2011, p. 345).

In our study, we have applied the method of discourse analysis to our data collected, since it is focused on non-naturally occurring talk and, therefore, seems more than suitable for our semi-structured interviews (Bryman & Bell, 2007, p. 535). We have taken a constructionist stance in our discourse analysis approach and this means that we emphasized “on the versions of reality propounded by members of the social setting being investigated” (Bryman & Bell, 2007, p. 536). Furthermore, as Bryman and Bell point out, citing Potter, discourse analysts prefer to “see things as things that are worked up, attended to and made relevant in interaction rather than being external determinants” and this perspective also reflects ideally our ontological assumptions (Bryman & Bell, 2007, p. 536). Additionally, our discourse analysis consists of an interpretivist approach where we have made a "thick description" of our interviews (David & Sutton, 2011, p. 364).

3.9. Quality Criteria and Limitations

The quality of a research can be evaluated through the use of certain criteria and these would be, in our case of a qualitative study, reliability and validity classified into two categories, internal and external respectively, as LeCompte and Goetz argue in their work (Bryman & Bell, 2007, p. 410).

External reliability, which actually reflects the replicability of the study, is difficult to be fulfilled in a qualitative research, where contexts are extremely dynamic and people, in most cases, do not have fixed points of view or perceptions throughout the years (Bryman & Bell, 2007, p. 410). Internal reliability is warranted in this research, as there has been an agreement between the researchers, throughout the whole course of the research, on the perceived view of the reality (Bryman & Bell, 2007, p. 410). On the other side, internal validity is also present in our research as our empirical observations are very well connected with the concepts developed in the theoretical sections of this paper (Bryman & Bell, 2007, p. 410). To conclude, the quality criterion of external validity would be impossible to be fulfilled in a small-scale qualitative study like ours, where the sample is extremely small and there is no way it could be generalized (Bryman & Bell, 2007, p. 410). However, according to Williams, there are some sensitive topics or difficult to research populations where a study can be carried out only through interpretive research that consists of in-depth interviews, so that the researcher can reach to “moderatum” generalizations (Williams, 2002, pp. 125-6). In this context, our research can be considered to examine the sensitive population of academics who intend to engage in entrepreneurial activities and try to keep a balance between these two different roles.
Concerning other limitations of our study, as our research has been carried out throughout the second half of the spring semester, it goes without saying that one of its most significant limitations has been the time constraint. If the time given was longer, it would have been possible for us to examine more in detail our data collected and analyze them more in depth. Moreover, since our study was related to the Design School within Umeå University, with which we are considerably less familiarized in comparison to Umeå School of Business, we needed to gather first some information regarding the faculty staff in order to be able to do our sampling and go on with our research. This process has been rather time consuming.

In some occasions, we made use of snowball sampling, due to the fact that we did not have many responses from the researchers concerning the interview, and, as a result, this has led to a certain degree of bias in our sample, as we were dependent on other participants’ recommendations. At this point, we should also mention that, in the course of our interviews, we discovered that one of our respondents did not fully meet the educational as well as research standards that we had set in order to ensure that our interviewees are qualified for our research. As a consequence, there is a limitation in our research concerning those replies, although they offered us some useful insights and this is why we decided to incorporate them in our study.

A last limitation considered can be the fact that our research design does not include all of the typical characteristics of a case study design. In specific, we could not use multiple sources of information (Creswell, 2007, p. 73) and, therefore, we only conducted semi-structured interviews in order to collect our data. Secondary data, such as relevant reports, official documents or previous research, were not available in our case. Furthermore, we decided not to use participant observation as a means of getting information, as this would require considerable time and there would also be a possibility that we create reactive effects (Bryman & Bell, 2007, p. 504).

3.10. Ethical Considerations

Our sensitivity towards ethical concerns, while carrying out our research, can be reflected on the care we have taken on certain issues, such as informed consent, privacy, confidentiality and anonymity as well as protection of participants from harm (David & Sutton, 2011, p. 43).

More specifically, we have ensured that our participants were well informed about our research topic as well as the fact that they were going to be recorded, and have willingly accepted our invitation to participate in the interviews held for the purpose of this study (Silverman, 2001, p. 271). In addition, we have made sure that we do not invade the privacy of our participants and that we keep their anonymity as well as the confidentiality of the information provided by them (David & Sutton, 2011, p. 47). For this reason, we have given our interviewees letters instead of names in our report, according to the chronological order with which the interviews were carried out, and we have not recorded or disclosed any personal details. Protection of harm is also a significant ethical consideration in research. Due to this fact, we have ensured that sensitive topics were not addressed in the course of our interviews (David & Sutton, 2011, p. 48).
4. Data Collection

4.1. Introduction of Umeå Institute of Design

Umeå Institute of Design currently provides five academic programs ranging from bachelor to doctoral studies and specialized in industrial design. From an administrative perspective, it belongs to the Faculty of Science and Technology within Umeå University in Sweden. Among the advantages of Umeå Institute of Design is the training provided to its students that raises their competitiveness within the job market and enhances their industrial design skills (Umeå Institute of Design, 2011).

In Umeå Institute of Design there is a unique creative environment with enrolled international students from 29 countries. UID works closely with the industry by cooperating with companies and organizations including Saab, Volvo Cars, Ericsson, Nokia, Electrolux and Husqvarna, etc. Several of these companies are involved with the Institute’s research programs. Moreover, many of the guest teachers are significant people in the industry (Umeå Institute of Design, 2011).

Doctoral studies in industrial design are also provided since 2001. Applied research and development work are organized into two areas: The Interaction Design Lab (IDL) and the Volvo Research Program (SET) (Umeå Institute of Design, 2011).

There are about 30 in-house employees at Umeå Institute of Design. The staff is also multicultural, since approximately 10 countries are represented among the staff. In addition to the in-house team, there is also guest staff from academia and industry with various nationalities represented (Umeå Institute of Design, 2011).

Since the initiation of its operations in 1989, it is equipped solely for teaching industrial design. It provides a creative study environment with newly-built facilities and high-quality equipment. The collaboration with numerous external lecturers from the industry and other academic institutions enables close cooperation with real projects within the industry (Umeå Institute of Design, 2011).

The publication, Designed in Umeå, illustrates the development of UID from 1989 to 2009. The book shows not only general information about the Umeå Institute of Design, but also photographs as well as pictures of the students' concepts and designs (Umeå Institute of Design, 2011).

Students and academics in within the Design School are open-minded and friendly to us even though we belong to the Business School which rarely has contacts with them. Students chatted with us while we were waiting outside for our interviews. Hence, we would say that the whole environment is rather open and internationalized. Additionally, the power distance between students and academics barely exists. They share most of the public space and sometimes dine together.

In order to encourage the shaping of a creative environment, students’ projects are displayed and asked for comments and suggestions. People might have the impression that designers work alone and afraid of others stealing their ideas. Yet, in Umeå Institute of Design, the spirit is to share and help each other; everyone there is like a member in a big family. Everyone in the class will be in charge of “Friday fika” which is a way of cultural interaction among students within the presence of Swedish culture.
Friday Pub is held by students and this provides a chance to them and academics to interact in an informal way. Moreover, students volunteer to be hosts of Friday Pub in order to be able to express their creativity. For example, some students combined sustainable design with drinking beer by letting people try cycling and practically bike for the equivalent volume of the energy for producing beer.

To sum up, Umeå Institute of Design is not only famous for its academic achievements, but it is also proud of its family spirit. This enjoyable and supportive environment is very helpful when involving in creative activities and, as a result, can be positive for entrepreneurial activities as well.

Before further analysis, data collected are presented and categorized according to the tentative theoretical framework, that is to say skills, network, perception, motivation and intention. Useful information which could not fall into any of these categories will be put into additional comments.

4.2. Interviewee A

4.2.1. Skills

Interviewee A is one of the youngest researchers within the Design School. After having completed her bachelor studies in Industrial Design and her master studies in Interaction Design, both in the Design School of Umeå University, she has been working as an interaction designer in the research lab of the school since August 2010, where she has been working on many different projects. She has not received any business-related education so far, but, in the past, she used to run her own company, which had nothing to do with her research interest. Quite recently she became co-owner of a company together with a friend of hers, but only her friend works for the company. In addition, she has not applied any patents in the past.

4.2.2. Network

She keeps a very good network here in Umeå, although she comes from a different region in Sweden, mostly due to the fact that she has spent many years studying here. This has given her some sort of “pass” to enter networks here and develop her own network throughout the years. She doubts if that would be possible in case she had not studied here. Many of the people within her network are also designers and have founded their own firms. Unless, they apply for the same projects, they do not regard each other as competitors. As a result, in some occasions where projects are large-scale, they do not hesitate to contact each other and cooperate by taking over different parts of these projects. Lately, they have been discussing the possibility to arrange monthly “fika” (the Swedish word for “coffee breaks”) here in Umeå, so that they talk about their interests and exchange information. Another reason why she manages to keep a good network here is also the fact that Umeå is a rather small city, therefore the distance is short and by attending different events it is easy to stay in touch without needing to be super active.

She is also a member in an association for designers and she cooperates quite closely with an organization that has facilitated the operations of her new company as it provides training through e.g. selling courses, valuable assistance with practical issues and modern facilities serving as her company’s office until they get their own one after
this summer. This organization has also helped her to get in touch with a software company, which can prove useful for her company.

The notion that she considers most closely related to “networks” is “experience”. To her, experience is a broader term that encompasses getting to know other people, identifying oneself by interacting with others, grabbing opportunities and gaining inspiration.

4. 2.3. Perception

A quite big part of her colleagues within the Design School run their own businesses or generally work with other things as well along with teaching or research in the school. Therefore, she believes that, in case she participated in a spinoff they would be positive and supportive, as they use to work in teams. Also, the people that are most closely to her, such as family and friends, would not be surprised at all if she decided something like that, since they have got used to her working on many different things at the same time.

In addition, she feels quite confident about engaging in entrepreneurial activities due to her educational background and her previous business experience. She also feels very secure, because even if she does not have the required capabilities to solve an issue, she knows who to ask help from. However, she does not feel she has the required business skills. Although she believes she communicates very well with people, she thinks that she is not skilled at selling but good at negotiating with others.

As long as she believes that she has good business idea, she does not feel any fear of failure that could prevent her from starting a business of her own. Yet, she points out that in Swedish culture failing in a business is a bad thing compared to U.S. where they think that trying is what counts. She wishes there was another word for failure so as to reflect the positive side of trying.

As far as business opportunities are concerned, she sees quite many here in Umeå mostly due to the fact that there is the organization previously mentioned, which offers good quality of assistance, and the community, in general, is very supportive. Umeå wants companies to start and grow here. Additionally, in contrast with Stockholm or Gothenburg, Umeå is a small place and there are not so many people competing for the same funding resources for their projects.

4. 2.4. Motivation

Although she knows people within her network that are already entrepreneurs, she does not feel she would be motivated only by that. If she wanted to start her own business, she would have done so no matter what. Her father has motivated her to a great extent by ensuring her that he would help her with practical issues, such as dealing with the tax office.

One motivation mentioned constantly in the interview would be that she has company before and is co-owner of a company now is that she could have the power of choice to decide what she wants to work with. In the interview, she stated, “there is no other way in between.”
4. 2.5. Intention

She prefers working in a company like the one she co-owns currently instead of founding a spinoff company. The reason for such a preference is that in a consultancy firm, like the one she is running, she focuses more on the method and has the opportunity to get involved in various projects instead of focusing on one specific product and trying to develop it over time.

4. 2.6. Additional Comments

She is currently on meetings with the organization previously mentioned under her role as a young researcher within the research lab of the Design School about how to work with patents and write agreements with companies. She should make sure that such an agreement does not affect her way of doing research. It is also a common occurrence that, when companies apply for patents, they do not want designers to keep going on with their research.

She never had the ambition to be an entrepreneur. Owning a company is the only way for her to do what she likes to do.

She feels absolutely comfortable with ambiguous situations and unknown environments. She strongly believes that one should not stay in their comfort zone, especially if they are working with inventions, but instead pursue learning through risk-taking situations. She highlights, however, that the risk she would take would not be the one that might put her social network or financial stability in danger.

Based on her previous entrepreneurial experience, she believes that, when starting her own business, she should have prepared a plan first and made a clear idea of what her goal was. She also thinks it was unwise of her to name the company after her, as this turned out to be a problem when she decided to hire other people and sell it after some time.

4.3. Interviewee B

4. 3.1. Skills

Interviewee B has been educated as a music teacher and has been working in the Design School since 2001. His work mainly consists of technological support to various projects. He has applied no patents before but is positive about applying a patent in the music related field in the future. He does not own a company right now; yet, he mentioned that in the past he did have his own business related to the internet sector. In the end of the interview, he stated that, in the future, he would definitely seize the chance to make his own start-up again.

4. 3.2. Network

As for networking, most of his personal networks have been developed from previous business relationships. He is confident about his personal networks and positive about how these networks could be useful for him in the future. He knows many entrepreneurs within his personal networks even though he knows no one in the Design School having
their own business. He mentioned that his colleagues are not interested in doing business.

4. 3.3. Perception

He is very confident about his professional skill and business related skills even though he has no formal business connections and does not belong to any business association or community. In accordance with that, he is not afraid of the failure.

4. 3.4. Motivation

His desire for independence is a strong motivation for him to start his own company. Being an entrepreneur allows him to choose who he wants to work with and what project he wants to work on.

4. 3.5. Intention

He is very positive that he will have his own company in the future. When talking about other researchers in the Design School becoming entrepreneurs in the future, he is very positive about this idea. He believes that everyone has the skill and desire to be entrepreneurs, plus the environment in the Design School is very supportive.

He is positive that he could be an entrepreneur as well. When talking about starting his own business, he stated that the working conditions should encourage team work. He needs skilled people around him in order to be sure that he can do it.

Since he has studied music teaching, he would like to start up a company in the music field in the future.

He thinks that becoming an entrepreneur is rather attractive because this allows him to choose freely who to work with and what to work on. Besides, being an entrepreneur would provide him with a strong sense of achievement.

4. 3.6. Additional Comments

He believes that in order for someone to start his own business, he has to quit his job first. That is because here in Sweden there is a high degree of security in jobs and this could be a hindrance for one to become an entrepreneur. Therefore, making a start-up could be hard in such a non risk-taking environment.

He pinpoints that a drawback of Sweden is that there is no funding environment, that is to say the risk-takers. Sweden needs more people who feel like trying out new things. Maybe it's because here the leverage that they can get for their money is not that much.

He mentions a Swedish saying: “Each and every of us is the blacksmith of his luck”. He thinks that the fact that most Swedish people are believed to be collectivists and not opportunity-minded is a sad downgrading of Swedish mind. From the past there have been great inventions and great individuals, such as musicians, sportsmen and businessmen. It is certainly a quite individualistic society offering great opportunities to individuals to take their own try.
He feels extremely comfortable with ambiguous environments.

4.4. Interviewee C

4. 4.1. Skills

Interviewee C holds a bachelor’s and a master’s degree in industrial design. He has been working as a consultant for the Design School since 2002. In August 2010 he was hired as a teacher, but has no research project to work on yet. After his graduation, he worked in the industry, and had no previous work related to academia. However, he would like to see himself more as a “teacher” rather than a “researcher” in relation to his 15-year experience of teaching related work. He worked on one patent in 1998 which belongs to the company.

He used to be a co-owner of a company and after selling it he started his own. It’s a consultancy firm focusing on product design. Even though he owns the company, he works more as a consultant not a businessman which is because he is not interested in the business part. He mentioned that this could be common problem among designers that most designers do not know how to run the company.

4. 4.2. Network

As far as networking is concerned, he likes to keep contacts with his networks for possible future business. Even thought he does not belong to any business association or community, he stated that he does get insider information from the business networking that he has.

As for any supporting agencies, there are two from which the one provides advice while the other one provides both advice and some funding. Yet, there is no help for business related skill such as financing and marketing which he would like to have if he could start all over again.

He knows four or five people that have started their own business in the past two years.

4. 4.3. Perception

He feels that his professional skills along with his networks are valuable when it comes to running a business.

In the Design School, people do not really talk about their own businesses. Teaching and academic research should be the priorities here. However, as long as entrepreneurship does not endanger the teaching job, owning one’s own business is regarding as something good, because it provides a link to the industry. As a consequence, the environment within the Design School is positive when it comes to a researcher becoming an entrepreneur.

He also believes that fear of failure as well as ambiguity would not be considered by him as influential through the decision process of becoming an academic entrepreneur.

4. 4.4. Motivation
Although some people within his network are entrepreneurs, he does not think they have motivated him to become an entrepreneur too, as he started his own company long ago.

He sees academic entrepreneurship as a very good combination of teaching, knowledge and contacts as well as a back-up plan for the future. It’s a win-win situation. Academics should know what is going on in the industry; also, companies could benefit from the school. Moreover, this could be good for the school reputation as well. Networks are other benefits of it. The connections among students, colleagues and industry are considered very valuable.

4. 4.5. Intention

He considers the realization of an academic spinoff a very attractive career option.

4. 4.6. Additional Comments

The cost of owning one’s own business would be time and reputation; time control is rather important because teaching is the priority here and reputation has to do with the complicated balance between being an academic and an entrepreneur at the same time.

4.5. Interviewee D

4. 5.1. Skills

Interviewee D first studied vocational education, equal to high school level, in display window decoration. Then the desire of becoming an art teacher led him to take art-related university level courses for one year. Yet, the big change in life, getting married, shifted his plan again.

He started his career as an illustrator in a print shop in Umeå. A chance to move to an advertising company led him to work for ten years within the industry as a graphic designer, art director and project leader. Working in the advertising company was a window for teachers in the Design School to reach out to him. After giving a presentation, he worked as a part-time consultant in the Design School. After a while, he decided to be an industrial designer and applied for a four-year master’s degree in the Design School. He got hired in the applied research lab and had been working there for some years and now he works both as a teacher and administrator. In the past, he worked for some local companies as a part-time occupation. Also, since 1993, he has been running his own company along with his duties in the Design School. His company is mainly working on graphic design, interaction design and service design. He stopped his PhD degree because there was no tutor available and he somehow felt he lost his motivation on the way.

He has worked in the research lab for approximately five to six years. Most of the projects they worked on were futuristic. More specifically, they worked together with big companies, as for instance Volvo and Nokia as well as governmental companies.

As for patenting experience, he has applied no patents. Yet, he has ensured design protection, as this kind of intellectual property protection is more common among designers.
4. 5.2. Network

In the past, he used to be part of some formal business associations, but it proved to be not that helpful for his business-related activities.

Quite many in his network are already entrepreneurs.

Opportunity, skill and experience are the notions he considers more closely related to network. Opportunity comes first for him. Skill is the basis of networking which derives from experience. He would like to see networking as a way to eliminate risks. The only way that network could be seen as risk is the risk of being extremely restricted by the terms and conditions of a contract agreement.

4. 5.3. Perception

In relation to his business skills, interviewee D does not feel confident that he is a skillful businessman, as he believes that his pricing policy is not one of his strong points.

As for the environment within the Design School, he stated that, at first, it was not supportive to academics being entrepreneurs. As time passed by, it started changing slowly towards a more supportive environment. There is around 20-25 % of the permanent staff that runs their own businesses, while the respective percentage for guest teachers is 80-90%. The Design School shows that it wants to have more teachers who are involved in the industry. Besides, the national changing from manufacturing to service industry along with the global economy makes entrepreneurship in the design field promising. He also mentioned that, as long as there is a healthy balance between teaching and business, colleagues here would be rather supportive although they do not really talk about their entrepreneurial activities.

Ambiguity is not a problem for him due to his previous entrepreneurial experience and perception of capability. In addition, fear or failure would not prevent him from becoming an entrepreneur.

As long as he manages to keep a healthy balance between teaching, business and personal life, his family and friends would encourage him to be an entrepreneur.

4. 5.4. Motivation

Knowing entrepreneurs in his personal network is not motivating him to become one, as he feels he has a different mindset compared to them.

Recently, he signed up with an agency which enlists him as a design artist. This event along with the uptrend of economy have boosted his opportunity recognition and motivated him to want to become an academic entrepreneur.

4.4.5. Intention

As for the research part, he is not that clear about which field he is interested in. In regarding starting his own company, he would like to work more as a consultant.
He finds becoming entrepreneurs appealing for two reasons; one is that he would be able to practice the theories he teaches in-depth and another is that he would have more real cases to use while teaching.

4. 5.6. Additional Comments

While working on those futuristic projects together with other colleagues in the research lab, the idea of starting their own business never occurred to them. Besides, it’s hard to make those futuristic projects become real without proper technology or sufficient funding.

Interviewee D is not so ambitious regarding entrepreneurial activities. He wishes he could take a more proactive approach, when it comes to business, and be able to get clients instead of clients finding him.

He acknowledges that being a teacher in the Design School could increase his reputation within the industry.

The biggest problem of becoming an entrepreneur would be the time issue. He would have to find a good balance between teaching, business and life.

4.6. Cross-Case Comparison

Regarding the academic spinoffs we introduced before, in accordance with the replies from our interviewees. The most common academic spinoffs in design industry would be the consultancy. The reason why that happens is, primarily, the fact that within the design sector most projects are large-scale, meaning that the funding should be rather large in order to support their development. Furthermore, in almost all of the cases it is doubtful whether a design will become successful, and thus profitable, until a considerable period of time passes by. Contrary to designs, in the technological as well as the biomedical sector inventions are more specific and, as a consequence, the pursuing of funding is a way easier task. In addition, the technology required in order for design projects to be developed and turn into commercialized products is difficult to be provided by large companies, that most of the times own this type of technology, mostly due to the fact that these projects cannot be part of their core operations.

As far as educational background is concerned, all of our interviewees hold similar degrees within the design field except for one whose studies have been on music. At this point, it is noteworthy that none of them has received business-related education. However, they all have had previous entrepreneurial experience, although none has participated in an academic spinoff. The fact that they have run their own businesses in the past has resulted in the expansion of their business network. As we can notice from our participants’ replies, the expansion of their network has two main effects.

Firstly, the networks provide them with insider information and solutions to problems for which they themselves do not have the required skills in order to tackle them. This phenomenon, in turn, leads to them being rather confident that they can succeed in a new business venture, as it has a strong impact on their perceived capabilities and perceived behavioral control. This means that they believe they have the required skill set and that they have the control over the situation when it comes to entrepreneurial
activity. That is why they show a positive attitude regarding their intention to become academic entrepreneurs and do not consider fear of failure as an element capable of holding them back. This is even stronger for those interviewees that have been actively involved in formal networks, where professional advice and assistance take place.

Secondly, business networks seem to broaden academics’ horizons and enable them to identify business opportunities as well as exploit them in the best possible way. Thus, networking influences perception also by promoting opportunity recognition, which leads academics to start thinking of engaging in entrepreneurial activities.

Consequently, through this procedure academic entrepreneurial intention is born and this conclusion is also drawn by Almeida and Kogut, cited in the work of Mosey & Wright, who argue that previous experience within the industry may contribute to human capital and provide access to networks for the identification as well as exploitation of business opportunities (Mosey & Wright, 2007). This could be an indication that, in this way, academics can have a considerable advantage of carrying out pioneer research that can turn into extremely profitable.

Here, we should also add that even though none of our respondents holds a PhD degree they do show high levels of perceived behavioral control mostly due to their network linkages. Therefore, we can build upon the arguments made on the positive link between PhD level in education and higher perceived behavioral control (Goethner, Obschonka, Silbereisen, & Cantner, 2011) by pointing out that social networks also promote the perception of entrepreneurial control even in circumstances where the levels of education are not the highest possible.

We should note that all of our respondents claimed they have no problem with ambiguous situations and unknown environments. It is noteworthy that some of them even stated that they feel rather comfortable under such circumstances, as they believe that only fuzzy and risk-taking situations can result in the biggest possible gains. This finding has proved quite interesting as it reveals a great deal out of entrepreneurial mentality.

Yet, working as a teacher and researcher within academia is inextricably linked with high levels of job security. This means that the motivation for starting a new business venture while being an academic would be rather low, as it is very easy for an academic to stay in his comfort zone. On the other hand, one of our respondents strongly believes that there are a number of incentives that could promote academic entrepreneurial intention. More specifically, academic spinoffs create links between the industry and students, they offer a better knowledge of the market, they provide networking opportunities for academics and they also boost the reputation of the universities. Additionally, another motivation is the strong sense of achievement as well as the independence one has to work in his own way and choose his team when involving in entrepreneurial activities.

When asked about entrepreneurs being part of their networks, our interviewees replied that this fact has not worked as a motivation at all to start their own business. By this statement, we doubt about the link between network and motivation in the model where we roughly illustrate the process through which academic entrepreneurial intention is generated. Of course, ensuring a higher income through running their own business is also a significant driver for academics. Therefore, such motives can also promote
directly academic entrepreneurial intention. But, how would their colleagues within the Design School react if our respondents were about to start their own academic spinoff?

They all believe they would be rather positive, although two of our interviewees make a point that it is not quite common to discuss about such issues within the School as the priorities here focus on teaching and research only. Generally, our interviewees argue that their colleagues would be quite positive and supportive as long as their entrepreneurial activity would not conflict with their role as academics mostly because of the time dedicated to entrepreneurial activities. In this sense, we can see that in terms of subjective norms entrepreneurially-minded academics enjoy a positive attitude by their colleagues. Along with the academics’ positive attitude towards academic entrepreneurship the high levels of perceived behavioral control create a fertile ground for the seed of academic entrepreneurial intention to grow according to the main principles of TPB (Ajzen, 1991).

It is rather surprising that although all of our respondents were quite enthusiastic about owning their own companies, none of them has realized an academic spinoff so far. A reason why this might have happened, according to their replies, might be that in the design field the amounts of funding required for a spinoff are extremely huge. Moreover, all of them have expressed their desire to work on a consultancy basis working with various projects at the same time instead of creating one specific product and trying to develop it over time. In addition, none of our interviewees had any great ambition to become an entrepreneur sometime in the future. As we have already mentioned, all of them have participated in a company or even owned it exclusively in the past, although these companies were not academic spinoffs. Yet, they stated that they ended up founding companies because they could not find any other way to get paid for their work.

It is also very important to mention that our research has been carried out in Umeå, which is a small city in the north of Sweden that tries to offer motives to prospective entrepreneurs, so that it grows more. That is why there are some agencies here helping new businesses and there are also other initiatives taken by the community that otherwise might not have been taken.
5. Analysis

In the previous section, we presented the data collected and realized a cross-case comparison. Here, in the analysis section, we will apply the tentative theoretical framework we presented in chapter two in relation with the data we collected. Analysis in relation with the theories examined and the tentative theoretical framework will be presented.

Firstly, we present the figure here again for the convenience of the analysis.

![Figure 1. Tentative Theoretical Framework](image)

Then, we organize the data collected into a table that sorts out the data according to the theories that formulate the tentative theoretical framework.
Table 2. Summary of the Data Collected

<table>
<thead>
<tr>
<th>Skill</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Bachelor: Industrial Design&lt;br&gt;• Master: Interaction Design&lt;br&gt;• No business related education&lt;br&gt;• Previous business experience (Self-owned company)</td>
<td>• Bachelor: Musical Education&lt;br&gt;• Technical support&lt;br&gt;• Previous business experience (Self-owned company)</td>
<td>• Bachelor: Industrial Design&lt;br&gt;• Master: Industrial Design&lt;br&gt;• Worked in the industry after graduation&lt;br&gt;• No previous work related to academia&lt;br&gt;• Owns company but more like consultant instead of businessman</td>
<td>• Vocational education: Window Decoration&lt;br&gt;• One-year university level: Art Teaching&lt;br&gt;• Master: Interaction Design&lt;br&gt;• PhD: Interaction Design (Stopped)&lt;br&gt;• Graphic designer, art director and project leader in advertising industry&lt;br&gt;• Researcher in futuristic projects&lt;br&gt;• Previous business experience (Self-owned company)</td>
<td></td>
</tr>
<tr>
<td>Network</td>
<td>• Good network in Umeå&lt;br&gt;• Small city, tighter connection&lt;br&gt;• Knows designers who own companies&lt;br&gt;• Monthly fika for mingling&lt;br&gt;• Member of association for designers&lt;br&gt;• Umenova&lt;br&gt;• Experience-related</td>
<td>• Developed from previous business networks&lt;br&gt;• Confident of his personal networks</td>
<td>• Keep contacts for future possibilities&lt;br&gt;• Insider information from networks&lt;br&gt;• Four or five people have started their own business in the past two years</td>
<td>• Used to be part of some formal business associations but found them not useful (Stopped)&lt;br&gt;• Quite many in network are entrepreneurs.&lt;br&gt;• Opportunity-related&lt;br&gt;• Skill-related&lt;br&gt;• Experience-related</td>
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<tr>
<td>Perception</td>
<td>Motivation</td>
<td>Action</td>
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<tr>
<td>• Peers’ attitude: positive and</td>
<td>• Not motivated by knowing entrepreneurs</td>
<td>• Eliminate risks</td>
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<tr>
<td>supportive</td>
<td>• Parent being supportive and motivate</td>
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<td></td>
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<td>• Significant others: used to it and</td>
<td>• Desire for independence</td>
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<td>supportive</td>
<td>• Desire for independence</td>
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<tr>
<td>• Confident about engaging in</td>
<td>• Not motivated by knowing entrepreneurs</td>
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<td>entrepreneurial activities</td>
<td>because he owns his business</td>
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<tr>
<td>• Feel secured because she knows where</td>
<td>• Win-win situation for industry, teaching and</td>
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<td>to find help</td>
<td>students</td>
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<tr>
<td>• No fear of failure</td>
<td>• Not motivated by knowing entrepreneurs</td>
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<td></td>
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<tr>
<td>• Has no required business skill</td>
<td>because different mindset</td>
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<tr>
<td>• Good at people skill which</td>
<td>• Uptrend of economy</td>
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<td>could be applied in business, ex.</td>
<td>represents more opportunities</td>
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<td>Negotiating</td>
<td>• Enlisted as design artist in</td>
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<td>• Should bit failure (culture related</td>
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<td>norm)</td>
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<td>• High opportunity recognition (small</td>
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<td>city)</td>
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<td>• Comfortable with ambiguity</td>
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<tr>
<td>• Peers’ attitude: positive and</td>
<td>• Confident in professional and business skills</td>
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<tr>
<td>supportive; yet, they are not</td>
<td>• Confident of professional and business skills</td>
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<td>interested</td>
<td>• Confident of professional skills and networks</td>
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<td></td>
<td>when running business</td>
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<tr>
<td>• Peers’ attitude: positive</td>
<td>• Comfortable with ambiguity</td>
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<td>• No fear of failure</td>
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<tr>
<td>• Peers’ attitude: positive if he</td>
<td>• Not confident in business skills</td>
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<td>could balance the teaching work (do</td>
<td>• Peers’ attitude: positive if he could balance</td>
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<td>not talk about it actively)</td>
<td>the teaching work (do not talk about it</td>
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<td>• Confident of professional skills and</td>
<td>actively)</td>
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<td>networks when running business</td>
<td>• School Culture: changing to supportive</td>
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<tr>
<td>• Comfortable with ambiguity</td>
<td>• 20-25 % of the permanent staff own business;</td>
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<td>80-90% of the guess teachers</td>
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<tr>
<td>• No fear of failure</td>
<td>• Comfortable with ambiguity</td>
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<td></td>
<td>• Fear would not prevent starting</td>
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</table>

**Perception**
- Peers’ attitude: positive and supportive
- Significant others: used to it and supportive
- Confident about engaging in entrepreneurial activities
- Feel secured because she knows where to find help
- No fear of failure
- Has no required business skill
- Good at people skill which could be applied in business, ex. Negotiating
- Should bit failure (culture related norm)
- High opportunity recognition (small city)
- Comfortable with ambiguity

**Motivation**
- Not motivated by knowing entrepreneurs
- Parent being supportive and motivate
- Desire for independence

**Action**
- Eliminate risks
- Not confident in business skills
- Peers’ attitude: positive if he could balance the teaching work (do not talk about it actively)
- Confident of professional skills and networks when running business
- Comfortable with ambiguity
- No fear of failure
- School Culture: changing to supportive
- 20-25% of the permanent staff own business; 80-90% of the guess teachers
- Comfortable with ambiguity
- Fear would not prevent starting

**Motivation**
- Not motivated by knowing entrepreneurs because he owns his business
- Win-win situation for industry, teaching and students

**Action**
- Not motivated by knowing entrepreneurs because different mindset
- Uptrend of economy represents more opportunities
- Enlisted as design artist in
### Intention

- Focus on Design
- Have company related to music business in the future
- Attractive career option

### Good for school’s reputation

- Work as consultant
- Practice theories
- Real cases to use while teaching

### Additional Comments

- There’s common conflict between company which applies for the patent and researchers who works on the project
- Not ambitious about becoming entrepreneur
- Low-risk of social networking and financially
- Should have plan before starting business

- Social welfare is a hindrance for starting one’s own business
- Sweden is risk-avoiding culture
- Swedes are collectivists and not opportunity-minded
- Extremely comfortable with ambiguity

- Time and reputation could be the cost
- It’s hard to find the complicated balance between academic and entrepreneurial activities

- Making business out of futuristic research never occurred to his mind
- Not ambitious about becoming entrepreneur
- Hope to be more proactive in the future
- Being teacher increases reputation in the industry
- It’s hard to find the time balance between academic and entrepreneurial activities
According to table 2, most of our interviewees have their higher education related to the skill that they would like to use in future academic spinoffs. This happens only regarding their professional skills. As far as their business skills are concerned, none of our interviewees had business-related education previously; however, they are rather positive about some of the business skills when managing their own company. Those business-related skills are rather related to communication and negotiation but not operations, such as financing or accounting. Analyzing from the replies, our interviewees sent out the message that as long as they were confident in their professional skills, this confidence could somehow pass on to the business-related skills that are positively related to the perceived control of entrepreneurial behavior as well as the perceived capabilities. Perceived capabilities together with the perceived control of entrepreneurial behavior seem to minimize interviewees’ fear of failure. They took risk into consideration before they started their own business; yet, with the perceived capabilities (professional and business skills) and perceived control of entrepreneurial behavior, the fear of failure did not prevent them from going a step further. Moreover, from the replies of our interviewees, they seem to be quite comfortable with ambiguity for two reasons: a) it is the characteristic of doing business related to invention and b) previous experience helps them deal with ambiguity. This is also regarding to the risk tolerance. They tend to pursue risk on the research topic but not the risk of finance or social networks.

The perceived peer pressure under perception, according to the replies, is rather positive. All of our interviewees strongly expressed that the environment within the Design School is friendly and that their peers would be supportive, if they considered involving in academic spinoffs. It is worth noting that two of our interviewees stated that the supportive environment would exist only under the condition that they would not endanger their academic work. Another interviewee also mentioned that it is hard to find time for both academic and business activities. Therefore, we can conclude that peers’ support is a fact only when researchers put their academic work as their first priority. As our interviewees’ replies have shown, support from peers can have a positive effect on one’s attitude towards academic spinoffs (Ajzen, The theory of planned behavior, 1991).

As for the intention element, we use the theory of planned behavior as the basis for analysis. The three sub-elements are attitudes, social norms (peer pressure) and perceived behavioral control (Goethner, Obschonka, Silbereisen, & Cantner, 2011). The sub-elements under perception, entrepreneurial behavioral control and perceived capabilities have positive effects on perceived behavioral control under intention (Ajzen, The theory of planned behavior, 1991). In addition, perception affects one’s attitude towards academic spinoffs. Higher entrepreneurial behavioral control, perceived capabilities and tolerance of ambiguity are positively linked to one’s attitude towards academic spinoffs as well as to lower levels of fear of failure (Sternberg & Wennekers, 2005).

Networks, under social capital theory, should provide information, resources and founding (Pohja, 2009). From the interviewees’ replies, they all supported that networks provide information and resources but not funding, as it proved when they tried to start their own business. Moreover, while speaking of networks, our interviewees recalled experience. They all believe that past experience is highly related to their networks, both formal and informal ones. Furthermore, they implied that their professional skills are highly related to their networks. One interviewee
clearly stated that networks should be connected to opportunity as well, while another interviewee expressed that networks can provide opportunities in the future.

The results from our interviews did not show an obvious connection between networks and motivation. All of our interviewees stated that they will not be motivated just because they know someone within their networks that is an entrepreneur. Hence, we should remove the arrow from network to motivation in our tentative theoretical framework. Even though the sub-elements of networks are not stated clearly throughout the interviews, the replies all showed a strongly positive attitude towards networks. Therefore, we believe that networks are important resources that researchers could use in the future when they start their own academic spinoffs. However, before that really happens, they cannot elaborate on how and why networks are useful and important. The only thing they know is that networks will be a useful asset for them and they all have high confidence in their personal networks.

The motivation of our interviewees to become academic entrepreneurs is mostly related to their desire for independence. They want to have the freedom of choosing whom to work with and what to work on. Desire for wealth was mentioned slightly but not as the main motivation. Two of our interviewees claimed that the synergy between academia and industry would bring benefits to all of the three participants, that is to say students, academics and firms: more real cases used while teaching, commercialized research and connection to the industry. Hence, we should add the synergy of academia and industry as one of our sub-elements in motivation. If one has favorable motivation, this should be positively linked to one’s attitude. Under this assumption, we could say that motivation has a positive effect on attitude, which is one of the sub-elements of intention.

To conclude, the replies of our interviewees support our tentative framework mostly. Education is proved to have a positive effect on skills. Yet, skills should be divided into professional and business skills, since no previous business-related education has been received by the respondents. The confidence in professional skills has a halo effect on the business skills; both skills are positively linked to the perceived capabilities and entrepreneurial behavioral control. These two together have significant effects on decreasing the fear of failure and increasing the tolerance of ambiguity. Besides, we found out that skills are positively linked to networks and that networks are mostly developed from the activities related to professional and business skills.

Perceived peer pressure is directly linked to the social norms under intention while indirectly relating to attitude. Fear of failure and tolerance of ambiguity should be positively linked to attitude while perceived capabilities and entrepreneurial behavioral control has a positive relation with perceived behavioral control.

There is no distinct connection between network and motivation from our interviewees’ replies. However, this may have derived from the small number of conducted interviews. Therefore, we keep the connection between network and motivation open for further research. Only two of the sub-elements of motivation are mentioned in the replies, but a new one has been added by our interviewees. The three sub-elements, that is to say desire for independence, desire for wealth and synergy of academia and industry, together have positive effects on one’s attitude.
The link between motivation and intention is not so strong as we assume in the tentative framework.
6. Conclusion

6.1. Conclusions and Implications

The purpose of our study has been to explore the process through which entrepreneurial intention is generated in academic scientists’ minds by examining, at the same time, theories deriving from the economics, management as well as psychology literature. We have conducted a case study research within the Design School of Umeå University by interviewing young as well as senior researchers who, as it has been revealed during our semi-structured interviews, have never realized an academic spinoff. However, all of our respondents expressed their desire to either found or participate in an academic spinoff in the future.

As the replies of our interviewees generally show, they believe that without taking some risks, no one can manage to go one step further with his entrepreneurial pursue. Although they stated that they are willing to take some risks in order to realize their dreams and start something of their own, they then argued that these risks should not have negative effects on either their financial condition or their network, putting thus restricting borders. In relation to risks, we should pinpoint that, as one of our interviewees highlighted, the Swedish social welfare system could be a significant reason why academics are prevented from becoming entrepreneurs. Financial stability and social security serve as anti-incentives for academic researchers regarding their decision on engaging in entrepreneurial activities.

Furthermore, the high degree of tolerance towards ambiguity that we observed in our respondents could be related to the characteristic of invention. More specifically, within the design industry, constant trials and experiments on new things take place and, therefore, tolerance of ambiguity proves to be a totally necessary trait for a designer in order to be able to come up with an invention afterwards.

Previous entrepreneurial experience is another important element according to our interviewees’ viewpoints. As stated in the cross-case comparison, previous entrepreneurial experience is positively linked to the expansion of networks. Previous entrepreneurial experience is also related to academics’ perceived capabilities concerning business-related activities regardless of their lacking business-oriented educational background. Moreover, the expansion of their networks has also raised their levels of recognized opportunities within the industry. In this sense, they become more alert and are able to identify as well as exploit business opportunities long before others do.

The role of social networks, either formal or informal, by no means should be undermined as they can enhance both perceived capabilities and the recognition of business opportunities. Although our interviewees seemed quite confident about getting involved with entrepreneurial activities, they do feel they lack significant business skills in order to be able to rely on themselves to a great extent in the future.

According to the analysis, we have made some adjustments to the tentative research framework, which is presented below.
From figure 2, the positive connection between education and skill, skill and perception, network and perception, and perception and intention are proved by the interview results. There is no connection between network and motivation showed from the results of our interviews. The connection of motivation and intention is not obvious.

We believe that both formal and informal education is positively linked to skills as long as it can contribute to skills. As we analyzed earlier, skill should be divided into professional and business skills. Professional skills are the basis for networks; according to the replies of our interviewees, networks are mostly formed thanks to professional skills, for example, developing business relationships out of design projects where the researchers used to work on before. On the other hand, networking proves beneficiary for our interviewees’ business skills. None of our interviewees had received business-related education before, but they are all confident that their network could provide significant assistance in issues related to business skills.

Adjustment of the sub-elements of networks has been made; they are now information, resources and opportunity recognition. As it is shown by the replies of
our interviewees, they can get information and resources from their network. Additionally, the opportunity recognition, which was not mentioned in the social capital theory, is also one of our findings. Thus, we have made the respective adjustments to our sub-elements. However, we believe there must be more about networks that could have a positive effect on perception. Future research might reveal more on that.

Perceived peer pressure is positively linked to social norms under intention. Perceived control of entrepreneurial behavior, perceived capability, fear of failure and tolerance of ambiguity all together have positive effects on attitude and perceived behavioral control. The sub-elements of motivation all have favorable effects on attitude. It is worth mentioning that only two of the sub-elements suggested by Shane, mentioned previously (2.3.4 Tentative Theoretical Framework), have been pointed out in the replies of our interviewees while the synergy between academia and industry was mentioned by three out of four respondents. A possible explanation for that could be either the small number of interviewees or a special characteristic of the Design School of Umeå University.

6.1.1. Practical Implications

An implication of our research is that academic entrepreneurs could be supported by the universities or the government. The universities can provide valuable practical assistance to academic researchers by arranging joint projects with the participation of business students, so that the latter facilitate researchers offering them advice and helping them tackle important managerial or marketing issues. In addition, the government can invest in academic researchers by organizing and funding business courses so that they get better trained for the challenges they are going to face while running their own businesses.

6.1.2. Theoretical Implications

To sum up, the process through which entrepreneurial intention is generated in academic researchers’ minds is shaped by various elements that are mostly linked with perceptual variables. We have employed the theory of planned behavior (TPB), human capital as well as social capital as the basis of our tentative research framework. While most parts of the tentative framework were valuable tools for our analysis, some adjustments were required. The contribution of this research is to help the reader understand more about how entrepreneurial intention is generated for the researchers in the Design School. We are the first ones conducting a qualitative research and gaining deeper insight into the Design School of Umeå University, in specific. As the design industry continues to grow, further research in this field could prove very useful.

6.2. Suggestions on Further Research

Due to time constraints as well as other limitations of our study, some aspects of this interesting topic have yet to be discovered. Therefore, here we present some suggestions on future research as far as academic entrepreneurial intention is concerned:

- A quantitative approach, regarding the research strategy, would be useful in order to test the strength of the relationship between the elements of our theoretical framework.
• It would be interesting to conduct a case study research in other faculties as well, including the business faculty, and make a comparative analysis.

• A research investigating the gap between academic entrepreneurial intention and the actual founding of academic spinoffs would also be quite contributing, so that reasons preventing academics from starting their own businesses would be more obvious and directions could be given to policy makers in order to encourage academic entrepreneurial activity.

• The way in which academic scientists experience conflicts of interests while seeking a balance between their role identities as academics and entrepreneurs could also provide us with a deeper understanding of the situation and also analyze the way academic entrepreneurial intention is influenced by that.
Bibliography


Appendix I. Interview Guide
1. What is your educational background? (Highest degree earned / potential cross-discipline education)
2. How many years have you been working as a researcher?
3. Have you applied any patents during the last 5 years? (Patenting experience)
4. Have you already participated in the founding of a firm in the past to commercialize your research? (Entrepreneurial experience)
5. Do you believe you are rather skillful to handle business-related activities? (Business skill)
6. Do you think your research is applicable within the industry?
7. How many business contacts do you have with research partners in the industry?
8. Do you personally know someone who has started his/her own business over the last 5 years?
   If yes:
   Would his/her entrepreneurial activity motivate you to do the same?
9. Regarding your personal networks, do you belong to trade and business associations, communities or other types of organizations?
   If yes:
   (a) To what extent has your involvement with these organizations facilitated the start-up of a new venture or provided a forum to discuss new business ideas?
   (b) Has your involvement in these organizations provided you with greater access to information, suppliers, employees or customers?
10. Do you happen to know any agencies or companies which would support you in the establishment of a firm for the commercialization of your research? (Consulting / advertising / promotion)
11. Opportunity, experience, skill, risk, failure, tolerance of ambiguity: Post-its with these words are made available to the respondents in order for them to pick those connected with the notion of “social capital” (i.e. social network)
12. Is becoming an academic entrepreneur an attractive idea to you? (Non-AE)
   If yes:
   Why is it appealing? (E.g. higher income, strong sense of achievement, independence, change in career goals, social prestige)
13. Do you think the achievement of something is important in a job? Why?
14. Do you think the opportunity to take initiative is important in a job? Why?
15. How many of your colleagues at the Institute of Design do you think would encourage your participation in the founding of a spinoff?
16. How many of your colleagues at the Institute of Design have already participated in the founding of a spinoff?
17. What would be the attitude of your closest people (i.e. family, friends, mentor etc.) towards you being an academic entrepreneur? Would they like it? Would that encourage/discourage you to become an academic entrepreneur?
18. What do you think would be the cost for you becoming an academic entrepreneur? (E.g. not good reputation, lack of time) Would that be capable of changing your mind?
19. If you intended to participate in the founding of a spinoff how much confident are you that you would succeed? (i.e. perceived capabilities, experience, education)
Would a low degree of confidence prevent you from becoming an academic entrepreneur?

20. Would fear of failure prevent you from founding a spinoff?

21. Do you think there are considerable opportunities for a scientist to become an entrepreneur in Umeå region?

22. How high is the possibility that, in the foreseeable future, you will participate in a spinoff? (Non-AE)

23. If you have already done so, what would you have done differently? (AE)