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Assessments of entrepreneurial traits in Swedish biotechnology companies

Bachelor thesis

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Preface

First of all I would like to thank the 26 individuals who took the time to complete the survey that is the foundation of the study. Without your kind participation the study would have been rather bleak. I would also like to thank those who replied telling me that they unfortunately did not have the time to complete the survey.

Also thanks to Drs Christian Jensen and Thomas Hedner at the University of Gothenburg, and to Dr Vesa Taatila at the Laurea University of Applied Sciences, who all provided invaluable help with ideas, suggestions and reading material.

Gothenburg, the 20th of January 2011

Jonas Söderholm

Abstract

Entrepreneurship is currently a very celebrated occupation and is often mentioned by politicians as the cure for the present economic downturn. There are many ways to measure entrepreneurship, but this study has chosen to study entrepreneurial traits using a questionnaire measuring the entrepreneurial orientation (EO) of a company. The focus of this bachelor thesis is companies in the biotechnology field that are situated in Science Parks in the south of Sweden. The study revealed the Chief Executive Officers (CEO) to be more proactive with more networking compared to non-CEOs, and that people who previously started companies scored higher on the entrepreneurial desire in relation to those who never started a company before. Furthermore, these respondents currently are working in smaller companies than those who never previously started. This might be explained by different goals and exit-strategies or that these entrepreneurs are more likely to fail compare to those with lower entrepreneurial desire. To improve subsequent studies of entrepreneurship, two additional traits (entrepreneurial driving force and entrepreneurial resilience) are suggested to be included to the entrepreneurial orientation survey in order to increase the overall understanding of entrepreneurs. Finally, a new scale facilitating comparisons between studies measuring the entrepreneurial orientation is purposed.

Keywords: Entrepreneurship, entrepreneurial orientation, proactiveness, risk-taking, innovation, entrepreneurial desire, Science Parks, Biotechnology

Sammanfattning

Entreprenörer är för närvarande mycket populära och politiker pratar ofta om att entreprenörer är bland det viktigaste vi har när vi nu försöker återhämta oss ur den ekonomiska nedgång vi har upplevt under de senaste åren. Det finns många sätt att mäta entreprenörskap varav denna studie valt att använda en enkät som mäter den entreprenöriella orienteringen i ett företag. Studien undersöker bioteknologiska företag i tre forskningsbyar i södra Sverige och visar att den verkställande direktören (VD) i de undersökta företagen är mer proaktiva och använder sig mer att sitt nätverk än de på andra positioner. Vidare så visade det sig de som tidigare startat företag hade en högre entreprenöriell längtan och att denna grupp nu jobbar i mindre företag än dem som aldrig startat något företag. Detta kan bero på att de med mer entreprenöriell längtan har ett annat mål med sin verksamhet eller att de misslyckas oftare än de men en längre entreprenöriell längtan. För att uppnå en större förståelse av entreprenörer så föreslås att två extra egenskaper (entreprenöriell drivkraft och entreprenöriell uthållighet) borde tas med i framtida studier som använder det entreprenöriella orienteringsverktyget. Till sist så introduceras en ny skala för att underlätta jämförelsen mellan olika studier i ämnet.

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Introduction

Entrepreneurs are generally admired and they have a good reputation. Politicians in the western world usually compete in their praise of entrepreneurs and TV-shows like Money Tigers (Japan), Dragon's Den (UK), Shark Tank (USA) and Draknästet (Sweden) features entrepreneurs pitching ideas to venture capitalists. The immensely popular reality show "The Apprentice", that follows young candidates who competes by showing how entrepreneurial they are, is currently on its eleventh season with the over 28 million viewers at its best (Berman 2004). The popularity is followed by a huge selection of literature explaining what an entrepreneur is, what the important traits for becoming a successful entrepreneur are, and how you should do in order to become a successful entrepreneur. The generally accepted definition of entrepreneurship was described in 1934 by Schumpter to be defined as "*the introduction of new goods or new quality of goods, introduction of new methods of production, opening of a new market, utilization of new sources of supple and carrying out new organizational forms*" (Gürbüz 2009). In this regard, many activities could be considered classified as entrepreneurial activities, even though the person doing the activity might not think of it as being entrepreneurial. Lambing and Kuehl from the University of Missouri (USA) defines three broad activities as being entrepreneurial (Lambing 2003, p. 25):

- **New concept/new business -** The entrepreneur invents or develops a new product and starts a business around that product. Starting Apple and Microsoft was innovative and entrepreneurial of both Steve Jobs and Bill Gates.
- **Existing concept/new business -** An entrepreneur could start a business based on an old concept. Starting a new McDonalds or ICA (a Swedish supermarket) is neither new nor innovative. However it is still a financial risk for the owner and it is a new store where no store previously existed.
- **Existing concept/existing business -** Buying an already existing business is even less innovative, but the buyer is taking several risks and thusly is considered being entrepreneurial.

What are the factors that generally would distinguish entrepreneurs from less entrepreneurial persons? Lambing and Kuehl continues explaining the traits that seems to be important in order to becoming a successful entrepreneur (Table 1) (Lambing 2003, pp. 25-27).

Traits	Description
Passion for the business	Starting a business is usually cumbersome and stressful so without a passion for what you do, the chance of success is drastically reduced. Steve Jobs said that said that Apple was not a success because it was a good idea but rather because it was "*build from the heart*".
Tenacity despite failure	Since starting a business comes with a lot of hurdles and successful entrepreneurs usually fails several times before becoming successful. Walt Disney failed miserably three times before making his first successful movie. A more current example is the American entrepreneurial mogul Donald Trump whose companies filed for bankruptcy three times (Peterson 2009).
Confidence	Besides having a passion for their business they also need to have confidence in their business concept.
Self-determination	Entrepreneurs must feel like they are in control of their own destiny.
Management of risk	Most entrepreneurs start a business while working at another job to minimize the financial risk. Furthermore, entrepreneurs are aware of the risks and actively tries to reduce them as far as possible.
Seeing changes as opportunities	A dynamic and changing environment creates opportunities that an entrepreneur may explore.
Tolerance for ambiguity	Factors outside the control of the business owner might have big impact on the business thus making business life unpredictable. A successful entrepreneur must accept this uncertainty.
Initiative and a need for achievement	Entrepreneurs take initiative in certain situations and they enforce their ideas. They do this because they have a higher need for achievement then the general public and they transform this need into accomplishments.
Detail orientation and perfection	Entrepreneurs aims for excellence and they have a great attention to details. This perfectionism might lead to the perception that entrepreneurs are difficult employers.
Perceptions of passing time	Because the entrepreneur knows that resources are limited they are often impatient and left with the feeling that nothing is done soon enough.
Creativity	The ability to imagining alternative scenarios makes entrepreneurs recognize opportunities where others do not.
Ability to see the big picture	Despite being focused on details, entrepreneurs scans the environment thus making educated guesses on how the company will have an advantage compare to their competitors.

Motivating factors	Money is usually not the motivating factor why entrepreneurs start companies. Being their own boss, a need for recognition and satisfying expectations is more important. This coincide with the Level 5 Leader identified by Jim Collins in his book "Good to great" (2001), where he found that CEOs who transformed their companies from average companies into a company that outperformed the general market 3.5 times or more over a period of 15 years actually had lower salaries then comparable companies that did not become great (Collins 2001, p. 49). He explains this by the fact that the right person cannot imagine doing anything less then their best, hence money is not the motivating factor.
Self-efficacy	A person whom believes he or she will become a successful entrepreneur is more likely to consider becoming an entrepreneur.

Table 1 - Traits identified by Lambing and Kuehl as important for becoming a successful entrepreneur

The traits described above are very general for general business and one could get the feeling that formal education is less important then hands-on experience, however successful entrepreneurs have shown to combine both formal education and hands-on experience (Johannisson 2005, p. 35). The education level needed in different fields should however vary according to the amount of intellectual properties needed to succeed. For example, a scientist many times founds companies working with the discovery of drugs, such as companies working in the pharmaceutical and the biotechnology fields, using an innovative and patentable finding while doing research at a university. Nevertheless how brilliant these scientists are at doing research, very few of them have the capital needed to fund a start-up company and one solution could be to get funding by presenting the business model to a venture capitalist (much like the hopeful people on Shark Tank). However, investing in companies in the pharmaceutical and biotechnology fields comes with huge risks. On the other hand, along with higher risks comes the chance for higher payouts. A encouraging example is what the venture capitalists Kleiner, Perkins, Caufeld and Byers experienced after their $200,000 invested in the Genentech biotechnology firm had risen to $40,000,000 when Genentech went public two years later (Lumpkin 1996).

One way to stimulate the entrepreneurial activities within academia is to build so called "Science Parks" (also known as Forskarbyar in Swedish) in the vicinity of the university. The idea with Science Parks is to provide a plethora of experts in intellectual property law, business planning and venture capitalist to newly formed company. The world's

oldest and most famous science park is the Silicon Valley in the San Francisco area, that have seen the creation of many successful high-tech companies such as Apple, Cisco, Google, HP, Intel and Oracle. Silicon Valley started as early as in the 40s and 50s around Stanford University after the university encouraged both faculty and students to start their own companies (Hansson 2007; Silicon Valley 2010). The first science park created in Sweden was the Ideon Science Park around Lund University. The early 80s was hard on the south of Sweden and many big industries were forced to shutdown. As a response, the business world in Skåne and the Lund University joined hands and started the Ideon Science Park in 1983, with over 700 companies that being active over the years (Ideon Science Parks Historia 2008). Other universities followed Lund's lead and created science parks around their universities; e.g. Sahlgrenska Science Park (Gothenburg), Uppsala Science Park (Uppsala), Mjärdevi Science Park (Linköping), Uminova Science Park and most recently Karolinska Institutet Science Park (Stockholm).

Purpose

My professional goal is to work either a pharmaceutical or a biotechnology company, and I am interested in knowing what is important when becoming an executive of company working with drug discovery. In this study I would like to assess the entrepreneurial traits of the management in the biotechnology field. Most of the entrepreneurial traits described in the introduction are traits that are important for succeeding in almost everything a person can undertake, and a large-scale interview base study would be needed to examine all traits. How could I make the study manageable with the possibility of completion within the ten weeks time limit, but still keep it relatively sizeable? So adhering to the constraints of the study, I decided to a survey based study.

Limitation

The sample size of the study had to be limited to follow the purpose of the study with the possibility of completion within the ten weeks our disposal. Besides being a full-time student at the School of Business, Economics and Law (University of Gothenburg) I also work full-time as scientist at the Sahlgrenska Academy (University of Gothenburg). At

the Sahlgrenska Academy I see the Sahlgrenska Science Park entrance almost everyday, so it felt natural to limit my study to companies located in Science Parks in Sweden.

Almost 400,000 articles and books discussing entrepreneurship was found using Google Scholar (scholar.google.se). The number of hits was reduced to less then 150,000 when using the search string "measuring entrepreneurship". Several questionnaires such as the General Enterprising Tendency (GET) Test (Stormer 1999) and the Academic Entrepreneurship Questionnaire (AEQ) (Brennan 2005) were described in the literature, but I decided to use a survey measuring the entrepreneurial orientation (Covin 1989). Professor Thomas Hedner at the University of Gothenburg suggested the survey to me since it previously had been shown to be an important instrument when surveying companies in hostile business environments. Furthermore, a colleague of him in Finland was currently using it and probably could assist with invaluable help and insights. Furthermore, a Swedish study by Löfsten and Lindelöf (2003) showed that companies in Sciences Parks scored higher on the entrepreneurial orientation scale then equivalent off-Sciences Parks companies.

Disposition

Most of the articles describing entrepreneurial traits using the entrepreneurial orientation scale does not have its own section dedicated for the problems investigated in the article, instead the authors formulates different hypotheses within the theory section. I will continue this tradition in this bachelor thesis, thus the problems investigated in the study will be found in the "Theory and hypotheses" chapter. The survey design and how the statistical analyses are done will be described in detail in the "Method" chapter. The results are stated in the "Results" chapter, followed by analyses of the result in the "Analysis" chapter. Finally, the thesis will be concluded with the most important findings in the "Conclusions".

Theory and hypotheses

Entrepreneurial orientation

Miller was one of the first who studied the entrepreneurial orientation (EO) when he surveyed 52 large Canadian firms across many disciplines. In his study, Miller described EO as three separate dimensions (Innovation, Proactiveness and Risk-taking) that positively correlated with the hostility of the business environment, i.e. companies operating in a hostile environments tends to lean more towards the entrepreneurial side of the entrepreneurial-conservation orientation scale (Miller 1983). This was confirmed and further developed by Covin and Slevin in a study of small companies revealing that more EO correlated with better performance in a hostile environment, and reversely that a more conservative strategic orientation was beneficial in benign environments. The failure rate within the biotechnology field is rather high, in the sense that it takes more then 10 years of testing before a candidate can be approved for clinical use. Furthermore, only five in 5,000 drug candidates will ever be tested in humans and only one of those five candidates tested in humans will ever be approved as a drug (Renko 2009). In this regard, the biotechnology sector should be considered very hostile with high competition, high failure rates and usually with long periods between the start of the company and the first revenue. So I have formulated my first hypothesis as following:

> *H1: The studied companies will be on the higher end on the entrepreneurial-conservation orientation scale.*

Renko *et al* (2009) studied both Nordic and American biotechnology companies with the Nordic companies being small to medium sized (average 23 employees) that had existed for an average of 7.11 years. The study suggested the Nordic respondents to be entrepreneurial oriented (0.66 on a 0-1 scale; see Methods for further explanation) on the entrepreneurial-conservative scale. However, when comparing the Nordic companies to the American companies the US counterparts scored significantly higher on the entrepreneurial-conservative scale (0.74). On the other hand, the US companies were significantly bigger (45 employees) with more capital invested into the companies

(Renko 2009). If the findings by Renko *et al* (2009) is consistent with my cohort, I would find the studied companies to be lower on the EO scale compared to the data presented by Renko *et al* (2009), since the companies in the present study are considerably smaller (average 13 employees) than both the Nordic and the US cohort.

H2: The studied companies will be lower than 0.66 on the EO scale

The questionnaire sent to the companies asked several questions regarding the company (location, size or if using venture capital) and the person responding (years in the company, gender, education, if he or she ever founded any other company before). By dividing the respondents into different groups depending on their responses, I will be able to test if any dimension is different between any groups. For example, women who chooses an entrepreneurial career might be higher in risk-taking then men or people who previously started a company maybe always have had a higher entrepreneurial desire. On the other hand, it would suggest the same traits being important when becoming an entrepreneur if no difference is detected regardless of background. For example, a study found no difference between men and women when investigating the EO of managers in Slovenia (Bertoncelj 2009).

H3: The entrepreneurial orientation is important in the biotechnology field and all groups shares the same traits. Thus none of the groups in the study will differ on the EO scale.

When Covin and Slevin (1989) discussed EO, their position was that the three dimensions of EO (Innovation, Proactiveness and Risk-taking) correlated to the EO with equal contribution and formed a basic one-dimensional strategic orientation. Later studies have questioned this conclusion and argued that each sub-dimension of EO makes unique contributions to the makeup of the entrepreneurial orientation of a firm (Lumpkin 1996; Lumpkin 2001). For example, some suggests that entrepreneurs do not take high risks but are prone towards innovation, and a big multinational study revealed the three EO dimensions varing independently (Kreiser 2002).

H4: The three sub-dimensions will contribute individually to the entrepreneurial orientation.

Is there a difference the entrepreneurial orientation between different positions in the company? No previous study comparing the EO between CEOs and CSOs was found searching the literature, thus this is a very good opportunity to study differences between Chief Executive Officer (CEO; VD in Swedish) and Chief Scientific Officer (CSO; Forskningschef in Swedish). CEOs and CSOs have different obligations in the company and different traits could be useful in each position. The responsibilities of the CEO are to steer the company to a better future and to seize opportunities (hence being proactive), whereas the CSO develops and invents new products (research and development; R&D). This might make CSOs more cautious and subject-drive with less entrepreneurial orientation compared to CEOs.

H5a: CEOs are more entrepreneurial on the EO scale and the most important factor responsible for this difference is proactiveness.

H5b: CSOs will be more focused on innovation.

Innovation

Innovation is the foundation of progress and without innovation there will be no new ideas, products or business concepts. Scientifically it has been defined as "*willingness to support creativity and experimentation in introducing new products/services, and novelty, technological leadership and R&D in developing new processes*" (Lumpkin 1996). Newly founded biotechnology companies usually have no product to sell to the market, thus most efforts are focused on R&D and the ability to show the products being safe and efficient. Innovation is also the basics of any academic research; hence respondents with a Ph.D. should be drilled towards innovation. A meta-analysis by Bausch and Rosenbusch of 60 published articles show innovation having an overall minute correlation with the firm performance but the correlation was much higher when only investigating biotechnology companies (Renko 2009).

H6: Innovation will be higher than the other sub-dimensions.

Risk-taking

The British philosopher John Stuart Mill identified risk-taking as being of paramount importance to entrepreneurs already in the 19th century (Kreiser 2002). Interestingly, studies have shown entrepreneurs perceive a business situation to be less risky then non-entrepreneurs, thus "*entrepreneurs may not think of themselves as being more likely to take risks then non-entrepreneurs, but they are nonetheless predisposed to cognitively categorize business situations more positively*" (Palich 1995). Furthermore, entrepreneurs tend to view a situation more positively the non-entrepreneurs (Kreiser 2002). Starting a biotechnology company should comes with a lot of risks, e.g. financial risk due to the long time between the initial patents and when the first revenue materializes, the high failure rate during clinical trials, and the risk of loss of face if the business concept stems from a patent the scientist has developed for many years.

Proactiveness

The third category of EO has been less studied compared to the two first categories and it is viewed to recognize both being opportunity seeking and forward-looking. Two main attributes of proactiveness have been identified: "*Aggressive behavior directed at rival firms, and the organizational pursuit of favorable business opportunities*" (Lumpkin 1996; Kreiser 2002). By being proactive it is possible for a company to position itself against competitors, and studies have shown first-movers having an advantage compare to followers (Kreiser 2002). A patent gives some security against competitors, but seeking opportunities for new applications and collaborations should be very important for companies in the biotechnology field.

Networking (Social capital)

A small company seldom lives in an isolated environment, on the contrary it needs help from other companies with the functions it lacks in order to excel. The basic idea with building a Science Park was to connect companies working with drug discovery to companies that specialize in intellectual properties, contract research organizations (CRO) and venture capitalists. Thus, it is very important to trust and share values with

the companies you are working with. Furthermore, a big network also facilitates collaborations. A study showed that a marginal increase in social capital is the single most important variable for a firm's probability for new innovations (Landry 2002). Also it has been shown that a high level of social capital is pivotal when attracting venture capital (Myint 2005). One parameter of social capital that has been identified to facilitate collaborations that are beneficial for the company is; Networking.

H7a: There is a positive correlation between EO and Networking

H7b: CEOs will score higher on networking then non-CEOs, because they meet more people in their line of work or because they are CEOs thanks to a bigger network.

Confrontational competitiveness

This dimension could be a part of risk-taking, however Dr Taatila lifted out confrontational competitiveness as its own dimension (personal communication). Risk-taking investigates how the respondent behaves towards and experience uncertainty. This additional dimension should however measure the competitiveness of the respondent in a confrontational situation.

Additional dimension

Additional dimensions beside innovation, risk-taking and proactivenesse have been proposed to contribute to the EO. Lumpkin and Dess (1996) introduced two additional dimensions: autonomy and competitive aggressiveness. Autonomy is defined as "*independent action by an individual or team aimed at bringing forth a business concept or a vision and carrying it through completion*". Competitive aggressiveness "*reflects the intensity of a firm's effort to outperform industry rivals, characterized by combative posture and a forceful response to competitor's actions*" (Lumpkin 1996). The confrontal aspect of competitive aggressiveness is in the present study investigated in confrontal competitiveness, however the aggressiveness towards competitors has been dropped. The rationale behind this decision is that few of the companies will due to patents

experience any direct aggressiveness from competitors (Lerner 1994), but they may still feel the competition from firms in adjacent fields and confrontations from investors.

Others have suggested a complementary concept to EO that they have named Entrepreneurial Management (EM; Strategic orientation, Resource orientation, Management structure, Reward philosophy, Growth orientation and Entrepreneurial culture). Articles studying EM argues that EO is the strategic orientation of a firm and EM is the organizational structure that supports the EO of the individual person (Brown 2001; Gürbüz 2009). Thus one may bluntly say that the EO determines how much EM will be used in each company, i.e. low EO leads to less focus on growth and utilization of resources.

Entrepreneurial desire

Has the entrepreneur always wanted to become an entrepreneur, has the decision mature over a long time or has the respondent never wanted to become an entrepreneur? It is possible that people with a business degree always was entrepreneurial and did those doing research in academia kind of stumbled upon the opportunity to become an entrepreneur. Dr Taatila found when investigating students at a Finnish university that business students scored lower on entrepreneurial desire then students from other disciplines (unpublished results). This finding seems to be in harmony with previous studies in other European countries such as the Netherlands (Oosterbeek 2001) and Turkey (Ertuna 2008). One explanation could be that goal of those who studies business is to work in already existing companies and that requires an education, whereas those with entrepreneurial desire starts companies as soon as an opportunity appears.

> *H8: People with a business degree have a lower entrepreneurial desire than those who became an entrepreneur without a business degree*

Method

In order to test the different postulated hypothesizes one may either do a quantitative or a qualitative study. A survey quantitatively measures the study subject's responses, whereas a qualitatively study will allow the researcher to study the subjects more in depth by conducting interviews. Both methods have its advantages and disadvantages, and one could if combined get the best of both worlds. The benefits with a survey are that many subjects can participate in the study and that the responses are easily measured. The disadvantages with a survey are that the respondents may misinterpret the questions and that there is no way to probe different questions deeply.

For this study I decided to do a quantitatively field study using a web-based questionnaire survey that was sent by email to the CEO and the CSO (when applicable) of selected company. The companies were found searching for biotechnology companies on the three Science Parks' website. I sent the survey directly to the respondent if I could find the email address to the persons of interest and in the other cases I sent the email to the contact address listed on the company's website (usually info@company.com) kindly asking them to forward the email to the CEO and if applicable to the CSO. Ideally, in order to increase the response rate, a reminder regarding the questionnaire should follow one week after the initial contact to those who had not yet responded. Later, a new reminder should be sent out three weeks after the initial contact and a final attempt should be done seven weeks after the original email (Lumpkin 2001). The scheme was not feasible due the time restraint for this bachelor thesis, thus only the first reminder one week after the initial email was sent.

Survey instrument

The questionnaire was based on a survey used to study entrepreneurship in higher education by Dr Vesa Taatila from the Laurea University of Applied Sciences in Espoo, Finland. The survey is still under development and is given electronically to students at the Laurea University of Applied Sciences and can be found at: https://elomake3.laurea.fi/lomakkeet/3292/lomake.html. I was given permission by Dr Taatila to use the survey and he also had some suggestions for adapting the survey to

the conditions in my study (personal communication). Besides the three original EO dimensions (Innovation, Proactiveness and Risk-taking) used in the Miller (1983) and the Covin and Slevin study (1989), Dr Taatila included three additional dimensions (Entrepreneurial desire, Networking and Confrontational competitiveness) of interest when studying students in higher education. I decided to keep those three additional terms, albeit with some minor changes to more reflect the environment in a biotechnology company. Some additional questions were added to increase the background information about the companies and the respondents (see Appendix II). The online survey was made using the free online survey tool KwikSurvey (www.kwiksurveys.com) and a link to the survey was included in the email:

http://www.kwiksurveys.com/online-survey.php?surveyID=HLLMNF_970fe3d2

Entrepreneurial orientation scale

The study uses a decreased six-point Likert scale version of the seven-point Likert scale used by by Covin and Slevin (1989) in the original study. Accordingly, the respondent has to indicate the degree of agreement to each statement from 1 (strongly disagree) to 6 (strongly agree), thus forcing a choice in either direction. Twelve of the questions were reversed for the analyses because they measured negative qualities. In the literature, some studies uses a seven-point Likert scale (Covin 1989; Lumpkin 1996), some a six-point scale (Gürbüz 2009) and some a five-point Likert scale (Löfsten 2003), which presents difficulties when comparing of the results between different studies.

Here I present a scale that takes this difference into account and produces a value of 0 to 1 making comparisons between dimensions and different studies easier. In this study each dimension contains at least two questions that gives a value of 1 to 6 depending on the answer. For example, the respondents will score 9 on the Entrepreneurial desire if he or she answers 5 on Q1 and 4 on the reversed Q24 (5 + 4 = 9). The average would accordingly be 4.5 (9 / 2 = 4.5) but in order for the scale to produce a 0 value as the lowest value “1 (strongly disagree)” needs to be 0 instead of 1, therefore 1 is subtracted from 4.5 (4.5 - 1 = 3.5). This value is divided by the maximum value of the scale, which

would in this study be 5 (6 - 1 = 5), thus in this example yielding a value of 0.7 (3.5 / 5 = 0.7). Hence, the suggested equation is:

$$\frac{\text{(The total value of the dimension / The number of variables in the dimension)} - 1}{\text{The maximum value of the scale} - 1}$$

The survey did not include the two additional EO dimensions (autonomy and competitive aggressiveness) suggested by Lumpkin and Dess (1996). Very few new biotechnology companies makes any money right off the bat, so there is no urgent need for competitive aggressiveness and it has been argued that these two dimensions are already included in the three original EO terms (Gürbüz 2009).

Selection of companies

I limited my study just to include companies in biotechnology related fields from three Swedish Science Parks; Ideon Science Park, (Lund) Sahlgrenska Science Park (Gothenburg) and Uppsala Science Park. A company was considered to be located in each Science Park if it was started at the science park and was listed on the website of each Science Park (www.ideon.se, www.sahlgrenskasciencepark.se and www.uppsalasciencepark.se). The email I sent out kindly asking for participation in my bachelor thesis clearly stated that I was a student of Handelshögskolan at the University of Gothenburg, and I am guessing that close vicinity to Handelshögskolan will yield a higher response rate from companies at the Sahlgrenska Science Park.

Questionnaire

Innovation:

Q2: In general, she/he prefers tried and traditional products and services over new and innovative products and services.

Q3: Over the last 3 years she/he has personally committed to more changes in the business concept in response to a changing business environment compared to similar companies.

Q4: Changes she/he has committed to has generally been quite dramatic.

Q14: Over the last 3 years she/he has personally committed to fewer changes in the business concept in response to a changing business environment compared to similar companies.
Q15: Changes she/he has committed to has generally been minor.

Risk-taking:

Q8: In general, she/he has a strong tendency for high risk projects.
Q9: She/he believes that owing to the nature of the environment, it is best to explore it gradually via cautious, incremental behavior.
Q10: Confronted with decision-making situations involving uncertainty, she/he typically adopts a cautious "wait-and-see" posture in order to minimize the probability of making wrong decisions.
Q19: In general, she/he has a strong tendency for low risk projects.
Q20: She/he believes that owing to the nature of the environment, bold, wide-ranging acts are necessary.
Q21: When confronted with decision-making situations involving uncertainty, she/he typically adopts a bold, aggressive posture in order to maximize the probability of exploiting potential opportunities.

Proactiveness:

Q5: In a new situation she/he prefers to follow someone else's lead than make decisions autonomously.
Q6: In her/his peer-group, she/he is typically the one who first starts using new products, services, etc.
Q16: In dealing with other people, she/he typically initiates actions to which other people then respond.
Q17: In her/his peer-group, she/he is very seldom the one who first starts using new products, services, etc.

Networking:

Q11: The social network that she/he uses in her/his work is large compared to those of her/his colleagues.

Q12: At work she/he rather focuses on the tasks than social interaction with her/his colleagues.

Q13: She/he keeps her/his social circles in her/his free time very clearly separate from those in her/his work.

Q22: She/he is very people-oriented, using her/his time for communicating with other people.

Q23: She/he actively uses her/his social networks to advance in her/his work.

Confrontational competitiveness:

Q7: In a confrontational situation, she/he typically adopts a very direct and competitive posture.

Q18: In a confrontational situation, she/he typically seeks to avoid clashes, preferring a "live-and-let live" posture.

Entrepreneurial desire:

Q1: Entrepreneurship is for her/him the most desired career choice.

Q24: Entrepreneurship is for her/him the least desired career choice.

Statistics

All statistics was using PASW Statistics 18.0.3 (SPSS: An IBM Company, Somers, NY, USA) or Prism 5.0c (GraphPad Software Inc., La Jolla, CA, USA) on a Mac OS X 10.6.5 (Apple Inc., Cupertino, CA, USA). All test are done using listwise deletion, meaning that if the respondent has not answered one or more questions within one dimension that respondent will be eliminated from further analyses using that dimension.

Regression analysis

A regression analysis measures the correlation between different variables. Pearson's correlation and Spearman's Rho are the two most common correlations test. Highly

correlating variables measures the same variable and one needs to be omitted to avoid big emphasis on one variable when doing the analysis. Also no correlation at all would suggest the variable measuring another dimension and should be omitted.

Pearson's correlation

To test the correlation between two factors a correlation test was performed using Pearson's correlation. The test will results in a value from -1 to +1, where +1 means a perfect positive correlation and -1 is a perfect negative correlation. A correlation higher then 0.9 is considered too high meaning that the two variables measures the same variable, thus one variable needs to be excluded to avoid collinearity. A confidence interval is also calculated and the *P*-value is presented. A *P*-value <0.05 is considered to represent a significant correlation between two factors. Pearson's correlation presumes a normal distribution, thus being most accurate with data following Gaussian distribution. For data not following a Gaussian distribution (such as small sample size) a non-parametric test is recommended (Wahlgren 2008, p. 123).

Spearman's rho

Spearman's rho is a non-parametric correlation test that results in a positive value if there is a correlation between two factors without considering a linear correlation as the Pearson's correlation test does. A ranking score replaces each measurement and the correlation between each ranking score is testes (Wahlgren 2008, p.123). A confidence interval is also calculated and the *P*-value is presented. A *P*-value <0.05 is considered to represent a significant correlation between two variables.

Cronbach's alpha test

Cronbach's alpha test will be used to test the reliability between the questions within each dimension. The covariance between the components in the test will yield a value between -1 to +1 with a positive result suggesting a positive correlation between the questions. In organizational research studies such as this one, alpha levels above 0.70 are usually considered to be acceptable (Kreiser 2002).

Factor analysis

A factor analysis is done to test if there are any sub-dimensions within the questionnaire. The factor analysis determines how much of the extent of the variability is due to different factors, i.e. if any of the questions in the questionnaire correlates to each other and not to the remaining question thus forming its own sub-dimension. Covin and Slevin (1989) argued that one should measure EO as a whole unit whereas Kreiser *et al* (2002) showed individual contributions of each sub-dimension. Before doing a factor analysis, variables that does not correlate with any other variable or correlate highly ($R<0.9$) in a correlation test needs to be eliminated (Field 2005, ch. 15). Furthermore, Field (2005) recommends that over 300 responses are needed to make an adequate factor analysis. Since this study contains less then 300 responses, the probability of a valid factor analysis is very small. Nevertheless, a factor analysis will be done and presented in this paper. To test the suitability of a factor analysis a Keyer-Meyer-Olkin (KMO) test and a Bartlett's test of sphericity are calculated. A KMO value of 0.5 suggests that sample tested is adequate (Field 2005, ch. 15).

The most common factor analysis method is a principal component analysis (PCA) that calculates the eigenvalue and divided the variables into factors depending on the eigenvalue results. Normally, all factors with an eigenvalue over 1 will be displayed. However, one can visualize each factor's eigenvalue using a scree plot and thus determine the number of relevant different factors by visually see where the decrease in eigenvalue flattens. One way to improve the identification of factors is to rotate the variables and factors. The most common method of rotation is the varimax rotation. Field (2005) suggests a factor loading higher the 0.4 is the cut-off value for being included into a factor.

Group comparison

The graphs will be presented using a box-and-whiskers plot with the whisker showing the 2.5 to 97.5 percentile. The box shows the 25 to 75 percentile with the median indicated (Wahlgren 2008, p. 102). Statistically significant different groups are indicated with * ($P < 0.05$) or ** ($P < 0.0.5$), in addition all P-values below 0.2 are printed.

Mann-Whitney U-Test

A t-test can be used to test if the answers from two groups of respondents are statistically different. The t-test tests the probability of the observed difference between two groups is real or not. It is commonly accepted in the research community that a less then 5% chance makes the difference statistically significant and is presented with a *P*-value of less then 0.05 ($P < 0.05$) (Wahlgren 2008, pp. 104-15). However, when small study groups are tested or when a Gaussian distribution is not expected, a non-parametric test is more suitable. The most common non-parametric test used when comparing two independent samples is the Mann-Whitney U-test. The Mann-Whitney U-test replaces each actual value with the ranking value of each sample, *i.e.* the lowest value is replaced with the ranking value 1, the second lowest value is replaced with the ranking value 2 *et cetera*. When all values are replaced, a *P*-value is calculated (Wahlgren 2008, pp. 144-145).

Kruskal-Wallis Test

An ANOVA test is usually done when the variances between three or more groups are tested and if the samples are believed to follow Gaussian distribution. However as stated above, these samples are not believed to follow a Gaussian distribution, hence a non-parametric test is needed. The non-parametric equivalent of an ANOVA test is called a Kruskal-Wallis Test (Wahlgren 2008, pp. 146-147).

Reliability

How valid are the responses I have collected? No study has a 100% response rate but can one really trust a study with less then a 100% response rate? Löfsten and Lindelöf (2003) had a 52% response rate when studying companies in Science Parks in Sweden and a similar rate would be considered acceptable for proceeding with the analyses. Also as mentioned in the introduction, being an entrepreneur comes with favorable effulgence making the respondents more favorable to appear more entrepreneurial then they actually are. Furthermore, one could imagine that the people responding to the survey are those who are more entrepreneurial. So one needs to keep this in mind when interpreting the results.

Finally, the thesis sets out to assess the entrepreneurial traits in companies, but the respondents completing the survey answers most questions as an individual. Hence, this is the entrepreneurial orientation of each individual, not the company. More in depth studies into each company are needed if one would like to fully explore the entrepreneurial orientation of the studied companies.

Results

Most of the responding companies responded within two days after receiving the initial email. Only three more companies completed the survey after the reminder was sent. As expected not all companies responded, however an overall company response rate of 48% (Table 2) is close to the response rate of 52% seen in the Löfsten and Lindelöf study (2003) and I consider this sufficient for proceeding with the analyses. When applicable the survey was sent to both the CEO and the CSO, but only in one case did both the CEO and the CSO complete the survey. Interestingly, that particular company headquartered in Gothenburg with the R&D located in Lund, so I decided to consider them as two separate companies. As suspected, the response rate from Sahlgrenska Science Park was substantially higher compared to Ideon and Uppsala Science Park (Table 2), albeit not statistically significant (Kruskal-Wallis Test).

Response rate	
Ideon Science Park	37% (7/19)
Sahlgrenska Science Park	61% (14/23)
Uppsala Science Park	42% (5/12)
Overall	48% (26/54)

Table 2 - Response rate

The distribution of the respondents can be seen in Table 3. More men then women answered the survey, which is explained by the fact that the survey was sent to more men then women. The companies were arbitrary divided into two sizes (more or less then 10 employees) depending on the number of employees in the company (13.2 being the average size). Also any business degree post-high school was considered “With business degree”.

Category distribution		
Gender	20 (Man)	6 (Woman)
Position	19 (CEO)	7 (Non-CEO)
Size of company (employees)	10 (>10)	16 (<10)
With business degree	11 (Business)	15 (Non-business)
Graduate degree	9 (Ph.D.)	17 (Non-Ph.D.)
Previously started companies	12 (Yes)	14 (No)
Venture capital	14 (Yes)	12 (No)

Table 3 - Category distribution

Variable correlation

Both Pearson and Spearman's Rho correlation were performed in order to test for correlation between the variables. All variables except *Q10:* "Confronted with decision-making situations involving uncertainty, she/he typically adopts a cautious "wait-and-see" posture in order to minimize the probability of making wrong decisions." from the risk-taking dimension correlated with at least one other variable (Appendix I). This is true for both the Pearson and Spearman's Rho correlation. Since Q10 does not correlate at all with any other question I decided to exclude Q10 from further analysis. Furthermore, no two variables correlate more then 0.9, hence no risk for collinearity are evident (Appendix I).

When correlating the dimensions of the survey with each other, none of the original EO dimensions correlated to each other. On the other hand, both of the two additional sub-dimensions (Networking and Confrontational competitiveness) in the study correlate with two of the original three EO dimensions and they also correlate to each other (Table 4). No correlation was detected between entrepreneurial desire and the other dimensions, on the contrary almost all dimensions correlated negatively with entrepreneurial desire.

Correlations[a]

			Innovation	Risk-taking	Proactiveness	Networking	Confrontational competitiveness	Entrepreneurial desire
Spearman's rho	Innovation	Correlation Coefficient	1,000					
		Sig. (2-tailed)	.					
	Risk-taking	Correlation Coefficient	,395	1,000				
		Sig. (2-tailed)	,094	.				
	Proactiveness	Correlation Coefficient	,268	,178	1,000			
		Sig. (2-tailed)	,268	,466	.			
	Networking	Correlation Coefficient	**,586****	,415	**,577****	1,000		
		Sig. (2-tailed)	**,008**	,078	**,010**	.		
	Confrontational competitiveness	Correlation Coefficient	**,563***	**,673****	,274	**,609****	1,000	
		Sig. (2-tailed)	**,012**	**,002**	,256	**,006**	.	
	Entrepreneurial desire	Correlation Coefficient	-,052	-,293	,068	-,142	-,420	1,000
		Sig. (2-tailed)	,832	,224	,782	,562	,074	.

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

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

a. Listwise N = 19

Table 4 - Non-parametric correlation test using a Spearman's rho test. Bold numbers with a grey background indicates a *P*-value less then 0.05, thus suggesting a correlation between the two dimensions

Reliability test

The Cronbach's alpha test revealed the overall reliability of the questionnaire (with Q10 excluded) to be very good with an alpha of 0.844 (Table 5). The alpha levels for risk-taking, networking and confrontal communication were higher than 0.70, however innovation, proactiveness and entrepreneurial desire were below 0.70. However, since both EO and the overall questionnaire have an alpha above 0.70 I have determined the study reliable with the knowledge that perhaps proactiveness and entrepreneurial desire are not suitable to be tested as unique dimensions. Before doing the factor analysis I decided to exclude the entrepreneurial desire because of the alpha being below 0.70. I will however retain proactiveness and innovation, since both innovation and proactiveness is a part of the original EO.

Term	Alpha
Overall	0.844
Entrepreneurial orientation	0.792
Innovation	0.676
Risk-taking	0.784
Proactiveness	0.563
Networking	0.785
Confrontal communication	0.713
Entrepreneurial desire	0.609

Table 5 - Cronbach's alpha test

Factor analysis

As mentioned in the methods, a factor analysis might not be suitable with less then 300 responses unless when very few variables are measured. So it came to no surprise that when measuring the suitability of a factor analysis both the KMO test and the Bartlett's test of sphericity resulted in: "*This matrix is not positive definite*". Meaning a factor analysis is definitely not suitable for the data entered into SPSS. However, SPSS do calculate the eigenvalue anyway and identified six factors that are responsible for 80,33% of the variance using PCA (Table 6). On the other hand, when looking at the scree plot it seems that the scree plots levels out after factor seven (as indicated by the arrow), suggesting that seven factors are identified (Figure 1).

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,482	28,855	28,855	5,482	28,855	28,855	3,134	16,493	16,493
2	3,270	17,208	46,063	3,270	17,208	46,063	2,647	13,929	30,422
3	2,153	11,331	57,394	2,153	11,331	57,394	2,598	13,672	44,095
4	1,659	8,733	66,127	1,659	8,733	66,127	2,388	12,567	56,662
5	1,397	7,350	73,477	1,397	7,350	73,477	2,257	11,881	68,542
6	1,313	6,911	80,388	1,313	6,911	80,388	2,251	11,846	80,388
7	,928	4,884	85,272						
8	,757	3,987	89,259						
9	,542	2,853	92,112						
10	,456	2,398	94,509						
11	,279	1,468	95,977						
12	,226	1,189	97,166						
13	,226	1,188	98,354						
14	,178	,939	99,293						
15	,093	,489	99,782						
16	,020	,104	99,886						
17	,012	,064	99,951						
18	,009	,049	100,000						
19	7,682E-17	4,043E-16	100,000						

Extraction Method: Principal Component Analysis.

Table 6 - Prinicpal Component Analysis giving six factors with an eigenvalue higher then 1

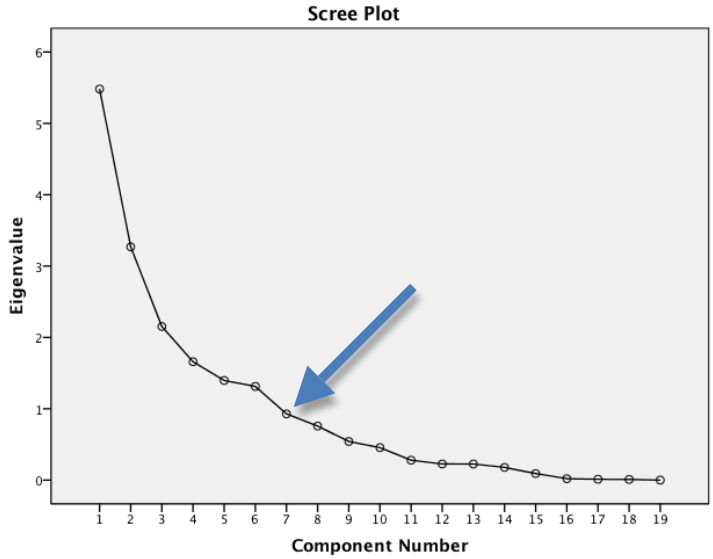

Figure 1 - Scree plot

Determining the amount of factors is rather arbitrary and since the PCA suggests six factors I show only six factors in Table 7. All variables expect Q8 and Q17 are positively loaded within factor one, suggesting that almost all questions are responsible for the variation measured by the survey. This indicates that EO with network and confrontational competitiveness behaves as one unit and that there is no individual contribution from each sub-dimensions. However, since factor analysis is not suitable for this sample one should not draw to many conclusions from the factor analysis.

Component Matrix[a]

	Component					
	1	2	3	4	5	6
Q2r	**,501**	-,116	-,153	**-,462**	-,195	**,459**
Q3	**,414**	,074	-,361	**,555**	,016	**,493**
Q4	**,631**	**-,426**	**-,409**	,216	,122	,292
Q14r	**,614**	,362	,092	,308	**-,440**	-,014
Q15r	**,662**	**-,486**	-,230	,195	-,176	-,238
Q8	,347	**,767**	-,365	,029	-,080	-,179
Q9r	**,479**	-,283	-,047	-,090	,373	**-,539**
Q19r	**,531**	,316	**-,469**	**-,471**	,082	-,018
Q20	**,497**	,392	-,213	-,083	**,486**	-,179
Q21	**,502**	**,705**	-,042	,176	,220	-,069
Q5r	**,400**	**-,419**	-,264	**,511**	,177	-,191
Q6	**,443**	,344	**,488**	,004	,301	,462
Q16	**,490**	**-,593**	,040	-,363	,181	,079
Q17r	,240	**-,506**	**,557**	,062	,293	-,001
Q11	**,795**	-,354	-,039	-,178	-,074	,095
Q12r	**,459**	**,468**	**,522**	,096	,158	-,072
Q13r	**,648**	,165	,091	**-,474**	-,222	-,086
Q22	**,671**	-,006	**,635**	,139	-,034	,023
Q23	**,592**	-,101	,247	,087	**-,601**	-,282

Extraction Method: Principal Component Analysis.

a. 6 components extracted.

Table 7 - Component matrix, a factor loading of 0.4 or more is indicated by being bold

Entrepreneurial orientation

The EO value on the arbitrary EO scale from the 19 respondents who fully responded was 0.68. The medians of all dimensions except networking were above 0.5 with entrepreneurial orientation and networking being significantly different as indicated by

** (Figure 2). The EO score decreases when including networking, confrontational competitiveness or both to the EO (Figure 3).

Group comparisons

The respondents were divided into groups depending on the categories in Table 2 and Table 3, and analyzed using a Mann-Whitney U-test. Nine parameters were analyzed: Entrepreneurial orientation, Innovation, Risk-taking, Networking, Confrontational competitiveness, Entrepreneurial desire, Entrepreneurial orientation and Networking, Entrepreneurial orientation and Confrontational competitiveness, Entrepreneurial orientation, Networking and Confrontational competitiveness.

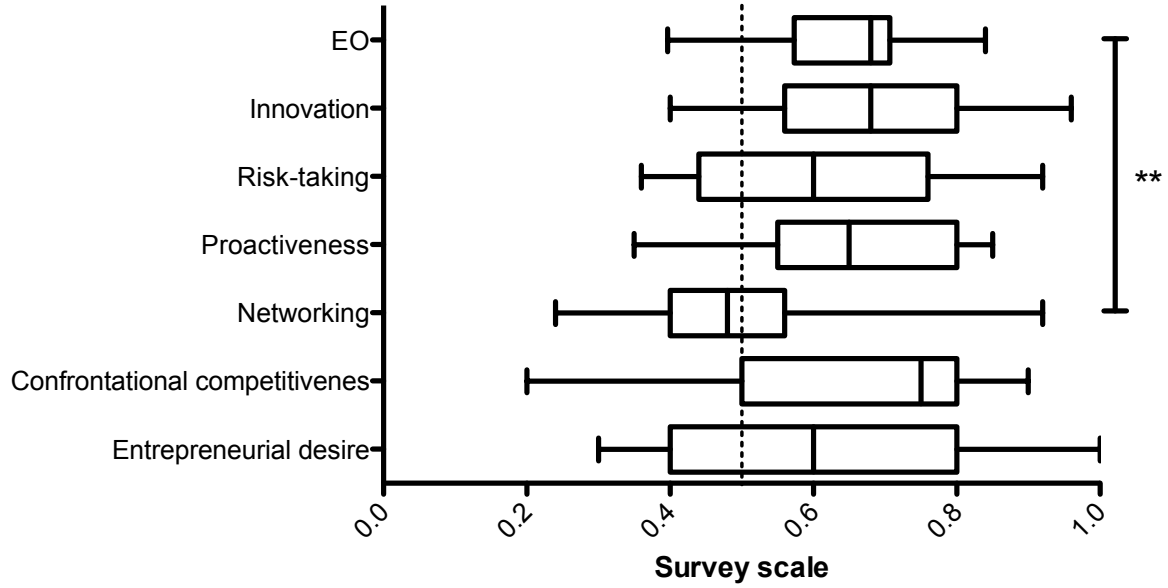

Figure 2 - Entrepreneurial orientation with sub-dimensions of all respondents. ** indicates *P*-value <0.005

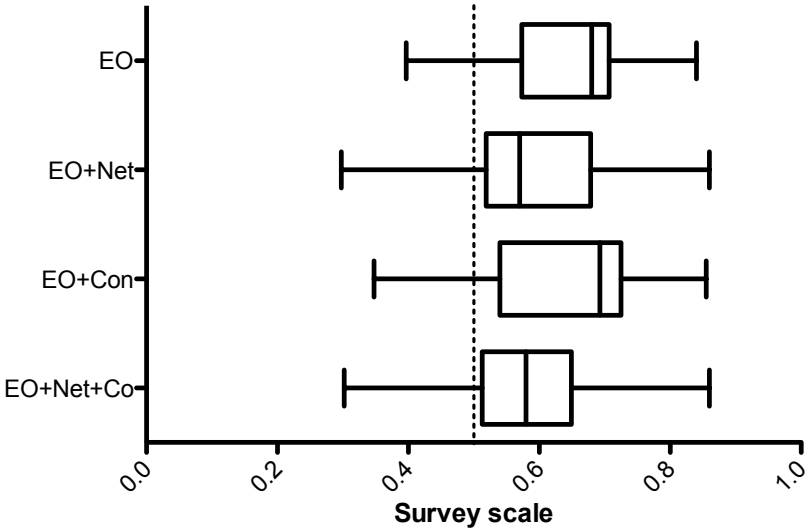

Figure 3 - EO including networking, confrontational competitiveness or both

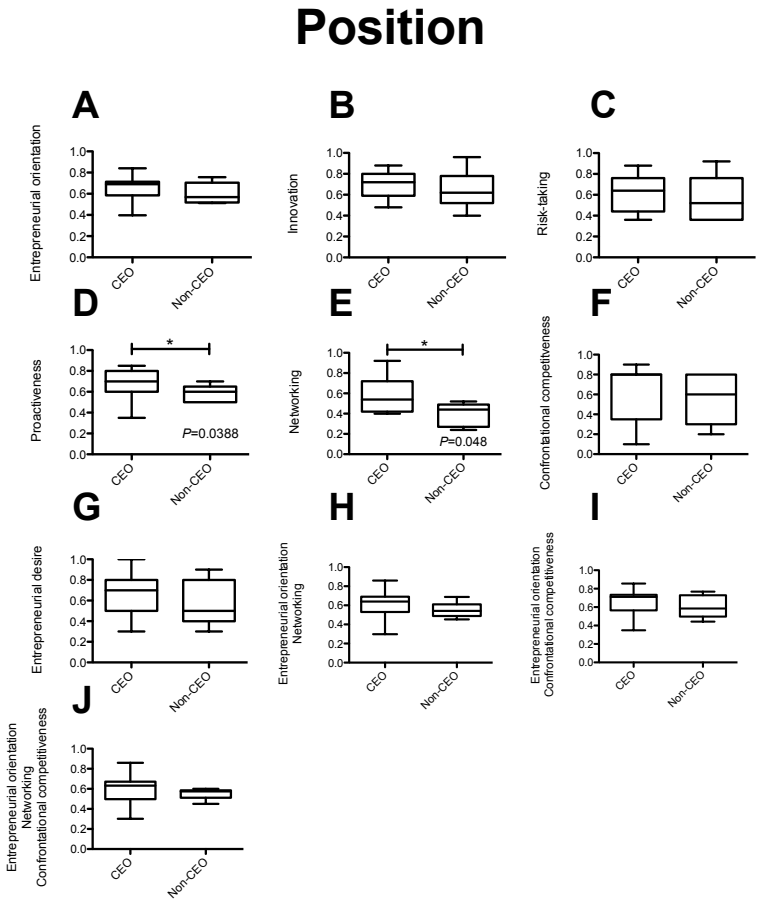

Figure 4 - Group comparisons depending on position in the companies

Group analysis was done to compare the parameters for the three different locations. Some respondents had to be excluded using listwise deletion in some dimensions when the respondent lacked one or more answers, making only three companies from both the Ideon and the Uppsala Science Park included in the analysis. No differences between the locations were detected using Kruskal-Wallis Test, but the small sample size from Ideon and Uppsala makes the analysis very unreliable (data not shown). Furthermore, no difference was detected using Mann-Whitney U-test after grouping the respondents into two groups depending on gender, entrepreneurial desire, size of company, business degree, graduate degree or if the company was funded using venture capital or not (data not shown). However there was a trend that women were higher than men on the confrontal competitiveness scale, albeit not statistically significant. Also, there was a tendency that companies using venture capital were higher on the proactiveness scale and that respondents without a business degree scored higher on entrepreneurial desire than those with a business degree (data not shown).

Grouping the respondents depending on the position in the company showed that CEOs are statistically more proactive the none-CEOs and them having more social capital in the form of more networking (Figure 4D and E). The non-CEO group is constructed of five CSOs, one CFO and one business developer (data not shown).

CEOs were significantly higher in both proactiveness and networking compared to non-CEOs, so I wanted to further investigate the difference between the two groups using the data I had collected. The data revealed when comparing the education levels of CEOs and non-CEOs that eleven of the 19 CEOs had a business degree compared to none of the non-CEOs and that four of the 19 CEOs had a Ph.D. compared to five of seven none-CEOs. Both these differences are statistically significant (Table 8). A majority of the CEOs have previously started at least one company before working at their current position, whereas only one non-CEO had previously started a company.

Parameter	CEOs	Non-CEOs	*P*-value
Business degree	11 of 19	0 of 7	0.01
Graduate degree	4 of 19	5 of 7	0.02
Previously started companies	11 of 19	1 of 7	0.057

Table 8 - Group comparisons between CEOs and non-CEOs

Finally, a significant difference was detected in the respondents entrepreneurial desire when dividing the respondents into groups depending if the respondent previously started a company or not (Figure 5G).

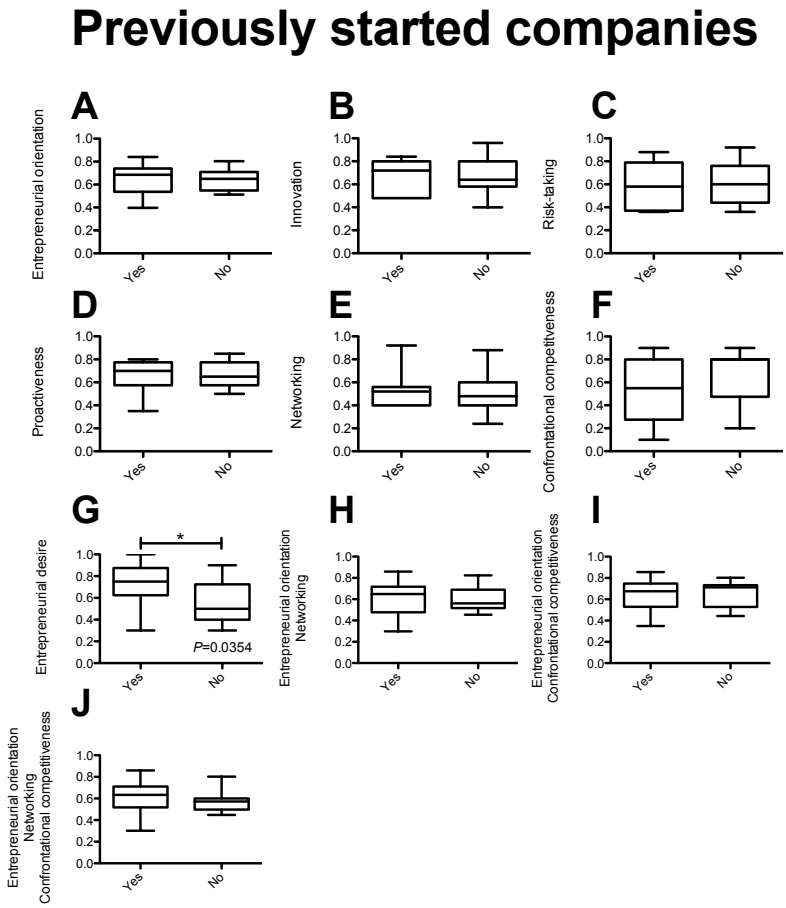

Figure 5 - Group comparison depending on if the respondent previously started a company

Interestingly, a more detailed analysis of the two groups showed that those who previously started a company currently work in significantly smaller companies compared to those who never started a company (Table 9). Also there was a trend that those who previously started a company currently works a CEO in a company that is not funded by venture capital (Table 9).

Parameter	Started companies before	Never started companies before	*P*-value
Business degree	5 of 12	6 of 14	0.98
Graduate degree	3 of 12	6 of 14	0.36
Being the CEO	11 of 12	8 of 14	0.057
Size of company	4.5 employees	20.7 employees	0.0067
Funded by venture capital	4 of 12	10 of 12	0.061

Table 9 - Group comparisons between those who started companies before and those who never started a company before

Analysis

The correlation matrix showed no collinearity between the questions and that all questions except Q10 correlated with at least one other question (Appendix I). So why does not question 10 “Confronted with decision-making situations involving uncertainty, she/he typically adopts a cautious "wait-and-see" posture in order to minimize the probability of making wrong decisions.” correlate with any of the other questions? To me the question seems straightforward and the only answer I can see is that different people perceive uncertainty differently, thus answering the question differently depending on the different perception rather then different behavior. Nonetheless I excluded Q10 from all further analysis.

The Cronbach’s alpha test show the test to be reliable, however three sub-dimensions did not live up to an acceptable reliability (Table 5). Entrepreneurial desire was the dimension with the lowest Cronbach’s alpha and it asked if being an entrepreneur is the most desirable choice or if it is the least desirable choice for the respondent. Several studies have previously suggested that students who studies business have less entrepreneurial desire than those who never studied business (Oosterbeek 2010; Ertuna 2008), and in the present study only one third of the respondents have any formal education in business (Table 3). This indicates that the studied group should score high on Q1 with being an entrepreneur being their first career choice. On the other hand, half of the respondents without a business degree had a graduate degree indicating that those respondents first chose another career before becoming an executive. However, all of the respondents currently have a high position within each company which would suggest that business probably always was an interesting subject to the respondents, hence being an entrepreneur was probably never the least desirable choice. I think this ambiguity towards being an entrepreneur produces a Cronbach’s alpha below 0.7. Also, if one looks deeper into the data and removes the Q1 (entrepreneurship being the most desirable choice) the EO alpha level increase to 0.856, whereas if one removes Q24 (entrepreneurship being the least desirable choice) the EO alpha level only increases to 0.845 (data not shown). Hence for this group of people entrepreneurship has never been the main focus in their career, but they were never

strangers to the idea and when an opportunity emerged they were never afraid to pursue it.

More surprisingly was the low alpha received for proactiveness, since previous research showed proactiveness to be very important when aggressively competing with rival firms, and pursuing favorable business opportunities (Kreiser 2002). The environment of biotechnology field with long developing times and protection of intellectual properties in combination with small or none-existing revenues may explain this, thus making other factors more important then quick responding to the market.

As I postulated in the method section, the Sahlgrenska Science Park group had a higher response rate the other two groups, albeit not statistically significant (data not shown). I think this is due to the proximity of the companies at the Sahlgrenska Science Park and to both Handelshögskolan and me. It is easier to ignore a request (although a very kind request) when you are three hours away from the person requesting your help.

A more evenly distribution of the respondents between the gender and the position categories (
Table 3) would of course have been better for the subsequent analyses, but this was expected since; firstly there are more men than women in the higher management for the investigated companies and secondly since the request was sent to more CEOs than non-CEOs. How come there are considerably more men in the top positions in biotechnology companies (if one can generalize from the studied companies)? The answer is outside the scope of this bachelor thesis. However, one reason might be that it previously been more men in science, thus an accumulation of men would then be expected. This may changes in the forthcoming years, since it is currently more female graduate students then men at for example the Karolinska Institutet in Stockholm, Sweden (Bungerfeldt 2008). Another explanation could be that men are on a population basis more entrepreneurial then women, however in this study no difference on the EO scale between those men and women whom approach a career as an entrepreneur was seen. The data suggests that the same trait emerges in the entrepreneur regardless gender. This is in accordance with my third hypothesis that assume the same traits to will be of importance for the whole group regardless of the studied parameters.

Accordingly, neither entrepreneurial desire, size of company, business degree, graduate degree, or if the company was funded using venture capital since produced any significantly different dimensions, thus fully in harmony with my hypothesis the same traits are important for executives in the biotechnology field. However, women score higher in confrontational competitiveness and further studies including more women are needed in order to bring clarity to this dimension.

H8 asks if people with more entrepreneurial desire in higher extent became entrepreneurs without a business degree compared to those who went to business school before becoming an executive. This study imply a non-significantly trend that this is holds true (data not shown). Many famous entrepreneurs such as Bill Gates, Paul Allen and Richard Branson dropped out of school before earning a degree. Resulting in many successful entrepreneurs flourishing in their business life without having a business degree.

Each sub-dimension will contribute individually to the entrepreneurial orientation is hypothesized in *H4*. One instrument commonly used for the discovery of sub-dimension is a factor analysis. In order to do a valid factor analysis one need to have many respondents and even though I was content with a 48% response rate it was still way below the recommendation to make a satisfactory factor analysis. So it came to no surprise that there were a non-existing validity of the factor analysis. Nonetheless, SPSS did identify six factors with an eigenvalue above 1 when performing a PCA factor analysis (Table 6). I was curious to see if SPSS would find the five sub-dimensions proposed by previous studies. This was however not the case, with most of the questions positively loaded within component one (Table 7). My interpretation is that the different sub-dimensions do not contribute individually to the EO and that EO should be measured as a whole. On the other hand, since the factor analysis was not valid, no conclusions can really be drawn from the factor analysis. Another, and for this study more suitable, method to measure if different sub-dimensions contribute individually to a dimension is a variable correlation test. The Spearman Rho's test is as described in the method recommended for a study like this and it reveled that none of the three original sub-dimensions of EO correlated with each other (Table 4). So as *H4* states, innovation,

risk-taking and proactiveness varies independently as shown by Kreiser *et al* (2002) and should thus be measured individually when studying small companies in Sweden.

Companies in hostile environments are more entrepreneurial oriented then those in benign environments (Miller 1983; Covin 1989). *H1* postulates that since most of the investigated companies lives in a hostile environment they will have an entrepreneurial positions on the EO scale. The respondents were at 0.68 on the 0 to 1 scale as shown in Figure 2, hence being more towards the entrepreneurial side of the scale as *H1* suggested. However, the next hypothesis tries to compare this study to a similar study done by Renko *et al* (2009) that placed Nordic biotechnology companies at 0.66 on the EO scale. *H2* states that the companies in this study should be below 0.66 on the EO scale since the size of the average company in the Renko *et al* study was bigger than the companies in this study. Furthermore, the same study showed that bigger companies scored higher on the EO scale than smaller companies. This was however not the case with 0.68 being higher than 0.66, but it is interesting that the 0.66 the authors found in Nordic biotechnology companies is almost identical to the 0.68 found in this study of Swedish biotechnology companies. So despite the sample size in this study being rather small, the consistency between the two findings brings some validity to the findings in this study.

All of the measured dimensions on the survey except networking are above 0.5 on the 0 to 1 scale when looking at the group as a whole (Figure 2). Innovation was the highest EO sub-dimension (as postulated in *H6*) with risk-taking being the lowest of the EO sub-dimensions is risk-taking. This was expected since innovation is the most important factor when working with R&D (Lumpkin 2001) and it might be good to be less prone to risk-taking when handling the huge financial risk associated with developing new drugs. It was surprising that confrontational competitiveness scored as high as it did with the highest median of all, since most companies should not face any head on competition at all. Perhaps this dimension also measures the driving force (drivkraft in Swedish) of the entrepreneurs, which previously has been described as an important entrepreneurial trait (Klofsten 2002, p. 25). It would be interesting to expand this dimension with additional questions and rename it to “Driving force”. Furthermore, confrontational competitiveness correlates with innovation, risk-taking and networking (Table 4),

suggesting other sub-dimensions already might measure this trait. I think it is reasonable to redo this dimension to instead measuring the driving force of the entrepreneur and it might provide additional information when studying entrepreneurs.

The only dimension below 0.5 was networking and it is for hard for me to believe that the studied executives are not inclined to have and to use a big network. Perhaps the questions need to be rephrased in order to really measure networking. With networking being statistically lower than the entrepreneurial orientation (Figure 2) it would not be a sensible approach to including networking to EO. Doing this shift the EO towards the middle while increasing the standard deviation (Figure 3). *H7a* hypothesizes that there is a positive correlation between networking and the entrepreneurial orientation, and in this material networking do correlate with both innovation and proactiveness (Table 4). Hence networking is associated with EO and could after rephrasing be included in the entrepreneurial orientation survey as its own sub-dimension.

H5a assumes CEOs scoring higher on proactiveness then non-CEOs since being a CEO is associated with more responsibilities than being the CSO or the CFO. As seen in Figure 4D CEOs actually score significantly higher on proactiveness than non-CEOs. This makes senses placing proactiveness in context of the everyday activities of a CEO. CEOs main responsibility is to align the company with the objectives set out by the board and being proactive is a very important quality of a CEO. As discussed above, the Cronbach's alpha of proactiveness was below 0.7 (Table 5) and this might be explained by the discrepancy found between CEOs and non-CEOs. In the light of this, non-CEOs should consequently be considered as a different cohort compared to CEO when discussing proactiveness. Innovation is also a very important quality for a CEO, but it is not lower in CEOs compared to CSOs as suggested by *H5b*. Furthermore, the dimension "Networking" is very low for non-CEOs (Figure 4E) almost suggesting non-CEOs to be introvert. However, it is reasonable to believe social capital being more important to the CEO compared to the rest of the company, thus confirming *H7b*. Further investigating these two groups revealed that most of the CEOs had a business degree while none of the non-CEOs had any formal business training. Additionally, significantly more non-CEOs compared to CEOs had a Ph.D (Table 8).

Previously starting companies is not associated with higher EO but correlates with more entrepreneurial desires (Figure 5D). It seems apparent that people envisioning themselves as being an entrepreneur are more prone to start companies. I find the fact that the variable "if you previously started a company" is statistically significant when measuring entrepreneurial desire to be very interesting. It either suggest that people with an entrepreneurial desire are doers like Bill Gates, who does not like to waste an opportunity when it comes along, or that people with an entrepreneurial desire starts more companies because these companies are less sustainable. This study did not investigate the success rate of the companies previously started by the respondents, hence I can only speculate in what alternative is more likely and I do think the first explanation seems more reasonable. Some previous studies have suggested entrepreneurial resilience to of great importance for an entrepreneur (De Vries 1977; Krueger 2008). Entrepreneurial resilience argues that failure is not the end and many successful entrepreneurs (as described in the introduction) failed several times before their first successful business endeavor. So it is of utterly importance not being let down by failure, to learn for mistakes and to try again. It would be very interesting to further study this and perhaps include entrepreneurial resilience as sub-dimension

Further penetrating the results showed those who previously started a company currently works in considerably smaller companies than those who never started a company before (Table 9). I think it is either because those with more entrepreneurial desire start companies but when the company becomes a success and thereof becomes bigger they loose interest and consequently leaves the company, or that those with more entrepreneurial desire rush into businesses that constantly fails before becoming bigger. It would be very interesting to qualitatively study these two groups to gain further understanding on what the success rates and what the exit-strategies are for the two groups.

Conclusions

I purpose to facilitate comparisons between studies measuring the entrepreneurial orientation, that subsequent articles should embrace the coherent scale suggested in this bachelor thesis. The fact that this study and a similar study by Renko *et al* (2009) produced the same value on the purposed scale suggests the scale to be very useful, regardless if the studies use a five-point or a six-point Likert scale.

It seems that the management in biotechnology companies in Sweden are rather homogenous producing very few differences between different groups. This suggests that the same entrepreneurial traits are important when becoming an executive in a Swedish biotechnology firm. It would be interesting in future studies to focusing more on measuring the EO between different countries and different fields. Also one could concentrate more on the different levels within companies, since being a CEO correlates to being more proactiveness and having more networking compared to the other studied positions. Proactiveness could explain why some are more suitable to become a CEO and the difference might be even starker between the CEO and non-management personnel.

An interesting finding was that higher entrepreneurial desire correlated to respondents who previously started companies. Furthermore, those who previously started companies currently are working in significantly smaller companies compared to those who never started a company. However, starting a company does not mean that they succeed in their business endeavors but it could be a very good learning experience. Quintessential entrepreneurs such as Donald Trump failed several times before becoming successful. Based on these findings I suggest that the entrepreneurial orientation scale should be adding with a dimension measuring entrepreneurial resilience or the “tenacity despite failure” as termed by Lambing and Kuehl (2003). Also a deeper understanding of the exit-strategies of those frequently starting companies could provide interesting understandings of entrepreneurial traits.

Networking and confrontational competitiveness does not in this study seem to add anything to the entrepreneurial orientation scale, and one has to decide whether to keep them or not. I suggest removing networking and rebuild confrontational competitiveness to measuring the entrepreneurial driving force. By adding the entrepreneurial driving force dimension, the survey would capture the "Passion for the business" that was described in the introduction as being identified by Lambing and Kuehl (2003) as a very important entrepreneurial trait.

I do not know if I by doing this survey have found what it takes to become an executive at a company working with drug discovery. This work may however be useful to identify subjects that need further studying. However, I have learned that different traits are beneficial in different situations and that I (who never started a company) probably will end up working in a bigger company.

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Appendix I

Correlations[a]

		Q2r	Q3	Q4	Q14r	Q15r	Q8	Q9r	Q10r	Q19r	Q20	Q21	Q5r	Q6	Q16	Q17r	Q11	Q12r	Q13r	Q22	Q23	Q7	Q18r	Q1	Q24r
Q2r	Pearson Correlation	1																							
	Sig. (2-tailed)																								
Q3	Pearson Correlation	,198	1																						
	Sig. (2-tailed)	,416																							
Q4	Pearson Correlation	,385	**,600****	1																					
	Sig. (2-tailed)	,103	**,007**																						
Q14r	Pearson Correlation	,143	,393	,147	1																				
	Sig. (2-tailed)	,559	,096	,548																					
Q15r	Pearson Correlation	,283	,311	**,660****	,432	1																			
	Sig. (2-tailed)	,240	,195	**,002**	,065																				
Q8	Pearson Correlation	,080	,238	,003	,422	-,036	1																		
	Sig. (2-tailed)	,744	,326	,989	,072	,884																			
Q9r	Pearson Correlation	,144	-,025	,249	-,015	**,521***	,044	1																	
	Sig. (2-tailed)	,557	,918	,303	,953	**,022**	,859																		
Q10r	Pearson Correlation	,181	-,329	-,229	-,040	-,152	,011	,201	1																
	Sig. (2-tailed)	,458	,168	,346	,870	,535	,963	,409																	
Q19r	Pearson Correlation	**,484***	,090	,262	,207	,184	**,634****	,199	-,004	1															
	Sig. (2-tailed)	**,036**	,713	,279	,396	,451	**,004**	,415	,988																
Q20	Pearson Correlation	,008	,169	,272	,308	,226	,415	,309	,253	**,502***	1														
	Sig. (2-tailed)	,973	,488	,260	,199	,353	,077	,197	,296	**,028**															
Q21	Pearson Correlation	-,013	,297	,096	**,499***	-,076	**,706****	,041	,160	,443	**,672****	1													
	Sig. (2-tailed)	,957	,217	,695	**,030**	,758	**,001**	,866	,512	,058	**,002**														
Q5r	Pearson Correlation	,018	,331	**,608****	,050	**,543***	,044	,452	-,376	,048	-,043	,090	1												

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	Sig. (2-tailed)	,942	,167	**,006**	,838	**,016**	,857	,052	,112	,845	,861	,714													
Q6	Pearson Correlation	,242	,198	,136	,325	-,142	,182	-,020	,325	,137	,275	,451	-,067	1											
	Sig. (2-tailed)	,319	,416	,580	,175	,563	,457	,935	,175	,576	,254	,052	,784												
Q16	Pearson Correlation	,327	-,026	**,553***	-,007	**,480***	-,372	,363	,085	,182	,224	-,177	,189	,133	1										
	Sig. (2-tailed)	,171	,915	**,014**	,978	**,038**	,116	,126	,729	,455	,356	,467	,437	,587											
Q17r	Pearson Correlation	-,045	-,123	,164	-,106	,205	**-,478***	,202	,284	-,177	-,078	-,085	,254	,265	,400	1									
	Sig. (2-tailed)	,855	,616	,503	,666	,399	**,038**	,406	,239	,469	,751	,729	,294	,272	,090										
Q11	Pearson Correlation	**,560***	,328	**,557***	,342	**,593****	-,028	,412	-,030	**,472***	,179	,150	,358	,149	**,596****	,422	1								
	Sig. (2-tailed)	**,013**	,171	**,013**	,152	**,007**	,908	,080	,903	**,041**	,465	,541	,133	,542	**,007**	,072									
Q12r	Pearson Correlation	,098	,150	-,170	,417	,000	,332	,260	,180	,104	,283	**,482***	-,031	**,531***	-,116	,133	,181	1							
	Sig. (2-tailed)	,690	,540	,487	,076	1,00	,165	,283	,462	,671	,240	**,037**	,901	**,019**	,637	,588	,458								
Q13r	Pearson Correlation	,428	,002	,202	,341	,261	,354	,283	,134	,446	,253	,317	-,062	,305	,361	-,006	**,516***	,369	1						
	Sig. (2-tailed)	,067	,992	,408	,153	,280	,137	,240	,585	,056	,295	,186	,800	,204	,129	,982	**,024**	,119							
Q22	Pearson Correlation	,253	,104	,240	**,471***	,342	,011	,289	,278	-,004	,167	,275	,174	**,612****	,293	,409	,421	**,667****	,365	1					
	Sig. (2-tailed)	,296	,673	,323	**,042**	,152	,963	,230	,249	,988	,494	,254	,477	**,005**	,223	,082	,073	**,002**	,124						
Q23	Pearson Correlation	,158	,000	,246	**,591****	**,503***	,160	,129	,170	,103	,000	,211	,202	,053	,230	,229	**,486***	,154	**,486***	**,595****	1				
	Sig. (2-tailed)	,517	1,000	,310	**,008**	**,028**	,512	,598	,487	,676	1,000	,385	,406	,830	,343	,345	**,035**	,530	**,035**	**,007**					
Q7	Pearson Correlation	,428	,172	,392	**,513***	,386	**,583****	,400	,180	**,523***	**,564***	**,687****	,251	,395	,180	-,035	,417	,409	**,669****	,447	,432	1			
	Sig. (2-tailed)	,068	,480	,097	**,025**	,102	**,009**	,090	,461	**,022**	**,012**	**,001**	,300	,095	,461	,887	,076	,082	**,002**	,055	,065				
Q18r	Pearson Correlation	,275	-,165	,401	-,208	,313	,136	,444	-,160	,375	,050	-,104	,357	-,119	,425	-,036	,288	-,060	**,570***	-,002	,175	,370	1		
	Sig. (2-tailed)	,255	,500	,089	,393	,193	,580	,057	,512	,113	,840	,673	,133	,627	,070	,884	,231	,806	**,011**	,993	,474	,119			
Q1	Pearson Correlation	-,161	,105	-,119	-,252	-,189	-,249	-,034	,134	-,102	-,126	-,165	-,154	-,161	,139	,277	,089	-,020	-,116	-,210	-,126	**-,487***	-,019	1	
	Sig. (2-tailed)	,510	,669	,628	,299	,439	,304	,889	,584	,677	,609	,499	,528	,510	,571	,251	,716	,935	,637	,389	,606	**,035**	,940		
Q24r	Pearson Correlation	-,170	-,017	-,071	,101	,204	**-,593****	,190	,027	-,420	-,112	-,262	,068	,119	,258	**,459***	,121	,207	-,201	,337	,057	-,336	-,185	**,468***	1
	Sig. (2-tailed)	,486	,946	,773	,682	,401	**,007**	,437	,914	,073	,647	,278	,782	,626	,286	**,048**	,621	,395	,409	,158	,816	,159	,449	**,043**	

Appendix I

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

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

a. Listwise N=19

Table 10 - Pearson Correlation where bold indicate p<0.05

Correlations[a]

		Q2r	Q3	Q4	Q14r	Q15r	Q8	Q9r	Q10r	Q19r	Q20	Q21	Q5r	Q6	Q16	Q17r	Q11	Q12r	Q13r	Q22	Q23	Q7	Q18r	Q1	Q24r
Q2r	Correlation Coefficient	1																							
	Sig. (2-tailed)	.																							
Q3	Correlation Coefficient	,242	1																						
	Sig. (2-tailed)	,319	.																						
Q4	Correlation Coefficient	,372	**,594****	1																					
	Sig. (2-tailed)	,117	**,007**	.																					
Q14r	Correlation Coefficient	,315	,486*	,306	1																				
	Sig. (2-tailed)	,190	,035	,203	.																				
Q15r	Correlation Coefficient	,321	,256	**,700****	**,530***	1																			
	Sig. (2-tailed)	,181	,290	**,001**	**,020**	.																			
Q8	Correlation Coefficient	,141	,267	,129	,310	-,104	1																		
	Sig. (2-tailed)	,563	,268	,600	,197	,671	.																		
Q9r	Correlation Coefficient	,182	-,068	,322	,037	**,525***	,064	1																	
	Sig. (2-tailed)	,456	,781	,178	,881	**,021**	,794	.																	
Q10r	Correlation Coefficient	,095	-,336	-,156	-,027	-,114	,026	,229	1																
	Sig. (2-tailed)	,699	,159	,524	,914	,641	,917	,345	.																

Q19r	Correlation Coefficient	**,491***	,097	,203	,239	,141	**,659****	,195	,065	1															
	Sig. (2-tailed)	**,033**	,693	,404	,324	,566	**,002**	,424	,791	.															
Q20	Correlation Coefficient	,060	,257	,330	,447	,263	**,466***	,239	,306	**,559***	1														
	Sig. (2-tailed)	,806	,288	,168	,055	,276	**,045**	,324	,202	**,013**	.														
Q21	Correlation Coefficient	,032	,371	,209	,417	,029	**,720****	,070	,146	**,588****	**,790****	1													
	Sig. (2-tailed)	,898	,118	,391	,076	,906	**,001**	,776	,551	**,008**	**,000**	.													
Q5r	Correlation Coefficient	,152	,409	**,668****	,158	**,602****	,118	,346	-,387	,051	-,013	,201	1												
	Sig. (2-tailed)	,534	,082	**,002**	,518	**,006**	,631	,147	,102	,836	,958	,410	.												
Q6	Correlation Coefficient	,282	,210	,137	,294	-,163	,180	-,035	,369	,080	,325	,376	-,088	1											
	Sig. (2-tailed)	,242	,388	,577	,221	,504	,462	,886	,120	,745	,175	,113	,721	.											
Q16	Correlation Coefficient	,405	-,018	,525*	,210	**,640****	-,283	,347	,109	,181	,260	-,074	,236	,157	1										
	Sig. (2-tailed)	,085	,941	,021	,389	**,003**	,241	,145	,656	,457	,283	,763	,331	,521	.										
Q17r	Correlation Coefficient	,064	-,069	,295	,033	,427	-,419	,283	,250	-,175	,103	-,052	,332	,245	**,537***	1									
	Sig. (2-tailed)	,793	,779	,220	,893	,068	,074	,241	,302	,473	,675	,833	,165	,312	**,018**	.									
Q11	Correlation Coefficient	,608**	,353	,448	**,544***	**,643****	,046	,369	,010	,442	,277	,205	,343	,101	**,554***	,428	1								
	Sig. (2-tailed)	,006	,138	,055	**,016**	**,003**	,852	,120	,966	,058	,251	,399	,151	,680	**,014**	,068	.								
Q12r	Correlation Coefficient	,171	,206	-,097	,353	-,128	,319	,050	,014	,089	,297	,401	-,100	**,579****	-,117	,037	,155	1							
	Sig. (2-tailed)	,485	,397	,692	,138	,600	,183	,839	,956	,717	,216	,089	,684	**,009**	,632	,880	,526	.							

Q13r	Correlation Coefficient	,456*	-,012	,164	,407	,212	,290	,218	,201	,309	,328	,282	-,072	,361	,371	,026	**,475***	,379	1						
	Sig. (2-tailed)	,050	,961	,502	,084	,384	,228	,370	,409	,199	,171	,242	,769	,129	,118	,916	**,040**	,110	.						
Q22	Correlation Coefficient	,250	,023	,130	,417	,262	-,024	,144	,264	-,060	,122	,152	,066	**,566***	,220	,347	,316	**,667****	,348	1					
	Sig. (2-tailed)	,302	,927	,596	,075	,278	,924	,558	,275	,808	,618	,533	,787	**,012**	,365	,146	,188	**,002**	,145	.					
Q23	Correlation Coefficient	,148	,020	,268	**,596****	**,551***	,140	,040	,128	,069	,103	,143	,232	,015	,232	,226	**,462***	,112	,447	,575*	1				
	Sig. (2-tailed)	,545	,935	,267	**,007**	**,015**	,569	,872	,602	,778	,676	,559	,339	,952	,339	,352	**,047**	,648	,055	,010	.				
Q7	Correlation Coefficient	,425	,198	,449	**,572***	,407	**,557***	,357	,192	**,530***	**,648****	**,689****	,262	,404	,281	,068	,426	,383	**,675****	,394	,421	1			
	Sig. (2-tailed)	,069	,416	,054	**,010**	,084	**,013**	,134	,430	**,020**	**,003**	**,001**	,279	,087	,244	,781	,069	,106	**,002**	,095	,073	.			
Q18r	Correlation Coefficient	,332	-,171	,381	-,177	,229	,169	,395	-,110	,249	-,036	-,087	,270	-,118	,420	-,014	,187	-,105	**,481***	-,119	,099	,325	1		
	Sig. (2-tailed)	,164	,483	,108	,469	,346	,490	,094	,653	,304	,885	,723	,264	,631	,074	,955	,443	,669	**,037**	,629	,688	,175	.		
Q1	Correlation Coefficient	-,100	,090	-,168	-,114	-,174	-,164	-,052	,178	-,186	-,070	-,134	-,172	-,052	,041	,215	,038	-,001	-,152	-,185	-,120	-,448	-,006	1	
	Sig. (2-tailed)	,684	,714	,491	,643	,476	,502	,831	,466	,446	,775	,584	,482	,832	,867	,376	,878	,995	,536	,448	,625	,054	,981	.	
Q24r	Correlation Coefficient	-,077	-,030	,009	,129	,306	**-,567***	,210	,010	-,382	-,095	-,212	,188	,130	,346	,495*	,111	,040	-,182	,256	,061	-,234	-,132	**,469***	1
	Sig. (2-tailed)	,754	,904	,972	,598	,203	**,011**	,388	,968	,106	,699	,384	,440	,597	,147	,031	,652	,871	,457	,291	,805	,334	,591	**,043**	.

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

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

a. Listwise N = 19

Table 1 - Spearman's Rho correlation test where bold indicate p<0

Appendix II

Entrepreneurship within the field of biotechnology

Bachelor thesis - Jonas Söderholm
Handelshögkolan at the University of Gothenburg

*** 1. Company Name**

2. Position in company

- ○ CEO (VD)
- ○ CSO (Forskningschef)
- ○ Other

3. Year(s) in company

- ○ 0-1
- ○ 1-2
- ○ 2-3
- ○ 3-4
- ○ 4-5
- ○ 5+

4. Total number of employees in the company.

5. Sex

- ○ Man
- ○ Woman

6. Education, year of graduation and university/college

7. Have you ever started or founded other companies?

- ○ Yes
- ○ No

If yes: How many companies have you started/founded?

8. Is the company funded using venture capital?

- ○ Yes
- ○ No

9. Was it hard or easy get investments from venture capitalists? (*If applicable*)

	1=Very hard to get investments	2	3	4	5	6=Very easy to get investments
Before the fall of 2008	○	○	○	○	○	○
Since the fall of 2008	○	○	○	○	○	○

10. Different people are described below. Please read each description and think about how much each person is of is not like you.

Choose the alternative that describes you best.

Reply using the scale:

1 = Not like me at all
2 = Not like me
3 = A little like me
4 = Somewhat like me
5 = Like me
6 = Very much like me

	1	2	3	4	5	6
Entrepreneurship was early on the most desired career choice for her/him.	○	○	○	○	○	○
In general, she/he prefers tried and traditional products and services over new and innovative products and services.	○	○	○	○	○	○
Over the last 3 years she/he has personally committed to more changes in the business concept in response to a changing business environment compared to similar companies.	○	○	○	○	○	○
Changes she/he has committed to has generally been quite dramatic.	○	○	○	○	○	○
In a new situation she/he prefers to follow someone else's lead than make decisions autonomously.	○	○	○	○	○	○
In her/his peer-group, she/he is typically the one who first starts using new products, services, etc.	○	○	○	○	○	○
In a confrontational situation, she/he typically adopts a very direct and competitive posture.	○	○	○	○	○	○
In general, she/he has a strong tendency for high risk projects.	○	○	○	○	○	○
She/he believes that owing to the nature of the environment, it is best to explore it gradually via cautious, incremental behavior.	○	○	○	○	○	○
Confronted with decision-making						

situations involving uncertainty, she/he typically adopts a cautious “wait-and-see” posture in order to minimize the probability of making wrong decisions.	○	○	○	○	○	○
The social network that she/he uses in her/his work is large compared to those of her/his colleagues.	○	○	○	○	○	○
At work she/he rather focuses on the tasks than social interaction with her/his colleagues.	○	○	○	○	○	○
She/he keeps her/his social circles in her/his free time very clearly separate from those in her/his work.	○	○	○	○	○	○
Over the last 3 years she/he has personally committed to fewer changes in the business concept in response to a changing business environment compared to similar companies.	○	○	○	○	○	○
Changes she/he has committed to has generally been minor.	○	○	○	○	○	○
In dealing with other people, she/he typically initiates actions to which other people then respond.	○	○	○	○	○	○
In her/his peer-group, she/he is very seldom the one who first starts using new products, services, etc.	○	○	○	○	○	○
In a confrontational situation, she/he typically seeks to avoid clashes, preferring a "live-and-let live" posture.	○	○	○	○	○	○
In general, she/he has a strong tendency for low risk projects.	○	○	○	○	○	○
She/he believes that owing to the nature of the environment, bold, wide-ranging acts are necessary.	○	○	○	○	○	○
When confronted with decision-making situations involving uncertainty, she/he typically adopts a bold, aggressive posture in order to maximize the probability of exploiting potential opportunities.	○	○	○	○	○	○
She/he is very people-oriented, using her/his time for communicating with other people.	○	○	○	○	○	○

She/he actively uses her/his social networks to advance in her/his work.	○	○	○	○	○	○
Entrepreneurship is for her/him the least desired career choice.	○	○	○	○	○	○

Tack så mycket för att du tog dig tid för att hjälpa mig göra en så bra C-uppsats som möjligt. Lycka i framtiden med ditt företag.

Med vänliga hälsningar, Jonas