



School of Management

**Antecedents of creativity and innovativeness in the Swedish
manufacturing pharmaceutical industry**

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Master's Thesis

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Abstract

The ability to create new products and services is a competitive advantage and in many cases a requirement for long term success of a company. In the manufacturing pharmaceutical industry, the freedom to think and act creatively is depressed by the demand for external and internal compliance. As such, it is important to understand the underlying factors of creativity and innovativeness in order to promote them. Several studies have been performed on the subject to increase creativity. A theme that is recurrent in several creativity increasing studies is that leadership and the leadership style of the management is important for creativity.

The purpose of this thesis was to investigate if the leadership style transformational leadership can be associated with a higher level of creativity and innovativeness in the Swedish pharmaceutical industry. Given that the effect of transformational leadership on creativity is likely to be derived from creativity enhancing variables that have been enhanced in the follower's a literature framework is built to find, and in turn empirically test, if this effect of transformational leadership (if any) is mediated by other variables.

The thesis contains a literature review of current leadership and creativity theories as well as literature review of intrinsic motivation and psychological empowering. From the theoretical framework 10 hypothesis's about performance, transformational leadership, creativity, innovativeness, intrinsic motivation and psychological empowering were stated.

The hypothesis's was tested trough an empirical study. Data was gathered by a questionnaire that was sent out to 22 manufacturing pharmaceutical companies in Sweden. The results of the study support the idea that transformational leadership increases creativity and innovativeness in the investigated market. However, no correlation was found between transformational leadership and intrinsic motivation or psychological empowering. While not the central question of this thesis the study also supports that a higher level of creativity and innovativeness is correlated with a higher performance.

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1 Introduction

1.1 *The need of innovation*

The question “how to increase innovation” is always current. New products from innovations are a source of competitive advantage and increased profits. As such, company leaders are always searching for information on how to develop new and smarter products in new and faster ways. Understanding the fundamentals of creativity and innovations in an industry is a way to increase the likelihood of creating a new product. While many believe that innovativeness, the ability to create and release new products and services to the market, is required for the long term success of a company, many companies and industries struggle to keep with the fast phase of today’s market (Gumusluoglu & Ilsev, 2009).

For many years the western world has been the leading producer of many industrial products. With time, globalization has increased and more countries have been able to enter the market for most large scale productions. Due to the lower labor costs in the developing countries the western world is in many cases unable to compete with the low production costs. As such, production has moved from the western world to countries with lower labor costs. In order to compete, the western world needs to gain another type of competitive advantage. One of many competitive advantages that have arisen for the western world is creativity and turning the creative thinking into innovations, e.g. Innovativeness. Innovation ability is a key for an enterprise to compete in today’s fast-changing international market and is also the foundation for an enterprise’s development of sustainable competitiveness (Gumusluoglu & Ilsev, 2009).

The pharmaceutical manufacturing industry in Sweden is no exception. It is in need of new innovations to be able to compete on the global market. In the world of pharmaceuticals being innovative and creative is difficult. The creativity in the industry is depressed by a dependency’s for internal compliance, external compliance, pre-set procedures and industrial guidelines. This demand for compliance have made the industry un-innovative and described as stiff with a large fear of “*stepping outside the box*” (Willink, 2009).

All innovations have to be derived from creative thinking of one or several employees. Where creative thinking, or creativity, is the skill to be able to think outside the box and see an opportunity that no one else have seen or tried before. As such all Innovations are derived from the creative thinking of individuals. Given that innovations are derived from people that are thinking outside the box and that the pharmaceutical industry as a whole is afraid of stepping outside the box it is understandable why the industry have been described as un-innovative (Willink, 2009).

The combination of need for new products due to falling profits and the need of high compliance have made research and development of new products very expensive. For example, one of the largest pharmaceutical companies in the world, AstraZeneca, spends an average of 12 Billion dollars for each new product on the

market (Harper, 2012). Not only is there a need to find new pharmaceutical products, in order to compete with lower income countries, but also to find a way to develop them in a way that is cheaper than the methods used today.

In order to increase creativity and innovativeness an understanding of what variables that can increase creativity and Innovativeness in the pharmaceutical industry is needed.

1.2 Problem discussion

Being creative is hard, especially in the pharmaceutical industry where creativity is depressed by internal and external demands for compliance (Willink, 2009). There is no known formula that can be applied in order to increase creative and innovative capability of a person or organization. While the formula for innovation might never be found there are several factors identified as likely to increase the innovative and creative capability of a person and organization (Egan, 2005). Studies have found that innovation and creativity can be enhanced by both external factors, such as Leadership, Role model, Team work, Feedback, Creative goal setting and internal personal traits, such as intelligence, interests and self-confident (Egan, 2005).

Given that the listed internal traits can be hard to effect in an organization and that all listed external factors are more or less associated with leadership and management it is clear that leadership have a huge opportunity to affect and increase creative thinking and thereby the innovative abilities of an organization. As such it is likely that leadership plays an important part for a high level of creativity also in the Swedish manufacturing pharmaceutical industry.

Leadership and management factors play a main role in creating the environment for employees' creativity. In many studies, leaders are deemed as an influencing factor that could affect the organizational climate for employees' creativity (Egan, 2005). A working environment that advocates risk-taking, transformation, and constant learning as a team is beneficial for the development of employees' creativity (Mumford & Simonton, 1997). Leaders can create the beneficial organizational climate for creativity through leadership behaviours, self-efficacy support and advocacy for independence (Tesluk, Farr & Klein, 1997). The democratic working style of leaders, their concern for employees and open attitude toward problems could also have a profound effect on employees' creativity. Organizational structure and work flow are also profoundly influenced by leaders which in turn interact with the work and possibilities of the employees (Redmond, Mumford&Teach, 1993). While the literature seems to show great support that leadership can increase creativity it is unclear if these finding are general for all markets and all industries.

Jung (2001) argued that leadership style has a direct and indirect effect on innovation. The direct effect is that the leaders cater to the original need of their subordinates, and motivate them to innovate. The indirect effect is that the leaders could create great innovation environment, freeing the employee from various pressure resulted from innovation failures. If fear of stepping outside the box in the Swedish manufacturing

pharmaceutical industry, due to the large cost of failure is a creativity depressing factor it is clear that a leader that frees the employee from the pressure of the results

Tierney, Farmer & Graen (1999) has shown that the leadership style of managers can increase employee intrinsic motivation and that intrinsic motivation in turn has a positive on creativity. As such there already existed support for Jung (2001) and his idea that leadership can have an indirect positive effect in innovation and creativity. While the studies performed by Tierney, Farmer & Graen (1999) show no support for how leadership promotes creativity in the pharmaceutical industry it supports the idea that leadership is important for creativity and that the leadership style of the managers is important.

One leadership styles that have been found to have a positive effect on creativity is called transformational leadership. Research results support the positive relationship between transformational leadership and organizational innovation (Jung, Chow, & Wu, 2003; Oke, Munshi, & Walumbwa, 2009). Many articles agree that transformational leadership improves innovation but it is rather unclear which factors of the transformational leader that are the most important and by which mechanism they improve innovation (Hu, Gu, & Chen., 2013) Several factors that might increase innovation through transformational leadership have been listen in various articles including increasing intrinsic motivation, empowering, reducing social inhibition of creativity, group structure, serving as a role model of creativity and organizational based self-esteem(Hu, Gu, & Chen., 2013; Jung, Wu, & Chow, 2008; Jung, Chow, & Wu, 2003). As such seems like that leadership style have an important effect on creativity in several markets and that the leadership style transformational can increase creativity. While it is unclear by which mechanisms this transformational leadership styles works by it seems like that it can be used as a factor to increase creativity in the pharmaceutical industry.

In the process of stimulating employees' creativity, transformational leadership is more effective than other leadership styles (Bennis & Nanus, 1985). Bennis and Nanus (1985) believe that the reason for this is that:

- General managerial personnel do the job in a right way; however transformational leaders do the right job.
- General managerial personnel only lead the team to established objective; however transformational leaders could extend influence and surpass general managerial personnel.
- Transformational leaders could spot new problems, find new solutions, encourage members and transform the organizational climate. Transformational leaders are not just playing an assistant role in creativity but also the key contributor during the process of creativity. Compared with team members, they could combine the ideas from members, discuss with them and put those ideas into practice.

While Bennis and Nanus (1985) is just speculations by with mechanisms that transformational leadership works by it seems reasonable that a leader that puts doing the right thing before doing it the right way can have a positive effect on creativity. Especially in a market such as the pharmaceutical industries where there are lots guidelines telling you to to things the right way instead of thinking for yourself.

Piccolo and Colquitt (2006) believe that transformational leaders broaden employee's horizon with their courage to challenge hypothesis and to take risks. They show concern to employee's need, improve their ability and skills, guide employee to strive for higher ideal of organizational vision instead of individual gain, and in this way, they lead the organization to accomplish transformation. Matzler (2008) pointed out that the leadership style at the highest management level has a direct influence on the innovation, growth and performance of an enterprise. He sampled from 300 innovation enterprises in Austria, and verified his hypothesis with structural equation model. Jung (2008) researched the direct and indirect effect of transformational leadership of CEO on enterprise innovation. Verified with modelling, he believed that there is a positive relationship between transformational leadership of CEO and organizational innovation. Transformational leadership have been found to increase innovativeness in pharmaceutical companies in Spain (García-Morales, Matías-Reche, & Hurtado-Torres, 2008). Given the support for that transformational leadership can increase creativity in different markets and the Spanish pharmaceutical industry it seems logical that transformational leadership also can increase creativity in Swedish pharmaceutical companies.

In order to promote creativity more efficiently, further studies are needed to understand which of the skills of the leader that are increasing the innovative capability of the individual and the organization. The practical importance of understanding how to promote creativity and innovativeness with leadership is easy to understand, Innovations leading to new products that can give advantages. If the mechanisms of leadership that promote innovativeness is known, these can be utilized to promote new products/services and sustain a competitive advantage through innovation. Further there is a need to verify that leadership have a positive effect on the innovative and creative ability in the Swedish pharmaceutical industry. To our knowledge no data exists that supports that leadership have a positive effect on creativity in this market.

1.3 Problem formulation and purpose

It is clear that creativity is important for organizations and that leadership style is important for how creative employees and organizations are. The leadership style transformational leadership have been found to be effecting creativity in the Spanish pharmaceutical industry. While it is unclear why transformational leadership increases creativity It is still likely that it can have a similar positive effect on creativity in the Swedish manufacturing pharmaceutical industry. The research questions in this thesis can thereby be stated as following

Is transformational leadership an antecedent of innovativeness and creativity in the Swedish pharmaceutical industry? If it does, is it mediated by any other antecedents?

The primary goal of this thesis is to investigate if a higher level of creativity and innovativeness in the Swedish manufacturing pharmaceutical companies can be associated with a higher level of transformational leadership. Secondary goals are to understand if transformational leadership's effect on creativity (if any) is mediated by other variables.

The purpose of the primary goal is to investigate if transformational leadership increases creativity and innovativeness in the Swedish manufacturing pharmaceutical industry. If transformational leadership can increase creativity and innovativeness it can be used as a tool for increasing creativity in this market. If it is not associated with a higher level of creativity, other methods are needed to increase creativity in this market.

The purpose of the second goal is to deepen the knowledge about how transformational leadership influence creativity and innovativeness since it is rather unclear why transformational leadership have this positive effect on creativity (Jung, Chow, & Wu, 2003; Oke, Munshi, & Walumbwa, 2009).

1.4 De-limitations

There are many variables that are likely to mediate the effect of transformational leadership on creativity and innovativeness of an organization, this thesis will therefore be limited in the sense how many variables that are investigated as mediators.

1.5 Thesis structure

This thesis consist of five major part presented in the following order for the ease of the reader.

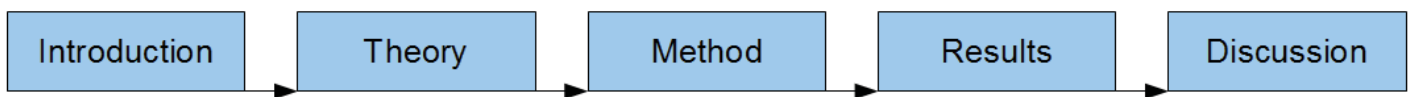


Illustration 1.1: Thesis structure

The first part highlights the research area and why innovations are important, especially why it is important in the Swedish pharmaceutical industry. The introduction also presents the theoretical framework used in this thesis. It gives a discussion into how leadership and other variables can promote creativity. This leads up to the research question with its limitations and a motivation to why this study is important and how the results can be used.

In the second part, theory of creativity, leadership and transformational leadership is presented. In the section about creativity factors are highlighted that can be affected by outside sources such as leadership. In the leadership section transformational leadership is presented as well as theories on how transformational leadership can be used to increase the creativity of organizations in different markets/industries. The theory section ends with clear a hypothesis that is derived from the information presented in the section.

The third part motivates the choice of research method and a description of how data for the empirical study and theory part was collected. The measurements used to investigate the hypothesis are presented. The unit of analyses is presented as well as the method to collect the measurements. Lastly, the method part gives a general explanation on how the data was analysed.

In the results section the data collected from the questionnaire is presented and described with text and figures. The result section contains all analyses of the data. Major findings are presented but not discussed.

The last and final section is the discussion section. This section will discuss the current findings and compare them with previous findings. The discussion contains suggestions for further research as well as any limitations in the results. References and appendixes are included after the main thesis.

2. Theory

The theory section is composed of two major areas. The first part is regarding creativity and innovativeness, section 2.1-2.3. The second part is aimed towards leadership and transformational leadership, section 2.4-2.7.

2.1 The Definition of Creativity

In 1950, J.P. Guilford was elected as the President of the American Psychological Association (APA), in his inauguration speech which was themed on creativity. Guilford emphasized the significance of creativity and advocated intensive research on creativity in academic circle (Guilford, 1950). Since then, creativity has received increased attention in psychological academia. As for the definition of creativity, scholars uphold different viewpoints resulting from different research interests and perspectives. In 1961, Rhodes collected the literature's about the definitions of creativity and defined four elements (the four P) of creativity, namely, *Person, Process, Product* and *Place* (Rhodes, 1961). Although scholars still have no unanimous opinion about creativity, most scholars deem the *Product* as the sole criteria when evaluating creativity.

After reviewing the definitions of creativity, Mayer found that most scholars believe that we can approach creativity from the perspective of Product (Mayer, 1999). Despite different descriptions, they agree that a creative product should have two primary features:

1. Novel: the relevant descriptive words include new, originality, original and so on.
2. Usefulness: the relevant descriptive words include valuable, appropriate, significant, adaptive, utility and the like.

Therefore, if we approach from the perspective of Product, creativity can be simply defined as: The ability to create novel and valuable products.

In this thesis creativity is held separate from innovativeness, which is the skill that brings the new product/service to the market.

Creativity = the ability to think of novel and valuable products/services.

Innovativeness = the ability to get a new a product to the market

2.2 Individual creativity and intrinsic motivation

Amabile brought forward the componential theory of creativity from the perspective of **Product** to describe the working environment components that affect creativity and made revisions and additions to the original componential model (Amabile, 1996, 1983). It was argued that creativity is composed of domain-relevant skills, creativity-relevant processes and task motivation (Amabile, 1983). During the process of creation, there are constant interactions among those three components, which will affect the individual creativity. The more they overlap, the higher the individual creativity will be. Amabile integrated previous research on the three elements of creativity and came up with a framework of creativity to describe how these components affect different steps in the process of creation (Amabile, 1983). In the 1996 revision of the framework, the effect of social environment on motivation was added to the componential theory (Amabile, 1996). It was suggested that the social environment can affect motivation and then affect individual creativity.

In the investment theory of creativity, motivation is deemed as one of the six resources required by creativity (Sternberg & Lubart, 1991). The authors of the theory believe that we need the assistance from other resources in order to motivate the hidden creative potential in individual. Those resources are as follows: **Intellectual Abilities, Knowledge, Styles of Thinking, Personality, Motivation and Environment** (Sternberg & Lubart, 1991). Motivation can be extrinsic, for instance, money, power and reputation, and also intrinsic like self-expression, self-challenge. Both extrinsic and intrinsic motivations can motivate individuals and make them concentrate on their work. However, intrinsic motivation is more important for a creative individual. Sternberg & Lubart states that intrinsic motivation is especially important for creativity, only when driven by intrinsic motivation, could one immerse himself/herself in his/her work and find pleasure doing it (Sternberg & Lubart, 1991). It is also believed that environmental components play a great important role during work processes, because creativity is a product of interaction between human and environment. Some environmental components will stimulate creativity, while others strangle creativity. Therefore, environmental components, including working environment and leadership, can be seen as the environmental variables that could affect creativity (Sternberg & Lubart, 1991).

It has been argued that intrinsic motivation is the most important personality component contributing to creativity (Feldman, Csikszentmihalyi, Gardner, 1994). They stated that that the combination of higher level intrinsic motivation and lower level extrinsic motivation could make a creative individual more independent in his work and less vulnerable to the external pressure and thereby increasing creativity. Intensive interest and curiosity to meet targets and remain persistence during problem-solving process is driven by the intrinsic award experience in information processing (Feldman, Csikszentmihalyi, Gardner, 1994).

From the above theoretical discussions, researchers come to an agreement that intrinsic motivation is conducive to the individual creativity. In addition, numerous empirical researches also verify the conclusion of the theoretical analysis (Amabile, 1985; Dewett, 2007).

Intrinsic motivation promotes the individual creativity performance because intrinsic motivation can evoke individual interest in his or her work and affect his or her devotion to the work. Secondly, intrinsic motivation encourages creative individual to pursue challenging tasks. Thirdly, intrinsic motivation promotes the persistence of an individual when solving an issue (Amabile, 1996; Mayer, 1999; Woodman, Sawyer, & Griffin, 1993).

Both theoretical and empirical researches show that intrinsic motivation is conducive to the individual creativity performance. Extrinsic motivation on the other hand yields negative influence on the individual creativity performance (Amabile, 1983).

2.3 Individual Creativity and Psychological Empowerment

Psychological empowerment is a mental state, the concrete manifestation of employee's intrinsic motivation. It reflects the effects of managerial behaviours and organizational environment in the employee and is directly influenced by leadership behaviours (Conger, 1989). It is the sense of perceived control felt by the employee.

Employee empowerment research priorities of early enterprise managerial personnel and organizational behavior lie in the empowerment from superior to subordinates, to provide more information and resources for subordinates. However, in recent years, researchers have shifted attention to the psychological level, to the spiritual motivation function of the empowerment itself. Conger & Kanungo from the McGill University argued that empowerment itself has a profound self-efficacy motivation connotation, it is a dynamic process during which an individual enhance self-efficacy in the organization (Conger & Kanungo, 1988).

Psychological empowerment is related with individual elasticity, and could thus motivate individual creativity (Thomas & Velthouse, 1990). It has been found that there is a significant correlation between empowerment and creative behaviour (Fulford & Enz, 1995). It has been shown through empirical research that there is a positive correlation between psychological empowerment and creative behaviour: the higher the psychological empowerment level is, the more creative the behaviour will be (Spreitzer, 1995).

Psychological empowered employees will consider themselves more capable and competent, and believe their work is of more significance (Bell & Staw, 1989). In addition, they could autonomously determine their working method, rhythm and the level of effort. Therefore, the empowered employees will perceive the support from the leader and organization for their creative work; they will accomplish the work in their own way rather than worry about they work will not be recognized.

2.4 The history of Leadership Theory

Leadership science refers to the theoretical studies on leadership effectiveness (House, 1971). Therefore the core of leadership theoretical research lies in the factors that will influence leadership effectiveness and the methods to enhance leadership effectiveness. Scholars have compiled numerous books on leadership

research; they hold similar opinion about the evolution and development of leadership research, which can be divided into four stages.

2.4.1 Trait Theory

Since the leadership behaviour is, first of all, associated with the individual leader, the leadership theory began with the study on personality of the leader (Eysenck, 1963). Trait Theory was well-known in this stage. According to Trait Theory, leaders are endowed with a gift or talent in at least one certain area; successful leaders have some traits in common in. However, some scholars argued that traits are only the basic requirements for leaders; experience and correct judgment on environment are also crucial to bring those factors into full play. Nevertheless, the Trait Theory has offered some standards and criteria to cultivate, train and select leaders (Eysenck, 1963).

2.4.2 Behaviour Theory

The Behaviour Theory shifted the focus on the influence of leadership style to the effectiveness of leadership. The purpose of it is to enhance the predictability and control of various leader behaviours and then improve work methods and leader effect.

Bowers and Seashore states that the main objective of research on leader behaviours is to find the type of leadership behaviour, the relationship between different behaviours types, and leadership effectiveness (Bowers & Seashore, 1966). Led by Professor Stogdill, the Ohio State University adopted the method of questionnaire, screened and identified two independent structures of leader behaviour: Initiating Structure and Consideration Structure (Stogdill, 1981).

Behaviour Theory has shown the relationship between leadership style and working productivity. Behaviour theory focused more emphasis on leadership style than the traits of the leader. It emphasizes the importance of leadership training and also helps us to understand different leader behaviour. The research object of the theory is the middle-low class management personnel which carried out by House and Aditya (House & Aditya, 1997). The sampling is somewhat one-sided; like the Trait Theory, the Behaviour Theory is a static research that focuses on leader behaviour regardless of the environmental factors that will affect the leadership. Therefore, the Behaviour Theory just provided a simple perspective to analyse the highly complicated leadership process and thus is of limited guiding significance.

2.4.3 Contingency and Situational Theory

According to Contingency Theory, leadership effectiveness is the function of the interaction between the leader, the subordinates, and the environment. The effectiveness of the leadership depends on the ability of the leader, the practical situation of his subordinates and the environment. During this stage, the researchers focused on the environmental factors that will influence the effectiveness of the leadership such as work task, organization type, and subordinates' traits and so on (Fernandez & Vecchio, 1997).

The representative researches include Fiedler's Contingency Model; Situational Leadership Theory by Hersey and Blanchard; Path-Goal Theory of House (Fiedler, 1964; Hersey & Blanchard, 1993; House, 1971). The advantage of Contingency Theory is that it could add more influencing factors or explanatory variables into the three-dimensional and concrete interpretation model of leadership, and make up the deficiencies of Trait Theory and Behaviour Theory to some extent. Although Fiedler's Contingency Model is supported by experimental researches, it still lacks of evidence from field researches. Situational Leadership Theory of Hersey and Blanchard meets the intuitive expectation of ordinary people, yet lacks of the support from empirical researches. In addition, some other researches have shown that in many cases, the effectiveness of leadership is confined by environmental factors, which prevents the leader from having a full play (Hersay, 1993). Researchers cannot find a universal criterion to judge the leadership effectiveness in different circumstances.

2.4.4 Integrative or Multi-Dimensional Theory

With the development of world economy, the acceleration of technical innovation and the increasingly competitive market after 1980s, the researchers began to study the various factors that will influence the leadership effectiveness from more perspectives. Many leadership theories were conceived such as Attribution Theory of Leadership, Charismatic Leadership Theory, Transactional Leadership, Transformational Leadership Theory, Self-leadership Theory and Super-leadership Theory and so forth (Bass, 1990.; Kelley & Michela, 1980; Manz & Sims, 1991). Some of those theories are the development and integration of the previous theories; some others are the different understanding and interpretation of new leadership environments, all have led to an increased understanding of leadership theories.

2.4.5 Attribution Theory of Leadership

According to Attribution Theory of Leadership, the basis of leadership is the attribution of people's behaviour, and the leadership is actually the response to the different attributions. The meanings that the leaders attach to subordinates' behaviours will lead to corresponding leader behaviours. Thus, how to identify the reason for peoples' behaviour is of great importance for leaders. An effective leader should identify the reasons behind subordinates' behaviour and then take action accordingly. By observing the employees during the work, a leader should collect the information about their behaviours and then identify the reasons for their

behaviours. According to the individual attribution (in-exertion, disloyalty or incompetence), situational attribution (poor facilities, unreasonable schedule or poorly designed work flow) and so on, the leader should take necessary management actions to address these problems. If leaders have different interpretations for the poor or good performance of their employees, they are certain to take different measures (Kelley & Michela, 1980).

2.4.6 Charismatic Leadership Theory

Charismatic Leadership Theory is the extension of the Attribution Theory, which means that the subordinates tend to attribute the action taken by the leader to his great and outstanding leadership ability. Some researchers tried to summarize the personality characteristics of charismatic leaders. Robert House has identified three characteristics: envisioning, energizing and enabling (House & Aditya, 1997). Conger, Rabindra and Kanungo from McGill University also found seven traits of charismatic leaders: confidence, vision, ability to expression the objective and environmental sensitivity (Conger & Kanungo, 1988). Studies have shown that charismatic leaders could encourage employees to devote more efforts in work, achieve better performance and make them more satisfied.

2.4.7 Transactional Leadership to Transformational Leadership Theory

Transactional leadership means that there are a series of exchanges and implicit contract between the leader and followers. The leader exchange tangible rewards for the work and loyalty of followers. The process seems like a transaction (Judge & Piccolo, 2004). While, the transformational leaders are leaders who instil ideas and moral values into employees and inspire them. They raise consciousness above individual interest to organizational interest, which yields lasting and unusual influence on the subordinates. They show concerns about the daily life and development needs of every subordinate; they help subordinates to view old problem with new concept and thus change their opinions on the problem; they are able to encourage and inspire subordinates to devote more efforts to achieve group goal (Bass, 1990).

Downtown states that transactional leadership and transformational leadership are different in terms of assumption about human nature, behaviour guidance, working manner and degree of innovation (Downtown, 1973). Transactional leadership advocates that human is driven by profit, thus the money is the best stimulant. Transformational leadership emphasizes the social attribute of human, and employs socialized methods to encourage human and elevate employees' organizational identification. Transactional leaders adapt clear performance standards to set up target of group work and highlight the speed and efficiency to achieve the target. Transformational leaders uphold individualized management, they pay attention to the psychological status of their employees and offer concern, guidance and suggestions according to individual difference (Downtown, 1973).

In terms of working manner, transactional leaders pay close attention to process monitoring and correct subordinates' behaviours. Transformational leaders inspire subordinates with a grand prospect and have positive influence on them with personal charisma. Transactional leaders emphasize stability, sustainability and well-aligned working process in the established environment. Transformational leaders embrace challenges and new strategies, they encourage subordinates to think outside of the box. Numerous studies on the officers in American, Canadian and German army have shown that transformational leaders received better assessment than transactional leaders at every level (Bass, 1999). In FedEx Express, the managers who are deemed as the transformational leaders by subordinates are evaluated by their immediate supervisors as well-performed workers deserving promotion.

2.5 Transformational leadership

2.5.1 The history and background of Transformational Leadership

The idea of the transforming (later *transformational*) leader was introduced 1978 by James Burns (Burns, 1978). In his book from the same year Burns state that the transforming leadership is when

“One or more persons engage with others in such a way that leaders and followers raise one another to higher levels of motivation and morality”.

A transforming leader is a person that can lift followers and leaders to the best of their abilities. Burns started to view leadership as something more than just giving and following orders, how the chess player moves the pawns on the chess table. He started to view leadership as the leader's personality and ability to make followers rise to a higher ability by charisma and through example (Burns, 1978). The word itself, transformational leadership, was first mentioned by Downtown in 1973 (Downtown, 1973).

The idea of the transforming leader was later developed to the transformational leader by Bass (Bass, 1985). He identified three key steps that can lift followers above their own motivational level.

First; the ability to raise the value and importance of reaching a designated outcome and suggesting ways for reaching these outcomes. Second, the ability to paint a bigger picture, to raise followers above and beyond simple personal interest or simply to make follower work for the team or the organization. Third, the ability to raise people from one level to the next on Maslow's hierarchy of needs, for example from self-esteem to self-actualization (Bass, 1985).

In order to promote these three key steps the transformational leader needs four skills *Intellectual stimulation, individual consideration, inspirational leadership and idealized influence* (Bass, 1985, 1999).

2.5.2 Intellectual stimulation

Intellectual stimulation can be seen as to which degree and how the leader challenges assumptions (Judge & Piccolo, 2004). How the leader talks about a problem and its solution. It is everything that makes the followers think about a problem in a new light, from a new direction with new solutions and possibilities. Intellectual stimulation is not meant to be an emotional stimulation; it strictly should concern the intellect (Bass, 1985).

A leader can stimulate follower's intellects by talking about and visualizing issues such as treats, opportunities, weaknesses and advantages the organization has. For bigger and more complex organizations it is important that the leader facilitates the problem-solving process in such ways that all issues and problems are solved and thereby getting the commitment of the whole organization. A transformational leader is likely to challenge the status quo in an organization; they want to challenge and improve even working systems. They are likely to suggest solutions that are innovative even if it comes with a bigger risk (Bass, 1985).

2.5.3 Individual consideration

Individual consideration is the ability to see each follower as a unique person. Among other things, individual consideration impels that the leader knows the name of the follower, it impels that the leader maintain face to face contact with the follower. Several companies have understood the worth of maintaining face to face contact across the organization. The reason behind this is that all employees have a unique and important point of view. A newly educated employee will be the most up to date on technical advances while an experienced employee will have the best knowledge about how the company works. Studies indicate that face to face contact is the most important information factor for decision making in organizations (Bass, 1985).

Further examples of individual consideration are when the leader keeps employees fully informed through personal communications. With this practice employees will feel more like a part of the organization. The personal communication also helps managers to know about employee's concerns and it helps to clarify communication (Bass, 1985).

The transformational leader tries to evaluate all of his or her followers and gives them tasks which offer a suitable challenge for the follower. The leader sees not only the present skills of the follower but also how they can develop to new skills. To always challenge the followers is an important trait of the transformational leader since it is an important basis for personal development of the follower. Individual consideration also implies that the leader serve as a role model for the followers (Bass, 1985).

2.5.4 Inspiration leadership & Idealized influenced

Charisma is an important trait of a leader and the most important trait of the transformational leader. A charismatic leader can increase respect, loyalty and enthusiasm for a task "simply" by being them self. Leaders with high charisma can make follower proud and increase the follower abilities to overcome obstacle. Charisma is a skill that does not come with a position but rather separates a leader from a manager and is unique to each person. Inspirational leadership is emotional, it is meant to touch people's emotions and thereby exalt people to perform better. Inspiration through emotions can be achieved in several different ways, some followers become inspired by arguments while others become inspired by knowing that they will help others. Inspiration will help followers to perform better by giving them emotional support and appeals (Bass, 1985).

As similar to being inspirational the transformational leader also increases performance by setting an example by his own actions. Setting an example as leader is meant to inspire follower as inspiration leadership meant to touch follower's emotions. The idealized influence can be achieved by a leader by describing how things can be and visualizing a way to reach it (Bass, 1999).

2.5.5 Transformational leadership today.

Today transformational leadership is recognized as its own leadership styles. Rising our view above the personal level to organizational level more positive effects of the transformational leader can be found. Studies about Transformational leadership ability to inspire creativity of the individual employees and the overall innovation capability of an enterprise can be found (Jung et al., 2003; Oke, Munshi, & Walumbwa, 2009). Studies have found that organizational responsibilities among followers increase with transformation leadership due to increased motivation and increased organizational citizenship (DuBrin, 2013, p. 129). The organizational citizenship have several positive effects on the organization such as that the individuals of the organization help each other without expecting a reward. There are also a few newer studies that have shown that transformational leadership have a positive correlation with intrinsic motivation (Jae-Shin & Zhou, 2014; Zhang & Bartol, 2010).

Other studies of transformational leadership reports that the main finding of transformational leaders is a higher job satisfaction from the followers as well as a higher organizational performance (DuBrin, 2013, p. 129). Comparing transformational leadership with more traditional leadership styles one can see that a difference is that transformational leadership is more about charisma of the leader and focuses much on emotions and how employees feel. The transformational leader puts his/her followers first. By placing the employee first the leader can encourage them further since they will feel appreciated and motivated (DuBrin, 2013, p. 129). As similar studies have also shown that transformational leadership can have a positive effect on psychological empowering (Zhang & Bartol, 2010).

As such close to almost all authorities is in agreement that transformational leadership have positive effects on organization and on innovativeness. While they agree that the effects are there, very few studies have investigated how transformational leadership increases innovation. Garcia-Morale et al reported in 2008 that learning outcome might be one way in which transformational leadership influence innovation (García-Morales et al., 2008). Apart from that there are few reports on the area.

2.6 Summary of Leadership Theory

We draw the following conclusions from a century worth of leadership theory development.

The development of leadership theory follows the principle of gradual improvement from simple to complex, from isolated to systemic. The research paradigm of leadership theory has extended from a simple trait, skill and leader behaviour investigation, to a multilevel and multi-oriented comprehensive research field. The research on leadership theory grows to become open and pluralistic instead of being closed and singular.

Trait Theory focuses on leaders themselves, trying to find the common traits of leaders by observing the personality, physiological and intellectual elements of the leaders.

Behaviour Theory shifted the focus from the traits of leaders to the leader behaviour, a major step to an open leadership ideology.

Contingency Theory takes environmental factors into account, believing that there is no universal leadership model and the leadership effectiveness is the result of interaction between leader behaviour and environmental variables.

The New Leadership Theory, which is represented by **Transformational Leadership Theory**, ushered in an open and pluralistic research prospect of leadership theory. The emergence of Transformational Leadership Theory brings a drastic change to leadership style. From Trait Theory to Behaviour Theory, and then to Contingency Theory, the main points of leadership theory research are leaders, environment or subordinates; with the ultimate purpose to enhance leadership effectiveness. However, Transformational Leadership Theory subverted such tradition and shifted the focus on followers.

The Transformational Leadership Theory attempts to interpret how successful leaders lead their teams to accomplish arduous tasks, how they motivate their subordinates and garner their trust and loyalty. It emphasizes emotional leader behaviour (e.g. express vision, individual support, role model, risk-taking and cognitive leader behaviour as well (e.g. intellectual stimulation, elastic response). Besides the conventional dependent variables of subordinates like satisfaction and performance, the theory also adopt other variables like the sense of self-respect, motivation, emotion, sense of identification with the leader and organizations. This theory no longer focus merely on leaders themselves, instead it can be held as a much broader theory that takes all parties during leadership and environmental elements into account. Therefore, the transformational theory is much broader.

In Transformational Leadership Theory, the leaders are not dictators; instead they should act as forerunners and mentors along the way to achieve the organizational goal. The leaders should improve the democratic awareness, moral responsibility and individual quality of the followers, and turn the followers the better leaders to have them make contribution to the organizational goal. Therefore, Transformational Leadership Theory is an inevitable evolution of leadership theory and also the embodiment of social democratic advance,

because with the social modernization, bureaucratization structure will be replaced by flat and networked structure, narrowing distances between leader and subordinate will lead to the decentralization of leadership, which entails the breakdown of the original pyramid structure and thorough reform of leadership style.

The two major findings in the creativity theory part are that intrinsic motivation and psychological empowering are factors that can increase creativity and innovation. Both are psychological factors and are as such likely to be effected by the environment in which a person is working. Transformational leadership has been found not only to increase motivation and job satisfaction but also creativity, just as intrinsic motivation and psychological empowering. It is likely that transformational leadership increases psychological empowerment since the leaders uses individual considerations and are therefore, for example, unlikely to give a task that the follower cannot complete and thus increasing their empowerment. Similar by giving a task to a follower that has a high intrinsic motivation for the task it is more likely that the follower produce a good result. We therefore speculate that intrinsic motivation and psychological empowering might be two factors that transformation leadership increase and that those in turn increase creativity and innovativeness.

2.7 Theoretical framework

Several factors have been identified in the literature review that is likely to increase creativity in any given market. Since it is not possibly to investigate all factors listed in, for example, the articles of Amabile (1983) and Egan (2005) this thesis will focus on three factors that have been found to increase creativity and are likely to do so in the pharmaceutical industry as well. These three factors are Leadership, Intrinsic motivation and Psychological empowerment. These factors were chosen since they have earlier been shown to have a positive effect on creativity in several markets (García-Morales, Matías-Reche, & Hurtado-Torres, 2008; Zhang & Bartol, 2010; Gumusluoglu & Ilsev, 2009; Jae-Shin & Zhou, 2014). However no data supports that they have an specific effect in the Swedish manufacturing pharmaceutical industry.

Several researchers have argued that there is a difference in how well different leadership styles are at improving creativity (Bennis & Nanus, 1985, Jung 2008). As such it seems possible to increase creativity by “choosing” the correct leadership style. Several articles draw the same conclusion that transformational leadership is the superior leadership style when it comes to increasing creativity and innovativeness (Bennis & Nanus, 1985; Jung, Chow, & Wu, 2003; Oke, Munshi, & Walumbwa, 2009). Since transformational leadership seems to be the superior leadership style when it comes to increasing creativity this thesis main purpose is to investigate the effect of transformational leadership on creativity in the Swedish manufacturing pharmaceutical industry.. No studies have previously, to our knowledge, tested if transformational leadership increases creativity and innovativeness in the Swedish manufacturing pharmaceutical industry.

One of the effects of transformational leadership found in the literature review is that it have been shown to increase intrinsic motivation and psychological empowering (Zhang & Bartol, 2010). As such there is a chance that transformational leadership’s effect on creativity is mediated by an increase in intrinsic motivation or psychological empowering. The reason behind this might be derived from the similarities that are found

between intrinsic motivation and the transformational leader. A transformational leader that tries to motivate his employees is bound to have at least some effect on the motivation of the employees, Similar likenesses can be see between psychological empowering and transformational leaders. A leader that does he's bes0 to support his followers is bound to found and improve some responsibilities for the followers. Therefore it is of interest to know if this is how transformational leadership increases creativity in the investigated market or if there are other transformational leader traits that are more important. In turn both intrinsic motivation and psychological empowering have been found to increase creativity in several markets (Spreitzer, 1995; Fulford & Enz, 1995; Dewett, 2007). As such it is of interest to know if these variables can improve creativity in the Swedish manufacturing pharmaceutical industry by themselves.

Several studies have found a link between creativity, transformational leadership, intrinsic motivation and psychological empowering in a variety of industries and countries. While most studies agree that transformational leadership increases creativity there is at least one exception (Gumusluoglu & Ilsev, 2009). Also several studies have identified that psychological empowerment and intrinsic motivation can be increased by transformational leadership and in turn increase creativity. See table 2.1 for an overview of previous finding of creativity, transformational leadership, intrinsic motivation and psychological empowering.

Author	Transformational leadership*	Creativity*	Psychological empowerment* (PE) or Intrinsic Motivation* (IM) as mediator	Industry	Country
(García-Morales, Matías-Reche, & Hurtado-Torres, 2008)	+	+	N/A	Pharmaceutical	Spain
(Gumusluoglu & Ilsev, 2009)	+	-	(IM) N/A (PE) +	Software	Turkey
(Jung, Chow, & Wu, 2003)	+	+	(IM) N/A (PE)+	Telecom	Taiwan
(Jaskyte, 2004)	+	+	N/A	Non-profit	U.S.A
(Cheung & Wong, 2011)	+	+	N/A	Service industry	China, (Hong kong)
(Pieterse, van Knippenberg, Schippers, & Stam, 2010)	+	+	(IM) N/A (PE) +	Governmental workers	Holland
(Jae-Shin & Zhou, 2014)	+	+	(IM) + (PE) N/A	Korean companies	Korea
(Zhang & Bartol, 2010)	+	+	(IM) + (PE) +	Information technology	China

Table 2.1: Summary of previous findings from studies investigating creativity, transformational leadership, intrinsic motivation and psychological empowering.

**A + sign means a positive link between transformational leadership, creativity and/or psychological empowerment/intrinsic motivation. A – sign means that there is no correlation.*

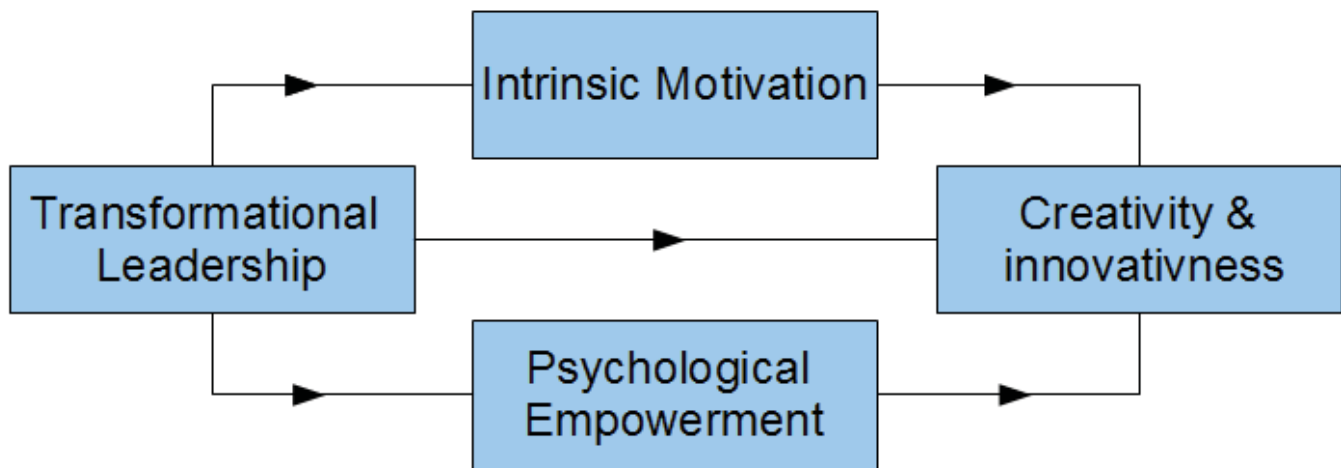


Illustration 2.1: Theoretical framework. The illustration is inspired by the work of Amabile, 1983; Egan, 2005; Zhang & Bartol, 2010

Given the above discussion and literature findings the theoretical framework for this thesis is set. The three variables chosen to investigate as likely antecedents to creativity and/or innovativeness are transformational leadership, intrinsic motivation and psychological empowerment. The support for that these variables are important in order to increase creativity is big. Given the general positive effect of transformational leadership, intrinsic motivation and psychological empowerment on creativity it is likely that that they also have a positive effect in the investigated market. Further, It is likely that intrinsic motivation and psychological empowering are mediators of the effect that transformational leadership has on creativity and innovativeness. Support for that intrinsic motivation and psychological empowering are mediators of transformational leadership is found in several studies presented in table 2.1. The theoretical framework is summarized in illustration 2.1.

While creativity and innovativeness is important for companies performance is usually more important. This thesis will therefore record and investigate if creativity/innovativeness is related to performance. How and why creativity and innovativeness is related to performance is however outside the scoop of this thesis.

2.8 Hypothesis's building

The literature review shows that there is a lot of research performed on creativity, intrinsic motivation, psychological empowering, leadership and transformational leadership over the years. While no information was found on the effect of transformational leadership on creativity in the Swedish manufacturing pharmaceutical industry several studies have been performed on the subject but in other countries and other

markets. In the following sections hypothesis will be formulated based on the theoretical framework presented in section 2.7.

2.8.1 Transformational leadership hypothesis's

Transformational leadership was first described by Burns (1978). Since then Transformational leadership have been acknowledge as its own leadership style and been studied in several studies. While the core idea of transformational leadership when it was presented by Burns (1978) was to increase morality and motivation of the employees it has since then been given a wider definition and more traits (Bass, 1985, 1999). In the later years it have receive attention due to that several studies have linked transformational leadership with an increased level of creativity and innovative capability of organizations (Jung et al., 2003; Oke, Munshi, & Walumbwa, 2009). While these studies have not been related to the Swedish manufacturing pharmaceutical industry they give support for the idea that transformational leadership is associated with a higher level of creativity and innovativeness. The theoretical framework presented in illustration 2.1 further supports the idea that transformational leadership can increase creativity and innovativeness. While the theoretical framework gives support for that Transformational leadership increases creativity there are markets where it could not be confirmed that transformational leadership had an effect on creativity (Gumusluoglu & Ilsev, 2009). As such it is of great interest to investigate if transformational leadership have a positive effect in the investigated market. If transformational leadership have a positive affect it can be used as a tool to increase creativity and innovativeness in the Swedish manufacturing pharmaceutical industry. This leads to the first two hypotheses of this thesis:

h1a: transformational leadership is positively correlated with a higher level of innovativeness

h1b: Transformational leadership is positively correlated with a higher level of creativity

Continuing from the ideas presented by Burns (1978) that transformational leadership can increase motivation of employees and organization we find similarities with the ideas presented by Sternberg & Lubart (1991), that motivation is important for creativity. Motivation can be separated as external and intrinsic. Of these two evidence points towards that the intrinsic motivation is important for creative ability (Feldman, Csikszentmihalyi, Gardner, 1994). The theoretical framework presented in illustration 2.1 supports the idea that transformational leadership can increase intrinsic motivation of the employees. While all studies presented in table 2.1 either says nothing about intrinsic motivation or supports the idea that transformational leadership increases intrinsic motivation the issue have not priory been investigated in the Swedish manufacturing pharmaceutical industry. If there is a stronger correlation between transformational leadership and intrinsic motivation it is likely that the effect of transformation leadership on creativity can be mediated by an increase in intrinsic motivation. This information can be useful since it can give an increased knowledge about which skills of the transformational leader that are of the most importance for increasing creativity. This leads us to the third hypothesis in this thesis:

h1c: Transformational leadership is positively correlated with a higher level of intrinsic motivation

The idea of the transformational leader was later developed by Bass (1985) when he introduced that the transformational leader applies individual consideration. Among other things the individual consideration implies that the leader keeps the employee fully informed (Bass, 1985). This is very similar to the idea presented by Conger (1989), that communication increases psychological empowering and is directly influenced by leadership behaviours. In turn psychological empowering has been found to increase creative behaviour (Spreitzer, 1995). The theoretical framework presented in illustration 2.1 supports the idea that transformational leadership can increase the level of psychological empowerment in the organization. While all studies presented in the framework either says nothing about psychological empowerment or supports the idea that transformational leadership increases intrinsic motivation the issue have not priory been investigated in the Swedish manufacturing pharmaceutical industry. If there is a stronger correlation between transformational leadership and psychological empowerment it is likely that the effect of transformation leadership on creativity can be mediated by an increase in psychological empowerment. This information can be useful since it can give an increased knowledge about which skills of the transformational leader that are of the most importance for creativity. This leads us to the fourth hypothesis of this thesis:

h1d: Transformational leadership is positively correlated with a higher level of Psychological empowerment

2.8.2 Intrinsic motivation hypothesis's

Intrinsic motivation has been argued to be the most important factor for individual creativity (Feldman, Csikszentmihalyi, Gardner, 1994). While it is hard to decide which factor that is the most important for creativity studies have found that intrinsic motivation is positively related to creativity in several markets (Amabile, 1985; Dewett, 2007). The theoretical framework presented in illustration 2.1 supports the idea that intrinsic motivation is important for and can increase creativity. While no support have been found for that Intrinsic motivation is important for creativity in the Swedish manufacturing pharmaceutical industry it is likely that this market behaves similar as to the previous studies in other markets. If intrinsic motivation is found as a creativity enhancing variable it can be used by companies to increase creativity. While intrinsic motivation might be hard to increase in an employee there are several studies that supports that transformational leadership can have a positive effect on intrinsic motivation (Jae-Shin & Zhou, 2014; Zhang & Bartol, 2010). Even if it was impossible to affect the level of intrinsic motivation organizations can use the knowledge if they want to hire new creative employees. This leads to the fifth and sixth hypothesis's presented in this thesis:

h2a: Intrinsic motivation is positively correlated with a higher level of innovativeness

h2b: Intrinsic motivation is positively correlated with a higher level of creativity

2.8.3 Psychological empowerment hypothesis's

Several studies have found that there is a significant correlation between empowerment and creative behaviour (Spreitzer, 1995; Fulford & Enz, 1995). The higher the psychological empowerment levels the higher the creative behaviour (Spreitzer, 1995). While these studies were performed in other countries and industries it is likely that similar results can be found in the Swedish manufacturing pharmaceutical industry. The theoretical framework presented in illustration 2.1 supports the idea that psychological empowerment is important for and can increase creativity. If psychological empowerment is found to be important for creativity it can be used in order to increase creativity. Studies point out that psychological empowerment is directly influenced by leadership (Conger, 1989). One leadership style that has been shown to be positively correlated with psychological empowerment is transformational leadership (Pieterse, van Knippen berg, Schippers, & Stam, 2010). As such companies could train their leaders in transformation leadership in order to increase psychological empowerment and thereby creativity in the organization. If this holds true for the Swedish manufacturing pharmaceutical industry remains to be tested. This leads us to the 7th and 8th hypothesis's presented in this thesis.

h3a: Psychological empowerment is positively correlated with a higher level of innovativeness

h3b: Psychological empowerment is positively correlated with a higher level of creativity

2.8.4 Creativity and performance hypothesis's

While the investigated issue in this thesis is to investigate if there are known creative increasing variables that can be applied in the Swedish manufacturing pharmaceutical industry to increase creativity, most companies are likely to be interested if a higher level of creativity/innovativeness is associated with higher performance. As such the variable performance is added to the study in order to control for if creativity/innovativeness is important for the success of the company. This leads us to the 9th and 10th hypotheses of this thesis:

H4: innovativeness is positively correlated with Performance

H5: creativity is positively correlated with Performance

While these two hypotheses have no support in the proposed theoretical framework, they will be recorded given the above mentioned motivation, that performance is an important factor for organizations.

2.8.5 Summary of hypothesis's

The 10 stated hypothesis's are presented and summarized in illustration 2.2. As described in illustration 2.2 all but transformational leadership have dependencies and are therefore seen as dependent variables. Transformational leadership is seen as an independent variable.

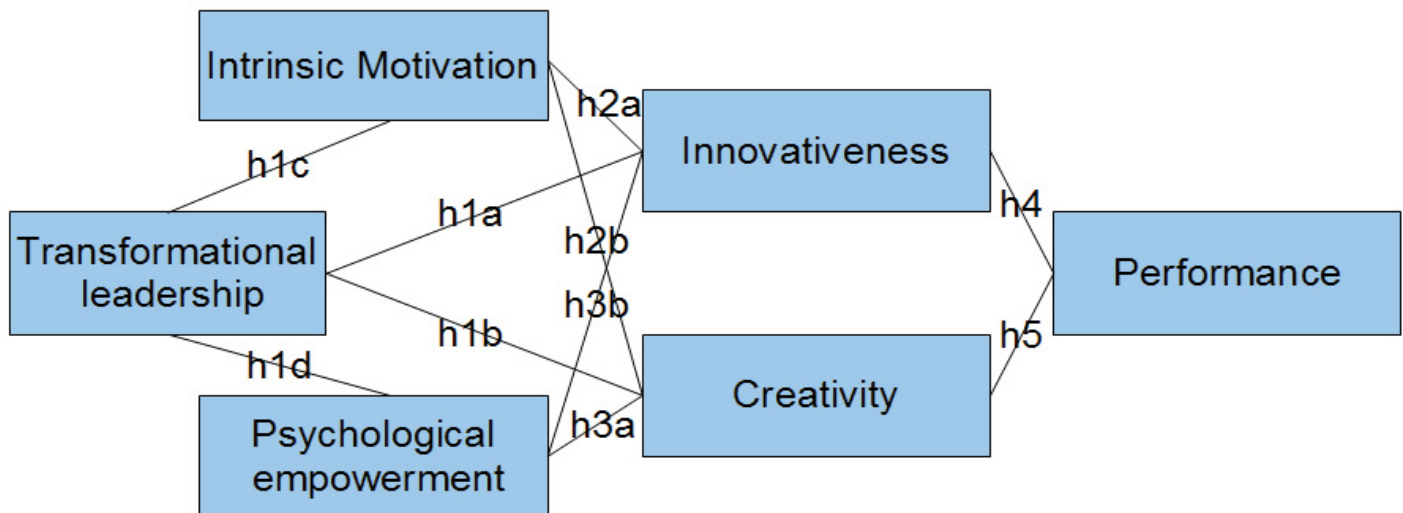


Illustration 2.2: Overview of Hypothesis's

3. Method

3.1 Selection of research method

A scientific problem can be approached from several directions with different methods, all with their own inbuilt advantages and disadvantages. The research question (and the hypothesis's) in this thesis is no exception in the sense that they can be approach from several different research methods.

The first choice was to study the research question trough observation with logical reasoning about the results, e.g. an empirical study supported by the findings of other researchers. This choice was based on that there is no data that directly supports the research question in the investigated market, as such observed data will greatly support the conclusions and the research. Since there are similar studies performed earlier the observations found can be compared, supported and put in context with earlier findings. This will strengthen the investigations since it is likely that similar markets behave in a similar way. This approach is the traditional scientific method, empirical testing supported by rational logic (Graziano & Raulin, 2004: 11). In this case the rational logic has to be based on the findings of earlier research. As such a Systematic review of previous finding in the investigated area is necessary in order to apply logic to the empirical findings. For a description of the review see section 3.2.

The second selection performed was if a qualitative (or low constrain methods) or quantitative research methodology should be used in order to address the research question. Qualitative studies are good when performing exploratory research where there is little or no earlier research in the area is performed and when the goal is to analyse how things function in a "live" setting (Graziano & Raulin, 2004: 135). This thesis is performed in a research area where lots of research already has been performed. This supports that a more constrained research method would be preferred in order to bring new knowledge to the field (Graziano & Raulin, 2004: 134). While it would be interesting to perform a qualitative study in order to gain data from a live setting this would require a longer data collection then possible in a 15 credit master thesis course. The reason for this is that in order to get an adequate qualitative sample of a behaviour, such as transformational leadership, and how that sample leads to a new innovation would require repeatedly sampling in order to investigate if transformational leadership have an effect or is associated with creativity or innovativeness (Graziano & Raulin, 2004: 139). This would have been too time consuming. Even if the qualitative study could have been performed a quantitative study would still be preferred given the large number of previously performed research on the subject the data from a low constraint method would have little impacts since its validity is low and the results are hard to reproduce (Graziano & Raulin, 2004: 134).

A quantitative research method was therefore selected. The main advantages with this type of study are that they are more objective, more generalized and reproducible. The main disadvantages is that it is hard to

sample “in action” and that only pre-set answers can be used minimizing the ability of respondents to answer freely (Graziano & Raulin, 2004: 92-93).

The last choice was then if an experimental or correlation study/research method should be used. While an experimental study has several advantages over a correlation study it also applies that we would have to manipulate the subjects of the study. Since no methods are available, to the knowledge of the authors, for efficiently manipulating the level of transformational leadership or intrinsic motivation this research method cannot be used in this thesis.

Therefore the chosen quantitative research method will have to be a Correlation research method (Graziano & Raulin, 2004: 147). See section 3.5 for more information about the correlation research method. While this research method is common it got the big disadvantage that it cannot prove a theory correct, only negate it if it is wrong (Graziano & Raulin, 2004: 147).

The quantitative data was decided to be gathered using a survey. The reason for this is that a survey is easy to send to several companies, as such more data can be gathered for testing of the hypothesis. Since a correlation research method is used the more data the better for representation of the investigated market. Other advantages is that similar studies have been done before and as such there are tested measurements for each of the investigated variables. As such a higher quality of data can be gathered then if we would have to make our own measurements. While this probably also hold trough for qualitative interview the authors had to little knowledge of the method to adopt it in this study.

While the researched market in this thesis is new the research question has been asked before in the Spanish pharmaceutical industry (García-Morales, Matías-Reche, & Hurtado-Torres, 2008). The methodology used in the study by García-Morales et al. (2008) was an empirical approach where the CEO's of the pharmaceutical companies were sent an mail with a survey. Since this approach is very similar to ours. Similar studies with similar results make it easier to draw conclusions in the end.

3.2 Systematic review

Systematic review/research refers to a scientific method, which sets up an overall objective, and then employs logic relationship analysis to explore the correlation and interaction of the secondary systems, in order to understand and solve problems in complex and dynamic environment (Graziano & Raulin, 2004). This thesis makes systematic research primary on a literature review and the formation of theoretical framework. The theoretical framework is then used for hypothesis generation and as a basis for an empirical study. The systematic review performed here is a two step model. First a general literature review is performed on Creativity, intrinsic motivation, psychological empowering, leadership and transformational leadership. The findings in the literature review are then used to build a theoretical framework where it is described how the variables are likely to act in a broader context.

The literature search was primary to be done using international business journals. Articles was search though Google scholar or directly from the journals homepages when feasible. Other sources that were used were published books. Searches on Google scholar contained different combinations of the following search terms; creativity, intrinsic motivation, psychological empowering, transformational leadership, pharmaceuticals, innovation and leadership. For example the search creativity+ transformational leadership+ pharmaceuticals resulted in 20800 hits on Google scholar. The systema

3.3 Empirical research method

The empirical research method in this thesis is a correlation research method (Graziano & Raulin, 2004: 147). The data in this thesis was collected using a designed questionnaire (Graziano & Raulin, 2004). The questionnaire is based on established protocols that have proven to be effective in measuring the investigated variables, e.g. Transformational leadership, creativity, performance, intrinsic motivation, psychological empowerment and innovativeness. The collected data were then used to answer if transformational leadership correlates with the creativity, innovativeness and performance of the organizations. In turn the measurements of psychological empowerment and intrinsic motivation was be used to answer if these two factors are increased by transformational leadership and if them in turn can effect creativity, innovativeness and performance of the organizations. Here a correlation analysis was used to investigate if transformational leadership is correlated with creativity and innovation in the Swedish pharmaceutical industry. The approach for analysis is to compare the findings in the survey with earlier findings. The questionnaire is based on previously published data and the hypothesis as well (see chapter 2 and 3). The novelty in this thesis is that the findings are applied to a new industry in a new country.

3.4 Date collection Method

The samples were collected from companies in the Swedish pharmaceutical manufacturing industry during the two last weeks of April 2014. The companies were found in the retriever database (<http://web.retriever-info.com.miman.bib.bth.se/services/archive.html?>) based on the retriever function industry code ("läkemedel, tillverkning). In total 33 sites and 27 companies where listed in the retriever database as of April 2014. From the list out of 27 companies 22 unique email addresses could be found to companies that were manufacturing pharmaceutical products.

The questionnaire was web based in Google form format. This provides an easy platform for the receivers of the questionnaire to use and it will record the data in an efficient way that is easy to use for analysis.

The questionnaire was sent to "info@companyname" (or similar, depending on what was listed on the company homepage) addresses for all 22 companies, using the send form option in Google forms. The questionnaire was sent with a request that it was to be sent/shared with mid-level managers for strategic business units such as production, sales and development sections. The introduction letter stated that anonymity was assured. This data collection method allows for an efficient way to reach all companies in the investigated market.

While the use of a middle hand can give different definitions to what a mid level manager is, it also assure that the data collected is less biased and more randomised then if we would have chosen the participants for our self. After 7 days a reminder was sent by email.

Data collection was performed during a total of 14 days before the data where saved from from the Google form homepage. Given the method for data collection no response rate can be calculated since it was emphasized that the questionnaire was shared.

For a complete version of the questionnaire see annex 1. For a complete list of companies the questionnaire was sent to see annex 2.

3.4.1 Minimal sample size

In the proposed method for analysis's (correlation calculations) normally the bigger the sample the more reliable analysis. Given the small number of companies (22) the numbers of replies are expected to be quite low. As such it is important to calculate the smallest number of required participants that are necessary for the correlation analysis to be accurate. In this thesis the minimal number of samples required for a correlation analyses will be calculated using the method proposed by Schönbrodt & Perugini (Schönbrodt & Perugini, 2013).

The method proposed by Schönbrodt & Perugini calculates the smallest sample size necessary to reach a critical point of stability for an expected correlation value. The critical point of stability is the sample size when more samples do not cause the final correlation value to change for more than a pre-set limit called width. . This *Width* is the pre-set number of correlation units that the correlation value can change, with a given confidence interval, as we increase the sample size (Schönbrodt & Perugini, 2013).

Using the method proposed by Schönbrodt & Perugini an expected correlation of 0.5 would require 34 samples to reach an 80 percent confidence value with a limit of 0.2 correlation units. If the expected correlation is lower than 0.5 more samples is required. If the expected correlation is higher than 0.5 less samples are required to reach the critical point of stability (Schönbrodt & Perugini, 2013).

Critical points of stability for a level of confidence of 80 % and an allowed deviation from the true correlation value of 0.2 correlation units.	
Expected correlation value (expected p value)	Sample size to require to reach the critical point of stability
0.1	61

0.2	57
0.3	51
0.4	43
0.5	34
0.6	25
0.7	20

Table 3.1: Sample size needed to reach the critical point of stability for an expected p-value (correlation value). Table inspired by Schönbrodt & Perugini (2013).

García-Morales et al received a correlation value of 0.492 between transformational leadership and organizational innovativeness in the Spanish pharmaceutical sector. By expecting a similar correlation value in the Swedish pharmaceutical industry the minimal sample size necessary would be at least 34 samples according to table 3.1 (García-Morales, Matías-Reche, & Hurtado-Torres, 2008).

3.4.2 Unit of analysis

Given the research question the chosen unit of analysis are companies in the Swedish manufacturing pharmaceutical industry. The unit of observation is mid-level managers in said companies.

The unit of observation was selected due to that mid-level managers are likely to have a good overview of the company and are likely to be in contact with several other leaders/managers in the company. As such they more likely give representative answers than an employee that only is in contact with one manager.

3.5 Data Analysis Method:

The data is analysed using SPSS with AMOS add-on, using the exploratory factor analysis, confirmatory factor analysis, correlation analysis, structural equation model and other methods.

3.5.1 Methods on the Validity of the Questionnaire

The validity of scale can be divided into the content validity, criterion validity and structure validity. Before the formal investigation, every item of the questionnaire has been reviewed by both thesis supervisor and authors and the questionnaire was revised in expression and wordings according to their suggestions, to ensure professional content validity. Therefore, in this study, the focus is on the structure validity of the scale.

The method to test structure validity is to employ confirmatory factor analysis (CFA) to see whether there are any violating phenomenon in the model, the goodness-of-fit of the model, the convergent validity and differentiation validity of the model. The structure validity test usually has three steps:

Violation can be estimated in three aspects: whether there is error variance; whether the standardized coefficient is beyond or too close to 1; whether there is an unacceptable standard error.

The validity test of single variable, namely the standardized load of single variable on the latent variable, named this kind of coefficient as the standardized validity coefficients (Boollen, 1989). If the coefficient is proven to be significance through the hypothesis test, it can be used to reflect the latent variables. In some

works, this step is also known as convergent validity (Bagozzi, 1988). This study adopts the χ^2/df , RMR, GFI, IFI, CFI and RMSEA to evaluate the goodness-of-fit of the model. A brief description about these factors follows:

χ^2/df : Some scholars argued that the value should below 3 whereas some others argued that it is acceptable as long as it is below 5 (Wheaton, 1977). This data analysis research adopts the latter standard.

RMR (RootMeanSquare Residual) : RMR is the square root of residuals variance/average value of Covariance. It is suitable especially in the evaluation of model quality. The RMR less than 0.05 indicate that the theoretical model is acceptable and has a great goodness-of-fit; 0.05 to 0.08 indicate a good goodness-of-fit; 0.08 to 0.10 indicates moderate goodness-of-fit; Greater than 0.1 indicates poor goodness-of-fit.

GFI (Goodness Fit Index): GFI value range is from 0 to 1. The bigger, the better. The recommended value given by Bagozzi & Yi (Bagozzi, 1988) is 0.9.

IFI (Incremental Fit Index): Its value range is from 0 to 1. The bigger, the better. Generally, it should be above 0.9.

CFI (Comparative Fit Index) : Its value range is from 0 to 1. The bigger, the better. Generally, it should be above 0.9.

RMSEA (Root Mean Square Error of Approximation) : RMSEA fitting indexes are sensitive to the error of the model and it is easy to explain the model quality with these indexes. The confidence interval of RMSEA can provide more important information. It is generally believed that RMSEA < 0.1 indicate a good fitting; RMSEA < 0.05 indicate a very good fitting (Steiger, 1990). Validity test of the single variable, also known as convergent validity can be explained with the Average variance Extracted (AVE) extracted from the latent variables. AVE value = (observation variable's standard load sum of square on the latent variable) / (observation variable's standard load sum of square on the latent variable + observation variable's sum of measure error). AVE evaluates the total variance of the latent variables relative to the measurement error. The common standard to accept measurement terms is that the explanatory power of measurement terms is greater than the error

variance (Error Variance). If the extracted average variance is equal to or above 0.5, the measurement of latent variables is deemed with enough convergent validity, the minimum of AVE is 0.5. In addition, the factor loading of the measurement terms should exceed a certain standard, and reach statistical significance level.

3.5.2 Methods on the reliability of the Questionnaire

Reliability can be divided into external reliability (mainly Retest Reliability) and internal reliability (Internal Consistency Reliability). Due to the limitation of the research conditions, this study did not re-test the same sample, however the previous studies have proven the Retest Reliability that these scales. Therefore this research will mainly confirm the internal consistency reliability of these scales.

The methods include Cronbach's Alfa, single item reliability, and structural reliability. In a Likert Scale, the most common method to test internal consistency reliability is Cronbach's Alfa, which is generally more than 0.7. But the Alfa's value cannot estimate the reliability of the single observation variables. The R2 of the variable that is calculated by exploratory factor analysis is actually the percentage indicating the degree that the variance of the variable can be explained by latent variables, reflecting the degree to which the variables are affected by the latent variables. It can be used as the reliability index for a single variable (Boollen, 1989). At first, this study tests the internal consistency reliability of all variables with Cronbach's Alfa analysis, and then uses the factor analysis to test the reliability of each variable.

3.6 Measurements

All scales are based on existing scales. All scales are 5 point Likert scales ranging from strongly disagree to strongly agree. Six different scales/measurements are used to measure the variables of interest. A total of 28 questions are used to measure the variables of interest. In addition to the investigated variables three questions are added to record a few descriptive variables of the participants.

3.6.1 Descriptive variables

Given that 13 of the 22 unique companies had less than 100 employees it was decided not to record the company name in the survey. This decision was decided to maintain the anonymity of participants in the survey. If age, gender and company name were recorder it would be possibly to track the answers back to a participant since companies with less than 100 or not likely to have more than a few mid-level managers.

While we have no intention of spreading the data and even stated that anonymity was assured we decided that a guaranteed anonymity was likely to increase the number of participants (Singer, Hippler & Schwarz, 1992). Since several of the measured variables are a bit sensitive (for example, questions about how the

leaders in the organization are acting) to some people a guaranteed anonymous is also likely to give more honest answers (Angeles, 2000).

Age, gender and years working for the current employer were decided to be recorded as descriptive variables. They were chosen in order to record if the recorded data could be biased to gender or age. Years working for the current employer were recorded to ensure that both “old” and “new” employees answered the questionnaire.

3.6.2 Intrinsic motivation

The intrinsic motivation related questions is designed based on Amabile’s Work Preference Inventory article (Amabile, Hill, Hennessey, & Tighe, 1994). With Loadings varying from 0.29-0.7 and with an Alpha value of $\alpha=0.79$ the scale seems reliable. Intrinsic motivation is measured with seven items.

3.6.3 Transformational leadership

Measurement of Transformational leadership is based on scale presented by Garcia-Morales, et al. (García-Morales, Llorens-Montes, & Verdú-Jover, 2006). Loadings vary from 0.72-0.82 and an alpha value of $\alpha=0.85$ indicates a reliable scale. Transformational leadership is measured with five items.

3.6.4 Psychological empowerment

The scale used to measure psychological empowerment is taken from Spreitzer et al (Spreitzer, 1995). All loadings are above 0.8 and the alpha value is $\alpha=0.74$. This value indicates a reliable scale. Psychological empowerment is measured using 5 items.

3.6.5 Performance

Performance is measured using four items (Caruana, Ewing, & Ramaseshan, 2002). Loadings vary from 0.60 to 0.69 and the alpha value is $\alpha=0.86$ which indicates a reliable scale.

3.6.6 innovativeness

The scale used to measure innovativeness is based on a scale presented by Calantone et al. (Calantone, Cavusgil, & Zhao, 2002). The scale have loadings varying from 0.58 to 0.69 and $\alpha = 0.76$ indicating a reliable scale. innovativeness is measured using 4 items.

3.6.7 Creativity

Creativity is measured using the scale presented by Scott and Bruce (Scott & Bruce, 1994). With loadings vary from 0.74 to 0.76 and $\alpha=0.83$ the scale is reliable. Creativity is measured using three out of five items from the original article which are oriented towards internal creativity.

4. Empirical findings

4.1 Statistical Description about the Subjects

22 questionnaires were sent out with a request that they were to be shared. 48 questionnaires were collected. Due to time constraint, data analysis was only performed on the first 43 responses'. The questionnaire's recovery rate cannot be calculated efficiently due to the fact that the questionnaire was meant to be shared with, if possible, several managers for strategic business units. No data has been recorded that can link how many companies that have answered. Male takes up 62.8% of all subjects, while female accounts for 37.2%. The basic information is showed in the following table:

	Frequency	%	
Gender	Male	62.8	
	Female	37.2	
Age	Below 30	11	25.6%
	30-39	13	30.2%
	Above 40	19	44.2%
Work Experience	Below 2 years	20	46.5%
	3-5 Years	12	27.9%
	6-10 Years	2	4.7%
	Above 10 Years	9	20.9%

Table 4.1: Descriptive statistics of data

4.2 Pre-processing of the Data

Before the formal data analysis, all collected data will be pre-processed, including preliminary examination, necessary deletion, selection, adjustment or transference. The main pre-processes include Item Analysis, Missing Data Analysis and Normal Distribution Test.

4.2.1 Item Analysis

Item analysis is conducted based on the top 27% of higher score group and the low 27% of lower score group, then T value is used to test if there are any significant differences in the average value of every item of higher and lower groups. T value is also known as Critical Ratio (CR). After item analysis, items that do not reach the significant level will be deleted. In this study, the total score of each scale was calculated, and then rank the scale score, calculate the score of the top 27% and lower 27% of the subjects. The sample is divided into two

groups: higher group and lower group. T value is used to test if there is significant difference in the average value of every item of higher and lower groups.

The statistical results show that the transformational leadership questionnaire has better degree of differentiation, and there is no significance difference in average value of higher score section and lower score section. Therefore, all items are retained.

4.2.2 Missing Data Analysis

The typical solution to missing data is to delete the whole case. If there is one or more missing data, the whole case record will be deleted. If the case that has missing data account for small proportion, such as less than or equal to 5%, this solution is advisable (Roth, 1994). However, considering the sample size of this study is small which covers only about forty-three people, the deletion of the case with missing data will reduce the validity of the overall statistics. In the survey, there is only one data entry missing, one response value for one question, which won't affect the overall picture of our data analysis result. Therefore, we retain this data entry for our analysis.

4.2.3 Normal Distribution Test

This study involves various descriptive statistical values of each item, such as mean value, standard deviation, skewness and kurtosis. It is generally believed that when the absolute value of skewness is less than 1.96 and absolute value of kurtosis is less than 1.96, the samples meet the normal distribution (Kim, 2013).

It can be seen in the table below that the survey result meet the normal distribution basically, so there is no need for normalization of data and the analysis can be carried on. In structural equation analysis, this study adopts the most mature Maximum Likelihood Estimates (MLE) method to conduct parameter estimation. Intrinsic motivation item 5 has quite high skewness and Kurtosis and will not be used in the final model.

Variables	Mean	Std. Deviation	Skewness	Kurtosis	Std. Error of Kurtosis
Intrinsic motivation1	2.837	0.998	0.041	-0.866	0.709
Intrinsic motivation2	4.186	0.732	-0.308	-1.040	0.709
Intrinsic motivation3	4.256	0.581	-0.077	-0.370	0.709
Intrinsic motivation4	4.326	0.808	-0.959	0.150	0.709
Intrinsic motivation5	4.535	0.827	-2.371	7.067	0.709
Intrinsic motivation6	4.395	0.728	-1.169	1.425	0.709
Psychological empowerment1	3.907	0.996	-0.869	0.549	0.709
Psychological empowerment2	4.070	0.593	-0.013	0.006	0.709
Psychological empowerment3	3.721	0.734	-0.259	0.038	0.709
Psychological	3.977	0.771	-0.613	0.491	0.709

empowerment4					
Psychological empowerment5	3.326	1.190	-0.142	-0.729	0.709
Innovativeness1	2.848	1.095	0.527	-0.354	0.688
Innovativeness2	3.130	0.859	0.179	0.333	0.688
Innovativeness3	3.130	1.002	-0.134	0.018	0.688
Innovativeness4	3.022	0.906	-0.044	-0.014	0.688
Creativity1	3.605	1.027	-0.780	0.404	0.709
Creativity2	3.279	1.031	-0.189	0.277	0.709
Creativity3	3.558	1.098	-0.608	-0.253	0.709
Transformational Leadership1	3.233	0.895	-0.488	0.448	0.709
Transformational Leadership2	3.023	1.012	-0.048	-0.209	0.709
Transformational Leadership3	2.930	0.884	-0.077	-0.187	0.709
Transformational Leadership4	2.907	1.087	0.076	-0.613	0.709
Transformational Leadership5	3.140	0.990	-0.292	-0.610	0.709
Performance1	3.152	0.965	-0.008	-0.014	0.688
Performance2	3.348	0.971	-0.005	-0.332	0.688
Performance3	3.022	1.064	-0.392	-0.033	0.688
Performance4	2.696	0.986	0.224	-0.025	0.688

Table 4.2: Normal distribution test

4.3 Analysis on the Reliability of the Questionnaire and its Variables

This study conducts internal consistency reliability analysis on all involved variables, including internal consistency coefficient (Cronbach's alpha), correlation between the questions and total score (item-total correlation), and the internal consistency after deleting the question (Cronbach's Alpha if Item Deleted), the specific results are as follows:

item	item-total correlation	Cronbach's Alpha if item deleted	Cronbach's Alpha
Intrinsic motivation1	0.444	0.830	0.802
Intrinsic motivation2	0.099	0.804	
Intrinsic motivation3	0.167	0.801	
Intrinsic motivation4	0.458	0.791	
Intrinsic motivation5	0.290	0.797	
Intrinsic motivation6	0.116	0.803	
Psychological empowerment1	0.338	0.795	
Psychological empowerment2	0.203	0.800	
Psychological empowerment3	0.057	0.805	
Psychological empowerment4	0.115	0.804	
Psychological empowerment5	0.385	0.793	
Innovativeness1	0.068	0.809	
Innovativeness2	0.388	0.793	
Innovativeness3	0.501	0.787	
Innovativeness4	0.218	0.800	
Creativity1	0.683	0.777	
Creativity2	0.578	0.783	
Creativity3	0.506	0.786	
Transformational Leadership1	0.421	0.792	
Transformational Leadership2	0.393	0.792	
Transformational Leadership3	0.493	0.788	
Transformational Leadership4	0.399	0.792	
Transformational Leadership5	0.614	0.782	
Performance1	0.413	0.792	
Performance2	0.405	0.792	
Performance3	0.389	0.792	
Performance4	0.377	0.793	

Table 4.3: Reliability test of data

Internal consistency reliability analysis on all involved variables has showed that the internal consistency coefficient of all variables are higher than 0.7, deletion of any item will not enhance the reliability. From the point of the correlation between questions and the total score, the correlation coefficient of all questions and the total score is higher, indicating that the questionnaire has great reliability. Factor analysis was used to test the reliability of each variable in scale.

4.3.2 Analysis on the Reliability of Intrinsic Motivation Variable

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy.	.679	
Bartlett's Test of Sphericity	Approx. Chi-Square	42.111
	df	6
	Sig.	.000

Table 4.4: Intrinsic motivation's Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity.

Component	Initial Eigen values	Extraction Sums of Squared Loadings				
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.255	54.243	54.243	3.255	54.243	54.243
2	.950	15.832	70.074			
3	.859	14.319	84.393			
4	.610	10.172	94.565			
5	.326	5.435	100.000			

Table 4.5: Intrinsic motivation's partitioning of total variance

	Component
	1
Intrinsic motivation1	.908
Intrinsic motivation2	.699
Intrinsic motivation3	.750
Intrinsic motivation4	.637
Intrinsic motivation5	.388
Intrinsic motivation6	.908

Table 4.6: Intrinsic motivation's factor loading value

As shown by tables above: KMO value is 0.679, which means the data collected is suitable for factor analysis. The Bartlett's Test of Sphericity's value is 0.000, indicating that the data is relevant and is suitable for factor analysis. In factor loading value's analysis, one component is extracted and the cumulative variance contribution rate of 54.243%. Five out of six loading factors' values are above 0.6, indicating good reliability of the questionnaire and the results meet the requirements. The loading factor with value below 0.6 will be omitted for further analysis.

4.3.3 Analysis on the Reliability of Psychological Empowerment Variable

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.692	
Bartlett's Test of Sphericity	Approx. Chi-Square	35.073
	df	10
	Sig.	.000

Table 4.7: Psychological empowerment's Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity.

Component	Initial Eigen values	Extraction Sums of Squared Loadings				
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.252	52.993	52.993	2.252	52.993	52.993
2	.982	19.636	64.668			
3	.773	15.457	80.125			
4	.574	11.490	91.615			
5	.419	8.385	100.000			

Table 4.8: Psychological empowerment's partitioning of total variance

	Component
	1
Psychological empowerment1	.465
Psychological empowerment2	.729
Psychological empowerment3	.687
Psychological empowerment4	.778
Psychological empowerment5	.654

Table 4.9: Psychological empowerment's factor loading value

As shown by tables above: KMO value is 0.692, which means the data collected is suitable for factor analysis. The Bartlett's Test of Sphericity's value is 0.000, indicating that the data is relevant and is suitable for factor analysis. In factor loading value's analysis, one component is extracted and the cumulative variance contribution rate of 52.993%. Four out of five loading factors' values are above 0.6, indicating good reliability of the questionnaire and the results meet the requirements. The loading factor, with value below 0.6, will be omitted for further analysis.

4.3.4 Analysis on the Reliability of innovativeness Variable

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.741	
Bartlett's Test of Sphericity	Approx. Chi-Square	48.156
	df	6
	Sig.	.000

Table 4.10: Innovativeness's Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity.

Component	Initial Eigen values	Extraction Sums of Squared Loadings				
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.458	61.460	61.460	2.458	61.460	61.460
2	.664	16.610	78.070			
3	.537	13.415	91.485			
4	.341	8.515	100.000			

Table 4.11: Innovativeness's partitioning of total variance

Variables	Component
	1
Innovativeness1	.757
Innovativeness2	.735
Innovativeness3	.815
Innovativeness4	.825

Table 4.12: Innovativeness's factor loading value

As shown by tables above: KMO value is 0.741, which means the data collected is suitable for factor analysis. The Bartlett's Test of Sphericity's value is 0.000, indicating that the data is relevant and is suitable for factor analysis. In factor loading value's analysis, one component is extracted and the cumulative variance contribution rate of 61.460%. All of four loading factors' values are above 0.6, indicating good reliability of the questionnaire and the results meet the requirements.

4.3.5 Analysis on the Reliability of Creativity Variable

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.672	
Bartlett's Test of Sphericity	Approx. Chi-Square	18.079
	df	3
	Sig.	.000

Table 4.13: Creativity's Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity.

Component	Initial Eigen values	Extraction Sums of Squared Loadings				
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.735	57.844	57.844	1.735	57.844	57.844
2	.812	27.081	84.926			
3	.452	15.074	100.000			

Table 4.14: Creativity's partitioning of total variance

	Component
	1
Creativity1	.630
Creativity2	.855
Creativity3	.779

Table 4.15: Creativity's factor loading value

As shown by tables above: KMO value is 0.672, which means the data collected is suitable for factor analysis. The Bartlett's Test of Sphericity's value is 0.000, indicating that the data is relevant and is suitable for factor analysis. In factor loading value's analysis, one component is extracted and the cumulative variance contribution rate of 57.844%. All of three loading factors' values are above 0.6, indicating good reliability of the questionnaire and the results meet the requirements.

4.4.1 Analysis on the Validity of Transformational Leadership Scale

In this research, confirmatory factor analysis was conducted on the one dimension and three dimension structures of the transformational leadership questionnaire. The fitting index comparison was made between the one dimension model and three dimension structures. The model and result of the analysis and comparison are as follow:

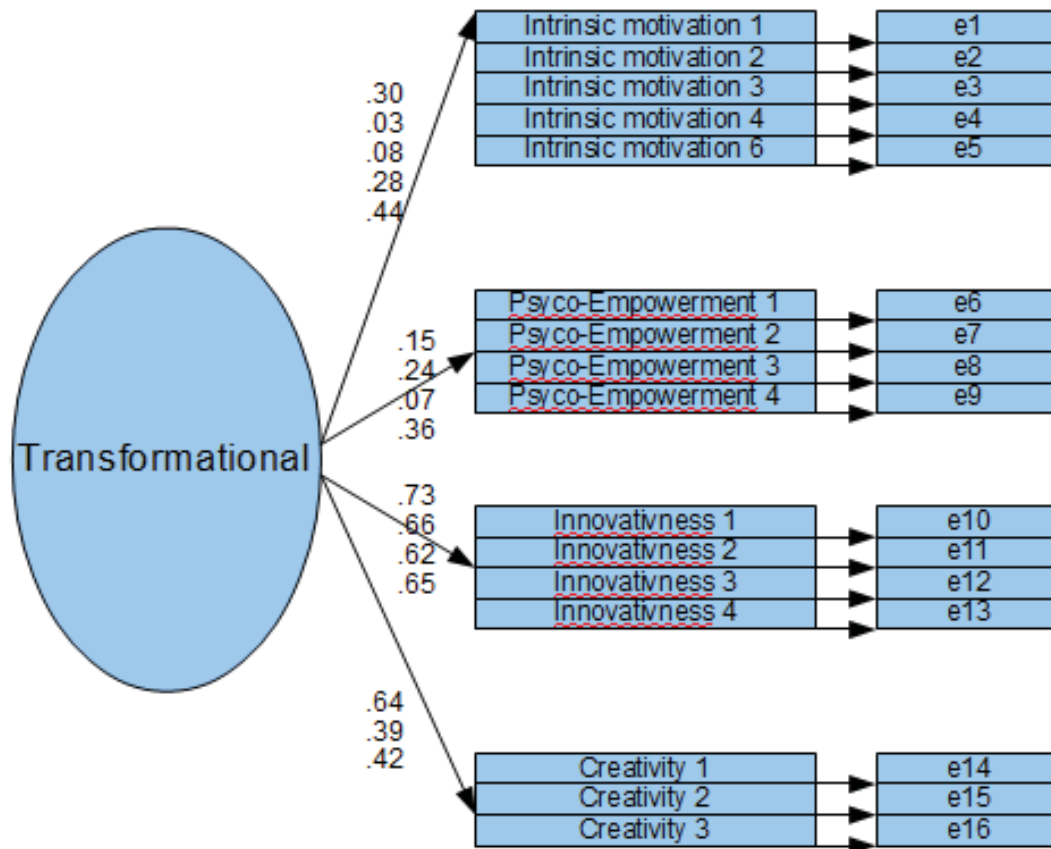


Illustration 4.1: One dimensional structure of the questionnaire

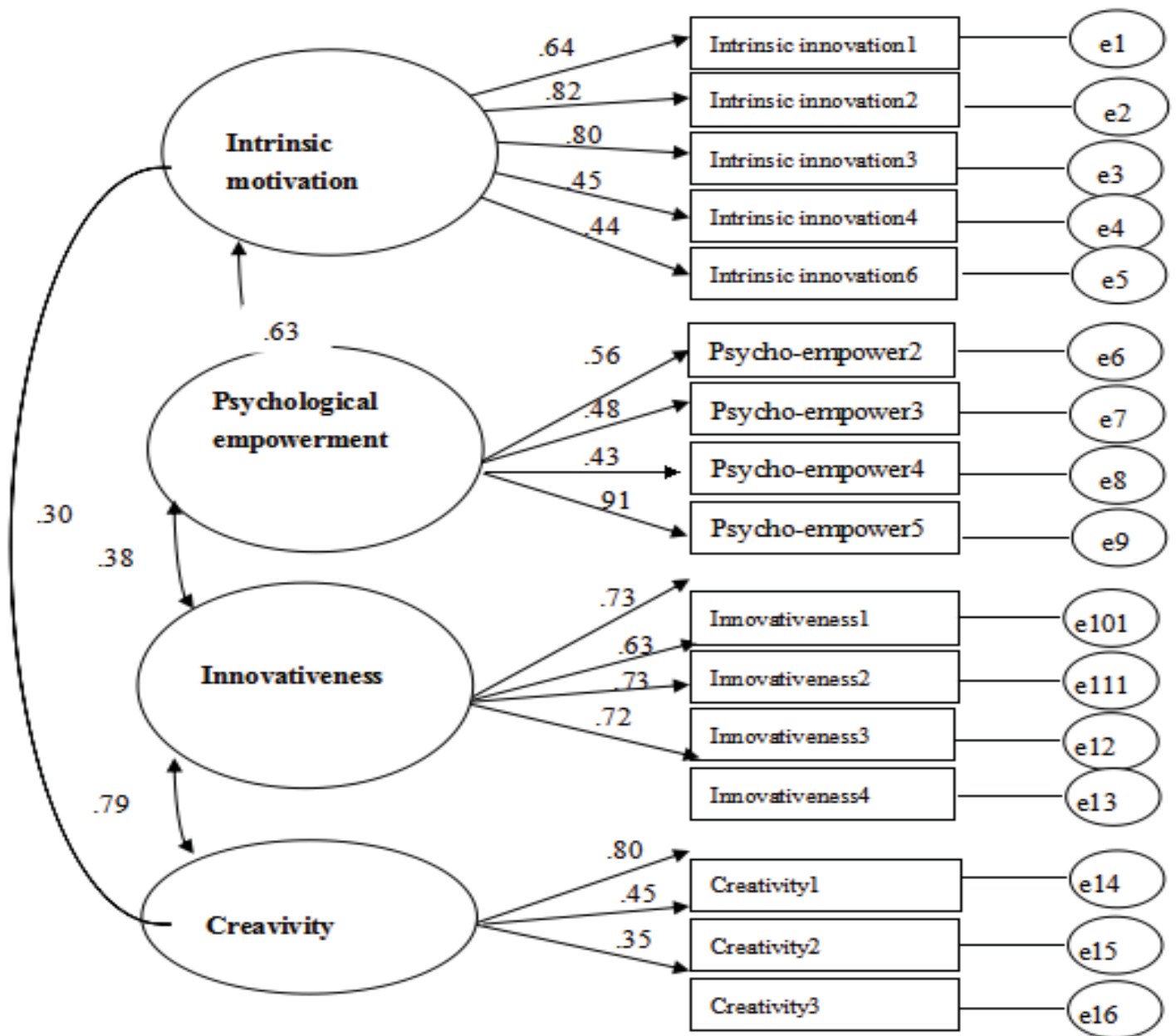


Illustration 4.2: Three dimensional structure of the questionnaire

	X ²	df	X ² / df	IMR	GFI	IFI	CFI	RMSEA
One dimension model	255.163	104	2.453	0.102	0.257	0.369	0.324	0.186
Multi-dimension model	152.34	98	1.458	0.046	0.845	0.897	0.867	0.051

Table 4.16: Comparison of one and three dimensional model

4.4.3 Conclusion on the Validity of Transformational Leadership Scale

As showed in the one dimension model of transformational leadership, all fitting indexes of one dimension model differs dramatically from the predetermined standard, while the all fitting indexes of multi-dimension model are close to the predetermined standard and have great data support. Therefore, the three dimension model of the transformational leadership is better than one dimension model.

Violation estimation of the scale was also carried out, while output data verification through AMOS. Error variance of all measurement items are above 0. The standardized loading coefficients are from 0.3 to 0.91. There is no significant standard deviation among loading coefficients, which indicates that there is no violation. The AVE value of latent variables is above 0.5, and the standardized loading coefficients are above 0.3, which indicates that the scale has a great convergent validity. In conclusion, this scale has great structure validity as a whole.

4.5 Descriptive Analysis on the Variables

The values of all variables are calculated in this study. The detailed analysis result is as follow:

	Intrinsic motivation	Psychological empowerment	Innovativeness	Creativity	Transformational Leadership	Performance
Intrinsic motivation	1					
Psychological empowerment	.348(*)	1				
Innovativeness	.094	.245	1			
Creativity	.130	-.020	.550(**)	1		
Transformational Leadership	.236	.135	.395(**)	.673(**)	1	
Performance	.239	.128	.479(**)	.496(**)	.627(**)	1

Table 4.17: Correlation table for investigated variables

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

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

The above analysis shows that there is a high correlation between transformational leadership and innovativeness (0.395), creativity (0.673) and performance (0.627).

However, the correlation between transformational leadership and intrinsic motivation (0.236) and psychological empowerment (0.135) is not significantly correlated according to this survey. A further justification action regarding these two variables needs to be carried out in the future.

4.6 Hypotheses Testing

According to the descriptive analysis above, we can examine the hypotheses and come to the following conclusions:

h1a: transformational leadership is **moderate positively (0.395)** correlated with **innovativeness**.

h1b: Transformational leadership is **moderate positively (0.673)** correlated with **creativity**.

h1c: Transformational leadership is **not** correlated with a higher level of **intrinsic motivation**.

h1d: Transformational leadership is **not** correlated with a higher level of **psychological empowerment**.

h2a: Intrinsic motivation is **not** correlated with **innovativeness**.

h2b: Intrinsic motivation is **not** correlated with **creativity**.

h3a: Psychological empowerment is **not** correlated with **innovativeness**.

h3b: Psychological empowerment is **not** correlated with **creativity**.

h4: Innovativeness is **moderate positively (0.479)** correlated with **performance**.

h5: creativity is **moderate positively (0.496)** correlated with **performance**.

5. Analysis and discussion

A few descriptive variables were recorded in order to gain an overview of the participants in the study and to get an idea about if the participants can be representative of the investigated market. In table 3.1 a complete overview of the participants is presented. A small difference is seen between the percentage of females and males that have participated in the survey. 37 % of the responses were from women and 63 % were from men. Given that the survey was meant for mid-level managers a slightly higher percentage of men than women might be representative since there (unfortunately) still is more common that men are managers than women. The age of the participants seems representative with most participants being older than 40 years of age. The group under 30 years is possibly bigger than what one would expect for mid level managers but given the data collection method, Internet Survey, it is likely younger participants were more willing to answer the questionnaire than older due to that younger people normally are more at ease with the use of computers. 40 % of the participants had worked for less than 2 years at their current employer. While this value is slightly higher than we expected it is not an unlikely number to be represented by mid-level managers in the Swedish manufacturing pharmaceutical industry. The reason for this is that several companies have had large downsizes in Sweden the last years 5 years (most from AstraZeneca and Pfizer). This in turn has forced large groups of people to change employer during the last few years. We therefore believe that the age, gender and years at the current employer can be representative for the investigated unit of observation.

Since it was decided not to record company name in the survey the data cannot support if the data is representative for all companies in the Swedish manufacturing pharmaceutical industry. While this decision might have been necessary in order to increase number of participants it is also a limitation of the study to not show such data (Singer, Hippler & Schwarz, 1992). However, given that people are more honest when they are 100 % certain that they are anonymous the data that is presented in this thesis is likely to be of higher quality than data not recorded as 100 % anonymous (Angeles, 2000). For further discussion regarding the choice of not recording company name as a descriptive variable see chapter 3.6.1. We therefore believe that the data is of high quality but that the representativeness of the data for the Swedish manufacturing pharmaceutical industry give room for speculation.

The number of participants that were included in the study was 43. This result is higher than the number of 34 participants that were set to the lowest acceptable number of participants in the study, see chapter 3.4.1 for details. Comparing 43 participants with the lowest number of required participants for a given correlation value as described in figure 3.1 we find that as long as a correlation is above 0.4 the results are likely to be accurate. All significant correlations used for hypothesis testing, except the correlation value between transformational leadership and innovativeness, is above this number. Since the correlation value for transformational leadership and innovativeness is 0.395 the results for this correlation will be discussed as positive correlated but the results cannot be guaranteed to be accurate given that the pre-set level of the

confidence interval was not reached. While this number is a bit lower than most correlation studies it can still be used to draw conclusions given the relative high correlations values greatly decreases the risk that other conclusions could be drawn from a larger data set. The major finding presented in this thesis is therefore likely to be reproducible but the correlation values are likely to change a few units if a larger data set was used.

Transformational leadership was found to be moderately positively correlated with both innovativeness (h1a, correlation 0.395 significant at 0.01 level) and creativity (h1b, correlation 0.673 significant at 0.01 level) in the data gathered from companies in the Swedish pharmaceutical manufacturing industry. This is similar to the results on the impact of transformational leadership in the Spanish pharmaceutical industry (García-Morales, Matías-Reche, & Hurtado-Torres, 2008), technology workers in China (Zhang & Bartol, 2010) and non-profit organizations in the US (Jaskyte, 2004). The correlation coefficient between creativity and transformational leadership is much higher than the coefficient for innovativeness and transformational leadership (0.673 vs 0.395). It is likely that transformational leadership have greater effect on creativity than on innovativeness. The reason for this might be that it is easier to affect creative thinking than it is to take the creative thinking through the process of making a new product (innovativeness). Further, innovativeness might require more skills than just leadership. Developing a new product or service in the pharmaceutical industry is expensive and as such, a large amount of capital is required to finish the development of the new product/service. This might limit the impact of transformational leadership on innovativeness. The assumption that innovativeness, the skill of turning new ideas into new products, requires more than just leadership might also explain why the relationship between innovativeness and creativity is “only” at a correlation level of 0.55 (significant at 0.01 level).

Transformational leadership was not found to be correlated with intrinsic motivation (h1c) or psychological empowerment (h1d). This result is not the same as earlier findings from technology workers in China (Zhang & Bartol, 2010) or governmental workers in Holland (Pieterse, van Knippenberg, Schippers, & Stam, 2010). While this is the first investigation on the effect of transformational leadership in the Swedish manufacturing pharmaceutical industry, to our knowledge, it is still unexpected that the results were not the same or similar as to the earlier findings in other industries. A reason to why the results from earlier findings could not be replicated might be because of the data. The mean value for both intrinsic motivation and for psychological empowerment is around 4 for all but 1 measurement. The high mean value reduces the impact of the measures due to reduced distribution of the data. Optimal a measurement with a mean value of 3 would be preferred on the 5 graded scales that were used. It might be that scales used were not suitable for the Swedish pharmaceutical industry, which seems to have employees with high intrinsic motivation and psychological empowerment. One could argue that the data for intrinsic motivation and psychological empowerment could be mean centralized in order improve the measurements and the results. Given that all measurements is performed in the same range of scales and that the scales are limited to five answers the operation of centralizing the data should not be necessary and not likely to improve the distributions since they will be unaffected of the centralizing. Data treatments such as unit variance transformation will change the distribution, but once again, since the scales are the same this operation is not preferable.

Further studies are needed, preferably with other scales, in order to investigate the role of transformational leadership's impact on intrinsic motivation and psychological empowering in the Swedish pharmaceutical industry.

As discussed above transformational leadership was not correlated with intrinsic motivation and psychological empowerment in the study conducted. While the reason for this might be that the data were not suitable for the analysis it might also be because of cultural differences between the investigated market and the previously investigated markets. Looking into table 2.1 we find that there are studies performed where transformational leadership was not correlated with creativity as well as studies performed where transformational leadership was correlated with creativity. While the studies seem similar they are performed in different countries and in different markets. As such cultural differences between countries and markets might be a factor that has a bigger effect on intrinsic motivation and psychological empowering than transformational leadership.

Given the unfavourable distribution of the intrinsic motivation and psychological empowerment the hypothesis testing of intrinsic motivation's effect on innovativeness and creativity failed (h2a and h2b). As well as the hypothesis for the effect of psychological empowerment on innovativeness and creativity failed (h3a and h3b).

This was unexpected given earlier findings (Pieterse, van Knippenberg, Schippers, & Stam, 2010 and Zhang & Bartol, 2010). The data for intrinsic motivation and psychological empowering gathered in this thesis might not be suitable to use to test the hypothesis stated in this thesis. The reason for this is as previously stated that the high mean value of the measurement might reduce the impact of the correlation analysis or that the effect of intrinsic motivation and psychological empowering simply is not important in the investigated market.

Innovativeness and creativity both are moderately correlated to performance (h4, correlation 0.479; h5, correlation 0.496 both are significant at 0.01 level). This agrees with the literature that most successful companies need to innovate in order to be successful (Gumusluoglu & Ilsev, 2009). As such it seems that both innovativeness and creativity are important in the Swedish pharmaceutical manufacturing industry since they both are related to performance.

While the relation between transformational leadership and performance was not a hypothesis's it achieves one of the strongest correlations (correlation 0.627 significant at 0.01 level) in the data set and has the highest correlation to performance of all investigated factors. It seems that transformational leadership is more important for a company's success than creativity/innovativeness. This is not unexpected given that there are several reports on other positive effects of transformational leadership than those on creativity/innovativeness. For example there are reports on higher job satisfaction and organizational responsibilities in organizations with a higher level of transformational leadership (DuBrin, 2013, p. 129).

The backside of correlations is that we don't know what that comes first. Just as well as that creativity might increase performance it is likely that high performing companies got room for more creative work since they are not under pressure to produce in order to stay alive. To show which factors are dependent and which are independent is outside the scope of this thesis.

As mentioned method chapter the correlation research method got one big in the sense that it cannot be used to prove a theory correct (Graziano & Raulin, 2004: 147). However the results show that the theory and hypothesis presented here can't be negated using this method. As such it is likely that transformational leadership is important in increasing creativity, innovativeness and even performance of a company.

6. Conclusions, Limitations and Future research

6.1 Conclusions

This thesis has worked with established measures and can confirm some but not all of the ideas presented in the theoretical frame work regarding the impact of transformational leadership on intrinsic motivation, psychological empowering and creativity.

The main purpose of this thesis was to investigate if creativity and innovativeness are affected by transformational leadership, intrinsic motivation and psychological empowering in the Swedish pharmaceutical manufacturing industry. This was done with a systematic review (theoretical part) as well as with an empirical study (survey).

The systematic review had a generalized approach that was not directly associated with the Swedish pharmaceutical industry. The systematic review led to a theoretical framework from which 10 hypotheses regarding the effect of transformational leadership, psychological empowerment and intrinsic motivation on creativity and innovativeness was formed. It was also tested if creativity and innovativeness were related to performance.

The results gathered from the theoretical framework and empirical study show that transformation leadership is positively correlated to creativity and innovativeness in the Swedish manufacturing pharmaceutical industry. These results are similar to previous studies that have shown that transformational leadership have a positive effect on creativity in various markets, including the Spanish pharmaceutical sector (García-Morales, Matías-Reche, & Hurtado-Torres, 2008; Zhang & Bartol, 2010; Jae-Shin & Zhou, 2014; Jung, Chow, & Wu, 2003; Jaskyte, 2004). As such companies might want to increase the number of transformational leaders in the organization since this is likely to increase creativity and innovativeness.

The authors also hypothesized that transformational leadership effect on creativity and innovation was mediated by intrinsic motivation and psychological empowering. This could not be verified in the investigated market. This was unexpected since previous studies have shown that transformational leadership increase both intrinsic motivation and psychological empowerment (Zhang & Bartol, 2010; Jae-Shin & Zhou, 2014; Jung, Chow, & Wu, 2003). The authors believe that the scales used for measuring the two variables were not suitable for the investigated market or that there are cultural differences regarding the effect of transformational leadership.

While not the primary research question both creativity and innovativeness was found to be positively correlated to performance of the companies. This highlights just how important creativity and innovations are for the performance of a company and is supported by previous research (Gumusluoglu & Ilsev, 2009).

While the correlation research performed here cannot prove that transformational leadership increases creativity, innovativeness in the investigated market the results presented in this thesis support the idea that they do. Given that several other studies show similar results in several markets it seems very likely that transformational leadership increases both creativity and innovativeness, not just in the Swedish manufacturing pharmaceutical industry but can be seen as a general creativity increasing factor in most markets (García-Morales, Matías-Reche, & Hurtado-Torres, 2008; Zhang & Bartol, 2010; Jae-Shin & Zhou, 2014; Jung, Chow, & Wu, 2003; Jaskyte, 2004).

The investigated research question(s) in this thesis was *“Is transformational leadership an antecedent of innovativeness and creativity in the Swedish pharmaceutical industry? If it does, is it mediated by any other antecedents?”*. With the support of the empirical findings are theoretical framework presented in this thesis our answer to the research question would be:

Transformational leadership is a likely antecedent of creativity in the Swedish pharmaceutical industry. While there was theoretical support for that transformational leaderships effect on creativity is mediated by intrinsic motivation or psychological empowering our data shows that intrinsic motivation and psychological empowering are not likely mediators.

6.2 Limitations and future research

The thesis was written in a limited time and thus has limitations to its size and scope. Due to the reasons presented below, the authors believe that the data presented here can form a good starting ground for future researchers in field but that there are some limitations in the conducted study that should be addressed before the findings are put into practice.

The first limitation is derived from the data and data collection method. The data was collected anonymous and sent to participants by a middle hand, without knowing or controlling for what persons or number or replies that were gathered from each company that answered the questionnaire. Theoretically all gathered answers could have been answered from representatives from the same company. While the authors have had personal communications from participants from 6 different companies (data not presented) we cannot guarantee that the data is representable for the whole market. While this decreases the representativeness of the study the data is still likely to be of a high quality given that the questionnaire were only sent to official addresses for pharmaceutical companies.

The investigated market consists of companies in a wide range of sizes. The smallest company only got 21 employees while the biggest got over 6200 employees. Leadership at mid-level management is bound to have different effects in a small company and in a big company. Data from small and large companies have not been separated.

Future studies should try to find why transformational leadership have an effect on creativity and innovativeness as well as to confirm the findings in this study.

It would also be interesting to investigate if transformational leadership have different effects on creativity, innovativeness and performance in small and large companies. Given the wide range of companies investigated here it is not unlikely that a mid-level manager with high transformational leader skill will have different effects in a small and large company.

7. References

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Appendix A - Questionnaire

Page 1 of 8

On leadership and creativity

Hello,

Thank you for being willing to participate in this survey. It will take approximately 5 minute to answer the questionnaire.

This survey is carried out by Peter Boman and Yiping Huang as a part of the master thesis course for the MBA program at BTH.

The goal of this survey is to investigate if certain leadership traits can promote creativity and innovativeness.

The survey is carried out anonymously, no personal or company names will be recorded. The results from the survey will be used in the master thesis of the surveyors. The thesis (once finished) will be published in the arkiv EX database at the BTH homepage (www.bth.se).

Should you for any reason want to contact us you can use the mail information attached at the end of the Questionnaire.

Last but not least, thank you again for your help and cooperation!

Peter & Yiping,

Add item



Introduce yourself

Select the option that best matches you and your background for each of the following questions.

Gender


- Male
- Female

Age

- 29
- 30-39
- 40-

Work experience in the Present Company

- less than 2 years
- 3-5 years
- 6-10 years
- more than 10 years

Add item 

Part 1 / 6

The following questions are answered on a five point scale. Choose the option that best matches your opinion on each statement.

- 1- Strongly Disagree
- 2- Disagree
- 3- Neutral
- 4- Agree
- 5- Strongly Agree

I prefer to work with familiar tasks, which can maximize my contribution to the company.

1 2 3 4 5

Strongly disagree Strongly agree

I'd like to solve complicated problems.

1 2 3 4 5

Strongly disagree Strongly agree

In most cases, I will be driven by my strong curiosity.

1 2 3 4 5

Strongly disagree Strongly agree

I'd like to deal with new problems.

1 2 3 4 5

Strongly disagree Strongly agree

I wish to gain more knowledge and new skills from what I'm doing.

1 2 3 4 5

Strongly disagree Strongly agree

I care about being able to get pleasure from my job

1 2 3 4 5

Strongly disagree Strongly agree

Part 2 / 6

The following questions are answered on a five point scale. Choose the option that best matches your opinion on each statement.

- 1- Strongly Disagree
- 2- Disagree
- 3- Neutral
- 4- Agree
- 5- Strongly Agree

My work means a lot for me.

1 2 3 4 5

Strongly Disagree Strongly agree

With independence and decision-making power, I can carry out my work.

1 2 3 4 5

Strongly Disagree Strongly agree

I master all required skills to complete my job.

1 2 3 4 5

Strongly Disagree Strongly agree

I am confident that I have the ability to accomplish all the things in my work.

1 2 3 4 5

Strongly Disagree Strongly agree

I have great influence on what happens in our department.

1 2 3 4 5

Strongly Disagree Strongly agree

Part 3 / 6

The following questions are answered on a five point scale. Choose the option that best matches your opinion on each statement.

- 1- Strongly Disagree
- 2- Disagree
- 3- Neutral
- 4- Agree
- 5- Strongly Agree

The overall performance of our organization in the last three years has been very good relative to other organizations.

1 2 3 4 5

Strongly Disagree Strongly agree

In relation to the resources committed, the improvements achieved by this organization in the last three years has been very high.

1 2 3 4 5

Strongly Disagree Strongly agree

The level of customer service provided by this organization the last three years has been much more than offered by other organizations.

1 2 3 4 5

Strongly Disagree Strongly agree

The level of cost effectiveness achieved by this organization in the last three years has been very high.

1 2 3 4 5

Strongly Disagree Strongly agree

Part 4 / 6

The following questions are answered on a five point scale. Choose the option that best matches your opinion on each statement.

- 1- Strongly Disagree
- 2- Disagree
- 3- Neutral
- 4- Agree
- 5- Strongly Agree

In general, managers here prefer to place a strong emphasis on innovativeness than on providing tried and proven services.

1 2 3 4 5

Strongly Disagree Strongly agree

We have introduced many new services over the last three years.

1 2 3 4 5

Strongly Disagree Strongly agree

In many cases, changes in society at large lead my company/organisation to promising new ideas

1 2 3 4 5

Strongly Disagree Strongly agree

It is easy for my company/organisation to find ideas that can be converted into successful new services.

1 2 3 4 5

Strongly Disagree Strongly agree

Part 5 / 6

The following questions are answered on a five point scale. Choose the option that best matches your opinion on each statement.

- 1- Strongly Disagree
- 2- Disagree
- 3- Neutral
- 4- Agree
- 5- Strongly Agree

Creativity is encouraged in this organization.

1 2 3 4 5

Strongly Disagree Strongly agree

We are encouraged to use original approaches to handle problems in the workplace.

1 2 3 4 5

Strongly Disagree Strongly agree

Managers in my company/organization here expect us to solve problems creatively.

1 2 3 4 5

Strongly Disagree Strongly agree

Part 6 / 6

The following questions are answered on a five point scale. Choose the option that best matches your opinion on each statement.

- 1- Strongly Disagree
- 2- Disagree
- 3- Neutral
- 4- Agree
- 5- Strongly Agree

The firms management is always on the lookout for new opportunities for the unit/department/organization

1 2 3 4 5

Strongly disagree Strongly agree

The firms management has a clear common view of its final aims

1 2 3 4 5

Strongly disagree Strongly agree

The firms management succeeds in motivating the rest of the company

1 2 3 4 5

Strongly disagree Strongly agree

The firms management always acts as the organizations leading force

1 2 3 4 5

Strongly disagree Strongly agree

The organization has leaders who are capable of motivating and guiding their colleagues on the job.

1 2 3 4 5

Strongly disagree Strongly agree

Appendix B – list of companies that could participate in the survey

Name	Employees
Abigo Medical Aktiebolag	59
AKLA Aktiebolag	38
Aktiebolaget Cernelle.	23
Apotek Produktion & Laboratorier AB	291
AstraZeneca AB	6232
Bioglan AB	57
Biora AB	35
Bohus BioTech Aktiebolag	34
Chemotechnique MB Diagnostics Aktiebolag	21
Cobra Biopharma Matfors AB	28
Crucell Sweden AB	111
DCG Nordic AB	22
Fresenius Kabi AB	1008
Fujirebio Diagnostics AB	34
Kemwell AB	167
McNeil AB	672
Octapharma AB	629
QPharma AB	124
Q-Med Aktiebolag	362
Rechon Life Science AB	55
Recipharm AB (publ)	46
Unimedic Aktiebolag	89