UNIVERSITY OF TWENTE.

Innovative work behavior

A case study at a tire manufacturer

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‘Charles Goodyear, zei Joe, vulkaniseerde voor het eerst rubber. Een revolutie. Copernicus maakte de wereld rond, Goodyear maakte ‘m berijdbaar. Rubber was in die tijd nog echt een probleem, het werd te zacht als het warm was en keihard als het koud was. Ze konden er nog weinig mee maar Goodyear was er maf van, van het idee van rubber. Hij experimenteerde jarenlang maar kreeg het niet voor elkaar. Toen hij op een dag zwavel mengde met rubber, liet hij per ongeluk een beetje vallen op een heet fornuis. En toen gebeurde het, het werd hard, het vulkaniseerde. Daar was op gewacht, dat was het begin, daarna veroverde rubber de wereld. Op rubberbanden! Maar Goodyear had er weinig lol van, die kon z’n patent niet eens verdedigen, die is arm dood gegaan. Martelaren zijn dat, die geven hun leven voor het doel.’

from Joe Speedboot by Tommy Wieringa

Preface

Enschede, July 2011

The last three months I have worked on my bachelor thesis for my study Business Administration at the University of Twente. My aim was to develop my ability to do scientific research. The capability to disseminate a questionnaire and the ability to statistically analyze the data are important to carry out a proper scientific research. In order to learn from this thesis I therefore wanted to include both in my research. Within the project 'competences for innovation' I got the opportunity to research the innovative work behavior of the production workers of EZ. A subject that really appeals me, but more importantly within this research I got the chance to achieve my goals. In addition, it provided me with the opportunity to increase my insight into organizations behind the theory I learned over the past three years. All in all, I have learned a lot during this research.

Several people have guided, helped and encouraged me during this project which helped me to successfully finish this thesis. First of all, I want to thank the employees of EZ for their help. The production workers for their remarkable willingness to cooperate in my research and the production coordinates for their help with handing out the questionnaire. Also I want to thank the colleagues at the four offices I have worked for their company. Special thanks go to my supervisors, André Veenendaal, Tom Groen and Erwin Hofman whom provided me during my project of advice, criticism and support. Last but not least, I would like to thank my family, boyfriend and friends for their support and encouragement during the last three months.

Tamara Oukes

Abstract

In today's rapid changing environment the ability of a business to gain competitive advantage is partly dependent on the capability of a business to innovate. In order to innovate the innovative behaviors of employees are of crucial importance, because it are employees that carry out innovations that otherwise would not be developed. Therefore, a case study was conducted in order to research how mangers can enhance innovative work behavior (IWB) at EZ. The main research question that I intended to answer was *'How can the management of EZ stimulate the innovative work behavior of their employees in order to increase competitive advantage?'*

Innovation is never a solitary activity. The innovative behavior of individuals is at least partly determined by the interaction with others. Within the context of a business employees are in particular depended on their leaders for the information, resources and support that are needed to innovate. The leader is therefore a driving force behind individual innovation. The question arises how leaders can enhance the IWB of their employees. A literature review revealed that innovation-stimulating leadership can enhance the innovative behavior of employees. However, based on the literature review it could also be argued that this relationship would be strengthened if employees believe that their innovative behavior will benefit their work.

An existing questionnaire of the project 'competences for innovation' of the University was used in order to find empirical evidence for these propositions and provide EZ of an analysis of the current situation regarding IWB. As research on individual innovation among employees of firms in the manufacturing industry is still scare, the questionnaire was handed out to production workers. The remarkably high response rate of 82 percent provided a solid basis for the data analysis.

The current situation regarding the innovative behavior of the production workers was determined based on the collected data. It appeared that production workers rarely find themselves to display innovative work behavior. Although the production workers do tend to generate ideas from time to time, they rarely champion or implement these inventions. This causes the perceived innovative output to be quite low. Regarding innovation-stimulating leadership and the expected benefits of innovative behavior on their job the employees were relatively positive.

Based on the results of the data analysis it can be confirmed that innovation-stimulating leadership is positively related with IWB. When supervisors display innovation-stimulating behaviors to a larger extent, employees will be more innovative. The results furthermore show that the relationship between innovation-stimulating leadership and IWB is not moderated by the expected positive job performance outcomes. When employees anticipated innovative behavior would benefit their work, the effect of the innovation-stimulating behaviors of supervisors on the level of IWB was not increased. Thirdly, the findings confirm the expected relationship between IWB and innovative output. When production workers display more innovative behaviors, their perceived innovative output will be higher.

In order to enhance the IWB of their employees, the supervisors of EZ should delegate responsibilities to their employees, recognize and support their innovative efforts, provide them with the resources needed to innovate and consult them in the decision making process. In addition, IWB can be stimulated by establishing a strong association between innovative behavior and job performance. This can be done by communicating the need for change, demonstrating that innovation will benefit the organization, improving the quality of the relationship between the employee and the supervisor, setting innovation as a job requirement and breaking the comfort with the status quo.

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Chapter 1 – Introduction

In this thesis a case study is carried out in order to research innovative work behavior (IWB), the effect of IWB on the performance of an enterprise, the effect of leadership on IWB and the impact of the moderator factor expected positive performance outcomes on this relationship. In this chapter the background, motive, goal, assignment and research questions of this study will be discussed.

1.1 Background

This research is carried out as part of a project of the University of Twente called 'competences for innovation.' The project is an initiative to study and improve the innovative capabilities of manufacturing organizations that are located in Twente and Achterhoek; the eastern part of the Netherlands. The aims of the project are to measure the innovative capabilities of organizations, to give specific improvements to reinforce the innovative capabilities of a particular business and to contribute to the further development of the innovative capabilities of these enterprises. The project focuses on the competences of employees, the competences of the organization and competences regarding external orientation that enhance the innovative capabilities of an enterprise.

In academic literature, it is widely recognized that organizations in the present market are facing an increasing demand from the environment to innovate in order to gain sustainable competitive advantage (Johnson et al., 2008). To meet this demand, enterprises nowadays rely increasingly on individual innovation by employees to innovate their products, process, methods and operations (Ramamoorthy et al., 2005). As it is demonstrated that innovative behaviors of employees have a positive effect on the innovativeness of an organization, theory suggest that employees have to engage in IWB in order for organizations to benefit from individual innovation (e.g. Scott & Bruce, 1994, 1998; De Jong & Den Hartog, 2010). For this reason various scholars have tried to find out which factors stimulate IWB. In general, five categories can be identified: individual factors, job characteristics, team factors, relationship factors and organizational characteristics (West & Farr, 1989). One of the factors that is repeatedly explored is the role of the leader as a driving force behind individual innovation, because researching how management can enhance individual behavior of their employees holds the promise of gaining sustainable competitive advantage. In particular, because in the context of an enterprise employees are highly dependent on their leaders for information, resources, support and the like to explore, generate, champion and implement their new ideas (Kanter, 1988). Therefore, an important question for as well research as practice is how leadership may affect innovative behavior. This question has however not got the attention that it deserves. The research into this field is still underdeveloped and the results remain rather inconclusive (De Jong, 2007). These inconclusive findings suggest that the understanding of the relationship between leadership and individual innovation may benefit from the identification of a moderator variable on which this relationship is contingent and that helps us to understand when the relationship is strengthened or weakened (Pieterse et al. 2010). So, in order to obtain better understanding of how leadership enhances innovative work behavior it is valuable to further explore this topic.

1.2 Motive

Within the project 'competences for innovation' Hartjes (2010) carried out a case study at the Twentsche Kabelfabriek. During her research she studied which competences production workers should possess in order to contribute to the innovativeness of the organization. For this purpose she used the concept of IWB. She studied various individual factors and organizational factors that could stimulate IWB. Hartjes (2010) suggested that three individual factors, namely task-related, cognitive and action competences have an impact on the innovative behavior of production workers. The organizational factors include leadership and organizational climate. To research this Hartjes (2010)

developed a questionnaire which was conducted under the machine-operators from the Twentsche Kabelfabriek. The results of the questionnaire demonstrated that the willingness to take initiative (action competence), technical production skills (task-related competences) and proper educational background (cognitive competences) are competences that enhance individual innovation. Also the leadership behaviors support for innovation, providing resources and delegating were found to stimulate IWB. Furthermore, it appeared that IWB was positively influenced by a supportive innovation climate.

The study of Hartjes (2010) presents some interesting and valuable findings. However, as she states herself the study is only 'a first step in identifying the role of production workers in enhancing organizational innovativeness.' Since the study involves only a case study, the extent to which the results can be generalized is limited (Babbie, 2007). In particular, this limits the usability of the data for the project 'competences for innovation.' In the light of the project, it would be valuable to get a more detailed insight in the impact of various factors on IWB. Therefore, it would be interesting to partly replicate this study with production workers in an organization in a different sectors that is part of the project 'competences for innovation.'

One of the participants of the project 'competences for innovation' is EZ. Because of confidentiality restrictions the name of the company is made unrecognizable in this public version of the report. The organization was recently acquired by the another Indian company. In order to gain sustainable competitive advantage the parent company's vision is to be 'a significant player in the global tire industry and a brand of choice, providing customer delight and continuously enhancing stakeholder value.' While their objective is to increase their turnover in the coming five years with four billion dollar; from two billion to six billion dollar in 2016. To realize this objective the enterprise is currently mapping out a strategic plan. This plan is based on four key points of attention: culture, quality, innovation and sustainability. In Europe, India, South-Africa and at global level, four groups are formed to research how these areas of attention can contribute to the vision of the parent company. The group 'innovation' aims to create a more innovative culture within the organization. For this purpose, at this moment is researched what is needed to create an innovative culture and how this can be achieved. The group recognizes that employees play a crucial role in realizing an innovative culture. Therefore, researching the extent the employees display IWB and how EZ can stimulate IWB would probably yield valuable information for the business.

1.3 Research goal

The goal of the research is in the first place to increase the ability to generalize the results of the study carried out by Hartjes (2010). This will increase the usability of the data for the project 'competences for innovation.' For this purpose in this thesis a large part of the questionnaire developed by Hartjes (2010) will be used to research the IWB of the employees of EZ. Furthermore, this study should yield valuable information for EZ to gain insights in the innovate behavior of the employees and to provide suggestions to stimulate IWB. In this way the company can explore how employees can contribute to the ability of the organization to gain competitive advantage. For this purpose the questionnaire developed by Hartjes (2010) will be adjusted based on a literature study into the innovative behavior of employees, the effect of IWB on the performance of the organization and the factors that enhance IWB.

1.4 Assignment

In this thesis, in the first place is researched to what extent the employees of EZ currently display IWB. In addition, is studied what the effect of IWB is on the innovativeness of the organization, because an enterprise first of all wants to know whether the stimulation of IWB has a positive impact on the competitive advantage of the organization. Otherwise there would be no need to research which factors could drive IWB. Also, is researched which factors can enhance IWB. The focus of the

research will be on the impact of leadership on IWB, because of the important role leaders play in driving individual innovation of employees. However, in the theoretical framework also other factors that enhance IWB are taken into account, because researchers as well as managers has to realize that leadership is not the only factor that has the potential to stimulate IWB. Lastly, is studied if the relationship between leadership and IWB could be moderated. Since Pieterse et al. (2010) argues that the understanding of the relationship between leadership and IWB could benefit from the identification of a moderator.

1.5 Main and sub research questions

Based on the assignment formulated above the following main research question can be formulated: *'How can the management of EZ stimulate the innovative work behavior of their employees in order to increase competitive advantage?*' In addition, I formulated six sub questions that will help study how the organization can stimulate IWB and analyze the current situation regarding the innovative behavior of employees.

1. *What is the effect of innovative work behavior on competitive advantage?*
2. *Which factors could stimulate innovative work behavior?*
3. *How can leadership enhance the innovative work behavior?*
4. *Which factors could influence the relation between leadership and innovative work behavior?*
5. *To what extent are IWB and these factors currently present at EZ?*
6. *Which steps can be taken to further stimulate the innovative work behavior of the employees of EZ?*

In chapter two the relationships between sustainable competitive advantage and organizational innovativeness and organizational innovativeness and individual innovation are theoretically researched in order to answer sub question one. Thereafter, is explored which factors could enhance individual innovation in order to provide an answer to sub question two.

In chapter three the third and fourth sub questions are partly answered by presenting the conceptual research model of this study. It is proposed that the concept of innovation-stimulating leadership of De Jong (2007) is positively related to IWB. However, based on the literature on this topic it can be argued that this relationship is moderated by the expectations of employees regarding the positive performance outcomes of their innovative behavior. Besides, it is suggested that IWB is positively related to innovative output.

In order to give a complete answer to the third and fourth sub question, the conceptual research model has to be empirically tested. For this purpose a questionnaire is used which is handed out to the employees of EZ. The methodology that is used in order to research the conceptual model is explained in chapter four. In this chapter also a description of EZ can be found.

The fifth sub question will be answered in chapter five by describing and analyzing the data that are retrieved from the questionnaire. Based on these data in the last chapter the sixth sub question will be answered by giving recommendations on how to further improve the innovativeness of the employees of EZ.

Chapter 2 – Theoretical framework

In the 21st century the survival and growth of an organization depends on its ability to create and sustain competitive advantage. In particular the ability to create sustainable competitive advantage allows an enterprise to maintain and improve its competitive position in the market (Gandotra, 2010). A business is said to have sustained competitive advantage 'when it is implementing a value-creating strategy not simultaneously being implemented by any current or potential competitors and when these other firms are unable to duplicate the benefits of this strategy (Barney, 1991, p. 102).' In addition, sustainable competitive advantage can be expected to result in superior performance, as well financial performance – shareholder value analysis, return on investment, etcetera – as marketplace performance – customer satisfaction, market share and the like (Johnson et al., 2008). Therefore, researchers and business managers have long be interested in creating an understanding of the sources of sustainable competitive advantage (Barney, 1993).

2.1 Sources of competitive advantage

Businesses are according to Barney (1993) more likely to gain sustainable competitive advantage over their competitors when the firm uses its internal strengths in exploiting environmental opportunities and neutralizing environmental threats, while avoiding internal weaknesses. Although, the research in this field focused mainly on the external environment as a source of competitive advantage, the environment is not necessarily the only source. For instance, an organization can be a superior performer even when it competes in exactly the same environment as competitors (Tidd & Bessant, 2009). Besides, an enterprise can be able to gain competitive advantage when it operates in an unattractive, high-threat and low opportunity environment (Johnson et al., 2008). The analysis of the environment is therefore only half the story. A complete understanding of the sources of competitive advantage requires also the analysis of the resources and competences of an organization. Resources are all the financial, human, intellectual, organizational and physical assets of an organization that are used to develop, manufacture and deliver products (Barney, 1993). Whereas capabilities are by Johnson et al. (2008, p. 96) defined as 'the skills and abilities by which resources are deployed effectively through an organization's activities and processes.'

In today's world the capability of an organization to innovate is particularly important to gain sustainable competitive advantage (Tidd & Bessant, 2009). The last decades, globalization, rapid technological advancements, shorter product life cycles, new legislation, increased competition and suchlike have raised a situation where an organization encounters an environment which can be characterized by its unprecedented opportunities and challenges. In addition, price, quality and customer satisfaction are given enormous emphasis (Leifer et al., 2001). This increasingly more competitive, dynamic and unpredictable environment has created a continuous need for new ways of doing things. Organizations constantly have to move into further innovation. Otherwise the risk exists that competitors take the lead in changing offerings, operational processes or underlying business models (Tidd & Bessant, 2009).

It is therefore not surprising that the research into the sources of sustainable competitive advantage places an important emphasis on an organization's capability to innovate, change, be flexible and learn how to adapt to a rapid changing environment (Johnson et al., 2008). For example, Bommer and Jalajas (2004) argue that businesses that are more innovative are better able to obtain the necessary capabilities to increase performance and to get a positive response for the environment than their competitors. Also, Tidd and Bessant (2009) suggest that innovation has a positive effect on the performance of a business. For instance, the development of new products allows an organization to increase profitability and retain market share. In addition, the focus on the speed of innovation can result in a larger market share which enables businesses to create higher turnover

and profitability. Likewise, process innovation can be a powerful source of competitive edge for an organization, because it allows an organization to retain their profit margins. In summary, those organizations that can mobilize technological capabilities and knowledge to create not only novelty in their offerings, but also in the ways in which they create and deliver their offerings are better able to secure their profitability, growth and long-term survival (Tidd & Bessant, 2009).

2.2 Defining innovation

Although various definitions of innovation exist, all include the need to complete the development and exploitation aspects of knowledge, not just its invention (Tidd & Bessant, 2009). Innovation is thus more than coming up with good ideas, it also includes making these ideas work technically and commercially. For example, West and Farr, (1989, p. 16) define innovation as `the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit role performance, the group, the organization or the wider society.' Whereas according to Luecke and Katz (2003, p. 2) innovation 'is generally understood as the successful introduction of a better thing or method. It is the embodiment, combination, or synthesis of knowledge in original, relevant, valued new products, processes, or services.' In this thesis however the definition as proposed by Boer and During (2001, p. 84) will be used. These authors define innovation as 'the creation of a new product-market-technology-organization-combination (PMTO-combination).' The definition is based on three key elements:

1. Innovation is a process.
2. The result is at least one new element in the PMTO-combination.
3. The extent to which the innovation is new varies.

2.2.1 Innovation as a process

Innovation is according to Boer and During (2001) a process. Despite that in the past years various scholars have argued that innovation is an iterative, complex, non-linear, disjunctive and cyclical activity, the most frequently used model to describe the process is still the activity-stage model (e.g. King & Anderson, 2002). Such a model breaks down the innovation process in a number of stages and focuses on the various activities that are carried out in order to innovate (De Jong, 2007). These stages can according to De Jong (2007) be divided in two main phases: initiation and implementation. Initiation includes activities like thinking about ways to improve products or processes and the recognitions of problems. The results of this phase are suggestions for innovations like new products or work processes. The initiation phase passes into the implementation phase when an idea is produced. Implementation is the development and launch of innovations. The implementation phase ends as soon as the idea is implemented (King & Anderson, 2002).

2.2.2 Elements of the PMTO-combination

According to Boer and During (2001) the result of the innovation process is at least one new element in the PMTO-combination. Either the product, market, technology, organization or a combination of them has to change. Products are the tangible and intangible outputs of businesses. The innovation of products consists of changes in the products or services an organization offers. A market can be seen as a group of customers with similar needs. Market innovation can thus be defined as changes in the context in which products and services are introduced. Technology is according to Boer and During (2001, p. 106) 'the knowledge, experience and skills of people, methods, techniques, tools and equipment companies need to perform their production, support and management processes.' The innovation of technology can be defined as changes in the way in which products and services are created and delivered. An organization is a social (structural, cultural and physical) arrangement aiming at creating value by dividing and coordinating the work. Organizational innovation can be seen as changes in the underlying mental models of an organization (Boer & During, 2001; Tidd & Bessant 2009).

2.2.3 Degree of novelty

The perceived newness of an innovation varies from incremental through synthetic to discontinuous innovation. Incremental innovation is small step innovation which makes minor improvements or simple adjustment to the current product, technology, market or organization. In contrast, with synthetic innovation the elements of innovation are combined in new ways. Whereas discontinuous innovation aims at making radical changes to the product, technology, market and or organization which changes the way we think about and use them. Furthermore can be explored to whom the innovation is new. This can range from new to the world, the country, the society, the organization to new to the individual (Boer & During, 2001).

2.3 Innovative work behavior

As mentioned, organizations that operate in the present fast changing competitive world face an increasing demand to engage in innovative behaviors to create and deliver new products to gain sustainable competitive advantage. In order to accomplish this task successfully organizations nowadays rely increasingly on their employees to innovate (Ramamoorthy et al., 2005). For instance, Getz and Robinson (2003) demonstrate that eighty percent of the ideas in an organization are initiated by employees. However, employees are rarely formally prescribed to innovate. In other words, innovative behaviors do formally rarely belong to the work of most employees. Therefore, employees are rarely directly or explicitly rewarded for innovative behaviors (George & Brief, 1992; Katz, 1964). For this reason individual innovation can be identified as a purely discretionary behavior which is in scientific literature regarded as extra role behavior (Katz, & Kahn, 1978). Nevertheless, stimulating individual innovation can benefit an employee. An employee may gain intrinsic rewards for his or her behavior, like recognition or the possibility to expand their skills. This may result in feelings of enhanced personal control and morale and therefore a greater commitment to self and ones job (Schuler & Jackson, 1987).

However, individual innovation may bring benefits to the organization as well. By engaging in innovative behaviors employees develop, carry, react to and modify ideas that would otherwise not be developed. This makes employees essential for the innovation of products, processes and methods within their organization (Ramamoorthy et al., 2005). The positive relationship between individual innovation and organizational innovativeness is also supported in literature. For example, Campbell et al. (1996) demonstrated a positive correlation between organizational performance and innovations-specific behaviors. However, the end result does not by definition have to be beneficial for the organization. It is possible that the end result is complete failure or results in a deterioration of the competitive advantage of the firm (Campbell, 2000). In each case, the intention of individual innovation is to benefit the organization as well as the employee.

Individual innovation can be conceptualized in various ways. The concept has been operationalized in terms of personality characteristics, outputs and behaviors. For example, Hurt et al. (1977) considered individual innovation to be personality-based. The authors defined individual innovation as the generalized willingness to change. On the other hand, West's (1987) measure of role innovation which measures the amount of changes individuals have initiated in their work can be regarded as an output-based measure. Also, Bunce and West (1995) considered individual innovation as output-based. The authors' composite innovation score measured individual innovation by multiplying the perceived effectiveness of innovations by the number of innovations. Though, most scholars have operationalized individual innovation as a set of complex behaviors (e.g. Janssen, 2000; De Jong, 2007; De Jong & Den Hartog, 2010). For instance, De Jong (2007, p. 8) defined innovative work behavior (IWB) as 'the intentional behavior of an individual to introduce and/or apply new ideas, products, processes, and procedures to his or her work role, unit, or organization.'

Several points about regarding this definition of individual innovation are worth noting. Firstly, IWB includes behaviors relating to both the initiation as well as the implementation phase of the innovation process. Innovation by individuals begins often with the exploration of an idea, like looking for improvements on current products, services and work processes or trying to think about them in new ways. Next, the idea is generated which means generating concepts related to new products, services, work processes, the entry of new markets and the like for the purpose of improvement. These two behaviors can be linked to the initiation stage of the innovation process which is shown in figure 1. Idea championing is the following step; it includes finding support and building a coalition of supporters for the new concept. For example, by mobilizing resources and pushing, influencing and negotiating with colleagues. Thereafter the idea is implemented. During this stage new products, services, work processes and such like are developed, tested and modified (e.g. De Jong, 2007; Zaltman et al., 1973). The last two activities can be related to the implementation phase of the innovation process, see figure 1.

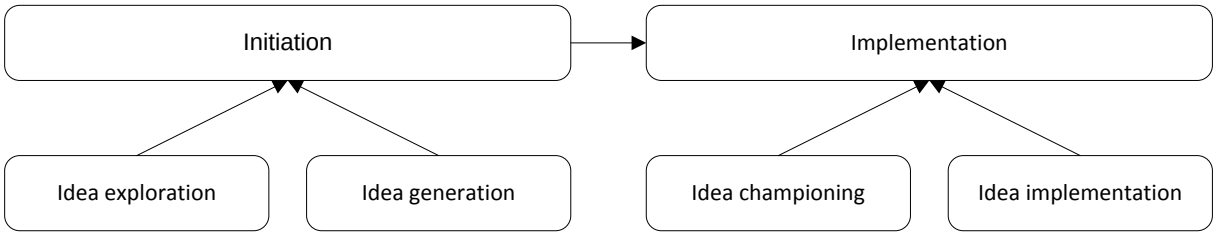

Figure 1. Stages of individual innovation linked to stages innovation process

Secondly, the concept of employee's innovative behavior can be applied to as well incremental as radical innovation. Individual innovation does not necessarily have to result in a minor change which can be applied in the existing infrastructure, but can also have a direct profound effect on the organization (Åmo, 2005). Thirdly, the definition of innovative work behavior includes all the elements of innovation: product, technology, market and organization. So, employee's innovative behaviors could be behaviors involving the initiation as well as the implementation of all the elements of the PTMO-combination. For example, the introduction of a new element in the organization's production process – technological innovation – or the implementation of new recruitment policies – organizational innovation. Finally, the new ideas, processes or methods being initiated or implemented do not have to be absolutely new to the world. It is enough for them to be new to the relative unit of adoption (Åmo, 2005).

In literature several concepts are available which show a close resemblance with innovative work behavior. A brief discussion about how the most used concepts differ from individual innovation will prevent confusion and enhances the understanding of IWB. In the first place, individual innovation differs from the concept of employee creativity; the production of ideas for new products, services, processes and work procedures (Amabile, 1988). Although creativity can been seen as a crucial element of individual innovation in the first phase of the innovation process, IWB include also the implementation of ideas. Furthermore, employee's innovative behavior is unlike employee creativity intended to somehow benefit the organization; it is expected to result in innovative output (De Jong & Den Hartog, 2010). Another construct that differs from innovative behavior is proactive behavior – taking self-initiative and future-oriented actions to improve the situation or oneself – because it focuses mainly on individuals realizing change after a problem is identified. Also proactive behaviors can be part of the innovation process, in particular in the last phase. However, these behaviors do not necessarily have to be innovative (Parker et al., 2006). A third similar concept to individual innovation is role innovation which can be defined as the introduction of significant new behaviors into a pre-existing role (West, 1987). Unlike with IWB, with role innovation only the procedures or processes within an employee's work role are changed, not in the department, unit or organization.

The last employee-related construct is continuous improvement that differs from individual innovation in the way that the concept focuses solely on continuous improvement with existing resources to enhance the innovativeness of the organization. Whereas individual innovation also aims at encouraging radical innovation (Bessant & Caffyn, 1997).

2.4 Determinants of innovative work behavior

As mentioned, organizations that have the capability to innovate are better able to gain sustainable competitive advantage over their competitors. As individual innovation is argued to increase innovativeness of the organization, it appears that individual innovation is of great significance for the organization to gain competitive advantage. Therefore, it is essential to develop and encourage the innovative potential of employees (e.g. Oldham & Cummings, 1996; Amabile, 1988).

An organization that aims for a continuous flow of individual innovation has to ensure that their employees are both willing and able to innovate (De Jong & Den Hartog, 2010). For this purpose various scholars have researched the determinants of innovative behavior. The research in this field however is still limited. In particular because most literature on the factors that enhance individual innovation focuses on creativity in general or employee creativity rather than the implementation of ideas (De Jong, 2007). In table 1 an overview of several factors that impact IWB is presented. The table is based on the categories of factors– individual characteristics, intrinsic job factors, team factors, relationships at work and organizational factors – that impact individual innovation according to West and Farr (1989). Studies that only include either the initiation or implementation phase, like research into employee creativity, are excluded. The reason for this is that the focus of this research is on both phases. The overview is however not exhaustive; the overview gives an impression of the scope of the research conducted in this area.

Firstly, innovation by employees can be affected by factors that vary at the level of the individual. Various scholars focused on individual innovation as an aspect of personality. For example Åmo and Kolvereid (2005) argue that employees with an intrapreneurship personality perform higher levels of innovative behavior than employees without such a personality. Likewise, various scholars stress that innovative behavior of an individual is positively affected by proactive behavior of the same individual (Åmo, 2005; Seibert et al., 2001). Proactive people are argued to be more likely to engage in extra-role behavior. As innovation by individuals can be considered as extra-role behavior, it is expected that employees that display more proactive behavior also perform more innovative behaviors (Seibert et al., 2001). Several scholars indeed demonstrate that there exists a positive link between the dimensions of proactive behavior – taking charge, role breath self-efficacy, proactive personality and personal initiative – and IWB (Åmo, 2005; Hartjes, 2010; Axtell et al., 2000; Bouwhuis, 2008; Farr & Ford, 1990; Seibert et al., 2001). Furthermore, researchers have explored the impact of cognitive features of employees on innovative behavior. Hartjes (2010) and Janssen (2000) for instance studied the impact of educational level on the innovative behavior of individuals. It appeared that higher educated employees display more innovative behavior. Also the problem-solving style is considered as a cognitive ability that affects the innovative behaviors of employees (Scott & Bruce, 1998). Other individual characteristics that positively influence the performance of innovative behavior are learning goal orientation (Bouwhuis, 2008) and employability (Stoffers & Heijden, 2009). However, according to Yuan & Woodman (2010) the characteristics of individuals do not solely influence individual innovation. The expectations of employees regarding the outcomes, risks and gains of the performance also affect IWB.

Category	Factors
Individual	Intrapreneurship personality (Åmo & Kolvereid, 2005)
	Self-efficacy (Axtell et al., 2000; Bouwhuis, 2007; Farr & Ford, 1990)
	Taking initiative (Hartjes, 2010; Huiskamp et al., 2008)
	Proactive personality (Seibert et al., 2001; Åmo, 2005)
	Employability (Stoffers & Heijden, 2009)
	Education level (Hartjes, 2010; Janssen 2000)
	Problem solving style (Scott & Bruce, 1998)
	Learning goal orientation (Bouwhuis, 2007)
	Expected performance outcomes (Yuan & Woodman, 2010)
	Expected image outcomes (Yuan & Woodman, 2010)
Job	Job autonomy (Ramamoorthy et al., 2005: Axtell et al., 2000)
	Job demands (Janssen, 2000; Martin et al., 2007; Hartjes, 2010)
	Functional flexibility (Dorenbosch et al., 2005)
	Role orientation (Hartjes, 2010; Axtell et al., 2000; Dorenbosch et al., 2005)
	Job tenure (Dorenbosch et al., 2005)
	Job control (Axtell et al., 2006)
	Obligation to innovate (Ramamoorthy et al., 2005)
	Influence in work place (Janssen, 2005)
	Psychological empowerment (Knol & Linge, 2009; Pieterse et al., 2010)
	Structural empowerment (Knol & Linge, 2009)
Team	Team leader support (Axtell et al., 2006)
	Team method control (Axtell et al., 2000)
	Team role breath (Axtell et al., 2000)
	Team support (Axtell et al., 2000)
Relationship	Participative leadership (Axtell et al., 2000)
	Supportive leadership (Axtell et al., 2000)
	Transformational leadership (Pieterse et al., 2010; Janssen, 2005)
	Transactional leadership (Pieterse et al., 2010)
	Influence-base leadership (Krause, 2004)
	Leader member exchange (Stoffers & Heijden, 2009; Scott & Bruce, 1994; 1998)
	Stimulating-leadership behaviors (De Jong, 2007; Hartjes, 2010)
	External work contacts (De Jong, 2007)
Organizational	Organizational climate (Imram et al., 2010; Solomon et al., 2002; Hartjes, 2010)
	Support for innovation (Scott & Bruce, 1994)
	Corporate entrepreneurship strategy (Åmo & Kolvereid, 2005)
	Innovation strategy (De Jong, 2005)
	Knowledge structure (Ong et al., 2003)
	Pay (Ramamoorthy et al. 2005)
	Desire for employee innovation (Åmo , 2005)

Table 1. Determinants of innovative work behavior

The second category includes job factors that affect individual innovation. According to various scholars job characteristics can have a significant impact on the innovative behavior of employees, especially regarding the challenge, variety and autonomy of a job. For example Ramamoorthy et al. (2005) and Axtell et al. (2000) argue that job autonomy has a positive influence on individual innovative behavior. The freedom to do one's job gives people space to try out new ideas even if they will eventually fail. So, job autonomy permits employees to engage in 'trial and error' and to find more effective and efficient ways of doing their work. Another job characteristic that is stressed to increase the level of IWB, is job demand (Janssen, 2000; Martin et al., 2007; Hartjes, 2010). Enriched jobs are in comparison with more simple work more challenging and require more thinking.

This will trigger employees during their daily work and result in more innovative behavior (Janssen, 2000). Besides, Dorenbosch et al. (2005) suggest that a multifunctional job design enhances the performance of innovative behavior by employees. Functional flexibility requires a high variety of tasks and skills. This wide span of job activities is assumed to broaden the psychological boundaries of one's work which in turn enhances the innovative behavior of employees. Besides job autonomy, variety and challenge, role orientation also affects employees' innovative behaviors (Hartjes, 2010; Axtell et al., 2000; Dorenbosch et al., 2005). Two types of role orientation can be identified: production ownership and importance of production knowledge. The more people feel concern and ownership of problems in the workplace – production ownership – the more innovative behavior. Since employees whom not feel responsible for the problems in their work environment will not be motivated to provide solutions for them. Also, individuals have to recognize the importance of a broad range of skills, knowledge and behavior for their effective performance. When employees are not able to recognize their own capabilities, they neither are able to innovate (Parker et al., 1997). Furthermore, structural empowerment – the power of an employee based on one's position in the organization – and psychological empowerment – the personal convictions of one's role with an organization – have a significant impact on the innovative behavior of individuals (Knol & Linge, 2008; Pieterse et al., 2005). Other factors that are argued to have an impact on innovative behavior of employees are job control (Axtell et al., 2006), obligation to innovate (Ramamoorthy et al., 2005), perceived influence of an employee in the work place (Janssen, 2005) and job tenure (Dorenbosch et al., 2005).

Thirdly, team characteristics can affect individual innovation. Although idea exploration and generation may sometimes be done individually, idea championing and implementation are never solitary activities. The latter behaviors, and commonly also the first, involve other individuals (Scott & Bruce, 1994). Individuals in the context of an organization have to rely on colleagues in order to innovate. Therefore the innovative behavior of employees is at least partly determined by the interaction with colleagues (De Jong, 2007). In particular, an employee can be significantly affected by the team's job characteristics and by his or her team members. Therefore, Axtell et al. (2000; 2006) studied the effect of team climate, team method control, team role breath, team support and team leader support on the innovative behaviors of individuals. It appeared that high team control and role breadth lead to higher levels of innovative behavior by employees. Also, team support, team climate and team leader support were demonstrated to have a significant influence on individual innovation. However, since most scholars focus solely on the effect of group characteristics on team innovation, the research on this topic – the effect of team characteristics on individual innovation – is scarce (Axtell et al., 2000; 2006).

The fourth group of factors that is likely to influence the innovative behavior of employees includes relationship factors in the wider organization. Most scholars and managers in this field of research have focused on the impact of leadership on individual innovation, because for the management of a business it is interesting to know how they can stimulate the innovative potential of their employees. Early research in this field studied mainly the effect of leadership style on innovative behaviors by individuals. Participative, supportive, transformational, transactional and influence-based leadership all are argued to have a positive influence on individual innovation (Axtell et al., 2000; Pieterse et al., 2010; Janssen, 2005; Krause, 2004; Stoffers & Heijden, 2009; Scott & Bruce, 1994; 1998). For example, leaders with a participative leadership style involve employees in the decision making process and gives employees the autonomy to design and guide their own work. This is likely to increase individual innovation, because employees are more motivated to propose new and improved ways to execute the outcomes of decisions made when they feel concern and ownership for these decisions (Axtell et al., 2000). The transformational leadership style results in higher levels of innovative behavior, since leaders with this leadership style express an inspiring vision, stimulate to question the status quo and allow individuals to develop themselves (Pieterse et al., 2010).

Another related relationship that is researched by leader-member exchange (LMX) theory is the relationship between the leader and the follower in the organization. This theory argues that the relationship between leader and employee improves over time; from low to high leader-member exchange. When the quality of the relationship between supervisor and follower is higher, employees are more likely to involve themselves is innovative behavior. This positive effect of LMX on individual innovation is confirmed by various scholars, like Stoffers and Heijden (2009) and Scott amd Bruce (1994). In addition, De Jong (2007) researched the influence of various leadership behaviors on individual innovation. The research indicates that the leadership behaviors support for innovation, consultation, recognizing, providing resources, delegating, monitoring and task assignment all have a significant positive relationship with innovative work behavior. Later, the positive effect of support for innovation, providing resources and delegating on innovative behavior was confirmed by Hartjes (2010). However, employees are not solely influenced by their supervisors. Also external work contacts can influence the innovative behavior of individuals. De Jong (2007) for instance argues that people with more frequent and diverse external work contacts perform higher levels of innovative behavior. The reason for this is that these people are more exposed to innovative opportunities and can more easily obtain the resources to implement an invention.

The last category of factors includes organizational factors. Especially organizational climate and strategy are given much attention in this field of research. Both factors emphasize the importance of the employees' perception of the extent to which an organizational encourages innovation in order to enhance the innovative behavior of employees. For example the definition of organizational climate by Isaken et al. (1999) stresses the importance of employee perception. The authors define the climate of an organization as the frequent patterns of behaviors, attitudes and feelings which are displayed in the daily environment of the organization and how individuals within the organization experience and understand it. Whereas, an innovative strategy can be regarded as means for increasing the perception of the extent to which an organization encourages innovation (Åmo & Kolvereid, 2005). Various researchers argue that both factors have a positive impact on individual innovation. For instance Hartjes (2010) and Scott and Bruce (1994) suggest that employees of an organization who perceive their organization to have a climate in which innovation is supported, perform higher levels of innovative behavior. Whereas employees of an organization that has an innovative or corporate entrepreneurship strategy, also are more likely to engage in individual innovation (Åmo & Kolvereid, 2005; De Jong 2005). However, organizations can stimulate individual behavior at a corporate level further by the means of rewards (Ramamoorthy et al., 2005), knowledge structure (Ong et al., 2003) and the desire of the top management level for employee innovation (Åmo, 2005).

2.5 Conclusion

Based on the above literature review it can be argued that in today's rapid changing environment the ability of a business to gain sustainable competitive advantages is partly dependent on the capability of an enterprise to innovate. In order to meet this demand the innovative behavior of employees is of crucial importance, because it are employees that carry out innovations that otherwise would not be developed. For an organization it is therefore interesting to know which factors stimulate innovative work behavior. Although the research in this field is still limited, based on previous research five categories can be identified: individual, job, team, relationship and organizational factors. These findings are summarized in the model in figure 2.

In addition, the literature review revealed several issues which Hartjes (2010) in her study did not mentioned, but which could be worth researching. In this chapter was, for example, assumed that innovation – and indirectly individual innovation – leads to competitive advantage. However, despite that Hartjes (2010) argues that IWB leads to an increase of organizational innovativeness she did not answer the question why an organization should innovate. Furthermore, she did not consider all the

factors that could possibly influence employee's innovative behaviors. She limited her research to individual and organizational factors while other factors might also be worth researching or at least considering. For these reasons, it is interesting and valuable to develop a new conceptual research model which can be used later in this research to test the relationships between employees' innovative behavior, the factors that enhance it and the effect of individual innovation on innovative output.

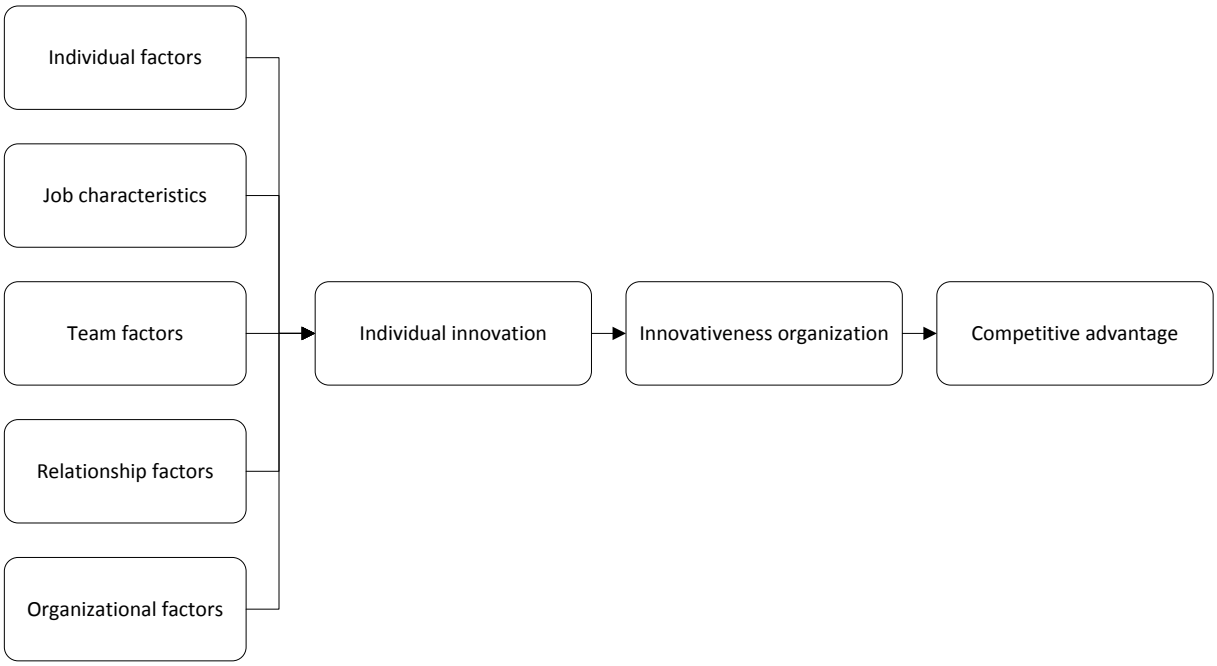

Figure 2. Summary of findings literature review

Chapter 3 – Research model

In the previous chapter it was concluded that it is useful to further explore the determinants of employee's innovative behavior, because individual innovation has a positive influence on the innovativeness of an organization and in this way the ability of a business to gain competitive advantage. For this purpose in this chapter a research model is developed that will be used in the remainder of this thesis to research the extent to which employees of EZ display innovative behavior, how the organization could enhance their individual innovation and the impact of innovative work behavior on employees' innovative outcome.

3.1 Research model

In figure 3 the central research model of this thesis is presented. As displayed in the model the effect of innovation-stimulating leadership on innovative work behavior will be researched. In addition, the impact of innovative work behavior on innovative output will be explored and the moderating effect of expected positive performance outcomes on the relationship between innovation-stimulating leadership and innovative work behavior will be tested. In the following sections each of these concepts and their mutual relationships are explained further.

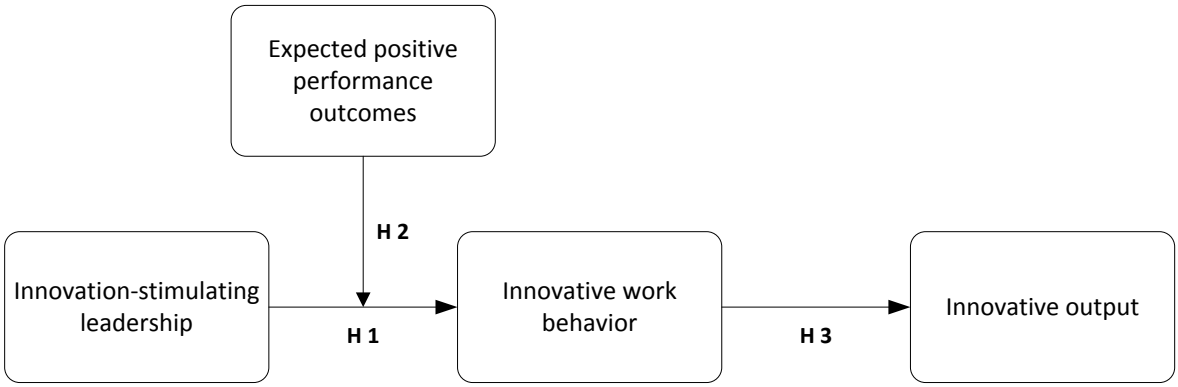

Figure 3. Conceptual research model

3.2 Innovative work behavior

Central to this research model is the concept of innovative work behavior (IWB). IWB is, drawing on De Jong (2007, p. 19), defined as '*individuals' behaviors directed towards the initiation and intentional introduction (within a work role, group or organization) of new and useful ideas, processes, products or procedures.'* The concept implies that individuals generate, promote and realize innovative ideas for improvements to for example products or processes. So, following authors such as Scott and Bruce (1994), Janssen (2000) and De Jong (2007) in this thesis individual innovation is conceptualized as set of complex behaviors consisting of both the initiation as well as the implementation of new ideas that can lead to incremental and radical innovation of one or more components of the PTMO-combination that may be new to the world, industry, organization or the work unit.

Since the concept of IWB was already described in detail in the previous chapter, it will not be discussed here further. However, one point is worth considering. Most studies on the concept of IWB theoretically distinguish several stages or dimensions, because the stages are argued to require different activities, behaviors and skills of an employee (e.g. Scott & Bruce, 1994; De Jong, 2007). For instance, Scott and Bruce (1994) considered IWB to be a multi-stage process. The authors identified based on Kanter (1988) three stages: idea generation, coalition building and implementation. On the other hand, De Jong & Den Hartog (2010) identified four dimensions: idea exploration, idea

generation, idea championing and idea implementation. The authors suggested that the concept of idea generation was rather broad and includes both the exploration and the generation of ideas. Firstly, because according to creativity research these behaviors rely on distinct cognitive capabilities (e.g. Basadur, 2004). Secondly, as entrepreneurship literature argues that opportunity exploration precedes idea generation and that both behaviors have distinct personality and environmental determinants (e.g. Shane, 2003).

Although IWB is theoretically treated as multi-dimensional, most studies used a one-dimensional measure of IWB. In particularly in early research IWB was operationalized as one-dimensional. Later studies attempted to try and develop a multi-dimensional measure. For example by De Jong and Den Hartog (2010) who anticipated that a multi-dimensional measure would better reflect the domain of the concept. However, most scholars found strong correlation between the dimensions which indicates that the distinctiveness of the stages is weak. Hence, was concluded that the dimensions could best be combined and used as a single additive scale (e.g. Janssen, 2000; Kleysen & Street, 2001; De Jong & Den Hartog, 2010). Although researchers suggest that IWB may theoretically be best understood if one assumes the dimensions of IWB as distinct stages. In practice the IWB process appears to be reciprocal with overlapping stages where individuals can be expected to be simultaneously involved in (De Jong & Den Hartog, 2010). For these reasons – as it better reflects reality – the concept of IWB is considered to be one-dimensional in this research.

3.3 Innovation-stimulating leadership behaviors

In the previous chapter it was argued that one group of factors that influence employee's innovative behavior includes relationships within the wider organization, like leadership and external work contacts. As previous work suggest that individual innovation is partly determined by the interactions with others. Most of the research in this field focuses on the impact of leadership on individual innovation. In particular, the effect of theory-based leadership styles on employee innovation, such as transformational leadership, participative leadership and leader-member exchange theory. These models were originally developed to explain the general work performance or effectiveness of employees rather than innovation-related outcomes. However, it is not necessarily the case that leadership behaviors aimed at boosting work performance in routine settings, are also appropriate to stimulate employee's innovative behavior. Furthermore, the findings of the research into this topic are rather inconclusive (e.g. De Jong, 2007). For these reasons De Jong (2007) empirically tested the impact of thirteen specific leadership behaviors on innovative behavior. The author demonstrated that six of these leadership behaviors were positively and directly related to IWB. Within these behavioral aspects two dimensions can be distinguished: participation and direct support. Participation includes encouraging employee's participation in decision making (consulting), giving people autonomy to determine themselves how to do a job or certain task (delegating) and clarifying work roles, responsibilities and requirements (task assignment). Direct support involves the response of leaders to the innovative efforts of an employee (support for innovation), giving employees the discretion to act on their innovative ideas (providing resources) and giving praise and showing appreciation for innovative effort (recognition). In practice, both forms of leadership will stimulate individual innovation, because they motivate employees for the content of their job and increase the commitment and the feeling that oneself is able to implement innovative ideas (De Jong, 2007). Based on these six leadership behaviors De Jong (2007) developed a measure of innovation-stimulating leadership which could be used in future work on the determinants of individual innovation. Innovation-stimulating leadership is defined as 'all leader behaviors that stimulate individuals to initiate and intentionally introduce new and useful ideas, processes, products or procedures within their work role, group or organization (De Jong, 2007, p 185).' Although the author demonstrated that the six leadership behaviors all contribute significantly to the overall construct, the direct relation between innovation-stimulating leadership and IWB was not studied. That is why it is interesting to test if and to what extent the overall construct of innovation-stimulating leadership

related to individual innovation. Besides, it provides a useful addition to the research of Hartjes (2010), because she studied only three of the six leadership behaviors that were positively related to employee's innovative behavior. Therefore, I hypothesize that:

H1: *Innovation-stimulating leadership is positively related to innovative work behavior*

3.4 Expected positive performance outcomes

In the previous chapter it was concluded that employee's innovative behavior can indirectly increase the ability of an organization to gain sustainable competitive advantage. Furthermore, several determinants of innovative behavior were identified, such as individual differences, job characteristics and organizational climate. However, the psychological processes that would explain how and why these different individual and contextual determinants affect innovative behavior of employees remain underdeveloped (Yuan, 2005; Yuan & Woodman, 2010). As a relevant psychological aspect, learning and motivation theories stress the importance of outcome expectations in determining human behavior. For instance, operant conditioning theory and social learning theory argue that individuals develop outcome expectations either from direct experiences or by observing others. In turn, these outcome expectations guide people's behavior (Yuan, 2005). More directly, Vroom's expectancy theory of motivation (1964) proposes that an individual's motivational force to behave or act in a certain way is determined by expectations regarding the results of the selected outcome, if the behavior will ultimately lead to the desired outcome and the value of the selected outcome.

As it is suggested that human behavior is partly guided by outcome expectations, also innovative behavior will be influenced by the expectations regarding the benefits and costs of the behavior (Yuan, 2005). Following the efficiency-oriented perspective in understanding innovation it can be argued that in particular the expectations regarding the potential influence of innovative behavior on job performance will effect individual innovation. The efficiency-oriented perspective assumes that individuals in organizations make rational decisions in adopting innovation to maximize the organization's efficiency gains (Yuan & Woodman, 2010). A full rational individual carefully collects the information and knowledge of all alternatives and their consequences. In practice, however, individuals do not take completely rational decisions but rather seek for a satisfactory solution (Simon, 1957). Nevertheless, it is suggested that one major reason for employees to engage in innovative behavior is because they expect it to bring performance gains. For instance, new technologies are introduced because these are expected to bring performance improvements and efficiency gains and new work methods are applied since these are considered to be better than existing ones.

In keeping with Yuan (2005, p. 4) expected performance outcomes are defined as 'an individual's expectations of how his or her innovative behaviors would affect the performance or efficiency of the individual's work role or unit.' Expected performance outcomes are positive when employees believe that their behavior will bring performance improvements or efficiency gains for their work roles or work units. Efficiency is in this case broadly defined and used synonymously with performance to describe objective or actual task performance. Naturally, relevant performance dimensions vary across different work roles, and employees weight various aspects of performance in distinct ways. Therefore, positive performance outcomes are subjectively defined by each particular employee.

Although, Yuan and Woodman (2010) demonstrated a significant positive effect of expected positive performance outcomes on individual innovation and prior research has suggested that expected payoffs or outcomes of innovative behavior can be important psychological considerations behind individual innovation, studies that directly theorize and test the effects of these outcome

expectations are still scarce (Yuan, 2005; Yuan & Woodman, 2010). For example, Scott and Bruce (1994) studied the impact of various factors on individual innovation through the perceptions of organizational climate which was suggested to influence employee's innovative behaviors as it signals potential outcomes of behavior. However, the authors did not examine the nature of these outcome expectations and their impact on organizational climate or individual innovation (Yuan, 2005; Yuan & Woodman, 2010). Also, De Jong (2007) stresses that expected payoffs or outcomes of individual innovation could be an important psychological consideration behind innovative behaviors. The author suggests that even if individuals sense a need or are stimulated to innovate, they are less likely to display innovative behaviors if they feel that the payoffs are too low or lacking. In other words, De Jong (2007) suggests that the effect of the determinants on IWB can be expected to be moderated by expected performance outcomes. However, this moderating effect of expected performance outcomes was not directly tested in the study of De Jong (2007) or in any other study to my knowledge. Therefore, it is interesting to research if expected performance outcomes moderate the relationship between one or more determinants of innovative behavior and individual innovation. In this way, a better understanding is obtained of how the expectations regarding the pay-offs of innovative behavior affect individual behavior. Besides, it will provide a valuable addition to the study of Yuan (2005) and Yuan and Woodman (2010). They only tested expected positive performance outcomes as a mediator between several determinants of individual innovation and innovative behavior, but didn't explore the possibility that it could moderate the relationship.

As mentioned above, in this research it is hypothesized that innovation-stimulating-leadership is positively related to IWB. In addition, was argued that the research into this field produced mainly inconclusive results. These inconclusive findings suggest that the understanding of the relationship between leadership and individual innovation may benefit from the identification of a moderator variable on which this relationship is contingent and that helps us to understand when the relationship is strengthened or weakened (Pieterse et al. 2010). Based on the above discussion it could be expected that this relationship is moderated by the expected performance outcomes of employees. In other words, the innovation-stimulating leadership will have a greater impact on IWB when an employee expects innovative behavior to have a positive effect on his job performance and vice versa. Therefore, I hypothesize that:

H2: *Innovation-stimulating leadership is more positively related to innovative work behavior when the expected positive outcomes are high, than when they are low*

3.5 Innovative output

As mentioned in chapter two, IWB is assumed to ultimately lead to an increase of the innovativeness of an enterprise. A few scholars explicitly studied the relation between IWB and innovative outcome and found a significant positive relationship. For example, Scott and Bruce (1994; 1998) reported significant correlations between independently rated count of invention disclosures and individual innovation of employees in R&D departments in two independent studies. Also, De Jong and Den Hartog (2010) found a significant relationship between self-rated innovative outcome and IWB among knowledge workers. However, the relationship is not specifically researched with employees from one or more manufacturing enterprises. Therefore, it would be a valuable addition to scientific literature to test the relationship between IWB and innovative output at EZ. Furthermore, it is interesting for EZ to know to what extent IWB contributes to the innovativeness of the organization. For this reasons, on basis of previous studies, I hypothesize that:

H3: *Innovative work behavior is positively related to innovative output*

3.6 Conclusion

In summary, in this thesis is researched to what extent innovation-stimulating leadership and innovative output are related to innovative behavior. Furthermore, the moderating effect of expected positive performance outcomes on the relationship between innovation-stimulating leadership and IWB will be studied. This model including the hypotheses was presented earlier in this chapter, see figure 3. However, because of limited available time to carry out this research some choices had to be made regarding the development of the conceptual research model. Figure 4 outlines how the conceptual research model is embedded in the broader framework of chapter two. At first, the figure shows that the relationship between the innovativeness of the organization and sustainable competitive advantage is not empirically tested. However, based on the literature review in previous chapter it can be assumed that the capability of an enterprise to innovate increases its ability to gain sustainable competitive advantage. Although it would be interesting to study, the limited time made it furthermore impossible to include all the factors that might influence IWB in the research model. Therefore, based on relevancy for scientific literature or EZ is chosen to include only innovation-stimulating leadership as determinant of the innovative behavior of employees and expected positive performance outcomes – not included in figure 4 – as moderating factor. In addition, it is chosen to not exactly replicate the research model of Hartjes (2010). Most of the factors, except of a few leadership behaviors, that she researched are left out of the new research model. Otherwise, this thesis would not yield any valuable new findings for scientific literature. Also, for me as a researcher it is more challenging to study something new than replicate the work of someone else.

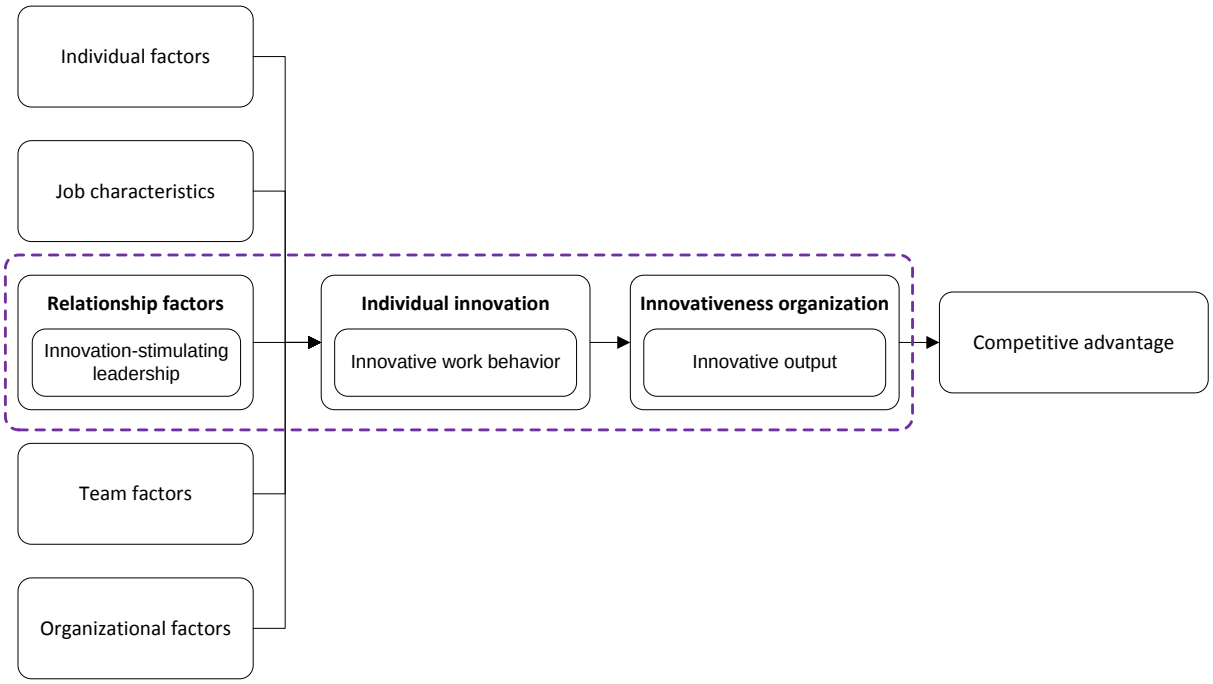

Figure 4. Research model within broader framework

Chapter 4 – Methodology

In this chapter the scientific methods – research design and context – are discussed that will be used in order to gather the required knowledge which is needed to test the conceptual research model as proposed in the previous chapter.

4.1 Research design

In the introduction of this thesis was mentioned that this research is part of a broader project, called 'competences for innovation.' Within the boundaries of this project, this study can be seen as a cross-sectional case study. A huge disadvantage of a cross-sectional study is that it limits the ability to determine causality, because it cannot be determined if the cause precedes the effect. To overcome this problem a longitudinal research should be carried out (Babbie, 2007). However, the limited time that is available to conduct this study – three months – makes this is impossible. Below the research sample, method, measures and procedure are explained.

4.1.1 Sample

The conceptual research model was tested in a sample of the production workers of EZ. Production workers are employees whom work at the machines. Further information about the organization, the production department and the employees of the firm can be found in section 4.2. As the time to carry out this research is limited only a part of the production workers were sampled. In total four hundred production workers were asked to participate in the research. It was expected that this would provide a representative sample of the total population.

The first reason why I chose for production workers is that it is suggested that lower level and operational employees play an essential role in the initiation and implementation of ideas in a firm and that it is important to develop the full innovation potential of these employees (e.g. Dumaine, 1990; Kanter, 1983). However, the research into the factors that enhance individual innovation at the lower or operational level is limited (Axtell, 2000). In addition, the goal of this study is to increase the ability to generalize the findings of the research carried out by Hartjes (2010). In her research Hartjes sampled the production workers of the Twentse Kabelfabriek. As the characteristics of a sample should be the same in order to increase the ability to generalize, this research also sampled production workers (Babbie, 2007).

4.1.2 Research method

In order to measure the effect of innovation-stimulating leadership behaviors on innovative work behavior (IWB) and the moderating effect of expected positive performance outcomes a survey, in the form of a self-administered questionnaire, is used. The first reason for this choice is that a survey allows for an effective and cost-efficient way to obtain information (Zikmund, 1997). Especially, because it would take too much time to conduct face-to-face interviews. In the first place because it would disrupt the work schedule of the production workers too much, but also because the time that is available to conduct this study is limited. Secondly, it is a quick way to get an extensive number of questions answered. In this way a broad range of variables can be measured (Souitaris, 2001).

For this research the self-administered questionnaire as developed by Hartjes (2010) is predominantly used. However, the questionnaire had to be adjusted to fit the current situation. In the first place, the questionnaire was changed to fit EZ. Furthermore, the questionnaire was supplemented with some additional questions, because not all the variables that had to be measured to test the conceptual research model were included in the questionnaire. Three extra constructs were included: consulting, recognizing and expected positive performance outcomes. These and the other used constructs are further explained in the next section. In addition, not all the questions

included in the original questionnaire are relevant for this thesis. It has however been chosen to leave these questions in the new questionnaire, because the data can later be used for the project 'competences for innovation.'

The questionnaire consists in total of 76 items. The first four parts involve self-rating questions. The questions are short closed-ended items with five point Likert-scales. All scales have an added option 'don't know.' The advantages of this format are that it uses space efficiently, the respondents will be able to complete the questionnaire faster and that it increases the comparability of the responses given to different questions. Though, the danger exists that this format fosters a response-set – developing a pattern in answering the questions – among some respondents. This problem is reduced by making all the statements short and clear (Babbie, 2007). The remainder parts of the questionnaire do entail ratings of one's superior and the organization. The items and scales of these questions were designed in accordance with the other parts. In addition, seven additional questions were posed in order to categorize the respondent. These questions concern: job position held, type of contract, job status, years employed at EZ, plant and educational background. At the end of the questionnaire some space was included for questions and remarks, in case the respondent would have any. The questionnaire is presented in Appendix A.

The reliability of the original questionnaire of Hartjes (2010) was checked by measuring the Cronbach alpha of the constructs. It appeared that the alpha of all the measured constructs was above the .70. Therefore, the scale that Hartjes (2010) used could be regarded as reliable (Field, 2009). However, Hartjes (2010) identified two probable threats to the reliability of her questionnaire that could also be relevant for my research. Firstly, the additional constructs had to be reformulated. Either because the original questions were formulated in English or because some of the terms had to be replaced with more simple descriptions. This increases the risk that the interpretation of the items deviates from the original meaning of the item. In addition, a limitation of the study is that it might be based on social desirability. The constructs involve self-rating items or are based on the respondents – subjective – perception. The result is that the data of this research might be influenced by social desirable answers. Nevertheless, the additional constructs were carefully selected. The items of these constructs were developed by other researchers in previous studies, and the constructs were originally internally consistent (Cronbach alpha >.70) which will be further described in the following section.

4.1.3 Measures

In order to test the model as proposed in the previous chapter four variables had to be measured by the questionnaire: innovation-stimulating leadership behaviors, expected positive performance outcomes, innovative work behavior and innovative output. *Innovation-stimulating leadership behavior* was measured by five constructs: consulting, delegating, support for innovation, recognizing and providing resources. These constructs resemble five of the six leadership behaviors that De Jong (2007) demonstrated to stimulate innovative work behavior. The constructs consist of between the three and four items, as showed in table 2. In this table also the Cronbach alpha's can be found. As all the constructs have an alpha higher than .70, their reliability is appropriate (Field, 2009). The measurement scale of these constructs is a five-point Likert-scale from strongly disagree to strongly agree. The sixth leadership behavior 'task assignment' of De Jong (2007) was not measured, because it overlaps with the construct 'challenging job' which was measured in the questionnaire for the project 'competences for innovation.'

Construct	*Items*	*Source*	*Alfa*
Delegating	*My leader* Allows me to decide myself how I do my work Gives me considerable independence and freedom Allows me to determine my own time planning	De Jong (2007)	.84
Support for innovation	*My leader* Shows sincere interest whenever I come up with an idea Reacts enthusiastically to my creative thoughts Supports me when I want to improve things Is someone you can count on, even when you initiate something unsuccessful	De Jong (2007)	.82
Providing resources	*My leader* Provides me with time to work out ideas Provides me with the means necessary for innovation Is willing to invest time and money in innovative efforts	De Jong (2007)	.81
Recognizing	*My leader:* Publicly recognizes me when I am innovative Praises my innovative efforts Recognizes my contribution to innovation Gives me credit for innovative ideas	De Jong (2007)	.87
Consulting	*My leader:* Asks for my opinion Consults me about important changes Lets me influence decisions about long term plans and directions Asks me to suggest how to carry out assignments	De Jong (2007)	.86

Table 2. Construct innovation-stimulating leadership

Expected positive performance outcomes was measured by three items from Yuan and Woodman (2010) that were based on House and Dessler's (1974) outcome expectancy scale. The items included in this construct are presented in table 3. The Cronbach alpha of this construct is .77. The measurement scale of the construct is a five-point Likert-scale from strongly disagree to strongly agree.

Construct	*Items*	*Source*	*Alfa*
Expected positive performance outcomes	The more innovative I am, the better my job performance Coming up with creative ideas helps me do well on my job My work unit will perform better if I often suggest new ways to achieve objectives	Yuan & Woodman (2010)	.77

Table 3. Construct expected positive performance outcomes

Innovative work behavior was measured by four constructs: idea exploration, idea generation, idea championing and idea implementation. These constructs resemble the four dimensions of IWB as defined by De Jong (2007). Idea exploration was measured by the construct 'opportunity exploration' of Kleysen and Street (2001). Whereas idea generation, championing and implementation were measured by three constructs developed by De Jong (2007). The measurement scale is a five point Likert-scale from never to always. The items of the constructs and their Cronbach alpha's are displayed in table 4.

Construct	*Items*	*Source*	*Alfa*
Idea exploration	*How often does this employee* Look for opportunities to improve an existing process, technology, product, service or work relationship Recognize opportunities to make a positive difference in your work, department, organization or with customers Pay attention to non-routine issues in your work, department, organization or market place	Kleysen & Street (2001)	.719
Idea generation	*How often does this employee* Search out new work methods, techniques or instruments Generate original solutions to problems Find new approaches to execute tasks	De Jong (2007)	.90
Idea championing	*How often does this employee* Encourage key organization members to be enthusiastic about innovative ideas Attempt to convince people to support innovative ideas	De Jong (2007)	.95
Idea implementation	*How often does this employee* Systematically introduce innovative new ideas into work practice Contribute to implementation of new ideas Put effort into the development of new things	De Jong (2007)	.93

Table 4. Construct innovative work behavior

Innovative output was measured by a construct developed by De Jong (2007). The construct consist of six items which are presented in table 5. The measurement scale of this construct is a five point Likert-scale from never to always. The reliability of this construct is unknown. However, Hartjes (2010) found a Cronbach alpha of .80 when she used this construct in her research. Therefore, this construct is still chosen to measure the variable.

Construct	*Items*	*Source*
Innovative output	*In your job, how often do you* Suggest improving current products or services Suggest improving current work practices Suggest acquiring new knowledge Actively contribute to developing new products or services Actively contribute to developing new customers Actively contribute to changing work situation	De Jong (2007)

Table 5. Construct innovative output

4.1.4 Data collection

The data will be collected from June to July 2011 using the questionnaire as described above. I will hand out the questionnaire accompanied with a cover letter and envelope to all the production coordinators in the production and engineering department who will ask ten of their production workers to fill out the questionnaire. Thereafter, the production worker will return the questionnaire to their production coordinator who would hand them over to me. Although participation was voluntary, several techniques were adopted to increase the response rate. In this way response bias – non respondents differ significantly from respondents in ways other than just their willingness to participate – could be prevented (Babbie, 2007). Firstly, data confidentiality was emphasized in the letter which accompanied the questionnaire. Secondly, an envelope was attached to the questionnaire to enhance perception of anonymity. In this way no other person than me would be able to see the answers. Thirdly, the production coordinators were personally contacted with the question to distribute the questionnaire. In addition, during this meeting a date and time were

arranged when I would collect the questionnaires. And last, the production workers got the time to fill out the questionnaire during their shift, not during their breaks or leisure time.

4.2 Research context

In order to obtain a better understanding of the research context in which this study is carried out, now EZ will be shortly described. The company was established to produce all kinds of rubber products. In the early twentieth century the business started with the production of tires, but it was not until after the second world war that they chose to focus solely on the tire production. As the enterprise was expected to be too small to operate and survive on its own in the market, the organization was in 2005 taken over by a Russian company. However, due to the bankruptcy of the Russian business only a few years later, the company was sold once again. In May 2009 the enterprise was acquired by an Indian company. Since then the company is named EZ.

The parent comapny is a multinational with offices and production plants in India, South-Africa and the Netherlands. It is a young, ambitious and dynamic organization. EZ has her main office in the Netherlands, where all organizational disciplines are located. EZ develops and produces car tires, tires for agricultural and industrial purposes and two wheel tires. A great amount of the tires are designed by the Italian design house. The tires are sold under their own brand name through an extensive network of own offices in Europe and North-America. Yearly EZ sells over seven million tires, of which most outside the Netherlands. As there is not enough capacity to produce all tires in-house, a part of the products is produced by partners in India and Thailand. Nowadays, in the Netherlands approximately six million person car tires and 300.000 tires for other vehicles are produced. This requires the full-continuous production of 18.000 tires a day.

4.2.1 Mission, vision and goals

The parent company of EZ has an ambitious growth strategy. In the coming five years the organization wants to increase their turnover with four billion dollar; from two to six billion dollar. Their vision thereby is to be ‘a significant player in the global tire industry and a brand of choice, providing customer delight and continuously enhancing stakeholder value.’ As an independent subsidiary EZ will also contribute to this vision. Their own vision therefore is aimed at continuous innovation and the maximum utilization of skills to improve the performance of the organization and develop talent. With this vision the organization tries to realize their strategy to create tires with an optimal price-quality ratio

The strength of the company is their flat organizational structure. EZ can be divided in five distinct disciplines: finance, production and engineering, marketing and sales, personnel and organization and research and development. The overall organizational structure the firm is presented in figure 5. Through the flat organizational structure decisions can be taken quickly and reliably which results in a fast development of new original products. EZ realizes that employees play an important role in the realization of the objectives of the organization. One of the objectives of the company is therefore to create sustainable employability. This means the capability of the employee to create value for the organization and pleasure for themselves in a productive and meaningful way as well at this moment as during their whole career.

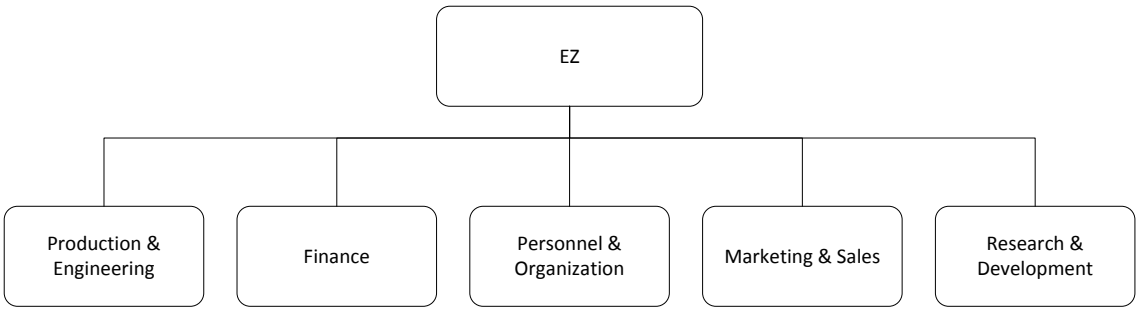

Figure 5. Organizational structure EZ

4.2.2 The production and engineering department

The production and engineering department is the largest department of EZ. Of the about seventeen hundred employees, approximately eleven hundred work in this department. The department includes the sections organization, secretariat and planning. However, the main divisions of the department are: mixing and tire components, building and curing and engineering. The structure of the department can be found in figure 6.

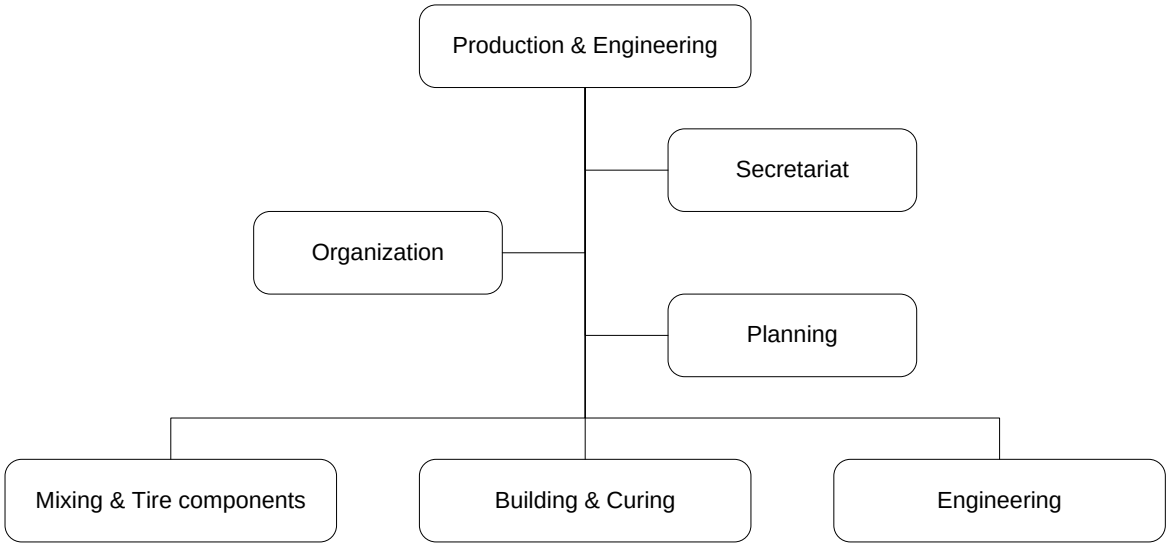

Figure 6. Structure production and engineering department

The production and engineering department produces all components of a EZ tire. The production process begins in the building material depot. In this depot all chemicals, natural rubber, synthetic rubber, soot, silica and other materials for the production of a tire are stored. Thereafter, the building materials are blended together in a mixing machine. The steam-rollers of the machine produce extreme heat which is needed to mix the various materials together. The composition of materials that go into the mixer depends on the layer of the tire that has to be produced, because every layer of a tire requires different kind of characteristics. In total a tire exist of around fifteen layers. Furthermore, the composition of materials depends on the type of tire that has to be produced; a winter, summer or four seasons tire. The next step is to make the semi-finished product into tread and sidewall compounds. This is done using extruder technology whereby materials, in this case rubber, are squeezed through a small opening. At this step other machines also integrate textile and steel types with rubber. In this way belt layers and carcasses are made which shape and strengthen the tire. Thirdly, the different layers are cut into the desired shapes and sizes. The above described activities all take place in the mixing and tire components department. At the next section – building and curing – the semi finished products are firstly assembled together. This can be done in

a half automatic and full automatic way. The first way requires more labor from a human operator, whereas with the latter the operator has a more monitoring role. A tire that is put together is called a 'green tire.' The green tire thereafter is vulcanized into the desired shape. After that the tire is stored in the warehouse before it is transported and eventually sold.

The production workers of the production and engineering department are employees whom work at the machines, producing a tire. The production workers are divided over five different teams (A to E). In this way the factory can run day and night seven days a week. A workday is divided over three different shift; the teams switch at 07.00 a.m., 03.00 p.m. and 11.00 p.m. Three levels of production workers can be identified: *bedieningsman*, assistant operator and operator. The tasks of these production workers are presented in table 6.

Level	***Bedieningsman***	**Assistant Operator**	**Operator**
Tasks	- sets/operates simple machines - performs manual, mostly serial, proceedings for production processing - transports and performs simple measurements	- sets/operates more complex machines or groups of machines - is at multiple *bedieningsman* functions employable - performs more complex product and quality controls	- anticipates on process, product and machines break downs and tries to solve these - enables specialists, performs line maintenance and is able to tune machines - gives task related guidance to the bedieningsman and Assistant Operator

Table 6. Tasks of production workers

Chapter 5 – Results

In the previous chapter the methodology that was used in order to test the conceptual research model was described. In this chapter the collected data are presented. For this purpose the program SPSS will be used. The chapter begins with a description of the collected data. First the research sample and response rates will be discussed followed by an analysis of the characteristics of the group of respondents. Next an exploratory factor analysis will be conducted, the reliability of the scales of the constructs will be checked and a missing values analysis will be done. Thereafter, the collected data will be analyzed in order to test the conceptual research model.

5.1 Data description

5.1.1 Research sample and response rates

As explained in the previous chapter forty production coordinators were asked to hand out questionnaires to ten of their production workers. So, in total four hundred production workers were asked to fill out the questionnaire. Of this sample 328 production workers returned the questionnaire. Therefore, the total response rate comes down to 82 percent. In the mixing and tire components department this was 85 percent and in the building and curing department 80 percent. An overview of the sample with corresponding response rates is presented in table 7. The reason for this slight difference in the response rates is that the section half automates in the building and curing department did not always consists of more than ten employees. Of the fifty questionnaires that were handed out in this section only 26 were returned while most other sections returned around forty questionnaires. An additional reason is that one of the production coordinators of this section did not hand over any of the questionnaires. As he was one the production coordinators of team A, this also explains that team A had a slightly lower response rate than the other teams. In Appendix B an overview of the descriptive data can be found including the team to which the respondent belongs and the section in which he works.

Department	Population size (#)	Response (#/(%))
Mixing & tire components	150	128 (85,3)
Building & curing	250	200 (80,0)
Total	400	328 (82,0)

Table 7. Response rates

The response rate is for a survey research remarkably high which is beneficial for the reliability of the research results (Babbie, 2007). A few factors can be identified that might stimulated the respondents to fill out the questionnaire. The most important reason is the willingness of the production coordinators to cooperate in my research and their encouragement of the staff to complete the form. Another factor could be the personal approach of data collection. I personally disseminated the questionnaires to the production coordinators which may triggered them to put more effort in the encouragement of their staff to fill out the questionnaire. The last and most obvious reason would be the willingness of the respondents to cooperate and participate in my research. This might be enhanced by my presence in the plant during the time the employees were asked to complete the questionnaire.

5.1.2 Descriptive statistics respondents

In this section some descriptive statistics of the respondents are presented and where possible compared to the key figures regarding the employee population of EZ 2010. In Appendix B a complete overview of the descriptive data is presented.

One point that is worth noting before continuing is that the question regarding the number of hours employed per week will be left out of the analysis. It appeared that the employees were not able to successfully answer this question, because the question was incorrectly formulated. The reason for this was that the number of hours the production workers work per week varies.

Most of the respondents are between 35 and 54 years old; 25 percent of the respondents is between 35 and 44 years old and 32 percent is between 45 and 54 years old. This finding is relatively common for manufacturing organizations. According to the key figures of EZ in 2010 this also closely resembles the overall age distribution of the companies' employees. The key figures show that the most of the company's employees are between 40 and 49 with mean age of 44.

The educational level of the group of respondents is dominated by intermediate vocational education (42%) and lower vocational education (24%). The group of respondents with intermediate vocational education is higher than can be expected within manufacturing organizations. This can be explained because during the first years that someone is employed at the company, he is educated. At the end of his training period, he gets a diploma at intermediate vocational level.

Most of the respondents are operators, 59 percent of the respondents, and have a permanent contract, 78 percent of the respondents. In addition, the largest group of respondents works less than ten years at EZ (43%). Although respectively 21 percent and 25 percent of the respondents work between the 10 and 19 and 20 and 29 years at the enterprise. According to the key figures of EZ 2010 this is in accordance with the overall service distribution of the company. However, the mean tenure of the respondents in this research was somewhat lower than overall mean (respectively 13 and 17 years). This can however be explained by the recent investments to increase the production capacity. For this purpose recently about two hundred new production workers were hired.

5.1.3 Factor analysis

Before we can continue with the remainder of the data description and analysis, first should be tested if the items in the questionnaire actually measure the variables that are included in the research model: innovation-stimulating leadership, innovative work behavior (IWB), expected positive performance outcomes and innovative output. For this purpose an exploratory factor analysis is conducted. One point worth noting is that the items which belong to the variable innovative output are left out of the analysis. It could be expected that the items of IWB and innovative output belong to the same variable, because of their close resemblance. However, by leaving the items of innovative output out of the analysis the variable is forced to differ from the variable IWB.

As recommended by Field (2009) pre-analysis test for the suitability of the data for analysis was computed using 32 items. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .92, which can be according to Field (2009) considered as good. All KMO values for the individual items were > .80 which is far above the threshold of .50 (Field, 2009). The Bartlett test of sphericity was significant at $p < .001$. So, both tests indicate the suitability of the data. An initial analysis was run to obtain eigenvalues for each component in the data. Six factors had eigenvalues of over Kaiser's criterion of one. However, this criterion was not applicable, because not all the communalities after extraction were greater than .70 (Field, 2009). As the sample size was larger the two hundred, the scree plot was used to determine the number of factors. The scree criterion suggested a three-factor solution, see Appendix C. Further analysis with oblique rotation showed that the three-factor solution explained 57 percent of the variance. However, according to Hair et al. (2007) the factor loadings should preferably be over .50. Based on this criteria the items 24 – how often do you generate original solutions to problems –, 31 – how often do you recognize opportunities to make a positive difference in you work, department, organization or with customers – and 44 – my leader

allows me to decide myself how I do my work – were excluded. The new 29 item scale explained 59 percent of the variance. In Appendix D the structure and pattern matrix are presented. The items that cluster on the same components suggest that as expected three variables can be distinguished: innovation-stimulating leadership (component 1), innovative work behavior (component 2) and expected positive performance outcomes (component 3).

Secondly, the assumption made in chapter three regarding IWB have to be tested. The assumption was made that the concept of IWB could be considered as one-dimensional. Although IWB is theoretically often treated as multi-dimensional, most scholars concluded that the dimensions could best combined and used as a single additive scale, (e.g. Janssen, 2000; Kleysen & Street, 2001; De Jong & Den Hartog, 2010). In order to test this assumption, the dimensionality of the IWB was as well tested by an exploratory factor analysis. Pre-analysis test for the suitability of the data for analysis was computed using the nine IWB items. The Kaiser-Meyer-Olkin measure of sampling adequacy was .89, which is good. All KMO values for the individual items were > .86 which is above the threshold of .50. The Bartlett test of sphericity was significant at $p < .001$. So, also in this case both tests indicate the suitability of the data. An initial analysis was run to obtain eigenvalues for each component in the data. Only two factors had eigenvalues of over Kaiser's criterion of one. However, this criterion was not applicable, because not all the communalities after extraction were greater than .70 (Field, 2009). As the sample size was larger the two hundred, the scree plot was used to determine the number of factors. The scree criterion suggested a three-factor solution, see Appendix E. Further analysis with oblique rotation showed that the three-factor solution explained 76 percent of the variance. However, according to Hair et al. (2007) the factor loadings should preferably be over .50. Based on this criteria the item 37 – how often do you pay attention to non-routine issues in you work, department, organization or the market place – was excluded from further analysis. The new eight item scale explained 79 percent of the variance. In table 8 the structure and pattern matrix are displayed. The items that cluster on the same components suggest that IWB consists of three dimensions: idea generation (component 1), idea championing (component 2) and idea implementation (component 3). The dimensions remained fairly strongly related. Therefore, the three dimensions are combined into an overall scale for innovative work behavior.

		Pattern matrix			**Structure matrix**		
		Component			**Component**		
Item	**Question**	**1**	**2**	**3**	**1**	**2**	**3**
38.	Systematically introduce innovative ideas into work practices	.87			**.91**	.53	.47
39.	Contribute to the implementation of new ideas	.86			**.88**	.45	.44
40.	Put effort into the development of new things	.81			**.86**		.57
25.	How often do you find new approaches to execute tasks		.87		.47	**.86**	
28.	How often do you search out new working methods, techniques or instruments		.74		.43	**.82**	.56
29.	Look for opportunities to improve an existing process, technology, product, service or work relationship		.68		.47	**.79**	.57
35.	Encourage key organization members to be enthusiastic about innovative ideas			.78	.60	.50	**.90**
36.	Attempts to convince people to support an innovative idea			.81	.61	.50	**.92**

Table 8. Results factor analysis

5.1.4 Reliability of scale

It can be argued that the results can be inferred for all production workers at EZ, because the response rate is high and the descriptive statistics reveal that the characteristics of the respondents match with the overall characteristics of the employees of the company. In addition, it is important to check the reliability of the scale of four variables included in this study. The Cronbach alpha of the original scale of all variables was greater than .70, see section 4.2.3. Hence, the scales can be considered reliable (Field, 2009). However, most of the items had to be translated and slightly altered. This might have influenced the reliability of the scale of the variables. Therefore, in table 9 the Cronbach alpha for the scales of the variables included in this research are presented.

Name of construct	Alpha	Valid cases (#)(%)		Items
Innovation-stimulating leadership	.95	269	(82,0)	18
Innovative work behavior	.90	275	(83,8)	8
Expected positive performance outcomes	.76	310	(94,5)	3
Innovative output	.83	287	(87,5)	6

Table 9. Cronbach alpha

The scales of the variables all score above .76 which indicates good reliability. However, the high Cronbach alpha's of the innovation-stimulating leadership and IWB variable can be caused by the high number of items, since the alpha of a variable depends on the number of items on a scale. To get a more realistic view on the Cronbach alpha's of the first two constructs, the alphas of its sub dimensions are presented in table 10 and 11. All scales of the dimensions have a Cronbach alpha of above the .69 and are therefore found to be reliable (Field, 2009).

Dimension of innovative work behavior	Alpha	Valid cases (#)(%)		Items
Idea generation	.79	309	(94,2)	3
Idea championing	.88	297	(90,5)	2
Idea implementation	.86	291	(88,7)	3

Table 10. Cronbach alpha dimensions of innovative work behavior

Dimension of innovation-stimulating leadership	Alpha	Valid cases (#)(%)		Items
Delegating	.69	314	(95,7)	2
Providing resources	.73	292	(89,0)	3
Support for innovation	.84	300	(91,5)	4
Consulting	.79	309	(94,2)	3
Recognizing	.85	284	(86,6)	4

Table 11. Cronbach alpha dimensions of innovation-stimulating leadership

5.1.5 Missing values

Before discussing the mean scores of the variables included in this research, it is important to provide some insights in the missing values of the data. Appendix F provides an overview of the percentage missing values per item. The items with more than five percent missing values are highlighted in red. The missing values included the 'non response' option in which case the respondent did not answer the question, the 'wrong' option in which case the respondent did not answer the question correctly and the 'don't know' option included in the scale of all items.

The most striking result when looking at the missing values is the relatively many missing values on the additional questions which were used to categorize the respondents. Two reasons for this can be identified. The first is that the questionnaire was two-sided printed. Hence, the additional questions were printed on the back of the cover letter. The additional questions were therefore less visible than the remainder of the questionnaire and could be accidentally skipped. This was confirmed by the fact that most of the respondents did not just skip one of the additional questions, but skipped the entire page. Secondly, some of the respondents indicated that if they answered the additional questions they felt they would no longer be anonymous. Especially, the year of birth was by some respondents for this reason not completed.

Furthermore, the dimensions idea implementation, providing resources and recognizing contain relatively many missing values in comparison with the other dimensions. Several respondents were not able to indicate to what extent they engage in idea implementing behavior. All the three items of the idea implementation dimension had a missing value percentage of above the five percent. This implies that these respondents may not implement any inventions at all or are not aware that they implement them. In this case production workers might implement inventions, but they do not perceive this as an implementation of a new idea. Besides, respondents find it hard to evaluate the resources their leader provides and the recognition they get from them. For instance by rating statements like 'my leader provides me with time to work out ideas' (providing resources) and 'my leader recognizes my contribution to innovation' (recognizing). It might be that several production workers are not able to answer these questions, because they have never came up with a new idea or innovation. If an employee has never came up with a new idea, he would not know how his leader would react in such a situation and therefore the 'don't know' option would seem the most reasonable choice.

One item that is worth noting is the item 'how often do you actively contribute to acquiring new customers', because it contains the highest amount of missing values. This might be due to the fact that this particular item is not applicable to the situation of the production worker. Acquiring new customers is somewhat uncommon, unrealistic and irrelevant for an employee in the production and engineering department. Another notable item with many missing values is the item 'how often do you encourage key organization members to be enthusiastic about innovative ideas.' The many missing values might be explained by the perceived vagueness of the terms used in the question. Several production workers indicated that they didn't understand some of the questions. Re-examining this statement, some terms of the item might be somewhat unclear such as 'encourage' and 'enthusiastic.'

A variable with relatively many missing values might implicate that if respondents would score these items, they might have chosen lower scores. For instance, when asked to rate the statement 'my leader provides my with time to work out ideas', a respondent might circle the option 'don't know' option when he feels that this had never happen while he should actually circle the option 'never.' For this reason it is important to keep in mind that that the variables with a high percentage of missing values might be an over-estimation.

For the remainder of the analysis, it is chosen to only use the complete cases. The cases with missing values are simply omitted and the remainder of the analyses are run on what remains. This approach is usually called list wise deletion. The advantage of this method is that although this method will result in a loss of power, under the assumption that data are missing completely at random, it leads to unbiased parameter estimates.

5.1.6 Mean scores constructs

After discussing the missing values in the previous section, now the mean scores of the variables are analyzed. The four variables used in this research were formulated in such a way that the higher the score of an employee on an item the better it is. In the end increasing the innovativeness and therefore the sustainable competitive advantage of the organization. The scores of the constructs range from 1 (low: 'totally disagree' respectively 'never') to 5 (high: 'totally agree' respectively 'always'). Option 6 ('don't know') was indicated as being a missing value. In this way it will not influence the mean scores of the constructs.

As can be seen in table 12 the score for innovation-stimulating leadership is the highest with a mean of 3,45. This implies that employees have a reasonable positive perception of their leaders' behaviors that stimulate them to initiate and intentionally introduce new and useful ideas, processes, products or procedures within their work role, group or organization. In order to further explore this mean score in table 12 also the mean scores of the sub dimensions can be found. It appears that the scores across the dimensions are almost equal, the highest score is 3,58 (support for innovation) while the lowest score is 3,36 (consulting). This indicates that the leaders of the production workers of EZ display the various innovation-stimulating leadership behaviors to approximately the same extent. Furthermore, the extent to which employees expected that their innovative behavior has a positive outcome on their job performance is also slightly positive with a mean of 3,39. The mean score of IWB is 2,82 which is not particularly high. However, the production workers of EZ score slightly higher than the colleagues at the Twentsche Kabel Fabriek in the research of Hartjes (2010). The mean score of the employees of the Twentse Kabel Fabriek was 2,68. In order to increase our understanding of this variable, the mean scores of the three sub dimensions of innovative work behavior are also displayed in table 12. It seems that the production workers both regularly generate new ideas. However, they rarely or occasionally champion or apply the idea. This is in accordance with the findings of Hartjes (2010) whom also found that production workers explore more new ideas than they actually implement. This also causes the perception of the innovative output – with a mean of 2,76 – to be quite low.

Name of construct	Mean	Scale used
Innovation-stimulating leadership	3,45	1: strongly disagree – 5: strongly agree
Delegating	*3,43*	*1: strongly disagree – 5: strongly agree*
Providing resources	*3,38*	*1: strongly disagree – 5: strongly agree*
Support for innovation	*3,58*	*1: strongly disagree – 5: strongly agree*
Consulting	*3,36*	*1: strongly disagree – 5: strongly agree*
Recognizing	*3,48*	*1: strongly disagree – 5: strongly agree*
Innovative work behavior	2,82	1: never – 5: always
Idea generation	*3.14*	*1: never – 5: always*
Idea championing	*2,58*	*1: never – 5: always*
Idea implementation	*2,71*	*1: never – 5: always*
Expected positive performance outcomes	3,39	1: strongly disagree – 5: strongly agree
Innovative output	2,76	1: never – 5: always

Table 12. Mean scores variables

5.1.7 Comparing subgroups

In order to get a more detailed insight in the mean scores of the four variables, the variables are now compared between different subgroups of respondents by an analysis of variance (i.e. department, team, section, age, type of contract, educational level, job position and years employed). Appendix G presents the results of this analysis. It appeared that both innovation-stimulating leadership and expected positive performance outcomes did not differ significantly between groups. However, it can be concluded that the innovative output of a respondent is significantly depend on the department

(F(21, 286) = 1,73, p < .05) and the section he belongs to (F(21, 286) = 1,62, p < .05). The employees of the sections in the mixing and tire component department perceive to produce more innovative output than their colleagues in the sections in the other department. A reason for this difference might be that the focus of the mixing and tire component department is more on producing a good quality end-product whereas the building and curing is more focused on the number of tires that are produced. The mixing and tire component department is according to the production coordinators continuously busy with finding new ways of improving the quality of their end-product. In the building and curing department on the other hand several production workers remarked that the work pressure is increasing, because they are constantly pushed to produce as many tires as possible. This indicates that the production workers get less time or space to innovate.

Furthermore, the analysis revealed that employees with a higher function, like operator or senior operator, perform higher levels of innovative behavior (F(f85, 257) = 1,49, p < .05). A explanation for this might be that employees with lower function still lack experience and knowledge in order to successfully carry out innovations. Several scholars, like Hartjes (2010), have demonstrated that the more work related knowledge and experience a production worker has, the more innovative he will behave. It could logically be argued that employees with higher functions have more knowledge and experience than employees with lower functions and therefore behave more innovatively.

5.2 Data analysis

After discussing the mean scores of the variables, the next step is to test the conceptual research model as presented in chapter three, see figure 3. For this purpose, first a correlation analysis will be done in order to indentify the various relationships between the variables. Thereafter, a multiple regression analysis is conducted to the test the hypotheses proposed in chapter three.

5.2.1 Correlations

In order to determine the relations between the variables used in this study a correlation analysis is conducted. As the control variables are not measured at interval level, Spearman's rank correlation coefficient is used to determine the correlation between the constructs (Field, 2009). The correlations between the various variables can be found in table 13. Merely significant correlations are shown. The size of the effect is considered as small when the correlation coefficient is about .1, medium when the correlation coefficient is around .3 and large when the correlation is about .5 or higher (Field, 2009).

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. ISL	1										
2. IWB	.404**	1									
3. EPPO	.507**	.388**	1								
4. Innovative output	.845**	.411**	.529**	1							
5. Department	-.054	-.096	-.034	-.110*	1						
6. Section	-.055	-.110*	-.008	-.115*	.857**	1					
7. Age	.096	.016	.030	.017	.055	.044	1				
8. Educational level	-.001	.047	-.079	.007	-.112*	-.117*	-.064	1			
9. Function	.210**	.234**	.056	.203**	.032	-.020	.298**	.056	1		
10. Type of contract	-.141*	-.065	-.031	-.109*	.046	.054	-.408**	-.009	-.518**	1	
11. Tenure	.164**	.097	.049	.119*	-.002	-.053	.745**	-.130*	.421**	-.612**	1

Table 13. Results correlation analysis (* p < .05, ** p < .01)

The results of the correlation analysis demonstrate that there exists a significant positive relation between innovation-stimulating leadership and IWB. The relationship is found to be moderately strong ($p = .40$, $p < .01$). Thus, how greater the extent to which employees believe that their supervisor stimulates innovation, the more innovative employees will behave. The high correlation between the variables was expected, because in chapter three it was proposed that innovation-stimulating leadership leads to innovative behavior. However, in order to test this proposition further a multiple hierarchical aggression analysis is conducted in the next section. According to the results there also exist a positive correlation between the employees' innovative behavior and his self-rated innovative output ($p = .41$, $p < .01$). This correlation is not surprising, because the variables show some resemblance. The variable innovative output was developed to measure individual innovative behavior while the variable IWB was created to measure the individual contribution the phases of the innovation process. Again, this result corresponds with the expectations based on the propositions made in chapter three which state that innovative work behavior will lead to innovative output. In order to be able to confirm this proposition in the next section a multiple aggression analysis is carried out.

Some points are worth noting regarding the other relations in table 13. The first is that innovation-stimulating leadership is not only significantly related to IWB, but it also has an extremly strong relation with the perceived innovative output of an employee ($p = .85$, $p < .01$). This finding implies that leaders that stimulate innovation, do not only affect the level of IWB performed by their employees, but also directly enhance the innovative output of their employees. This can be considered as beneficial for the organization, because it is suggested that innovative output increases the innovativeness of the organization. Secondly, the innovative behavior of employees is also related to employees' expectations regarding the effect of their behavior on their job performance ($p = .39$, $p < .01$). The moderately strong correlation between these two variables implies that the expected payoffs of innovative behavior are considered before a production workers engage themselves in such a behavior. In addition, an employee's expected positive performance outcomes has a direct relation with their perceived innovative outcome. This could be expected, because, as was already stated above, the variables IWB and innovative output show some resemblance. The last point worth noting is the correlation between innovation-stimulating leadership and expected positive performance outcomes ($p = .51$, $p < .01$). Although in the research into IWB this is not an unusual phenomena, this correlation can be a problem in testing hypothesis two by multiple regression analysis in the next section. When the correlation between two or more predictor variables exceeds .80 than the problem of multicollinearity probably exists. This causes a problem for the multiple regression analysis, because when there is a high correlation between two predictor variables it becomes almost impossible to obtain unique estimates of the regression coefficients (Field, 2009). However, the correlation between the predictor variables do not exceed .80. Therefore, multicollinearity will not be a problem.

When looking at the correlations of the control variables with the variables used in this study, it is striking that the function of an employee is moderately strong related to three variables included in this study. It is only not related to the expected positive performance outcomes. In addition, the number of years and function an employee is employed at the company are also related to two of the four variables, namely innovation-stimulating leadership and innovative output. The correlations between the various control variables are rather small. The strong correlations that do exist between the control variables are however not surprising. For example, the correlation between the number of years in service and the type of contract ($p = -.61$, $p < .01$) could be explained by keeping in mind that most of the temporary agency workers work less than one year with the company while employees with a permanent contract often work considerably longer with the organization.

5.2.2 Multiple regression analysis

This section refers to the hypotheses that were formulated in chapter three regarding the relation between innovation-stimulating leadership and IWB and the effect of the expected positive performance outcomes on this relation as well as the relation between IWB and innovative output based on previous research on individual innovation. For the purpose of readability, I have recapitulated these hypotheses in table 14. To test these hypotheses hierarchical multilevel regression is used.

H1: *Innovation-stimulating leadership is positively related to innovative work behavior*

H2: *Innovation-stimulating leadership is more positively related to innovative work behavior when the expected positive outcomes are high, than when they are low.*

H3: *Innovative work behavior is positively related to innovative output*

Table 14. Hypotheses

Testing hypothesis one included the estimation of two models. The first model makes an estimation of a model with the control variables: department, section, team, age, educational level, function, type of contract and tenure. The estimation of a model with all the control variables and innovation-stimulating leadership is made in model two. The results of the multiple regression analysis are presented in table 15.

	Models	
	1.	**2.**
Standardized effect parameters:		
Department	-.143	-.157
Section	.058	.113
Team	.067	.017
Age	-.026	-.009
Educational level	-.028	-.024
Function	.175*	.084
Type of contract	-.062	-.110
Number of years employed	.089	.062
Innovation-stimulating leadership		.324**
Model fit:		
N	216	216
Δ F	2,020	23,470
R^2	.072	.131
Δ R^2	-	.095
Significance	*	**

Table 15. Results multiple regression analysis ISL (* p < .05, ** p < .01)

Based on the results of the regression analysis, **hypothesis one (H1) can be accepted.** Although De Jong (2007) did not actually test this relationship, he suggested innovation-stimulating leadership should have a positive impact on the IWB. The results of the regression analysis confirm that the overall variable 'innovation-stimulating leadership' has a direct significant relation with IWB (b = .32, p < .001). This implies that the more an employee perceives their leader to display behaviors that stimulates him to initiate and intentionally introduce new and useful ideas, processes, products or procedures within their work role, group or organization, the higher the level of innovative behavior he displays. So, supervisors who involve their employees in the decision making process, give them the freedom to determine themselves how to do their job, demonstrate confidence in them, praise and appreciate their innovative efforts and provide them with the time and money to innovative, stimulate their employees innovative behaviors.

	Models		
	1.	**2.**	**3.**
Standardized effect parameters:			
Department	-.143	-.111	-.111
Section	.059	.066	.065
Team	.067	.002	.003
Age	-.026	-.026	-.025
Educational level	-.029	.027	.026
Function	.175*	.130	.130
Type of contract	-.062	-.107	-.107
Number of years employed	.088	.051	.050
Innovation-stimulating leadership (ISL)		.145**	.146**
Expected positive performance outcomes (EPPO)		.423**	.424**
ISL*EPPO			.004
Model fit:			
N	215	215	215
Δ F	2,011	35,503	0,005
R^2	.72	.312	.312
Δ R^2	.072	.239	.000
Significance	*	**	

Table 16. Results multiple regression analysis ISL*EPPO (* p < .05, ** p < .01)

Before we can test hypothesis two, first the values of the predictor variables are centered. This prevents that the product of the variables is highly correlated with the original variable. In addition, this will ease the interpretation of effect parameters (Aiken & West, 1991). Testing hypothesis two included the estimation of three models. The first model makes an estimation of a model with all the control variables: department, section, team, age, educational level, function, type of contract and tenure. The estimation of a model with all the control variables, innovation-stimulating leadership

and expected positive performance outcomes is made in model two. The third model is an estimation of a model with all the control variables, innovation-stimulating leadership, expected positive performance outcomes and the product of the innovation-stimulating leadership and expected positive performance outcomes. The significance of the interaction effect can derived from the regression coefficient of these products terms after the main effects of the separate predictors are partialed out. If the interaction effect provides a better fit and has a significant regression coefficient, the interaction term add significantly to the prediction of innovative work behavior, showing that moderation is present. The results of the multiple regression analysis are presented in table 16.

Hypothesis two proposed that the relation between innovation-stimulating leadership and innovative work behavior is strengthened by expected positive performance outcomes. However, this proposition is not confirmed by the data. Only a non-significant standardized effect parameter of .004 was found. Therefore, **hypothesis H2 has to be rejected.** Although both variables are significantly related to IWB, there is no evidence that the effect of a leader's behavior that stimulates innovation on IWB is higher when the employee expects that the effect of their innovative behaviors on their job performance is high. This falsifies the suggestion of De Jong (2007) that the impact of various determinants of innovative behavior of employees is moderated by the expected pay offs of that behavior.

In order to get a better understanding why hypothesis two has to be rejected, another multiple regression analysis was conducted with innovative output as dependent variable. The results of this analysis can be found in Appendix H. It appeared that the relationship between innovation-stimulating leadership and innovative output is moderated by the expected payoffs of the employee regarding his innovative behavior even when controlling for IWB ($b = .08$, $p < .05$). When an employee believes that his innovative output will benefit their work is some way, the effect of the innovation-stimulating behaviors of their leaders on their innovative output is higher than when they do not think their behavior will pay off. An explanation for this finding might be that the innovation-stimulating behaviors of a leader are enough for an employee to start innovating by exploring and generation ideas. However, in order to actually champion and implement the idea more is needed to convince the employee to continue innovating. The production worker has to believe that their behavior will benefit their work or work environment, otherwise they will not implement the ideas even if their leader stimulates their innovative behavior.

Testing hypothesis three included the estimation of two models. The estimation of a model with the control variables - department, section, team, age, educational level, function, type of contract and tenure – makes the first model. The second model is an estimation of a model with all the control variables and IWB. The results of the multiple regression analysis are presented in table 17.

Hypothesis three (H3) can be confirmed by the data. According to the results of the analyses there exist a positive relation between the employees' innovative behavior and his self-rated innovative output ($b = .85$, $p < .001$). This strong relationship is not surprising, because the variables show some resemblance as was argued in the previous section. In literature an empirical confirmation of this relation among employees of manufacturing firms was still lacking. The finding confirms that also with production workers a higher level of perceived innovative behavior leads to a higher level of self-rated innovative output. Besides, the positive relationship between the two variables gives EZ an indication that the IWB of employees indeed contributes to the innovativeness of the organization.

	Models	
	1.	2.
Standardized effect parameters:		
Department	-,186	-,041
Section	,002	-,038
Team	,111	,016
Age	-,041	-,061
Educational level	-,058	-,021
Function	,194*	,012
Type of contract	-,001	,005
Number of years employed	,038	,017
Innovative work behavior		,853**
Model fit:		
N	231	231
Δ F	2,205	588,926
R^2	.074	.747
Δ R^2	.074	.674
Significance	*	**

Table 17. Results multiple regression analysis IWB (* p < .05, ** p < .01)

5.3 Conclusion

In this chapter the collected data were described, discussed and analyzed. Based on the remarkably high response rate in combination with the high Cronbach alpha's of the scales of the variables the data used in this research can be considered as reliable. In addition, the exploratory factor analysis revealed that the variables in this research could be considered as distinct. With this analysis also the the assumption of the one-dimensionality of innovative work behavior was tested. Remarkably, it became clear that innovative work behavior should be considered as three dimensional. Based on the factor analysis three dimensions of phases could be distinguished: idea generation, idea championing and idea implementation. However, because of the strong relation between the dimensions the dimensions were combined into a single additive scale. Thereafter, the mean scores of the variables were discussed. The theoretical desired situation would be that all variables had the highest possible mean score. Based on this criterion it can be concluded that the mean scores on the variables are quite moderate. The production workers of EZ have a reasonable positive perception of the positive outcomes of their innovative behavior on their job performance as well as their leaders' innovation-stimulating behavior. The perception of the production workers on their innovative work behavior and their innovative output is only slightly positive. When analyzing the mean scores of the variables it appeared that the perceived innovative output of the employees is significantly higher in de sections of the mixing and tire component department than in the building and curing department. The analysis also revealed that employees with higher functions behave more innovatively. Subsequently, the three hypotheses proposed in chapter three were tested in order to present evidence for my conceptual research model. Although the first (H1) and third (H3) hypothesis could be confirmed, the second (H2) had to be rejected. In summary, it was found that

innovation-stimulating leadership has a significant positive relation with innovative work behavior which has in turn a positive correlation with innovative output. However, the relation between innovation-stimulating leadership and innovative work behavior is not moderated by expected positive job performance outcomes of employees. In figure 7 the accepted hypothesis are shown.

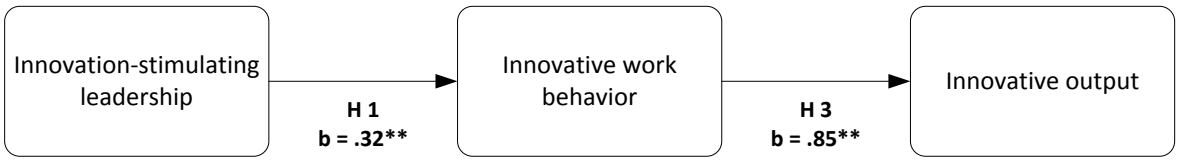

Figure 7. Accepted hypothesis (* p < .05, ** p < .01)

Some other important results that were revealed in this chapter were that the correlation as well as the multiple regression analysis revealed that the expectations of employees regarding the effect of their innovative behavior on their job performance do have a significant positive relation with innovative work behavior. Also, it became clear that both innovation-stimulating leadership and expected positive performances outcomes have a significant correlation with innovative output. In addition, it appeared that the relationship between innovation-stimulating leadership and innovative output, unlike the relation between innovation-stimulating leadership and IWB, was moderated by the expected payoffs of an employee regarding their innovative behavior. The important findings of this chapter will be kept in mind when in the next chapter the final conclusions are drawn and some recommendations are given on how to enhance the innovative behavior of employees.

Chapter 6 – Conclusion

In the previous chapters the available literature on innovative work behavior was discussed, the research methods were described and the results of the collected data were presented and analyzed. Based on this information, in this chapter the research question that was formulated in the first chapter will be answered. Furthermore, the limitations of this research and some possibilities for future research are discussed.

6.1 Discussion

As stated before, in the 21st century the survival and growth of an organization depends on the ability of the organization to create sustainable competitive advantage. In the today's dynamic market environment characterized by increasing competition, especially the capability of a business to innovate is essential to create this sustainable competitive advantage. Nowadays, organizations do not longer solely rely on specialists, scientists and R&D professionals to innovate, but make use of the innovative capabilities of their employees. Research shows that through individual innovation ideas are created that otherwise would not be developed. This makes the innovative behaviors of employees crucial for the initiation and introduction of new and useful ideas, processes, products or procedures within a work role, group or organization.

As the innovative behaviors of employees increase the ability of an organization to innovate and therefore their capability to create sustainable competitive advantage, in this thesis a case study was carried out in order to research how mangers can enhance innovative work behavior (IWB) at EZ. In the first chapter the main research question that I intended to answer by this research was formulated. The main research question was *'How can the management of EZ stimulate the innovative work behavior of their employees in order to increase competitive advantage?'*

Several scientist and managers have tried to find out which factors stimulate IWB. Based on the available scientific literature in general five categories of factors can be identified. Firstly, factors at the level of the individual such as personality and educational level. Furthermore, the characteristics of a job can enhance individual innovation like the variety, autonomy and level of challenge of a job. Thirdly, an individual's innovative behavior can be influenced by organizational factors such as the organizational climate and strategy. Moreover, team characteristics impact IWB as well as relations with other people inside and outside the organization.

Since innovation is never a solitary activity, innovative behavior of individuals is at least partly determined by the interaction with others. Employees in a business are particularly dependent on their leaders for the information, resources, support and the like that are needed to generate, promote and implement new ideas. Therefore, the role of the leader is an important driving force behind individual innovation. The question arises how leaders can enhance the IWB of their employees. In scientific literature multiple answers to this question can be found. It is for example suggested that leadership style and the quality of the relationship between supervisor and follower influences IWB. However, these models are not necessarily appropriate to stimulate employee's innovative behavior, because they were originally developed to explain the general performance of employees rather than innovation-related outcomes. In contrast, the concept of innovation-stimulating leadership was developed with the aim of enhancing individual innovation. The concept consists of behaviors that stimulate individuals to initiate and intentionally introduce new and useful ideas, processes, products or procedures within their work role, group or organization. Within these behavioral aspects two dimensions can be distinguished: participation and direct support. Participation includes encouraging employee's participation in decision making (consulting) and giving people autonomy to determine themselves how to do a job or certain task (delegating). Direct support involves the response of leaders to the innovative efforts of an employee (support for

innovation), giving employees the discretion to act on their innovative ideas (providing resources) and giving praise and showing appreciation for innovative effort (recognition). It was argued that the leaders of EZ could enhance the innovative behaviors of their employees by engaging themselves in innovation-stimulating leadership.

Although, a concept could be found that focuses solely on stimulating IWB, the research into this field is still underdeveloped and the results remain rather inconclusive. These findings suggest that the understanding of the relationship between leadership and individual innovation may benefit from the identification of a moderator variable. After reviewing the literature, it appeared that little research was done on the psychological processes that explain how and why innovative leadership affects the innovative behavior of employees. A relevant psychological aspect that may underlie this effect is the importance of outcome expectations in determining human behavior. An individual's innovative behavior will be influenced by their expectations regarding the payoffs of their behavior. Although, an individual might be stimulated by their supervisor to initiate and implement new and useful ideas, they are less likely to display innovative behaviors if they feel that the payoffs of their behavior are too low or lacking. Therefore, it was proposed that the behaviors of the leaders at EZ aimed at stimulating innovation would have a stronger effect when the employees expect higher results of their innovative behavior.

Theoretically, the main question could now be answered. The competitive advantage of EZ could be improved by increasing the innovative capabilities of the organization which can be achieved by enhancing the innovative behaviors of employees. The leaders of the organization can stimulate IWB by engaging themselves in the five innovation-stimulating behaviors. However, these behaviors would have more influence if the employees of the organization expected that their innovative behavior has a positive effect on their job performance. However, in order to give a more complete answer to the main research questions an questionnaire was used in order to be able to provide EZ of an analysis of the current situation regarding the IWB of their employees as well as finding empirical evidence for the proposed hypothesizes. The used questionnaire was a slightly adapted questionnaire that was previously developed as part of the project 'competences for innovation' in order to research IWB. The questionnaire was disseminated to four hundred production workers at EZ. I chose for production workers, because little research has been done on individual innovation among employees of companies in the manufacturing industry. The response rate was remarkably high for a survey research, namely 82 percent. In addition, the characteristics of the respondents match with the overall characteristics of the employees of EZ. Therefore, this research can be regarded as reliable.

Based on the collected data an analysis could be made of the current situation regarding the innovative behaviors of the employees of EZ. It appears that production workers rarely find themselves to display innovative work behavior. Although the production workers do tend to generate ideas from time to time, they rarely champion or implement these ideas. However, the championing and realization of innovative ideas is crucial when turning them into an innovation. Therefore, the low scores on idea championing and application cause the perceived innovative output to be quite low. When regarding the employees' perception of the innovation-stimulating behaviors of their supervisors a more positive outcome arises. It turns out that production workers feel that their innovative behavior is stimulated by their leaders to a reasonable extent. Supervisors do sometimes to regularly involve their employees in the decision making process and give them the autonomy to determine independently how to do their jobs. In addition, the leader quite regularly directly supports the innovative efforts of their employee by supporting the innovation, providing the resources needed to develop new ideas and giving praise for innovative efforts. When considering the expected outcomes of production workers regarding their innovative behavior, it emerges that they do believe that their innovative behavior will benefit their work to some extent. The theoretical

desired situation would be that all variables had the highest possible score. Based on this criterion it can be concluded that the results of analysis of the current situation are quite moderate. Therefore, there are opportunities for EZ to increase the innovative behaviors of their employees.

Before we continue with identifying how the IWB of the employees of EZ can be enhanced, first the empirical findings on the proposed hypothesis are discussed. A summary of the findings is presented in table 18.

H1.	Innovation-stimulating leadership is positively related to innovative work behavior	Accepted
H2.	Innovation-stimulating leadership is more positively related to innovative work behavior when the expected positive outcomes are high, than when they are low	Rejected
H3.	Innovative work behavior is positively related to innovative output	Accepted

Table 18. Summary of findings

Firstly, the results confirm that innovation-stimulating leadership is positively related with IWB. The more supervisors involve their employees in the decision making process, give them the freedom to determine themselves how to do their job, demonstrate confidence in them, praise and appreciate their innovative efforts and provide them with the time and money to innovative, the more innovative behaviors the employee will display. Participation will increase the enthusiasm and commitment of the employee which likely stimulates their intrinsic motivation and makes them perceive to be able to change the situation resulting in more initiations of ideas and a higher commitment to their implementation. Direct support is essential when leaders want to enhance the generation and implementation of ideas, because without direct support employees are less likely to engage themselves in future attempts to initiate and realize innovations. Furthermore, employees do not have to worry of being punished when supported by their leader and can therefore focus more on innovation. Secondly, the results show that the relationship between innovation-stimulating leadership and IWB is not moderated by the expected positive job performance outcomes. When employees anticipated innovative behavior would benefit their work, the effect of innovation-stimulating behaviors of supervisors on the level of IWB was not increased. However, the expected positive performance outcomes do moderate the relationship between innovation-stimulating leadership and innovative output which might imply that innovation-stimulating behavior of leaders is enough for employees to start innovating by exploring and generation ideas, but that in order to actually champion and implement the idea more is needed to convince the employee to continue innovating, like the expected payoffs of their behavior. It would be interesting to further research this finding in future research by for instance dividing IWB in different phases. The results also revealed that the expected positive performance outcomes have a direct effect on IWB. Employees who believe that innovation will benefit their work are more likely to engage themselves in innovative behaviors, because people who feel that the expected payoffs of a particular behavior are too low or lacking would never engage themselves in such a behavior. Thirdly, the findings confirm the expected relationship between IWB and innovative output. When production workers display more innovative behaviors, their perceived innovative output will be higher. This is in accordance with other findings in academic literature who found that IWB helps to enhance the ability of a business to innovate. However, the relationship was again tested to confirm that it also holds for production workers.

6.2 Recommendations

In summary, the ability of EZ to gain competitive advantage can be increased by improving the innovativeness of the organization. The innovative output of the business can be raised by enhancing the innovative work behavior of the employees. The next step is to provide some recommendations on how EZ could stimulate IWB. Based on the research two factors were identified that can stimulate innovative behavior, namely innovation-stimulating leadership and the extent to which employees believe their behavior will benefit their work. Below some steps are discussed that can be taken in order to enhance IWB.

6.2.1 Innovation-stimulating leadership

Innovation-stimulating leadership consists of five behaviors that stimulate individuals to initiate and intentionally introduce new and useful ideas, processes, products or procedures within their work role, group or organization. The first is providing resources. Supervisors should provide time and money to their employees if they want them to innovate. When leaders provide the production workers with the resources needed to innovate, they will motivate them to implement their inventions and keep thinking about new innovation in the future. If the supervisor refuses to provide resources, the employee would never be able to implement an innovative idea. A second behavior that stimulates innovation is recognizing. Leaders should recognize the innovative efforts of their employees. Major forms of recognition include praise, awards and ceremonies or public occasions. These forms of recognition ensure that the efforts of an employee are acknowledged and become visible to others. The third behavior includes consulting. Consulting means that supervisors consult their followers before initiating and implementing changes that affect them. In addition, leaders should encourage and facilitate the participation of their employees in the decision making process and actually incorporate their ideas and suggestions into the decision. In this way, employees are motivated to generate new ideas and their feelings of being in control to strive to realize these ideas are encouraged. A fourth behavior that stimulates innovation is delegation. Delegating implies that supervisors give their employees the autonomy to determine themselves how to do a job or certain task. Therefore, leaders should allow the production workers to have substantial responsibility and discretion to carry out work activities, to act independently when a problem of something unusual occurs and make important decisions independently. The last behavior includes support for innovation. Supervisors' support stimulates production workers to initiate and realize innovations by showing consideration, acceptance and concern for their employees who are involved in innovative behavior. It is important to be friendly, patient and helpful whenever a follower explores changes for innovation, comes up with an idea, faces problems when championing or introducing the idea (De Jong, 2007). Based on the above discussion five ways can be formulated in which innovation-stimulating leadership at EZ can be improved:

- Supervisors should provide employees with time and money to carry out innovative efforts
- Leaders should praise and award production workers for their innovative efforts
- Supervisors should be open to suggestions of employees
- Leaders should give employees the responsibility to solve problems themselves
- Leaders should react positively to the innovative efforts of production workers

6.2.2 Expected benefits

Based on the research of Yuan and Woodman (2010) four ways can be identified in order to establish a strong association between innovative behavior and job performance. The first way is establishing an organizational climate for innovation that communicates the need for change and demonstrates that innovation will benefit the organization. These values and beliefs, when integrated in the culture of the business, will be transmitted to and become internalized by the members through the socialization process in the organization. In this way, employees will perceive their innovative efforts as more beneficial in bringing performance gains. Furthermore, an employee with a high quality relationship with its leader is likely to be more confident that their innovative efforts will results in

performance gains. Production workers who have a good quality relationship with their supervisors are given greater resources, decision latitude and freedom. As generating, championing and realizing innovative ideas requires additional time, resources and freedom at work, the greater resources and freedom is provided by the supervisors how higher the chance that the innovative efforts will be successful. Another possibility to improve the expectations regarding the results of innovative behavior is to set innovation as a job requirement. In this way, the relevance of innovative behavior to successful performance is explicitly specified. In addition, dissatisfaction with the status quo is important to strengthen employees' beliefs that new innovative ideas will bring benefit to their work by making people aware of the need to change and the value of innovation for the organization. Dissatisfaction with the status quo could arise from for example changes in de work environment or potential improvement opportunities. In summary, EZ can increase the expected benefits of the innovative behaviors of their employees in the following ways:

- Communicate the need for change
- Demonstrate that innovation will make the organization more efficient and successful
- Improve the quality of the relationship between the employee and the supervisor
- Set innovation as a job requirement
- Break the comfort with the status quo

6.3 Limitations and future research

This research aimed at providing some insights into the perception of production workers regarding their innovative work behavior, the innovation-stimulating behaviors of their supervisors, the expected benefits from their innovative behaviors and their innovative output. However, the conclusions drawn above should be interpreted in light of this study's limitations. First of all, a cross-sectional research design was used. Although the relationships in the research model follow the hypothesized causal order, with innovation-stimulating leadership affecting IWB which lead to innovative output, the ability to determine causality was limited by the design. Strictly speaking the results only prove that innovation-stimulating leadership and IWB and IWB and innovative output are connected, but no causal relationship can be demonstrated. For example, the relationship between innovative behavior and innovative output may be reciprocal with innovative output leading to more innovative behavior and vice versa. Therefore, I strongly recommend future studies that use longitudinal designs to explore the relationships in my research model. In that longitudinal study the data collected by the questionnaire in this study can be used as starting point. In about one or two years the innovative behavior and innovative output of the production workers of the employees of EZ should be measured again in order to determine the causality of the relationships found in this research.

Another limitation of this study is the potential common method bias. There could be discrepancies between the observed and the true relationships between the variables measured in this research. This is caused by collecting the data of all my research variables from the same source using the method at the same time which raises the tendency of respondents to consistently answer the questions. For example, employees who think negatively about their supervisor have the tendency to give a negative answer all the questions about their leader. For this reason, it is recommended that in future studies multiple sources or methods are used to collect the data. This will also provide additional insights in the relationships between the variables studied in this thesis, because the research is now only based on the perception of the employee.

Furthermore, the ability to generalize our findings can be improved by doing research in other contexts. The focus of the research was on production workers in the production and engineering department of EZ, because the research into the innovative work behavior of this group of employees was still scarce. However, there are still many other professions, such as consultants and

doctors, departments, like the HRM and the financial department, and businesses, such as hotels and farms, which can be explored.

A last recommendation is that most research on innovative work behavior was done in the United States and Western Europe. This may imply that previous work overlooks the fact that the innovative behavior of individuals from different cultures may be enhanced by different factors. The evaluation and meaning of the factors that stimulate innovative work behavior may vary across cultures, because cultural values likely influence how innovative ideas are generated and implemented. Therefore, it is important to research the factors that enhance innovative work behavior across cultures.

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Appendices

Appendix A – Questionnaire including accompanying letter

Beste EZ medewerk(st)er,

Als onderdeel van mijn studie Bedrijfskunde aan de Universiteit Twente, ben ik sinds begin mei bezig met mijn bacheloropdracht bij EZ. In mijn opdracht onderzoek ik hoe de medewerkers van de productieafdeling van EZ een bijdrage kunnen leveren aan het innovatievermogen van het bedrijf. Als onderdeel van dit onderzoek heb ik een vragenlijst ontwikkeld.

De vragenlijst gaat over de dagelijkse werkzaamheden van medewerkers in de productie. Ook zijn er vragen over zogenaamd 'innovatief werkgedrag.' Dus in hoeverre een werknemer bijdraagt aan het innovatiesucces van EZ. Tot slot zijn er nog een aantal vragen over de ruimte en ondersteuning die EZ biedt om vernieuwend of innovatief gedrag te vertonen.

Graag zou ik u willen vragen deze vragenlijst vandaag tijdens uw dienst in te vullen. Het invullen van de vragenlijst duurt slechts **15 minuten**. Mocht u hier vandaag geen tijd voor hebben, dan vraag ik je het morgen te doen. U hoeft geen naam of personeelsnummer in te vullen. Hierdoor blijven uw antwoorden **anoniem**. Ik vraag u daarom ook om alle vragen zo eerlijk mogelijk te beantwoorden. Ik zal alle antwoorden **vertrouwelijk** behandelen. Is een vraag niet van toepassing op uw situatie of weet u het antwoord niet, vul dan 'weet niet' in. Aan het einde van de vragenlijst is er ruimte voor eventuele opmerkingen. Na het invullen van de vragenlijst kunt u de vragenlijst in de bijgevoegde envelop doen, en de **envelop inleveren** bij uw productiecoördinator. Mocht u nog vragen hebben dan kunt u deze stellen aan uw productiecoördinator of direct aan mij.

De resultaten van mijn onderzoek zullen in rapport vorm gepresenteerd worden aan de leidinggevenden. De ingevulde vragenlijsten en de daaruit voortvloeiende data zullen niet aan de leidinggevenden worden verstrekt.

Alvast bedankt voor uw medewerking!

Vriendelijke groet,

Tamara Oukes

Stagiaire P&O
Student Universiteit Twente

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Telefoonnummer: 8636

Voordat de vragenlijst begint, wil ik u vragen om wat algemene informatie. Kruis aan wat op u van toepassing is.

Functie:

- ☐ Bedieningsman
- ☐ Assistent operator
- ☐ Operator
- ☐ Anders, nl _____

Dienstverband:

- ☐ Vaste aanstelling
- ☐ Contract bepaalde tijd
- ☐ Uitzendkracht

Dienstverband; uren:

_____ uur per week

Aantal jaren in dienst:

_____ jaar

Geboortejaar:

_____

Hoogst afgeronde opleiding:

- ☐ Basisschool
- ☐ VBO/VMBO
- ☐ LBO/LTS
- ☐ MBO/MTS
- ☐ HBO/HTS
- ☐ Anders, nl:_____

Nu begint de vragenlijst. Let op: de vragenlijst bestaat uit 76 korte, gesloten vragen. De vragen gaan over uw functie, dagelijkse werkzaamheden en over innovatief werkgedrag. Dus in hoeverre u bijdraagt aan verbeteringen en vernieuwingen (innovaties) binnen EZ. Beantwoord de vragen a.u.b. allemaal! **Omcirkel het juiste antwoord**. Is de vraag niet van toepassing op u of weet u het antwoord niet, omcirkel dan 'weet niet.'

Geef a.u.b. aan in welke mate u het met de volgende stellingen eens of oneens bent:		Zeer mee oneens	Mee oneens	Neutraal	Mee eens	Zeer mee eens	Weet niet
1.	mijn werk is gevarieerd	1	2	3	4	5	6
2.	in mijn werk kom ik regelmatig met nieuwe plannen	1	2	3	4	5	6
3.	meestal doe ik meer dan dat er van mij gevraagd wordt	1	2	3	4	5	6
4.	mijn baan vereist dat ik nieuwe dingen leer	1	2	3	4	5	6
5.	mijn werk is uitdagend	1	2	3	4	5	6
6.	als er iets misgaat op mijn werk, zoek ik meteen naar een oplossing	1	2	3	4	5	6
7.	ik neem meteen initiatief, zelfs als collega's dat niet doen	1	2	3	4	5	6
8.	mijn baan vereist creativiteit	1	2	3	4	5	6

Nu volgt een aantal stellingen die gaan over uw functie en dagelijkse werkzaamheden als productiemedewerk(st)er. Geef a.u.b. aan in hoeverre er sprake is van deze zaken in uw functie.

De volgende vragen gaan over uw functie als productiemedewerker. In hoeverre:		Zeker niet/nooit	Nauwe-lijks	Enigszins	Wel	Zeker wel/altijd	Weet niet
9.	kent u de hoofdoorzaak van de productieproblemen die optreden	1	2	3	4	5	6
10.	weet u wat het verschil is in producten gemaakt door EZ en producten van concurrenten	1	2	3	4	5	6
11.	bent u in staat om uit te werken wat te doen als de instructies vaag zijn	1	2	3	4	5	6
12.	bent u in staat de problemen in het productieproces te meten en analyseren	1	2	3	4	5	6
13.	bent u bereid om de manier waarop dingen gedaan worden in twijfel te trekken	1	2	3	4	5	6
14.	weet u welke vaardigheden iedereen in uw werkgebied heeft	1	2	3	4	5	6
15.	kent u de prioriteiten van werk in uw werkgebied	1	2	3	4	5	6
16.	bent u in staat productieproblemen te voorzien en voorkomen	1	2	3	4	5	6

17.	bent u bekend met de algemene doelen van EZ	1	2	3	4	5	6
18.	begrijpt u hoe werk georganiseerd is in uw werkgebied	1	2	3	4	5	6
19.	bent u bereid om nieuwe verantwoordelijkheden te accepteren en te nemen	1	2	3	4	5	6
20.	bent u in staat beslissingen te nemen in een groep	1	2	3	4	5	6
21.	bent u bekend met de eisen van de klant of eindgebruiker van de band	1	2	3	4	5	6
22.	bent u in staat om mensen te motiveren en erbij te betrekken	1	2	3	4	5	6
23.	begrijpt u andermans standpunten	1	2	3	4	5	6

De volgende stellingen gaan over verschillende manieren om bij te dragen aan vernieuwingen en verbeteringen binnen EZ. Geef a.u.b. aan hoe vaak er bij u sprake is van deze zaken door het antwoord te **omcirkelen**. Is de vraag niet van toepassing, antwoord dan 'weet niet.'

De volgende stellingen gaan over innovatief werkgedrag. Hoe vaak:		Nooit	Zelden	Soms	Regel-matig	(Vrijwel) altijd	Weet niet
24.	bedenkt u originele oplossingen voor problemen	1	2	3	4	5	6
25.	zoekt u naar nieuwe manieren om taken uit te voeren	1	2	3	4	5	6
26.	doet u suggesties om bestaande producten of diensten te verbeteren	1	2	3	4	5	6
27.	doet u suggesties om werkmethoden te verbeteren	1	2	3	4	5	6
28.	stelt u nieuwe werkwijzen, technieken of methoden voor	1	2	3	4	5	6
29.	zoekt u naar mogelijkheden om een bestaand proces, technologie, product, service of werkrelatie te verbeteren	1	2	3	4	5	6
30.	doet u suggesties om nieuwe kennis op te doen	1	2	3	4	5	6
31.	herkent u mogelijkheden om een positief verschil te maken in uw werk, afdeling, EZ of met klanten	1	2	3	4	5	6
32.	draagt u actief bij aan de ontwikkeling van nieuwe producten of diensten	1	2	3	4	5	6
33.	draagt u actief bij aan de werving van nieuwe klantgroepen	1	2	3	4	5	6

34.	draagt u actief bij aan veranderingen in de organisatie van het werk	1	2	3	4	5	6
35.	maakt u sleutelfiguren enthousiast voor vernieuwingen	1	2	3	4	5	6
36.	probeert u mensen over de streep te trekken om vernieuwingen te steunen	1	2	3	4	5	6
37.	besteedt u aandacht aan niet .routine dingen in uw werk, afdeling, EZ of de markt	1	2	3	4	5	6
38.	voert u vernieuwingen planmatig in	1	2	3	4	5	6
39.	levert u een bijdrage aan de invoeringen van vernieuwingen	1	2	3	4	5	6
40.	spant u zich in om vernieuwingen gerealiseerd te krijgen	1	2	3	4	5	6

Nu volgen drie stellingen over in hoeverre u denkt dat uw innovatief gedrag een positieve invloed heeft op u en uw afdeling.

Geef a.u.b. aan in welke mate u het met de volgende stellingen eens of oneens bent:		Zeer mee oneens	Mee oneens	Neutraal	Mee eens	Zeer mee eens	Weet niet
41.	hoe innovatiever ik ben, hoe beter mijn prestaties op het werk	1	2	3	4	5	6
42	het komen met nieuwe ideeën zorgt er voor dat ik het goed doe op mijn werk	1	2	3	4	5	6
43.	mijn afdeling zal beter presteren, als ik vaak suggesties doe voor nieuwe manieren om de gestelde doelen te bereiken	1	2	3	4	5	6

De volgende stellingen gaan over uw leidinggevende. Deze vragen richten zich op de mate waarin leidinggevenden u de ruimte bieden en stimuleren om te komen met vernieuwingen en verbeteringen in producten, processen en werk. Geef aan in hoeverre u het eens of oneens bent met onderstaande stellingen. **Let op:** alle vragen beginnen met: " Mijn leidinggevende….". Als een vraag niet van toepassing is op uw situatie, vul dan 'weet niet' in.

Geef aan in welke mate u het eens of oneens bent met de volgende stellingen. **Mijn leidinggevende:**		Zeer mee oneens	Mee oneens	Neutraal	Mee eens	Zeer mee eens	Weet niet
44.	laat mij zelf beslissen hoe ik mijn werk aanpak	1	2	3	4	5	6
45.	verschaft mij de middelen die nodig zijn voor innovatie	1	2	3	4	5	6

46.	geeft mij de steun die nodig is om zaken te kunnen verbeteren	1	2	3	4	5	6
47.	houdt rekening met mijn suggesties	1	2	3	4	5	6
48.	heeft tijd en geld over voor vernieuwende inspanningen van mij	1	2	3	4	5	6
49.	prijst mij voor vernieuwende inspanningen	1	2	3	4	5	6
50.	geeft medewerkers de credits voor vernieuwende ideeën	1	2	3	4	5	6
51.	laat mij onafhankelijk en vrij te werk gaan	1	2	3	4	5	6
52.	vraagt naar mijn mening	1	2	3	4	5	6
53.	toont interesse als ik met een idee kom	1	2	3	4	5	6
54.	waardeert het openlijk als ik bijdraag aan innovatie	1	2	3	4	5	6
55.	raadpleegt mij bij belangrijke veranderingen	1	2	3	4	5	6
56.	geeft mij zeggenschap over de indeling van mijn tijd	1	2	3	4	5	6
57.	is iemand waar u op kunt rekenen, ook als u iets onderneemt dat minder succesvol is	1	2	3	4	5	6
58.	laat mij meepraten over lange termijnplannen	1	2	3	4	5	6
59.	vindt het leuk als ik vernieuwende ideeën heb	1	2	3	4	5	6
60.	herkent mijn bijdrage aan innovatie in het bedrijf	1	2	3	4	5	6
61.	geeft mij de tijd om ideeën uit te werken	1	2	3	4	5	6

Nu volgt een aantal stellingen over het personeelsbeleid van EZ. Geef a.u.b. aan hoe in hoeverre u het eens of oneens bent met de stellingen door het antwoord te **omcirkelen**. Is de vraag niet van toepassing, antwoord dan 'weet niet.'

Geef a.u.b. aan in hoeverre u het eens of oneens bent met de volgende stellingen:		Zeer mee oneens	Mee oneens	Neutraal	Mee eens	Zeer mee eens	Weet Niet
62.	ik word niet onderbetaald voor mijn werk	1	2	3	4	5	6
63.	ik krijg genoeg kansen om naar vaardigheden-trainingen te gaan om beter te worden in mijn huidige functie	1	2	3	4	5	6
64.	ik ben goed op de hoogte van de visie en missie van het bedrijf	1	2	3	4	5	6

65.	zover ik weet ligt mijn salaris net zo hoog als of hoger dan de salarissen bij vergelijkbare bedrijven	1	2	3	4	5	6
66.	ik ben goed op de hoogte van de bedrijfsresultaten van het bedrijf	1	2	3	4	5	6
67.	in vergelijking met mijn collega's krijg ik goed betaald	1	2	3	4	5	6
68.	ik ben goed op de hoogte van de toekomstplannen van het bedrijf	1	2	3	4	5	6
69.	ik krijg genoeg kansen om naar vaardigheden-trainingen te gaan om mijn kansen te vergroten op een betere functie	1	2	3	4	5	6
70.	ik ben goed op de hoogte van de activiteiten van andere vestigingen en afdelingen van het bedrijf	1	2	3	4	5	6
71.	ik ben goed voorbereid op mijn werkzaamheden door de training die ik gekregen heb van mijn afdeling	1	2	3	4	5	6

Tot slot nog enkele stellingen over EZ en innovatie. Geef a.u.b. aan in welke mate u het hier mee eens of oneens bent.

Geef a.u.b. aan in welke mate u het hier mee eens of oneens bent.		Zeer mee oneens	Mee oneens	Neutraal	Mee eens	Zeer mee eens	Weet niet
72.	EZ is altijd bezig met het ontwikkelen van nieuwe oplossingen	1	2	3	4	5	6
73.	EZ kan worden beschreven als flexibel en continu aanpassend aan verandering	1	2	3	4	5	6
74.	medewerkers van EZ zijn altijd op zoek naar nieuwe manieren om met problemen om te gaan	1	2	3	4	5	6
75.	creativiteit wordt gestimuleerd bij EZ	1	2	3	4	5	6
76.	EZ staat positief tegenover risico's nemen, zelfs als daardoor af en toe dingen fout gaan	1	2	3	4	5	6

Dit is het einde van deze vragenlijst. Fijn dat u de tijd hebt genomen om deze vragenlijst in te vullen. Check a.u.b. even of u alle 76 vragen heeft ingevuld. Mocht u nog aanvullingen, opmerkingen of vragen hebben, dan kun u die op de volgende bladzijde kwijt.

Nogmaals hartelijk bedankt voor uw medewerking!

Met vriendelijke groet,

Tamara Oukes

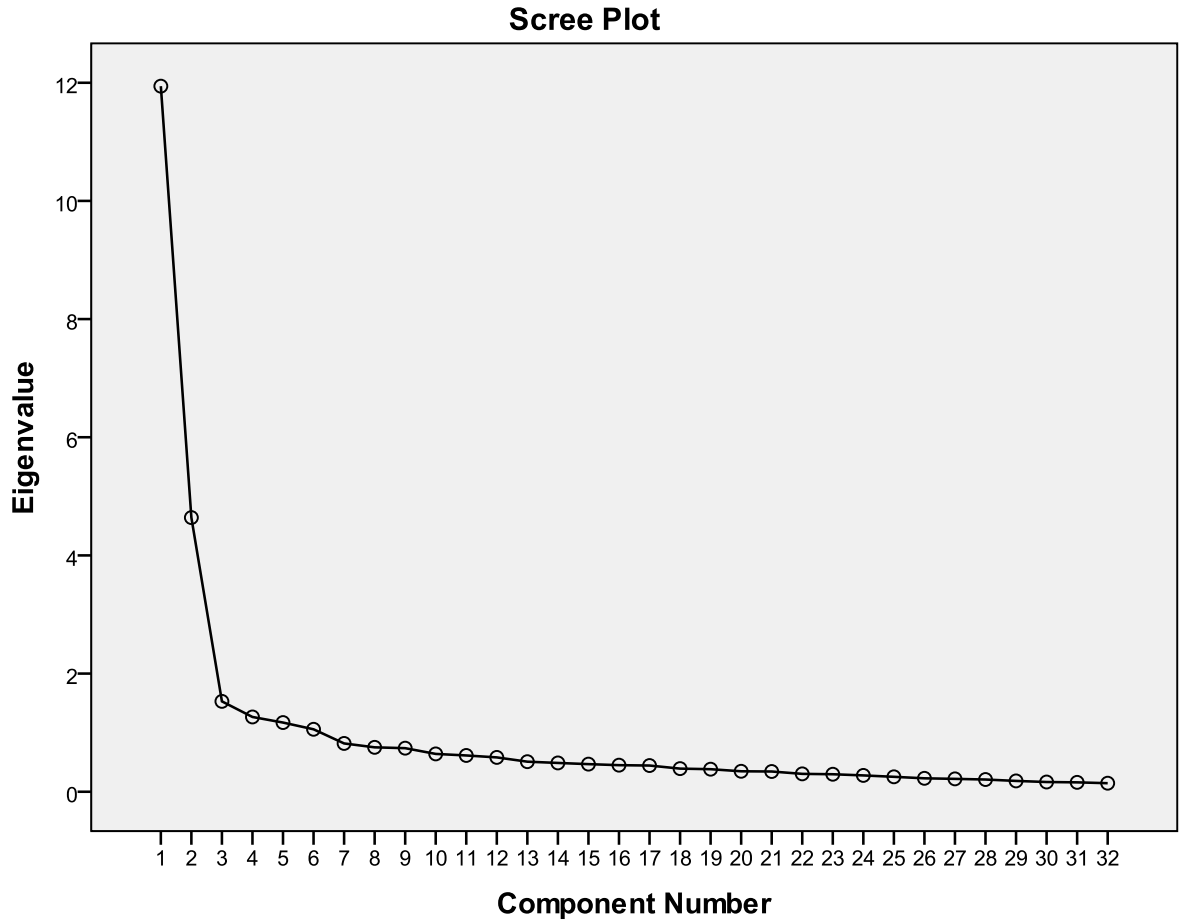
Ruimte voor opmerkingen en vragen:

Appendix B – Descriptive statistics respondents

Respondent statistics	Frequency (%)
Team	
A	57 (17,4)
B	66 (20,1)
C	69 (21,0)
D	69 (21,0)
E	67 (20,4)
Total	*328 (100)*
Section	
Section 2/Hielen	43 (13,1)
Mixing	45 (13,7)
Extrusion	40 (12,2)
Automates	48 (14,6)
Half automates	26 (7,9)
Curing	81 (24,7)
Argiculture	45 (13,7)
Total	*328 (100)*
Age	
15 – 24	27 (8,2)
25 – 34	62 (18,9)
35 – 44	83 (25,3)
45 – 54	104 (31,7)
55 +	15 (4,6)
Total	*291 (88,7)*
Non response	37 (11,3)
Type of contract	
Permanent	255 (77,7)
Fixed-term	17 (5,2)
Temporary	35 (10,7)
Total	*307 (93,6)*
Non response	21 (6,4)

Respondent statistics	Frequency (%)
Educational level	
Primary school	3 (0,9)
Secondary school	45 (13,7)
Lower vocational	80 (24,4)
Intermediate vocational	138 (42,1)
Higher vocational	8 (2,4)
Other	30 (9,1)
Total	*304 (92,7)*
Non response	24 (7,3)
Function	
Bedieningsman	19 (5,8)
Assistent operator	61 (18,6)
Operator	193 (58,8)
Senior operator	28 (8,5)
Other	6 (1,8)
Total	*307 (93,6)*
Non response	21 (6,4)
Tenure	
Less than one year	31 (9,5)
1 – 4 years	49 (14,9)
5 – 9 years	53 (16,2)
10 – 19 years	65 (19,8)
20 – 29 years	76 (23,2)
More than 30 years	23 (7,0)
Total	*297 (90,5)*
Non response	31 (9,5)

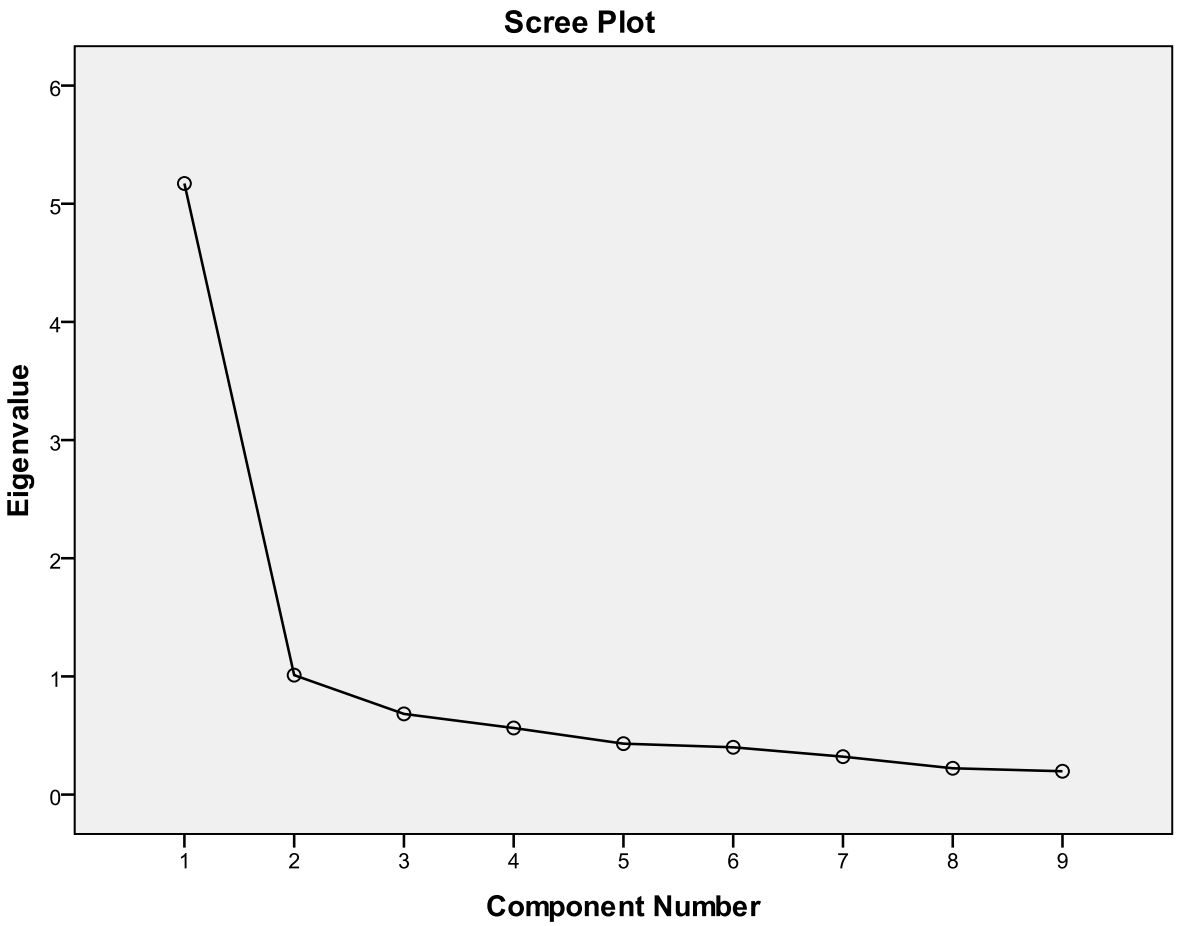
Appendix C – Scree plot exploratory factor analysis



Appendix D – Pattern and structure matrix exploratory factor analysis

		Pattern matrix			Structure matrix		
		Component			Component		
Item	Question	1	2	3	1	2	3
53.	Shows sincere interest whenever I come up with an idea	**.83**			**.82**		
47.	Asks me to suggest how to carry out assignments	**.83**			**.82**		
50.	Gives me credit for innovative ideas	**.80**			**.80**		
54.	Publicly recognizes my when I am innovative	**.80**			**.80**		
46.	Support me when I want to improve things	**.78**			**.79**		
57.	Is someone you can count on, even when you initiate something unsuccessful	**.78**			**.78**		
60.	Recognizes my contribution to innovation	**.78**			**.77**		
49.	Praises my innovative efforts	**.77**			**.77**		
52.	Asks for my opinion	**.77**			**.76**		
61.	Provides me with time to work out ideas	**.75**			**.76**		
59.	Reacts enthusiastically to my creative thoughts	**.75**			**.75**		
48.	Is willing to invest time and money in innovative efforts	**.72**			**.75**		
55.	Consults me about important changes	**.72**			**.75**		
58.	Lets my influence decisions about long term plans and directions	**.71**			**.70**		
56.	Allows me to determine my own time planning	**.66**			**.69**		
45.	Provides my with the means necessary for innovation	**.60**			**.65**		.41
51.	Gives me considerable independence and freedom	**.58**			**.60**		
39.	Contribute to the implementation of new ideas		**.84**			**.82**	
40.	Put effort into the development of new things		**.84**			**.82**	
38.	Systematically introduce innovative ideas into work		**.81**			**.81**	
36.	Attempts to convince people to support an innovative idea		**.79**			**.80**	
37.	Do you pay attention to non-routine issues in you work, department, organization or the market place		**.77**			**.79**	
35.	Encourage key organization members to be enthusiastic about innovative ideas		**.75**			**.76**	
29.	Look for opportunities to improve an existing process, technology, product, service or work relationship		**.66**			**.69**	
28.	How often do you search out new working methods, techniques or instruments		**.59**			**.66**	.46
25.	How often do you find new approaches to execute tasks		**.54**			**.61**	.43
42.	Coming up with creative ideas helps me do well on my job			**.78**			**.80**
41.	The more innovative I am, the better my job performance			**.72**		.41	**.78**
43.	My work unit will perform better if I often suggest new ways to achieve objectives			**.71**			**.77**

Appendix E – Scree plot exploratory factor analysis IWB



Appendix F – Missing values per item

Construct/ Dimension	Question	Missing values
	Function	6,4
	Employment	7,0
	Years employed	6,4
	Year of birth	11,3
	Highest rounded education	7,3
Idea generation		
	Search out new working methods, techniques or instruments	3,0
	Find new approaches to execute tasks	2,4
	Look for opportunities to improve an existing process, technology, product, service or work relationship	4,0
Idea championing		
	Encourage key organization members to be enthusiastic about innovative ideas	8,8
	Attempts to convince people to support an innovative idea	4,9
Idea implementation		
	Systematically introduce innovative ideas into work practices	9,5
	Contribute to the implementation of new ideas	6,1
	Put effort into the development of new things	5,8
Innovative output		
	Suggest improving current products or services	2,1
	Suggest improving current work practices	2,4
	Suggest acquiring new knowledge	1,2
	Actively contribute to developing new products or services	4,3
	Actively contribute to acquiring new customers	9,1
	Actively contribute to changing the work organization	5,8
Expected positive performance outcomes		
	The more innovative I am, the better my job performance	1,2
	Coming up with creative ideas helps me do well on my job	2,7
	My work unit will perform better if I often suggest new ways to achieve objectives	4,9
Delegating		
	Gives me considerable independence and freedom	1,5
	Allows me to determine my own time planning	3,4
Providing resources		
	Provides me with time to work out ideas	7,0
	Provides my with the means necessary for innovation	2,1
	Is willing to invest time and money in innovative efforts	5,8
Recognizing		
	Publicly recognizes my when I am innovative	5,5
	Praises my innovative efforts	5,2
	Recognizes my contribution to innovation	8,8
	Gives me credit for innovative ideas	5,2
Consulting		
	Asks for my opinion	0,9
	Consults me about important changes	2,4
	Lets my influence decisions about long term plans and directions	4,6
	Asks me to suggest how to carry out assignments	2,1

Support for innovation		
	Shows sincere interest whenever I come up with an idea	3,0
	Reacts enthusiastically to my creative thoughts	6,7
	Support me when I want to improve things	0,9
	Is someone you can count on, even when you initiate something unsuccessful	2,4

Appendix G – Comparing sub groups

ANOVA – Innovative work behavior

		Sum of Squares	df	Mean Square	F	Sig.
Department	Between Groups	20,032	85	0,236	0,978	.539
	Within Groups	45,554	189	0,241		
	Total	65,585	274			
Section	Between Groups	337,071	85	3,966	0,981	.532
	Within Groups	763,896	189	4,042		
	Total	1100,967	274			
Team	Between Groups	142,948	85	1,682	0,827	.840
	Within Groups	384,529	189	2,035		
	Total	527,476	274			
Age	Between Groups	107,000	85	1,259	1,168	.199
	Within Groups	174,544	162	1,077		
	Total	281,544	247			
Educational level	Between Groups	95,188	85	1,120	0,958	.582
	Within Groups	197,620	169	1,169		
	Total	292,808	254			
Function	Between Groups	61,833	85	0,727	1,490	.014
	Within Groups	84,000	172	0,488		
	Total	145,833	257			
Employment	Between Groups	38,091	85	0,448	1,134	.244
	Within Groups	67,987	172	0,395		
	Total	106,078	257			
Tenure	Between Groups	177,826	83	2,142	1,011	.468
	Within Groups	353,728	167	2,118		
	Total	531,554	250			

ANOVA – Innovation-stimulating leadership

		Sum of Squares	df	Mean Square	F	Sig.
Department	Between Groups	29,538	127	0,233	0,978	.550
	Within Groups	33,540	141	0,238		
	Total	63,078	268			
Section	Between Groups	512,628	127	4,036	1,011	.475
	Within Groups	563,179	141	3,994		
	Total	1075,807	268			
Team	Between Groups	270,192	127	2,127	1,207	.138
	Within Groups	248,626	141	1,763		
	Total	518,818	268			
Age	Between Groups	110,997	121	0,917	0,816	.867
	Within Groups	137,081	122	1,124		
	Total	248,078	243			
Educational level	Between Groups	163,265	125	1,306	1,255	.102
	Within Groups	131,148	126	1,041		
	Total	294,413	251			
Function	Between Groups	70,363	125	0,563	1,121	.262
	Within Groups	63,795	127	0,502		
	Total	134,158	252			
Employment	Between Groups	49,969	125	0,400	1,015	.466
	Within Groups	50,398	128	0,394		
	Total	100,366	253			
Tenure	Between Groups	243,022	125	1,944	0,904	.712
	Within Groups	262,317	122	2,150		
	Total	505,339	247			

ANOVA – Expected positive performance outcomes

		Sum of Squares	df	Mean Square	F	Sig.
Department	Between Groups	4,521	12	0,377	1,606	.089
	Within Groups	69,676	297	0,235		
	Total	74,197	309			
Section	Between Groups	84,436	12	7,036	1,749	.056
	Within Groups	1194,841	297	4,023		
	Total	1279,277	309			
Team	Between Groups	17,123	12	1,427	0,748	.704
	Within Groups	566,555	297	1,908		
	Total	583,677	309			
Age	Between Groups	5,515	12	0,460	0,397	.964
	Within Groups	306,877	265	1,158		
	Total	312,392	277			
Educational level	Between Groups	16,089	12	1,341	1,084	.373
	Within Groups	338,762	274	1,236		
	Total	354,850	286			
Function	Between Groups	7,640	12	0,637	1,091	.368
	Within Groups	161,674	277	0,584		
	Total	169,314	289			
Employment	Between Groups	4,400	12	0,367	0,843	.605
	Within Groups	120,414	277	0,435		
	Total	124,814	289			
Tenure	Between Groups	8,799	12	0,733	0,328	.984
	Within Groups	601,116	269	2,235		
	Total	609,915	281			

ANOVA – Innovative output

		Sum of Squares	df	Mean Square	F	Sig.
Department	Between Groups	8,173	21	0,389	1,729	.027
	Within Groups	59,667	265	0,225		
	Total	67,840	286			
Section	Between Groups	134,683	21	6,413	1,617	.045
	Within Groups	1051,352	265	3,967		
	Total	1186,035	286			
Team	Between Groups	25,757	21	1,227	0,633	.893
	Within Groups	513,742	265	1,939		
	Total	539,498	286			
Age	Between Groups	21,290	21	1,014	0,879	.619
	Within Groups	274,494	238	1,153		
	Total	295,785	259			
Educational level	Between Groups	20,404	21	0,972	0,812	.704
	Within Groups	292,081	244	1,197		
	Total	312,485	265			
Function	Between Groups	13,999	21	0,667	1,249	.212
	Within Groups	131,326	246	0,534		
	Total	145,325	267			
Employment	Between Groups	4,893	21	0,233	0,591	.923
	Within Groups	97,419	247	0,394		
	Total	102,312	268			
Tenure	Between Groups	43,640	21	2,078	0,988	.479
	Within Groups	504,696	240	2,103		
	Total	548,336	261			

Appendix H – Results multiple regression analysis

	Models		
	1.	**2.**	**3.**
Standardized effect parameters:			
Department	-,034	-,032	-,018
Section	-,033	-,032	-,052
Team	,037	,025	,034
Age	-,032	-,036	-,025
Educational level	-,031	-,016	-,027
Function	,005	,008	,004
Type of contract	,002	-,015	-,008
Number of years employed	,001	-,003	-,012
Innovative work behavior	,857**	,784**	,782**
Innovation-stimulating leadership (ISL)		,027	,038
Expected positive performance outcomes (EPPO)		,129**	,142**
ISL * EPPO			,079*
Model fit:			
N	206	206	206
Δ F	64,821	6,006	4,583
R^2	.749	.763	.769
Δ R^2	.749	.015	.005
Significance	**	**	*

(* p < .05, ** p < .01); outcome variable innovative output