The Entrepreneurial Firm as a Context for Employee Work

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Novelty Creation in Small Organizations from a Multilevel Perspective

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ABSTRACT

Entrepreneurs and entrepreneurial firms are a frequent research topic in psychological research. However, the focus of this research has largely been on the entrepreneur as a person and on the entrepreneurs' strategy for the business. By contrast, the entrepreneur as a leader and the entrepreneurial firm as a work environment for employees have received little attention. Therefore, this dissertation aims to integrate theoretic thoughts from organizational behavior research into entrepreneurship research. Specifically, I will focus on novelty creation within entrepreneurial firms and organizational phenomena which provide a context for employees in novelty creating activities. This dissertation adds to the literature as it provides insight in the effects of work environment facets on employees' engagement in novelty creating activities in entrepreneurial businesses.

In three empirical chapters, I will focus first on the effects of entrepreneurial orientation on efficiency of employee work in innovation projects. Second, I will look at a facet of organizational culture, the error management culture, and its effects on individual learning of employees. Last, I will focus on occupational roles of employees within small businesses and effects of these roles on responses to a questionnaire and on work in innovation projects. In all three empirical chapters I test my hypotheses in a sample of $N = 40$ entrepreneurial businesses and employees within these businesses. For my chapter on occupational roles this sample is complemented by two additional samples of college students.

In sum, results indicate that the entrepreneurial business in all three chapters exerts significant influences on employee work. Furthermore, I show that employee participation in novel activities is positive for entrepreneurial businesses (Chapter 2: Correlation between employees' and entrepreneurs' evaluation of innovation project effectiveness: $r = .44$; $p < .01$; Chapter 3: Correlation between organizational level leaning and organizational growth in sales: $r = .35$; $p < .01$). Therefore, I suggest that research on the entrepreneurial firm as a context for work may contribute to our knowledge on success factors in entrepreneurship, and may therefore be a relevant direction of future research. Especially, it may be fruitful to investigate aspects of work in which entrepreneurial firms may differ from other, less entrepreneurial organizations.

CHAPTER 1

General Introduction to Influences of the Entrepreneurial Firm on Employees Work in Creating Novelty

Researchers and politicians widely agree that entrepreneurship is a precursor for innovations, which translate into jobs and economic development in societies ("Briefing: European entrepreneurs," 2012; Brännback & Carsrud, 2008; Hisrich, Langan-Fox, & Grant, 2007; Kirzner, 1997; Shane, 2005a; Shane, 2005b). Therefore, entrepreneurial firms are a major focus of state interventions, to boost performance of national economic systems (Brännback & Carsrud, 2008). If such ventures aim to meet expectations of national officials and researchers, they need to promote novelty through the learning of new skills which they can translate into innovative new products (Argote, 2011; Nooteboom, 2002). Businesses can employ a range of strategies to achieve this goal: They may for example cooperate with universities (Shane, 2005a), or other businesses and share knowledge (Freel & Harrison, 2006; Lipparini & Sobrero, 1994; Miles, Miles, & Snow, 2005; Wehner, Clases, & Bachmann, 2000), or they may rely on their own ability to stretch own resources, and innovate (Cohen & Levinthal, 1990; Mumford, 2000; Rosenkopf & McGrath, 2011). Organizations need to do one or more of these activities to maintain a competitive advantage on markets for their products. Businesses with a competitive advantage are more efficient in creating additional value than other companies in the same industry (Peteraf & Barney, 2003). Because learning and innovation are of paramount importance for organizations, large literatures exist for both learning and innovation in organizations (e.g. Bingham & Davis, 2012; Black & Boal, 1994; Grant, 1996; Nag & Gioia, 2012; Rosenkopf & McGrath, 2011).

1.1 The Multilevel Perspective on Novelty Creation in Entrepreneurial Firms

A group of scholars attempts to identify factors which contribute to the success of new products on markets (cf. Balachandra & Friar, 1997; Henard & Szymanski, 2001; Pattikawa, Verwaal, & Commandeur, 2006). In their analyses, these scholars frequently find that processes within the organization are relevant for achieving desirable outcomes. This is apparent since prior to the launch of a product, innovations need to be developed within a firm; a task which can rarely be met by an individual. Instead, to develop a successful new product, a number of employees need to engage in novelty creating activities. Consequently, a number of factors have been identified to support successful innovation in businesses. Most notably, researchers warrant that the working environment plays an important role in innovation activities (Amabile, 1996; Anderson & West, 1998; Hülsheger, Anderson, & Salgado, 2009; Liu, Chen, & Yao, 2010; Pirola-Merlo & Mann, 2004). In some environments, it seems that individuals are greater inclined to work on novelties. Thus, given the right circumstances they are better able to learn and innovate.

However, it is often unknown, why some environments encourage novel actions, whereas others promote routine action. Routine actions are frequent in organizations and are guided by rules, regulations, or norms (Hodgson, 2008). Such activities are designed to achieve a predefined goal through activities that have repeatedly proven successful in the past. By contrast, novel, unprecedented activities may lead to a variety of positive results, and even initially negative results. Therefore novel activities are risky for the employee and the organization. I expect that the context plays a role when employees decide whether or not they take on such a risk. Additionally, researchers point to the fact that individuals appraise the same context differently and therefore do not react uniformly to a context (Mischel, 2004). Therefore, Mischel and Shoda (1995) advise researchers to search for the "active ingredient" (Mischel, 2004, p.15) in a given situation, which refers to the specificity that makes a context relevant for a person, so that their behavior is changed. In the following chapters I will search for such active ingredients within entrepreneurial organizations which support or hinder the desired novel actions of employees.

To deepen the understanding of employees' motivation to proactively engage in novelty creating activities within entrepreneurial firms, I turn to concepts which describe individu-

als, and concepts which describe the organization. This is based on the assertion that individual differences exist which may explain novelty creating activities of certain individuals, but that the context plays an important role when individuals decide to act. Context influences individuals' decision to act in two ways: (1) context may comprise opportunities and constraints which reduce or enhance specific behaviors of individuals in an environment, and (2) context may influence relationships between concepts at other levels of analysis (Johns, 2006). Context may therefore serve both as a main effect, and as a moderator variable. A variety of concepts exist which describe the context for individual work in organizations. These concepts represent attributes of the group and not of the individuals within the group (Chan, 1998; Cronin, Weingart, & Todorova, 2011). There has recently been a debate on how individual and organizational concepts influence each other within organizations for predicting outcomes (Chan, 1998; Cronin et al., 2011; Johns, 2006; Klein & Kozlowski, 2000; Meyer, Dalal, & Hermida, 2010). Inspired from this debate, an increasing number of publications focuses on such influences within organizations.

Although these influences have been acknowledged to be as important for entrepreneurial firms as they are for larger businesses (Wales, Monsen, & McKelvie, 2011), there has not been much research on the entrepreneurial firm as a context for the work of employees. I define entrepreneurial firms as small or medium sized firms which discover, evaluate, and exploit opportunities for business (Shane & Venkataraman, 2000), in order to achieve growth. However, when my research team and I entered entrepreneurial small businesses, differences between these organizations in terms of group functioning immediately caught our attention. For example, it became obvious that small businesses, compared to larger counterparts, rely less on standardized processes, but are heavily influenced by entrepreneurs and their style of working. Entrepreneurs' style may be different from that of working in other groups from an organization. Differences have been found between entrepreneurs and managers (Busenitz, 1999; Miner & Raju, 2004), and may also exist between entrepreneurs and employees. Schein (2004) describes influences of an entrepreneur's style of work on employees: In a case study on the DEC Computer Company and its founder Ken Olsen, an engineer, Schein reflects on the role of engineers and the culture of engineering for the formation of the overall business culture of DEC Computer Company. Schein (2004) suggests that engineers dominated the whole company causing insufficient coordination between different units of the company, but also insufficient marketing activities, among other outcomes. In a way, the engineering style

in which Olson led the business influenced the work of all employees within the company. In sum, I suggest that small firms operate differently from larger organizations due to heterogeneous influences of the entrepreneur on the firm.

Through the next chapters I will contribute to the understanding of employee behavior in novelty creating activities in entrepreneurial firms. I will focus on influences through the entrepreneurs' personality and action (Chapter 2), through employees' shared perceptions of the environment (Chapter 3), and occupational roles of employees in a business (Chapter 4).

1.2 Influences of Leader Behavior in Entrepreneurial Ventures

In Chapter 2, I take on the most obvious influence on individual work in entrepreneurial businesses, which is the entrepreneur themself. Surprisingly, influences of entrepreneurs on employees in businesses have not been explored in detail. Instead, entrepreneurs are often considered to act in the same ways as other leaders. However, there exist concepts which are thought to be unique for entrepreneurs and which may, in my view, influence the way work is done in their ventures. I argue that an entrepreneurial firm is a special context for work because it is highly dependent on the entrepreneur and the entrepreneurs' way of doing business. The literature stipulates that a prominent construct is the entrepreneurial orientation construct (Lumpkin & Dess, 1996). Entrepreneurial orientation describes the strategy, an entrepreneurial business pursues. Entrepreneurship literature sees entrepreneurial orientation as a consequence of the personality of the entrepreneur, and as an antecedent for business success (Frese, 2009; Rauch, Wiklund, Lumpkin, & Frese, 2009). In Chapter 2, I will focus specifically on the entrepreneurial orientation construct.

Chapter 2 has two primary goals. First, I want to introduce entrepreneurial orientation as an organizational level influence on the effectiveness of work in innovation projects. I choose innovation project work as a context because it is clearly focused on novelty creation and an antithesis of routine work. As a second goal, I introduce the entrepreneurs' personal initiative as an antecedent of entrepreneurial orientation and effective innovation project work. I suggest that the effectiveness of employees in innovation projects is both reduced and enhanced by entrepreneurs showing strong entrepreneurial orientation. I suggest that effec-

tiveness reduces when entrepreneurs' strategic decisions lead to insecurity among employees, whereas structure increases effectiveness.

1.3 Influences of the Culture of the Organization

In organizational psychology, a number of organizational phenomena are believed to come into existence based on interaction of individuals in a group (Cronin et al., 2011). These concepts are often referred to as emergent constructs (Klein & Kozlowski, 2000). In Chapter 3, I shift attention to an organizations' culture, a factor which is constructed jointly by employees and entrepreneurs and influences work in entrepreneurial businesses (Schein, 1996). Organizational cultures are multifaceted as they are defined as a set of shared norms and values which lead to common practices and behavior (Reichers & Schneider, 1990). I focus on organizational culture facets concerned with reactions to errors since it is believed that handling errors is an important means by which organizations achieve long terms success (Sitkin, 1992). In line with this argument, error management practices, stored in a culture of a firm, have been found to predict organizational success (van Dyck, Frese, Baer, & Sonnentag, 2005).

In Chapter 3 I expand previous findings on the effectiveness of an error management culture by looking at learning as a mediator in the relationship between culture and organizational success. I argue that error management culture helps entrepreneurial firms to learn new skills and develop knowledge which differentiates them from other businesses. The possibility to learn from errors as a means to develop new knowledge has been put forth in previous research (Wehner & Stadler, 1994) and as a link between organizational error management culture and business success (van Dyck et al., 2005). The link is strengthened by the fact that knowledge learned from errors may be uncommon and therefore valuable if it is transferred into innovation (Nag & Gioia, 2012).

To develop new knowledge from errors, I suggest that it is insufficient to solely research organizational culture and outcomes at the organizational level. Instead, employees play an important role because they first need to develop the knowledge which may later become organizational knowledge (e.g. Argyris, 2009). Chapter 3, therefore, has two primary goals. First, I want to show the effects that error management culture may have on business success; something mediated by learning at the organizational level. I will therefore explore the relationship between error management culture, organizational learning, and growth in

sales as a dimension of business success in more detail. As a second goal, I will analyze effects of an error management culture on employees within an organization. I suggest that the error management culture is especially useful for some individuals, whereas others may not profit from such a culture. I therefore explore individual goal orientations, which can motivate individuals to learn as antecedents of individual learning. I will suggest ways by which an error management culture influences individuals' learning. I imply that an error management culture helps those who want to learn to transfer their desire into learning at the workplace.

1.4 Influences of Occupational Roles of Employees

In Chapter 4, I investigate influences of context on individuals' thoughts of the self, and how these thoughts of the self influence engagement in innovation projects. Recently, Miron-Spektor and colleagues (Miron-Spektor, Erez, & Naveh, 2011) suggested that teams with a mixture of employees with different cognitive (thinking) styles often lead to the best outcomes in terms of their innovativeness in teams. In Chapter 4, I will explore, how occupational roles influence individuals' perceptions of own cognitive styles. Literature suggests that common lines of thought can be found across groups. These groups may hold specific cognitive schemata or prototypes, which relate to their role (Fiske & Taylor, 1991; Hogg & Terry, 2000). In Chapter 4, I investigate the effects which these cognitive schemata or prototypes have on responses to a questionnaire, but also on actions which individuals report within the organization.

In the chapter, I use the adaption-innovation inventory by Miron and colleagues (2004) for the analyses; the inventory covers three different cognitive styles, creative cognitive style, attentive-to-detail cognitive style and conformity with group/norms cognitive style. Cognitive styles are defined as a "consistent individual difference in preferred ways of organizing and processing information and experience" (Messick, 1976, p.4). The adaption-innovation inventory is a cognitive style concept frequently employed as a predictor for innovation at work (e.g. Miron-Spektor et al., 2011). It is available in multiple versions from a range of scholars (Kirton, 1976; Miron et al., 2004). I choose this inventory because I suggest that differences in cognitive styles may be vulnerable to group influences. Literature indicates that although cognitive styles are suggested to be trait like as they are consistent over time and over situations, there may be influences through context, for example through training (Mur-

dock, Isaksen, & Lauer, 1993). I therefore suggest that occupational roles may exert influence on cognitive styles.

Chapter 4 has two primary goals: First, I will investigate antecedents of biased responses on the questionnaire. Second, I aim to show that if biases are not taken into consideration, interpretations of the adaption-innovation inventory can easily lead to inaccurate judgments on a persons' innovativeness. These results are valuable as researchers and practitioners in HR departments often rely on questionnaire based methods for assessing innovation potential of individuals.

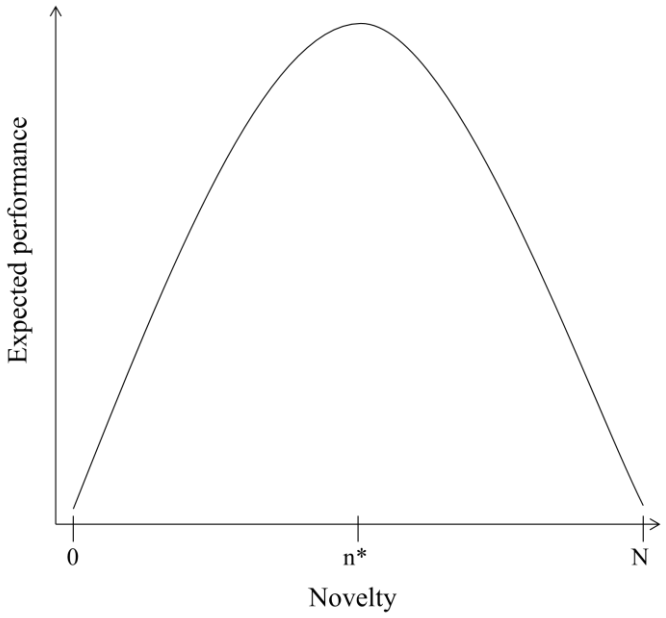
1.5 The Context of this Research

When reading this dissertation on contextual influences on individuals at work, it is essential to keep this study's own context in mind, which may also influence (Rousseau & Fried, 2001). Here, empirical analyses are based on a sample of 40 small businesses in northern Germany. All businesses were visited between August of 2010 and October of 2011 by the three principal members of the research team, Prof. Jochen Weihe, Björn Seeger, and me. We conducted interviews with all entrepreneurs. If there was more than one entrepreneur leading a business, the interviews were done with all of them together. Additionally, we obtained data from financial records of the companies, and I collected data from employees and entrepreneurs via questionnaires. I will describe the data and its source for each study separately in the chapters. Sample sizes in the chapters may vary slightly because some individuals or businesses failed to report data and have missing values on single items or scales. Further details can be found in the Appendix, along with the original (German language) questionnaires. In general it is noteworthy that all businesses operated under German law and few had operations in other countries. For Chapter 4, the sample of business employees is complemented by a dataset of German university students.

The focus of my dissertation will be on employees' willingness to engage in novelty creating activities, as they learn and innovate. For these activities, employees decide to contribute effort to the organization in order to solve organizational questions (Richardson & Taylor, 2012). For such behaviors, the exact novelty or innovativeness is difficult to determine. Usual classification schemes for innovations tend to center on finished products lead-

ing, for example, to the differentiation between radical and incremental innovation activities (Damanpour, 1988; Romijn & Albaladejo, 2002; Subramaniam & Youndt, 2005). As an advantage, such a classification makes it possible to compare outcomes of innovation activities. However, contributions of single employees are difficult to extract, and these contributions are most important in my analyses. Therefore, lacking objective indicators for individual level outcomes, I will instead relate employees' assessments of own engagement in novelty creating activities to entrepreneurs' assessments on these activities (Chapter 2 and 4) as well as the businesses growth in sales as an objective indicator of organizational success (Chapter 3).

Figure 1: *The Degree of Novelty versus Expected Performance of Activities*



Note. Adapted from Rosenkopf and McGrath, 2011.

Additionally, mentioned above, all businesses were visited by the research team. After the visit, we discussed innovativeness of participating businesses. On the basis of these discussions, I expect that most organizations and most innovation projects which I use in the upcoming chapters are of medium novelty in what they do. The entrepreneurial businesses

frequently develop and introduce innovations or changes into the business, but these innovations or changes rarely reach the level of being new to the world or even a market. Such a distribution of innovations makes sense from a theoretical standpoint because moderate levels of novelty are most successful in terms of expected performance in innovation (see Figure 1; Rosenkopf & McGrath, 2011). Novelties, which go far beyond what is currently available on markets, may be difficult to grasp for customers, which reduces the usefulness of the product. At the low end of the novelty-scale, pure imitations of current products may not evoke curiosity in customers, again limiting the usefulness of an innovation. When studying random samples of entrepreneurial businesses, it is likely that most innovations in these businesses will therefore be on a medium level of novelty (Rosenkopf & McGrath, 2011). However, such a sample is also interesting, because these entrepreneurial firms may be able to change their innovation activities according to scientific findings and increase their degree of novelty in order to grow.

CHAPTER 2

Entrepreneurial Orientation as a Double Edged Sword – A Multilevel Investigation on Efficient Innovation in Entrepreneurial Firms

2.1 Introduction

Ken Olson, the outstanding entrepreneur and founder of the DEC computer company, said at the 1987 MIT graduation address (according to Schein, 2004, p.32). "My ambition is to be remembered as someone who challenged them [the DEC-company employees], who influenced them to be creative and enjoy work and have fun for a long time"

In this delivery Olsen describes an idealized workplace which he wants to create; one which allows employees to flourish in developing their skills. Entrepreneurs often design their own enterprise as an antidote to businesses which they have encountered themselves as an employee (Sørensen, 2007). For example, Olson designed DEC, after experiencing work at IBM as being highly bureaucratic; something that made him perceive the work environment as being innovation-adverse (Schein, 2004). This example shows the significant influence entrepreneurs exert on work within a company, since they have the potential to design employees' work environment. In this paper, I explore effects of this phenomenon on employees' work in entrepreneurial businesses, more specifically, on their work in innovation projects.

Literature in the field of entrepreneurship is often concerned with the person of the entrepreneur as the key to success of failure of small ventures (Frese, 2009; Rauch & Frese, 2007). It is consensus in large parts of the literature that individuals boasting an entrepreneurial strategy achieve good results in terms of success of a venture (Rauch, Wiklund, Lumpkin, & Frese, 2009). These entrepreneurs lead their business by being innovative, proactive, risk taking, autonomy granting and competitive (Lumpkin & Dess, 1996). In doing this, these entrepreneurs expect to "develop their firm's strategy, communicate it within their organization, and watch as entrepreneurial behavior begins to blossom throughout their firm" (Wales, Monsen, & McKelvie, 2011, p.899). Recent research has found limitations to this statement. Em-

ployees do not react to all facets of this strategy positively because some aspects can increase their stress, role ambiguity, or intentions to quit (Monsen & Wayne Boss, 2009), which makes the entrepreneurial strategy a double edged sword. Therefore, there has been an increase in studies focusing on relationships between the strategy of an entrepreneurial firm and employee reactions to it (Anderson, Covin, & Slevin, 2009; Thongpapanl, de Clercq, & Dimov, 2012).

In this study I want to focus on effects of entrepreneurial strategies on the effectiveness of work in innovation projects within entrepreneurial firms. Effectiveness in organizations is multidimensional; there is no one best way to assess the effectiveness of organizations (Quinn & Rohrbaugh, 1983). Different dimensions of effectiveness are suggested to contribute to the overall success of businesses (Quinn & Rohrbaugh, 1983). Focusing on innovation projects, I think of effectiveness as the efficient pursuit of these projects. Therefore I suggest that outcomes of innovation projects may either go beyond, or fall short of, what was initially expected from a project.

Innovations are one outcome of initiative entrepreneurial actions. According to West and Farr (1990, p. 9) innovations are defined as "the intentional introduction and application within a role, group or organization of ideas, processes or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, organization, or wider society." Innovations are therefore necessary for entrepreneurial firms to survive and succeed on competitive markets (Carland, Hoy, Boulton, & Carland, 1984; Kirzner, 1997). Future success is enhanced, if organizations are able to find solutions for problems that may later become apparent or need to be solved. Employees play a role for future success of entrepreneurial ventures because they, aside from supporting the entrepreneur to serve the customers or produce certain goods, can contribute towards innovation via creative ideas (e.g. Shalley, Zhou, & Oldham, 2004).

Factors have been identified separately for entrepreneurs and employees, which lead to achieving effective innovation outcomes in businesses. For entrepreneurs, personal initiative is important because it increases innovative actions within small businesses, but also increases the successful implementation of ideas (Glaub, Fischer, Klemm, & Frese, in prep.). For employees or teams of employees, researchers identified the organizational environment as a relevant influence on innovation activities (e.g. Anderson & West, 1996).

In the following sections I will briefly introduce innovations as a result of processes in entrepreneurial firms and an outcome of value for entrepreneurs. Then I investigate personal initiative, a personality construct related to entrepreneurs, and its relationship with innovation in entrepreneurial firms (Glaub et al., in prep.). I am interested in ways through which this individual difference supports environments for innovation in employees and thereby contributes to innovation project success. Next, I turn to entrepreneurial orientation as a set of active behaviors which result from individuals' personal initiative (Frese, 2009) and help entrepreneurs to spread strategic knowledge within the firm (Ireland, Hitt, & Sirmon, 2003). Lastly, I look at effects of entrepreneurial strategy on innovation project effectiveness in entrepreneurial businesses.

2.2 Theory

2.2.1 Innovation in Entrepreneurial Firms

Innovations are a central construct in entrepreneurship research. Innovations are central, because entrepreneurs have a competitive advantage when they are speedy in bringing new products to markets, but also if they provide products which are well suited for specific customers (Chen & Hambrick, 1995). By contrast, if an entrepreneur copies a product which is already available on the market targeted by the entrepreneur, then it will be difficult for them to outperform their competitors. Therefore the entrepreneur always has to do something new and different from competitors. There are several ways by which entrepreneurs can get to this point (Subramaniam & Youndt, 2005). On the one hand, entrepreneurs can introduce a product which is novel. Completely new innovations are termed radical innovations since they are "major transformations of existing products, services, or technologies that often make the prevailing product/service designs and technologies obsolete" (Subramaniam & Youndt, 2005, p.452). With radical innovations, entrepreneurs destroy old competencies and thereby enhance dynamics in the environment (Tushman & Anderson, 1986). Radical innovations are strongly connected to entrepreneurs, since their strategies are suggested to promote technological innovation in new products and processes (Renko, Carsrud, & Brännback, 2009). Entrepreneurially oriented firms "embark on proactive initiatives to change the competitive landscape" (Renko et al., 2009, p.336). Pérez-Luño and colleagues (2011) see entrepreneurial strategies as an antecedent of more radical innovation as compared to incremental innova-

tions. However, successes of radical innovations are seldom, or it takes them a long time to become accepted on markets. For example, Shane (2000) looked at entrepreneurial opportunities resulting from a radical innovation, the three-dimensional printing machine. The machine may lead to significant transformations of production processes in the future. However, the technology today is not used extensively more than ten years after Shane's study in 2000. Entrepreneurs who wanted to capitalize on this radical innovation in 2000 would have needed a long outlook.

For that reason, the introduction of incremental innovations is what can mostly be seen on markets. Incremental innovations occur in businesses all the time, when individuals or groups adopt existing knowledge as a solution to new problems. Incremental innovations are defined as the generation of "innovations that refine and reinforce existing products and services" (Subramaniam & Youndt, 2005, p.452). In turn they can enhance an organizations' competence as they increase a firms' knowledge of a specific product or process (Tushman & Anderson, 1986). These innovations can later be exploited entrepreneurially as they lead to more specialized products (Kirzner, 1997). Therefore, in environments with many incremental and few radical innovations, complexity increases instead of dynamism (Tang, Dickson, Marino, Tang, & Powell, 2010). In complex environments, continuous incremental innovations are necessary to sustain a competitive advantage of current products (Bhaskaran, 2006).

However, Pérez-Luño and colleagues (2011) suggest that there is insufficient support for small scale improvements within entrepreneurial organizations. These authors suggest that the lack of support is due to an entrepreneurial strategy that these organizations follow, which is oriented towards achieving radical innovation. In this study I focus on the effects of an entrepreneurial work environment on incremental innovations.

2.2.2 Entrepreneurs' Personal Initiative and Innovation in Entrepreneurial Firms

Entrepreneurship research has tended to focus on the unique person of the entrepreneur for bringing innovations to markets. As such individual differences between entrepreneurs have been found to influence the success or failure of a business (Rauch & Frese, 2007). Personal initiative is an individual difference, supportive to innovation, change and high performance (Anderson, de Dreu, & Nijstad, 2004; Tornau & Frese, subm.). Personal initiative is frequently subsumed under the general label of proactive work concepts (Parker, Bindl, & Strauss, 2010), which comprises, other than personal initiative, concepts such as voice (van

Dyne & LePine, 1998) or proactive personality (Bateman & Crant, 1993). Personal initiative individuals are characterized by action patterns that are self starting and action oriented, proactive, persistent in the face of barriers, goal directed, and long term focused (Frese, Fay, Hilburger, Leng, & Tag, 1997). Personal initiative individuals act without being told to do so, they orient their actions towards own goals for their future, and continue to act towards their goal despite any probable obstacles on the way (Frese & Fay, 2001).

It is hypothesized that entrepreneurs generally represent a subset of the normal population who show high levels of personal initiative (Koop, de Reu, & Frese, 2000). Individuals with high levels of personal initiative are more likely to become entrepreneurs because they actively search and construct environments which let them be enterprising (Frese, Garst, & Fay, 2007). To become an entrepreneur, individuals need to show high levels of personal initiative in start-up activities (e.g. visiting a bank, writing a business plan) which eventually lead to the creation of a business (most employees need to show less initiative to be selected for a job in a larger company). Through business creation, entrepreneurs who are already highly personal initiative enable themselves to be even more so because they can achieve high levels of autonomy in decision making (Frese & Fay, 2001).

2.2.3 Personal Initiative and the Effective Pursuit of Innovation Projects

Personal initiative is also connected with effective outcomes in innovation projects. Setting up a business is often referred to as an innovation project of its own (e.g. Hisrich, Langan-Fox, & Grant, 2007). Once the business is running, personal initiative behavior helps to increase the successful implementation of new and innovative opportunities (Kickul & Walters, 2002). By being personal initiative, first, entrepreneurs actively approach their environment. They constantly think about possible opportunities that may arise in the future, and about obstacles that may prevent them from taking advantage of these opportunities. Therefore, personal initiative entrepreneurs bring new ideas on their organizations' agenda (van Dyne & LePine, 1998). Second, these entrepreneurs are highly motivated by their goals for the future. They actively set targets for the future, envision desired future states, and plan on how to reach these states (Frese & Fay, 2001; Parker et al., 2010). These goals motivate subsequent actions. Therefore, initiative entrepreneurs enact their goals and are persuasive towards other members of the enterprise or customers of the product or business idea (Parker et al., 2010). Because of the high importance they ascribe to their aims, initiative entrepreneurs are also more focused on meeting their goals and are less distracted by off tasks (Frese & Fay,

2001). Third, initiative entrepreneurs stick to their goal and do not change them frequently. Instead they are flexible about ways to reach them (Frese et al., 1997). Locke and Baum (2007) see this tenacity, or perseverance, as an archetypical entrepreneurial trait.

In effect, a positive relationship between initiative and entrepreneurial performance has been established (Glaub et al., in prep.; Koop et al., 2000; Rauch & Frese, 2007; Utsch & Rauch, 2000), but also between personal initiative and innovative actions (Glaub et al., in prep.). Furthermore, personal initiative entrepreneurs have consistently been found to excel at persuading others to support their projects, because such individuals use active strategies here, too (Kodithuwakku & Rosa, 2002; Zhao, Frese, & Giardini, 2010).

We suggest that personal initiative entrepreneurs are more likely to start new innovation projects because they identify more opportunities for innovative new products, or new utilities for their established products. Additionally, they are also more likely to finish these projects successfully because they are future oriented, anticipate barriers on the way to their goals, and are able to overcome them. Personal initiative entrepreneurs are therefore more effective in instigating innovation projects. In businesses where entrepreneurs can be personal initiative, innovation projects should therefore be more likely to be successful than in businesses with less personal initiative entrepreneurs.

Hypothesis 1: Personal initiative of the entrepreneur increases effectiveness in innovation projects.

2.2.4 Entrepreneurial Orientation

When entrepreneurial businesses grow and become more mature, entrepreneurs often realize that their direct influence on innovation outcomes declines For small scale innovation projects they may not even be consulted any more (although radical innovations will most likely still require the approval of the entrepreneur). Instead, entrepreneurs take over the role of a leader who influences innovation projects by providing the environment in which they are carried out. For innovation projects this means that personal initiative entrepreneurs need to ensure that these projects work effectively, even if they themselves are not present.

As a means to exert such an influence on their business, entrepreneurs may set up an entrepreneurial strategy (Lumpkin & Dess, 1996). In fact, in order to spread leaders' ideas for

a business among employees, a suitable strategy is an important means (Connelly, Certo, Ireland, & Reutzel, 2011; Hambrick & Mason, 1984; Ireland et al., 2003; Love, Priem, & Lumpkin, 2002; Monsen & Wayne Boss, 2009; Raes, Heijltjes, Glunk, & Roe, 2011). The strategy defines basic methods, practices, and decision-making styles (Lumpkin & Dess, 1996; Rauch et al., 2009). Thereby, it signals to employees how they should behave in their work environment (Connelly et al., 2011). In other words it sets the 'rules of the game' which should guide all activities, including innovation activities (Dougherty & Tolboom, 2008; Taylor, 2010). For employees, a strategy may provide cognitive shortcuts which can be used to make decisions more quickly and easily, as put forth in social cognitive theory (Fiske & Linville, 1980; Fiske & Taylor, 1991). The entrepreneurial orientation construct is suggested to resemble such a businesses' strategy (Covin & Slevin, 1989; Ireland et al., 2003; Lumpkin & Dess, 1996), through which an entrepreneur may shape the environment for employees.

In an entrepreneurially oriented business, the strategy is oriented towards high levels of innovation, proactiveness, risk taking, autonomy for employees, and competitiveness (Lumpkin & Dess, 1996). In detail, these facets of the entrepreneurial orientation construct are defined as follows: A firm's innovativeness is defined as their tendency to support innovative ideas which are new and require some experimentation and creativity (Lumpkin & Dess, 1996). Strategic proactiveness is a forward-looking perspective by the people in a company that is accompanied by innovative or new venturing activities, as well as an honest assessment of current operations. If necessary it includes the elimination of operations which concurrently are mature, but which are likely decline in the future (Lumpkin & Dess, 1996). Risk taking is defined by the degree to which an entrepreneurial venture is willing to allocate resources to projects which are costly and have reasonable chances to fail (Miller & Friesen, 1978). Competitiveness is a firm's propensity to challenge its competitors to achieve entry or improve their own position in a market, with the goal of outperforming competitors (Lumpkin & Dess, 1996). Lastly, strategic autonomy is a process by which employees are "enabled to not only solve problems, but to actually define the problem and the goals that will be met in order to solve that problem."(Lumpkin, Cogliser, & Schneider, 2009, p. 50). Thereby, autonomous employees may bring own ideas to the organization instead of solely working on ideas of the entrepreneurs.

Following the model of entrepreneurial success by Frese (2009), I suggest that an entrepreneurially oriented strategy is suggested to result from personal initiative of the entrepre-

neur. This is due to the wish of personal initiative entrepreneurs to actively shape their business, which they can do by showing entrepreneurial orientation.

Hypothesis 2: Personal initiative leaders influence the strategy of their business towards an entrepreneurially oriented strategy, characterized by innovativeness, proactiveness, risk-taking, competitiveness, and autonomy.

2.2.5 Innovation in Entrepreneurial Firms

Based on studies on work environments for innovation, researchers warrant that an entrepreneurially oriented strategy may have dark sides (Wiklund & Shepherd, 2011), compared with other strategic choices such as differentiation, cost leadership, focus, or asset parsimony (cf. Dess, Lumpkin, & McGee, 1999; Miller, 1986; Porter, 1998). Whereas differentiating firms aim to create unique products, cost leaders try to produce products more cheaply than competitors. Firms with a focus strategy search for a niche for their products, and an asset parsimony strategy tries to reduce the inputs into a production system by keeping the output constant (Miller, 1986). Authors suggest that an entrepreneurial orientation strategy increases the spread of potential outcomes of entrepreneurial processes (Wiklund & Shepherd, 2011), whereas all other strategies aim to reduce this variance. This means, that both extreme success and failure can be due to adopting an entrepreneurial orientation, whereas non-entrepreneurial strategies subsequently have the potential to reduce this variance in outcomes. Therefore outcomes of non-entrepreneurial processes are more predictable.

We suggest that entrepreneurial leaders also increase the spread in outcomes of innovation projects because they experience difficulties in managing innovation projects. Literature on leadership for innovation in entrepreneurial firms suggests that entrepreneurs benefit from effective management of innovation process (cf. Cogliser & Brigham, 2004). Effectiveness can thereby be achieved if innovation projects are organized systematically, so that novel and useful ideas become implemented in the organization (cf. Mumford, 2000). Amabile and colleagues (2004) investigate leader behaviors which help employees to innovate. They find (among other behaviors) positive effects of a variety of monitoring and supporting behaviors. These results indicate that entrepreneurs can enhance the effectiveness in innovation projects through effective management of innovation processes.

However, an entrepreneurial orientation may also reduce effectiveness in innovation projects. Instead, it leads to insecurity and frustration among employees (Dess et al., 1999), or reduces the stability of internal processes in entrepreneurial firms (Wales et al., 2011). For example, researchers found that a very entrepreneurial strategy challenges and stresses employees of entrepreneurial businesses (Monsen & Wayne Boss, 2009). Ambiguity and uncertainty are common among employees in entrepreneurial businesses, wherein flexibility instead of stability is demanded from them (Ireland et al., 2003; Ketchen, Ireland, & Snow, 2007). Conversely, it is easier for larger firms to achieve clarity of expectations for employees who work in innovation projects. In large firms, process management strategies are used to organize processes involving in knowledge creation (Golann, 2006). This provides larger businesses with a more structured way of improving their products and processes than most entrepreneurial businesses.

Studies on the negative effects of entrepreneurial orientation have often been done in larger organizations (Dess et al., 1999; Ireland et al., 2003; Monsen & Wayne Boss, 2009). For these businesses an entrepreneurially oriented strategy differs strongly from a more traditional strategy (e.g. low-cost leadership, differentiation, and focus; cf. Dess et al., 1999). However, I suggest that similar effects may occur in small entrepreneurial businesses. In the following paragraphs I will focus on potential consequences of an entrepreneurial orientation for innovation project effectiveness in small entrepreneurial businesses.

2.2.6 Entrepreneurial Orientation and the Effective Pursuit of Innovation Projects

When investigating facets of an entrepreneurial strategy which may make it difficult for employees to work effectively in innovation projects, the risk-taking propensity of an entrepreneur stands out. Risk-taking is a decision making style which suits highly uncertain situations (where radical innovations may occur), but is less helpful in situations where structure is emphasised as in incremental, complexity-increasing innovation projects. Risk-taking entrepreneurs are willing to take on a variety of risks such as "venturing into the unknown," "committing a relatively large portion of assets," and "borrowing heavily" (Baird & Thomas, 1985, pp. 231- 232). Typically they will stretch organizational boundaries and direct search behavior towards innovation projects with high risks and chances for high returns (Avlonitis & Salavou, 2007; Pérez-Luño et al., 2011). Entrepreneurs may succeed with such risk-taking acts in highly uncertain environments because they can rely on heuristics for decision making instead of complex decision rules. For the entrepreneur, this kind of risk-taking reduces search

costs prior to decisions (Wickham, 2003). Specific heuristics used by entrepreneurs are overconfidence, a bias towards optimistic outcomes, and representativeness; a bias towards developing broad generalizations from a limited amount of information (Busenitz, 1999). Consequently, entrepreneurs seem to be willing to base decisions on a small number of cases, or on cases which were not representative for the total number of cases (Busenitz, 1999; Miner & Raju, 2004).

However, for employees who work on innovations, decisions which are not properly grounded in available information may seem pre-mature and produce insecurity (Manimala, Jose, & Thomas, 2005). Insecurity implies that employees find it difficult to diagnose what to do, find it risky to predict what will be a likely outcome, or find it unclear to what extent causes relate to effects (Johns, 2006). Uncertainty thereby counters facets which increase effectiveness in innovation projects such as a clarity (Monsen & Wayne Boss, 2009; Mumford, 2000), or general support for innovation within organizations (Anderson & West, 1998; Hülsheger, Anderson, & Salgado, 2009), or psychological safety (Edmondson, 1999). Therefore I suggest that entrepreneurs' risk-taking propensity is negatively related to innovation project effectiveness because it increases insecurity.

Hypothesis 3: High entrepreneurial risk-taking propensity reduces innovation project effectiveness.

Other facets of entrepreneurial strategy seem to be more supportive of innovation efforts in employees, and therefore increase innovation project success. For example, the entrepreneurial orientation facet of innovativeness may increase clarity and reduce insecurity among employees. An entrepreneurs' orientation towards innovativeness is a mental framework which is positively correlated with innovation (Manimala, 1992). Entrepreneurs who pursue a strategy of high innovation may be those who have a commitment towards mastering the latest technological advances and ideas (Lumpkin & Dess, 1996). Empirically, Manimala (1992) found in a study on heuristics of entrepreneurs an orientation called "quest for the unknown" to be a relevant predictor of product and process innovation because this quest supports looking out for new things that can be useful to the firm. I suggest that high entrepreneurial innovativeness operates similar to an innovative vision; a factor which impacts innovative success of businesses positively (Anderson & West, 1996; Hülsheger et al., 2009). Ad-

ditionally, the innovative strategic orientation indicates support for originality of propositions, which is another key indicator innovation team success (Anderson & West, 1996). Positive effects of innovativeness on employees' role clarity have been found (Monsen & Wayne Boss, 2009). Therefore, I suggest that an entrepreneurial strategy which emphasizes innovativeness, clarifies for employees, that it is an important means to sustain business success (Manimala et al., 2005), and therefore increases the effectiveness of work in innovation projects.

Hypothesis 4: High entrepreneurial innovativeness increases innovation project effectiveness.

Additionally, the entrepreneurial strategy facet of autonomy, which lets employees make self-reliant strategic decisions in their own field of expertise, may also support innovation project effectiveness. In entrepreneurial business autonomous employees may deepen their knowledge, gain experience in important areas which seem important to them, and thereby broaden the knowledge base of the firm (Lumpkin et al., 2009). Furthermore, with the autonomy to explore new fields, the knowledge base of a firm may also diversify. This range may in turn increase creativity when employees work together on a common project. In this case, they need to communicate, discuss, and integrate diverse knowledge. Such processes have been found to relate positively to innovation (Hülsheger et al., 2009; Johnson, Johnson, & Tjosvold, 2000).

As an additional effect, decentralized, autonomous decisions can lead to better work organization in innovation projects (Mumford, 2000). In this type of environment Individuals are enabled to respond to urgencies or mission changes immediately, without consulting a supervisor (Thongpapanl et al., 2012). Autonomy thereby makes it easier for employees to overcome barriers to innovation. Barriers are situations or things that prevent employees from translating their ability and effort into high levels of job performance (Spector & Jex, 1998). First, in the case of barriers, autonomy is most helpful because it enables employees to adapt to the situation (Thongpapanl et al., 2012). As such it may be possible to overcome them if one knows the barrier well and finds a way around it. Giving employees the autonomy to react to situations independently therefore increases efficiency. Second, autonomy is helpful because it provides employees with room for own initiative actions and room for self-

determination (Den Hartog & Belschak, 2012; Moller, Deci, & Ryan, 2006). Self-determination goes along with feelings of self-control (Muraven, Gagné, & Rosman, 2008) and interest in a task and enjoyment of working on a task (Ryan & Deci, 2000), which has been linked to individual proactive behavior (Frese, Kring, Soose, & Zempel, 1996). Proactive behavior of employees is an important antecedent for innovation at work (Bindl & Parker, 2011; Grant & Ashford, 2008) and increased motivation among workers (Parker et al., 2010). Giving employees autonomy therefore increases their contributions into the organization.

Thereby, organizations which grant their members high levels of autonomy are better able to handle unexpected situations, new possibilities, problems, or new tasks (Brav, Andersson, & Lantz, 2009). This helps the organization in everyday tasks, but also in innovation projects. These reasons let me suggest that autonomy granted to employees increases innovation project effectiveness.

Hypothesis 5: Innovation project effectiveness increases for businesses in which employees experience high levels of autonomy in decision making.

Barriers to innovation are usually experienced during individuals' work and may therefore be noticed only by employees, but not entrepreneurs. Examples of individual barriers are insufficient prior knowledge, information, budget or time, but also a lack of perceived support from colleagues or supervisors (Peters & O'Connor, 1980). I suggest that individuals are more likely to label work in innovation projects as effective if they were also able to work autonomously and were relatively unconstrained by barriers to work in innovation projects.

As a drawback, the severities of barriers influence the impact of autonomy on innovation project effectiveness. If individuals experience problems to be small scale, it is easy for them to self-organize a solution and adapt suitably to the problem (Fay, Lührmann, & Kohl, 2004). In this case though, their work becomes more efficient since barriers are overcome efficiently. Additionally, self determination theory predicts, that individual who work autonomously are motivated to solve problems on their own because of increased individual energy or vigor, which they exhibit at work. It may even seem rewarding to achieve a goal for which barriers need overcome on the way. Therefore, autonomy in case of small scale barriers increases innovation project effectiveness. However, if large scale barriers stand in way, autonomous decision making is constrained. Large barriers restrict employees' freedom to decide

because solutions to problems may become very costly or labor intense, and in those cases the entrepreneur or supervisor has to step in and make the key decisions. Some problems may even go beyond the scope of the employees or organizations' skills and therefore impossible to resolve without external support. As an example for such a situation, Goodman (1986) describes how the introduction of self-managed work groups (which increase team autonomy) only had a minor effect on the productivity of coal mining teams, since constraints in the technological environment prevented the intervention to be effective. Therefore, I suggest that employees' perception of their own effectiveness in innovation projects may not always increase, even if they are granted autonomy, as they may experience large scale barriers to their innovation efforts.

Hypothesis 6a: Barriers to innovation decrease employees' innovation project effectiveness.

Hypothesis 6b: Autonomy moderates the relationship between barriers to innovation and innovation project effectiveness so that innovation project success is highest if autonomy is granted and small scale barriers to innovation exist.

Aside from risk-taking, innovativeness and autonomy, the entrepreneurial orientation facets of proactiveness and competitiveness remain. Competitiveness and proactiveness are components of strategy which are oriented towards the external business environment, either by an emphasis on outperforming competitors, or by spotting opportunities for innovation before competitors do (Lumpkin & Dess, 1996). This emphasis requires intense environmental scanning and monitoring (Barringer & Bluedorn, 1999; Pérez-Luño et al., 2011). Businesses that focus on competitiveness and proactiveness therefore allocate high proportions of their resources on interactions with the external environment. I suggest that businesses that invest a high proportion of their assets on environmental scanning may lack these assets for organizing internal processes such as innovation processes. However such companies could nonetheless remain highly innovative as they may be more likely to take an innovation from a competitor and include it into their business model than pioneering products of their own. For employees, the effect of such a strategy may be that innovation project effectiveness reduces, because innovation projects do not necessarily play an important role in predicting organizational success. In turn, employees reduce their input in these projects.

Hypothesis 7: High competitiveness and proactiveness reduces innovation project effectiveness.

2.2.7 Entrepreneurial Orientation Facets as Mediators in the Personal Initiative – Innovation Project Effectiveness Relationship

We suggest that an individual's personal initiative may lead to a more entrepreneurially oriented strategy along the facets of risk taking, innovativeness, autonomy, proactiveness and competitiveness. Additionally, I suggest that some facets of an entrepreneurially oriented strategy lead to more innovation project effectiveness, whereas in contrast other facets reduce effectiveness. Therefore some of these influences counter my initial notion, that an entrepreneurs' personal initiative is positive for innovation project effectiveness. As such, I suggest that the personal initiative entrepreneur may act supportive of innovation project effectiveness by being self-starting, long term focused and overcoming barriers on the way to the goal (thereby increasing structure and a feeling of getting things done). However, at the same time these traits can also reduce innovation project effectiveness by encouraging reckless risk-taking, because this increases uncertainty due to role ambiguity in project work of employees (Monsen & Wayne Boss, 2009).

Theoretically, such counteracting between inner-organizational forces is suggested to occur within groups from uncertain environments (Anderson, 1999; Tang et al., 2010). Through counteracting forces the organization becomes more complex. This complexity is supposed to be advantageous because it helps the organization to adapt to changes in the environment. In the context of this study, I suggest that there are counteracting forces in the strategy of the entrepreneurial businesses (Tang et al., 2010). The entrepreneurial orientation supports on the one hand radical innovation through risk-taking propensity, proactiveness and competitive aggressiveness of the entrepreneur, but on the contrary it also supports incremental innovation through autonomy and innovativeness. The ambivalent (ambidextrous) strategy may reduce risks which are associated to any single strategy (e.g. Tang et al., 2010). However, I suggest that through ambivalent strategic actions, the entrepreneur reduces the effect of personal initiative on innovation project effectiveness. I therefore propose that the entrepreneurial orientation is a double edged sword for personal initiative entrepreneurs.

Hypothesis 8: Due to ambivalent effects of entrepreneurial strategy facets (risk-taking, competitiveness and proactiveness) the relationship between entrepreneurs' personal initiative and innovation project effectiveness is larger after controlling for entrepreneurial strategy facets.

2.3 Method

2.3.1 Sample and Procedure

We studied the hypotheses in a sample of N=560 employees and N=61 entrepreneurs of K=39 small and medium-sized businesses. Businesses were randomly sampled from a larger population of firms within a specific region of Germany. The region currently receives strong support by governmental agencies to improve economic performance through innovation.

Data within the businesses were gathered in 2010 and 2011 as part of a larger survey on individual innovativeness and innovation capabilities of small and medium-sized organizations. A total of 47 small and medium-sized businesses were approached by the university research team, five of which refused to participate due to insufficient time. 42 businesses agreed to participate in a study on small firm innovativeness. Two firms dropped out of this initial sample (one went bankrupt, the other reported lack of time), and one entrepreneur refused to reply to the questionnaire, leading to the final sample size of 39 businesses. The businesses were first visited by the research team and in-depth interviews were conducted with entrepreneurs or CEOs of the businesses concerning their strategies for encouraging innovation. In a second step, questionnaires were distributed to the entrepreneurs/CEOs and employees. Participation was anonymous; the questionnaires were distributed and collected by members of the research team. It took approximately 25 minutes to respond to all of the questions. In exchange for their participation, businesses were given feedback on psychological success factors for innovation within their businesses, and I offer support to those businesses from the sample who want to change their innovation systems. All items used in this study were part of the questionnaire.

The businesses' total number of employees ranged between 5 and 240 with a mean of M = 44. I included only full-time employees in the study which reduced business size to a

range between 5 and 143 employees. The mean age of businesses was M = 21.51 years. In the 39 businesses, the overall response rate to all questionnaires was 85% (from all businesses, some 112 questionnaires were returned blank or not returned). Employees and entrepreneurs were on average 38.39 years old, 219 were female and 315 were male. The average tenure in the organization was M = 6.6 years with a span between 0 and 34 years.

2.3.2 Measures

All items were measured on five point scales except innovation project goal achievement which was measured on a seven point scale. Information on constructs in this study stems from different sources: Entrepreneurial orientation of the business was assessed only by the entrepreneurs. Individuals' personal initiative was self-assessed both by entrepreneurs and employees. Barriers to innovation and success in innovation projects were assessed only by employees.

Personal initiative was measured with the seven item questionnaire by Frese et al. (1997). Example items are "I actively attack problems." and "Whenever something goes wrong, I search for a solution immediately." For organizations with more than one leader I aggregated data to the organizational level ($r_{wg(j)}$ = .85, N = 18). Cronbach's alpha among entrepreneurs was α = .77. For employees, I calculated reliabilities as well as ICCs (Cronbach's α = .81; ICC1 = .05; ICC2 = .42). These numbers indicate that the measure of personal initiative is reliable, but that the organizational environment exerts only minor influences on the personal initiative of employees.

Entrepreneurial orientation was measured with a questionnaire by Lumpkin et al. (Lumpkin et al., 2009), which comprises items from older entrepreneurial strategy questionnaires developed by Covin and Slevin (1989) and Lumpkin and Dess (2001), and new items on entrepreneurial autonomy. The items were translated into German and back-translated by other members of the research team, in order to ensure similarity of meaning in the translated version of the questionnaire (cf. Brislin, 1970). In general, the questionnaire is designed as five point semantic differentials. On each side of the differential, action alternatives are presented. As there were multiple leaders in some of the organizations, I controlled for the number of entrepreneurs in all analyses.[1]

[1] Although the subsample of entrepreneurs is small (N=61) we conducted confirmatory factor analyses to test the factorial structure of the entrepreneurial strategy construct. Results for the five-factor-solution were satisfactory (Chi^2 = 113.44 (DF= 95, p < .10), CFI = 92, RMSEA = .06, SRMR = .08).

Proactiveness was measured with four items from Lumpkin et al (2009), three of which originate in Covin and Slevin (1998), and one in Lumpkin and Dess (2001). An example item is: In dealing with competitors, my firm typically (EITHER) responds to action which competitors initiate, (OR) initiates action which competitors then respond to." Cronbach's alpha for the five item measure among the 61 business leaders was $\alpha = .71$. For organizations with more than one leader I aggregated data to the organizational level ($r_{wg(j)} = .83$, $N = 18$). Innovativeness was measured with five items from Lumpkin et al (2009), three of which originate in Covin and Slevin (1998). One example item is: "In general, top managers of my firm favor a strong emphasis (EITHER) on the marketing of tried and true products and services, (OR) on R & D, technological leadership, and innovation." Cronbach's alpha for the five item measure among the 61 business leaders was $\alpha = .76$. For organizations with multiple leaders I aggregated data to the organizational level ($r_{wg(j)} = .86$, $N = 18$). Risk-taking was measured with four items from Lumpkin et al (2009), three of which originate in Covin and Slevin (1998). One example item is: "The top managers of my firm have a strong proclivity for (EITHER) low risk projects (with normal and certain rates of return), (OR) high risk projects (with chances of very high returns)." Cronbach's alpha for the five item measure among the 61 business leaders was $\alpha = .69$. For organizations with multiple leaders I aggregated data to the organizational level ($r_{wg(j)} = .86$, $N = 18$). Competitive aggressiveness was measured with one item from Lumpkin and Dess (2001, Lumpkin et al., 2009). It is: "My firm is (EITHER) very aggressive and intensely competitive, (OR) making no special effort to take business from the competition."(Inverted item, recoded for analyses). For organizations with multiple leaders I aggregated data to the organizational level ($r_{wg(j)} = .57$, $N = 18$). The item was re-coded so that high values indicate high competitive aggressiveness. Autonomy items focus on autonomy from a bottom-up perspective (Lumpkin et al., 2009). I assessed autonomy with all 8 items from Lumpkin et al (2009). An example item is "In general, the top managers of my firm believe that: (EITHER) Individuals and/or teams are most effective if their goals and performances targets are set by their supervisor(s). (OR) Employees and/or teams are most effective if they set their own goals and performance targets." Cronbach's alpha for the five item measure among the 61 business leaders was $\alpha = .54$. For organizations with multiple leaders I aggregated data to the organizational level ($r_{wg(j)} = .91$, $N = 18$).

Barriers to innovation were assessed via Spector and Jex's (1998) organizational constraints scale, which is based on eight areas of constraints that interfere with job perfor-

mance (Peters & O'Connor, 1980). Constraints may lie in information, tools and equipment, materials and supplies, budget, services or help from others, task preparation, time availability, and work environment (Peters & O'Connor, 1980). For this research project I asked participants to rate specifically whether these constraints occurred in innovative projects. Participants were asked to indicate, how often they found it difficult or impossible to do their job with regards to eleven different constraints (response options range from 1 "less than once per month or never" to 5 "several times per day"). I calculated reliabilities as well as ICCs (Cronbach's $\alpha = .88$; ICC1 = .08; ICC2 = .53).

Innovation project effectiveness. I conceptualize innovation project effectiveness as the individual perception of their effectiveness when working in specific, named innovation projects. For the assessment I focused on two recent organizational innovation projects. Names of relevant innovation projects were drawn from an interview with the entrepreneurs prior to collecting the data. Entrepreneurs were asked to name innovation projects which would, most likely, contribute to the future success of the organization. To ensure that employees remember their effectiveness correctly, I only used projects which were finished by the time of the data collection but not longer than one year before the data collection. Employees' personal effectiveness perception was rated on one item per project, stating: "In this innovation project (EITHER) less than initially expected was achieved (OR) more than initially expected was achieved." My measure focuses on the outcome from the innovation project. Overall reliability estimates were sufficient for aggregation (Cronbach's $\alpha = .61$, $r_{wg(j)} = .64$, ICC1 = .28; ICC2 = .84), indicating only moderate agreement of all judges within firms, but strong differences between the organizations in this sample (LeBreton & Senter, 2007). The results indicate that there is variation between individuals in forms that may be accounted for both through organizational level and individual level variables. However, some organizations yielded $r_{wg(j)}$s below .60 indicating low agreement on effectiveness of innovation projects. Therefore I repeated analyses which focused only at the organizational level excluding these organizations, in order to control for this unreliability of the measure at the organizational level.[2]

[2] As a control for unreliability I recalculated analyses excluding companies where effectiveness in innovation projects (DV) showed weak agreement ($r_{wgs} < .60$). In sum, 16 organizations were excluded. Most results showed only minor changes in magnitude. Effects of personal initiative on facets of entrepreneurial strategy were significant for proactiveness and risk taking. Effects of entrepreneurial strategy facets on the DV were significant for autonomy and innovativeness (positive) as well as for risk taking and competitive aggressiveness (negative). The direct effect of personal initiative on the DV after controlling for the mediators remains signifi-

Some factors may be relevant for the attenuated $r_{wg(j)}$-values. First, the assessment of innovation project effectiveness is difficult, as it is often challenging to determine who might be able to assess the outcome in a valid and reliable way. For this study I used employee rating at the individual level of analysis because employees could best assess their individual perception of effectiveness in these projects. Second, not all employees have the same insight into processes and outcomes and are equally qualified to judge effectiveness. Third, the perceived effectiveness in innovation projects varies between employees.

Control variables. In all multilevel analyses I controlled for factors both at the individual and at the organizational level. At the organizational level I controlled for the number of entrepreneurs in each business because I had to aggregate all variables which were assessed by the entrepreneur. Additionally I controlled for the size of the businesses, as measured by the amount of employees. At the individual level I controlled for age, gender, and tenure of employees. I additionally controlled for employee personal initiative, due to the general idea in proactivity research that autonomy may not make it easier to overcome barriers to innovation for effective innovation project work, but may instead make it easier for those who are personal initiative to initiate changes. This finding has been reported in the literature on personal initiative (Frese, Garst, & Fay, 2007).

Analytic strategy. The hypotheses presented earlier suggest influences of the organizational level on employees' efficiency of work in innovation projects within these businesses. Therefore I tested hypotheses using multilevel modeling (Bliese, 2002, Bliese, 2009; Hox, 2010). Individual level variables were grand-mean centered for these analyses. However, some hypotheses focus on the entrepreneur and how this person defines the strategy of the business. Such hypotheses, which operate solely on the organizational level, are tested using Preacher and Hayes' (2008) syntax for testing and comparing indirect effects in SPSS. I did this because it is recommended to use bootstrapping and confidence intervals for testing significance of results when working with small samples (N = 39 businesses).

cant as well. Additionally, I tested the r_{wgj} in the DV as a control variable for the whole model. However, as it did not have a meaningful partial effect on the DV, it was dropped for final analyses (γ = -.26, s.e. = .69, t = -.38, p = .78).

2.4 Results

Intercorrelations of study variables can be found in Table 1 (individual level) and Table 2 (organizational level). I used two separate models to assess the hypotheses. Hypothesis 1 predicted that the entrepreneurs' personal initiative is significantly related to innovation project effectiveness of employees. Results from Model 2 (Table 3) indicate that the personal initiative of the entrepreneurs did not have a significant effect on innovation project effectiveness ($\gamma = .29$, $T = .95$), disproving Hypothesis 1. In Hypothesis 2 I predicted that the personal initiative of a leader would increase the strategic entrepreneurial orientation of a firm on the facets of innovativeness, proactiveness, risk taking competitiveness and autonomy. The data partially supported these hypotheses (Table 4) since I found significant positive influences of personal initiative on proactiveness ($\gamma = .43$, $T = 1.67$) and risk taking ($\gamma = .50$, $T = 1.95$). However, there were no significant effects identified to support the relationships of personal initiative with autonomy ($\gamma = .06$, $T = .33$), innovativeness ($\gamma = .30$, $T = 1.14$), and competitive aggressiveness ($\gamma = .38$, $T = .96$).

Table 1: *Means (M), Standard Deviations (SD), and Intercorrelations of Variables at the Individual Level*

		M	SD	1	2	3	4	5
1	Age (years)	37.13	1.68					
2	Gender	1.53	.50	-.09*				
3	Tenure (years)	5.69	5.90	.46**	-.05			
4	Barriers to innovation	2.43	.68	.03	-.02	.13**		
5	Personal initiative (employees)	2.87	.54	.03	.02	-.09*	-.06	
6	Innovation project effectiveness (employees)	4.41	1.18	-.02	.07	-.06	-.25**	.16**

Note. N = 409-560. Coding gender: 1 = female; 2 = male.

$^{+}$ $p < .10$, * $p < .05$, ** $p < .01$.

Table 2: *Means (M), Standard Deviations (SD), and Intercorrelations of Variables at the Organizational Level*

		M	SD	1	2	3	4	5	6	7	8	9	10	11
1	Number of entrepreneurs	1.59	.67											
2	Number of employees	4.88	48.42	-.02										
3	Age of the business	22.88	19.24	-.22	.39*									
4	Reliability within groups ($r_{wg(j)}$) in innovation project effectiveness (employees)	.54	.30	.09	-.14	-.09								
5	Leader personal initiative	3.01	.43	.17	.47**	.09	.04							
6	Competitive aggressiveness	3.40	.81	-.08	.14	.05	-.28^{+}	.24						
7	Autonomy	2.85	.41	.25	.10	.00	.18	.14	.16					
8	Innovativeness	3.61	.59	.07	.36*	.13	.00	.29	.39*	.27^{+}				
9	Proactiveness	3.56	.58	-.12	.00	.02	-.16	.29	.70**	.26	.57**			
10	Risk taking	3.20	.61	-.08	.38*	.16	-.16	.37*	.33*	.41**	.37*	.24		
11	Innovation project effectiveness (employees)	4.42	.78	.01	-.03	-.10	.44**	.05	-.30^{+}	.20	.10	-.05	-.17	
12	Innovation project effectiveness (leader)	4.93	.90	-.03	.19	.18	.03	.41*	-.02	.24	.21	.30^{+}	.18	.44**

Note. $N = 39$.

$^{+}$ $p < .10$, * $p < .05$, ** $p < .01$.

Table 3: *Results of Multilevel Modeling on Innovation Project Effectiveness*

Independent variables	Model 1: Null model			Model 2: Fixed (direct) effects			Model 3: Fixed (direct) effects			Model 4: Random effect			Model 5: Random effect & interaction		
	γ	$SE\,\gamma$	T	γ	$SE\,\gamma$	T	γ	$SE\,\gamma$	T	γ	$SE\,\gamma$	T	γ	$SE\,\gamma$	T
(Intercept)	4.39	.12	36.64**	3.14	.91	3.46**	2.26	1.23	1.83^{+}	2.22	1.19	1.87^{+}	2.29	1.19	1.92^{+}
Employee level															
Age				-.00	.01	-.18	-.00	.01	-.30	-.00	.01	-.11	-.00	.01	-.12
Gender				.10	.12	.84	.12	.12	.98	.12	.12	.96	.12	.12	1.02
Tenure				-.00	.01	-.17	.00	.01	-.30	-.00	.01	-.18	-.00	.01	-.30
Barriers to innovation				-.36	.09	-4.26**	-.37	.09	-4.35**	-.35	.12	-2.94**	1.36	.81	1.68^{+}
Personal initiative (employees)				.23	.11	2.18*	.24	.11	2.27*	.22	.10	2.14*	.21	.10	2.00*
Organizational level															
Number of entrepreneurs				.11	.17	.65	-.13	.18	-.70	-.13	.17	-.77	-.13	.17	-.76
Number of employees				-.00	.00	-.10	-.00	.00	-.03	.00	.00	.01	.00	.00	.02
Personal initiative (entrepreneurs)				.29	.31	.95	.67	.31	2.14*	.65	.30	2.15*	.63	.30	2.07*
Entrepreneurial orientation															
Innovativeness							.28	.25	1.15	.27	.24	1.11	.32	.24	1.30
Proactiveness							-.07	.32	-.21	-.03	.32	-.10	-.08	.32	-.25
Risk taking							-.64	.27	-2.39*	-.62	.26	-2.44*	-.63	.26	-2.46**
Competitiveness							-.24	.22	-1.06	-.24	.22	-1.09	-.22	.22	-1.03
Autonomy							.75	.36	2.08*	.77	.35	2.19*	.75	.35	2.14*
Interaction term															
Barriers to innovation X Autonomy													-.59	.28	-2.12*

Table 3continues on next page

Table 3 continued: Goodness-of-fit statistics and explained variance (R^2)

	Model 1: Null model	Model 2: Fixed (direct) effects	Model 3: Fixed (direct) effects	Model 4: Random effect	Model 5: Random effect & interaction
DF	370/39	306/33	306/27	306/27	305/27
logLikelihood	-620.04	-530.00	-525.34	-522.77	-521.90
AIC	1246.07	1082.00	1082.69	1081.54	1079.81
BIC	1258.11	1124.08	1143.62	1150.09	1152.10
Explained slope variation					.06
Δ pseudo R^2 (random slope)		.09	.18	.07	.01

Note.

$N = 409$, $k = 39$. Coding gender: 1 = female; 2 = male.

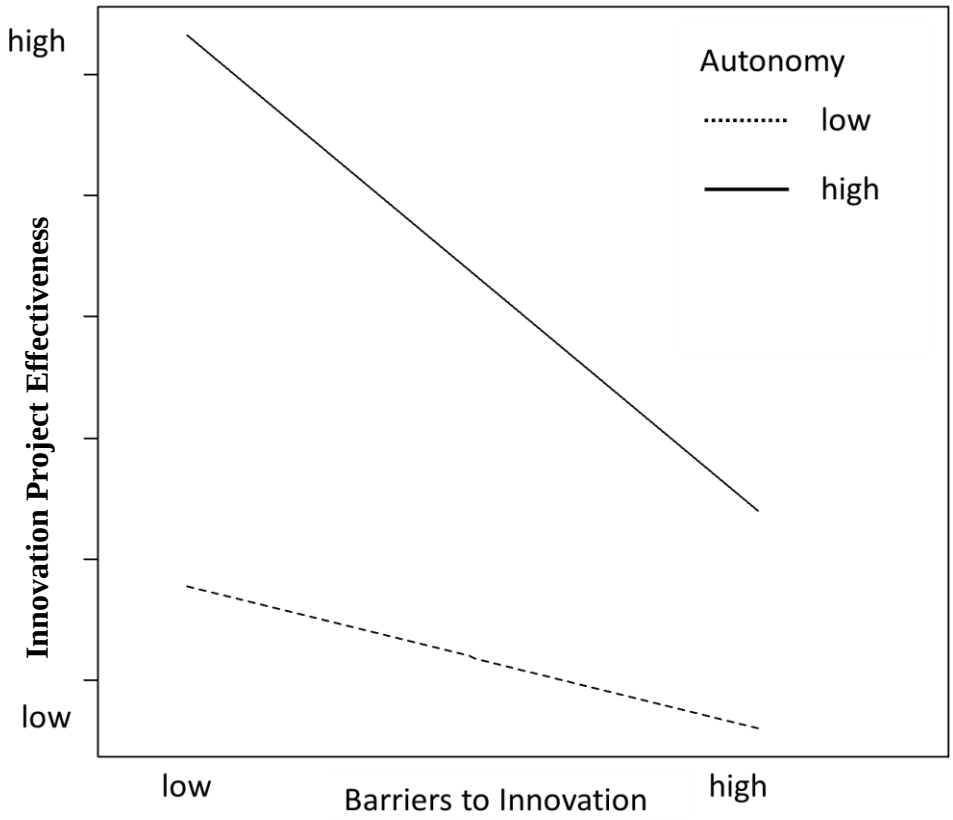
$^{+}$ $p < .10$, * $p < .05$, ** $p < .01$.

I further predicted that entrepreneurial orientation facets would show distinct relationships with employee innovation project effectiveness. In Hypothesis 3 I predicted that entrepreneurs' risk-taking strategic orientation relates negatively to innovation project effectiveness. The expected negative effect of risk taking on innovation project effectiveness was supported (γ = -.62, T = -2.37). In Hypothesis 4 I further predicted that entrepreneurs' innovativeness is positively related to innovation project effectiveness. However, on the contrary no significant positive effect was found for innovation (γ = .41, T= 1.14). In Hypothesis 5 I predicted a positive relationship with innovation project effectiveness when entrepreneurs' give autonomy in decision making to employees. As predicted, a significant relationship was found with autonomy (γ = .85, T = 2.41).

In Hypotheses 6a I hypothesized that barriers to innovation reduce employee effectiveness in innovation projects. Barriers to innovation indeed exert a significant negative influence on effectiveness in innovation projects (γ = -.37, T = 4.35). In Hypotheses 6b I hypothesized autonomy to have a moderating influence on relationships between individuals' overcoming barriers in innovation projects, and innovation project effectiveness.[3] First I investigated whether significant differences exist between separate companies concerning the relationships between barriers to innovation and effectiveness in innovation projects. I found a significant increase in model fit for a model letting slopes between barriers to innovation and innovation project success vary between businesses (LogLikelihood (LL), fixed, Model 3) = -525.34; LL (random, Model 4) = -522.77; LL-Ratio = 5.15 (DF = 2), p = .07). Results indicate that the interaction term is significant (Model 5; Table 3; γ = -.59, T = -2.12) and explains approximately 6 % of the slope variation. A graphical representation of this interaction effect can be found in Figure 2.

[3] I tested post-hoc whether any other entrepreneurial strategy facet moderates individual level relationships significantly. Consistent with my theoretical thoughts, no other individual-level relationship was significant.

Figure 2: *Interaction Effect of Organizational Autonomy and Barriers to Innovation Predicting Innovation Project Effectiveness*



In Hypothesis 7 I suggested negative effects of entrepreneurs' proactiveness and competitive aggressiveness on innovation project effectiveness. However, contrary to my hypotheses, no significant negative effect was identified for proactiveness (γ = -.05, T = -.14) or competitive aggression (γ = .37, T = -1.63).[4]

In Hypothesis 8 I hypothesized that due to suppressor effects of entrepreneurial strategy facets (risk-taking, competitiveness and proactiveness) the relationship between entrepreneurs' personal initiative and innovation project effectiveness is larger, after controlling for

[4] I checked for multicollinearity, which is a frequent problem in multiple regression analyses resulting in instable or accidental results. For these analyses, tolerance values for all entrepreneurial orientation facets as predictors of performance in innovation projects were between .39 and .79. Variance inflation factors ranged between 1.26 and 2.6. Cut off scores are tolerance values below .25 and variance inflation factors above 3. Therefore I suggest that multicollinearity of entrepreneurial strategy facets should not be a problem in these analyses.

entrepreneurial strategy facets. Results indicate the relationship between personal initiative of the entrepreneur and effectiveness in innovation projects is positive and significant after controlling entrepreneurial strategy facets (Model 3; Table 3; $\gamma = .67$, $T = 1.14$), supporting Hypothesis 8.

To further test the potential suppression effect of one of the entrepreneurial strategy constructs on the relationship between leaders' personal initiative, and innovation project success, I looked at positive and negative indirect effects, via entrepreneurial strategy facets (Table 4 and Table 5). Suppressor variables are defined as variables which increase the predictive validity of another variable by its inclusion in a regression equation (Beckstead, 2012; MacKinnon, Krull, & Lockwood, 2000). Of the five indirect effects I tested, only two yielded significant results (at the .10-significance level and based on 1000 bootstrap samples): There was a significant positive indirect effect via innovativeness ($\gamma = .12$, 90 % CI [.00, .82]), as well as a significant negative indirect effect via risk taking ($\gamma = -.31$, 90% CI [-.88, -.04]).

Table 4: *Direct Effects at the Organizational Level*

Personal Initiative on Mediators (direct effects)				Personal initiative and Mediators on innovation project effectiveness (partial direct effects)			
DV	γ	$SE\,\gamma$	T	Independent variables	γ	$SE\,\gamma$	T
				Personal Initiative	.64	.36	1.78^{+}
Competitiveness	.38	.40	.96	Competitiveness	-.37	.22	-1.66
Autonomy	.07	.19	.33	Autonomy	.85	.35	2.41*
Innovativeness	.30	.26	1.14	Innovativeness	.41	.30	1.36
Proactiveness	.43	.28	1.57^{+}	Proactiveness	-.05	.39	-.13
Risk taking	.50	.26	1.92*	Risk taking	-.62	.26	-2.37*

Note. Model $R^2 = .43$, F (8, 29) = 2.71*. Control variables: Employee level: age, gender, tenure. Organization level: Number of entrepreneurs, number of employees; $N = 39$.

$^{+}$ $p < .10$, * $p < .05$, ** $p < .01$.

Table 5: *Indirect Effects at the Organizational Level*

Indirect effects	γ	[90% CI BCA-Bootstrap]	Bias	*SE* γ
Total indirect effect	-.30	[-.96, .17]	-.03	.33
Competitive aggressiveness	-.14	[-.62 ,.05]	-.00	.18
Autonomy	.05	[-.22, .55]	-.00	.14
Innovativeness	.12	[.00, .82]	-.01	.17
Proactiveness	-.02	[-.58, .14]	.03	.23
Risk taking	-.31	[-.88, -.04]	.02	.24

Note. $N = 39$. Based on 1000 Bootstrap-resamples.

Post-hoc I checked the correlation between employees' perceptions of innovation project effectiveness and those of entrepreneurs. The correlation between both assessments for the same projects was high ($r = .44$, $p < .01$).

2.5 Discussion

2.5.1 Discussion of Findings

There were two objectives of this paper. First, I investigated the role leaders' personal initiative for innovation project effectiveness, in entrepreneurial businesses. Second, I investigated entrepreneurial orientation; a concept consisting of five facets of entrepreneurial strategic behavior as a result of personal initiative. Here, I investigated whether for innovation projects an entrepreneur's entrepreneurial orientation provides ambiguous cues to employees. I suggested that the entrepreneurial orientation concept may be a double edged sword because some facets mediated the relationships between leaders' personal initiative, and innovation project effectiveness (innovativeness and autonomy), whereas other facets suppressed the relationship (risk-taking). With these research questions I responded to calls of other researchers to explore differences between entrepreneurial orientation facets (Dess et al., 1999; McMullen & Shepherd, 2006; Monsen & Wayne Boss, 2009). I also considered the specific role of autonomy, which in addition to directly increasing innovation project success also moderates the individual level relationship between barriers to innovation and innovation project effectiveness.

Consistent with theory, I found that leaders' personal initiative is positively related to their innovation project effectiveness. I suggest that this is due to specific traits of personal initiative individuals which are self starting, proactive and overcoming barriers on the way to a goal (Frese et al., 1997). Furthermore, I find that for entrepreneurial businesses, these actions play an important role as they may strengthen or weaken the effect of leader personal initiative on innovation project effectiveness. Indeed, results indicate that facets of entrepreneurial orientation influence innovation project effectiveness in different ways. I found (1) a significant negative effect of risk-taking on innovation project effectiveness, (2) a direct positive effect of autonomy on innovation project effectiveness, and (3) an interaction effect of autonomy with barriers to innovation. The interaction effect indicates that in businesses where employees are highly autonomous, effectiveness in innovation projects is increased for those experiencing fewer barriers to their innovation.

Results can be interpreted along two lines of reasoning as they may inform research on active behaviors of entrepreneurs (e.g. Frese, 2009) and on the leadership of small firms (Cogliser & Brigham, 2004).

As previously mentioned, active entrepreneurial actions are seen as key to entrepreneurial success (Frese, 2009). Successful innovations and advancements of own products and processes are necessary to achieve this kind of success (Manimala et al., 2005). From the present study I argue there may be situations, e.g. being engaged in business innovation projects involving employees, where entrepreneurs need to act on the role of a leader or manager. Managers tend to be characterized as taking less risk than entrepreneurial counterparts (Busenitz, 1999). These results lead me to expect that entrepreneurial business leaders may be able to increase project performance by increasing structure in innovation projects. This can be done via process management tools, or by introducing additional managers that actively structure innovation projects.

We thereby extend current discussion on entrepreneurs' active performance and entrepreneurial success (Frese, 2009). Established effects of active performance characteristics on outcomes include the positive effect on performance (Rauch et al., 2009), innovation (Gielnik, 2010), active goals and visions (Baum, Locke, & Kirkpatrick, 1998), planning (Frese et al., 2007), networking (Kodithuwakku & Rosa, 2002; Zhao et al., 2010), and learning (Unger,

Keith, Hilling, Gielnik, & Frese, 2009).We extend these findings by reporting a positive effect of autonomy-granting, and a negative effect of risk taking on innovation project effectiveness.

For entrepreneurs, this research provides some guidelines on how to encourage successful innovation project work within their businesses. The entrepreneur usually is the CEO of a business, what makes the entrepreneur accountable for all major decisions of that organization (Frink & Klimoski, 2004). Therefore, I suggest that entrepreneurs can support innovation project work, should they offer autonomy to employees. Additionally it may be valuable for entrepreneurs to clarify decision making strategies within the businesses, so that role ambiguity and insecurity about decisions reduce. This paper indicates that risky decision making may reduce innovation project effectiveness of employees; an effect which may be due to role ambiguity and insecurity among employees. As such, results from this study could inform training sessions for entrepreneurs. For example, efforts have been reported to enhance entrepreneurs' personal initiative through a training course, in order to boost success (Glaub et al., in prep.). It was found, that training in personal initiative increased the success of entrepreneurs and helped them to hire new employees (Glaub et al., in prep.). With this research I are able to give advice to entrepreneurs as their business grows, so that they may better innovate successfully.

However, this research points to potential downsides that an entrepreneurial strategy may have for employees. Olson's statement from the introduction (Schein, 2004) promotes establishing an environment in which employees can act as if they are entrepreneurs. However, in such an environment difficulties can arise in the relationship between the entrepreneur and the employee since the entrepreneur will eventually evaluates staff performances (Witt, 1998). From a psychological perspective, this suggests that some facets of an entrepreneurial strategy can increase insecurity among employees; something that has negative effects on group level factors suggested to increase performance (Edmondson, 1999; Hülsheger et al., 2009), and they may increase cognitive demands for employees. Social-cognitive theory suggests that schemata, which allow for faster and easier processing of information, can develop if situations are repeatedly solved in a similar way (Fiske & Taylor, 1991). If entrepreneurs base their decisions on different amounts of information each time and employees do not know how such decisions come about, cognitive schemata of processes cannot develop. This makes work in innovation projects cognitively demanding and decreases perceived effectiveness. Thus, a number of reasons exist that make work in entrepreneurially oriented businesses

more difficult than work in non-entrepreneurial businesses. I therefore propose that entrepreneurs should change their approach to that of leadership. In leadership theory, recent advancements suggest the superiority of situational approaches (Uhl-Bien, Marion, & Mckelvey, 2007), for example to increase effectiveness in innovation projects through opening behaviors that foster exploration of new knowledge in some stages of innovation projects, as well as closing behaviors that foster exploitation of current knowledge in other, later stages of innovation projects (Rosing, Frese, & Bausch, 2011).

However, I want to point to the fact that there are good reasons for entrepreneurs in organizations to act entrepreneurially. First, there exist stable relationships between entrepreneurial orientation and firm performance (Rauch et al., 2009). Second, an entrepreneurial orientation can lead to a strategic ambivalence, which may then relate to positive organizational outcomes in uncertain environments, since it enables organizations to adapt quickly to environmental changes (e.g. Tang et al., 2010).

2.5.2 Strengths and Limitations

There are a number of strengths and limitations to this study. A key strength of this research is the relatively high amount of employees from the businesses participating in the sample. With this group it was possible to investigate the processes within entrepreneurial businesses in more detail. Additionally my investigation featured data from multiple informants for independent and dependent variables in order to avoid same source bias. Finally, I put considerable effort in to finding outcome measures that can be interpreted meaningfully, in order to draw valid conclusions from my study. For example, many studies use rating scales (Jansen, van den Bosch, & Volberda, 2006) as a measure of innovativeness. The items in such measures are abstract, whereas the dependent variable for this study asks specifically how efficient two innovation projects, named by the entrepreneur, were for the employee. These projects are more concrete and employees can recall specific episodes in order to judge effectiveness of these projects.

However, while I suggest that this approach has advantages, I recognize that it also has a number of limitations. First, I am unable to determine the objective effectiveness of the innovation projects and scope of the innovation projects. This is because the entrepreneurs named innovation projects according to their idea of innovation, thus named exclusively successful projects, excluding non-successful and ineffective projects. Therefore I technically

cannot determine whether factors which I found to predict higher or lower project effectiveness also predict innovation project success versus failure. Secondly the sample size at the organizational level is relatively small (N = 39) for drawing conclusions at such a level from the data. Therefore I suggest future research should look in more detail into organizational outcomes of entrepreneurial orientation facets. Much of entrepreneurship literature focuses on venture success measure as dependent variable. I suggest that proactive behaviors of employees, but also other behavior based measures, for example counterproductive work behaviors, could be taken into consideration to clarify why entrepreneurial orientation increases the success their businesses. Third, I rely for my dependent variable on the accurate recall of past information, which may be biased. Fourth, this study deals with small businesses leaders' initiative and entrepreneurial orientation, as well as employee performance perceptions. Entrepreneurial orientation was assessed by entrepreneurs. Researchers who wish to investigate leadership processes in more detail may consider assessing entrepreneurs' actions as seen by employees. Finally, causal inferences in cross-sectional studies are usually difficult to interpret as being directional. Previous research demonstrated reciprocal effects of initiative and autonomy of employees in a longitudinal study (Frese, Garst, & Fay, 2007). All indicators in that study were employee perceptions. In this study, autonomy was indicated by the entrepreneur. As such I do not know the extent to which the initiative of single employees can influence the autonomy granted by the entrepreneur to the whole business.

2.6 Conclusion

In spite of the limitations of my research, this study highlights the complex relationships between entrepreneurs and employees within small, entrepreneurial businesses. I shed light on risk-taking and autonomy as two major factors which guide work in innovation projects within entrepreneurial firms, and show how the entrepreneurs' personality may simultaneously hinder and support the very processes. In line with previous research (Covin, Green, & Slevin, 2006; Dess et al., 1999; Monsen & Wayne Boss, 2009; Pérez-Luño et al., 2011) this suggests that more research in the area of entrepreneurial orientation should address specifically on entrepreneurial orientation facets and their influence on processes within entrepreneurial firms.

CHAPTER 3

Effects of Organizational Error Management Culture – A Multilevel Investigation on Mediating and Moderating Mechanisms in Entrepreneurial Businesses

3.1 Introduction

Sooner or later every organization is confronted with errors (van Dyck, Frese, Baer, & Sonnentag, 2005). Errors are defined as "unintended deviations from goals, standards, a code of behavior, the truth, or some true value" (van Dyck et al., 2005, p.1229). While the scale of errors may vary with the organization, at their most severe they have the potential to threaten the survival of organizations (Perrow, 1999; Reason, 1990). As such, a forming area in organizational psychology is the development of strategies to reduce the impact of errors, and also to help organizations find ways in which they can learn from them. Dillon and Tinsley (2008) propose that careful consideration of near-misses – situations in which only luck prevented an error – can be invaluable. Sitkin (1992) proposes the implementation of a strategy emphasizing the importance of small, intelligent failures, which can be contained easily. These failures should increase employees' experimentation and thereby lead to learning and innovation (Sitkin, 1992). However, while these propositions are right to highlight the necessity of learning as a consequence of errors, they perhaps optimistically neglect that such errors are human, and therefore cannot be completely prevented (van Dyck et al., 2005). Thus an omission in the literature is that even when these strategies are implemented, large scale errors may occur. Van Dyck et al., (2005) proposed that organizations can better handle unforeseen errors should they implement sensitive error management strategies in their culture (van Dyck et al., 2005). An organization's culture is defined as a set of shared norms and values which promote common practices and behaviors (Reichers & Schneider, 1990). The error management approach helps organizations to reduce negative error consequences and increase the potential for positive error consequences after an error occurs (van Dyck et al., 2005). This approach

has appeared effective, as businesses with strong error management were better able to achieve their self-set goals, achieve higher returns on assets, and show increased survivability (van Dyck et al., 2005). However, the reasons underlying this effectiveness are currently unknown.

An error management culture is characterized by a positive approach to deal with errors, implying that they cannot be completely prevented (van Dyck et al., 2005). Instead, an error management culture provides practices on how to react to an error once it has occurred, in order to minimize its negative impact on the organization. Practices are: Communication about errors, sharing of error knowledge, helping in error situations, quick detection of errors, analyzing of causes of errors, coordination of error handling and effective error handling (van Dyck et al., 2005). In an error management culture, these practices are stored in the culture of the organization.

My research adds to the literature on error management culture by further clarifying pathways in which error management culture can influence organizational success. First, I follow theoretical arguments by van Dyck et al. (2005) in suggesting that organizational learning may be a mediator in the relationship between an error management culture and business success. Organizational learning is defined as the development of new individual knowledge or insights that have the potential to influence individual and organizational behavior (Griffith & Sawyer, 2010; Slater & Narver, 1995). In theory, organizations with a strong error management culture should learn better from their mistakes, thereby broadening their knowledge and improving subsequent products and processes (van Dyck et al., 2005); outcomes that are central to the continued survival and success of organizations (Argyris, 2009; Barney, Wright, & Ketchen, JR, 2001; Grant, 1996; Griffith & Sawyer, 2010; Ireland, Hitt, & Sirmon, 2003; Levitt & March, 1988; Sitkin, 1992; Teece, Pisano, & Shuen, 1997). At this moment, these are plausible thoughts, but they have not been fully developed theoretically and tested empirically. My chapter adds to the literature by taking a closer look at organizational learning as a mediator in the relationship between an organizations error management culture and performance.

Second, I theorize that the effectiveness of organizational constructs such as an error management culture can be better understood if I investigate how it influences individuals in their work places. For example, organizational learning is suggested to depend on individuals

learning, although they then need to share and store it in some way (Goodman & Dabbish, 2011; Wilson, Goodman, & Cronin, 2007). The sharing and storing of information regarding errors is paramount to an effective error management culture. Additionally, I need to take into consideration individual differences in team members' propensity to learn, since error management may only be effective if individuals are willing to. Thus I follow researchers who propose that organization level concepts potentially have a major impact on organization level outcomes, because they moderate relationships between individual personality traits and their actions within the organization (Cronin, Weingart, & Todorova, 2011; Hartnell, Ou, & Kinicki, 2011; Kozlowski & Klein, 2000; McGrath & Tschan, 2004; Meyer, Dalal, & Hermida, 2010; Meyer & Dalal, 2009; Meyer, Dalal, & Bonaccio, 2009; Mischel & Shoda, 1995; O'Reilly, Chatman, & Caldwell, 1991). In this tradition I propose that organizational culture, which emphasizes error management, moderates relationships between individuals' propensity to learn and the amount of individual learning. Error management is a salient influence on these relationships because it comprises ways to deal with errors. Errors have the potential to operate as a form of negative feedback, threaten individual workers' self-esteem or evoking fears of punishment (Bernichon, Cook, & Brown, 2003; Brodbeck, Zapf, Prümper, & Frese, 1993). Furthermore, if errors are threatening then the individuals who originally were inclined to learn new skills may refrain from these wishes and orient towards routine performance. I suggest that an effective error management culture may therefore influence relationships between personality traits and individual learning at a workplace.

A personality trait which has been identified to relate to learning is the mastery goal orientation (DeShon & Gillespie, 2005; Dweck, 1986; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Payne, Youngcourt, & Beaubien, 2007; Vandewalle, 2003). Individuals with mastery goals pursue the strategy of developing new skills and competence, in order to be successful (Dweck, 1986; Harackiewicz et al., 2002; Vandewalle, 1997). However, studies found that relationships between a mastery goal orientation and learning or performance outcomes depend on other personality traits (DeShon & Gillespie, 2005; Elliot & Church, 1997; Vandewalle, 1997; Yeo & Neal, 2004) and on the environment (DeShon & Gillespie, 2005; Hirst, van Knippenberg, Chen, & Sacramento, 2011). In this chapter I therefore investigate whether error management practices stored in a firm's culture can provide an environment that increases their learning at the workplace, for those who are goal orientated. I add to the

literature because I investigate reasons why the error management culture increases organizational learning through individual learning at the workplace.

3.2 Theory

3.2.1 Error Management Culture as an Antecedent for Organizational Success

Productive error management practices center around the reduction of negative error consequences in order to promote positive outcomes. As a positive error consequence, for example, organizations may be able to fix errors in their products (van Dyck et al., 2005). As such the product may become better, and the organization potentially gains knowledge on how to produce a stronger output. This continuous process of improvement is an organizational learning process, which is suggested to relate to an organizations' success (Argyris, 2009).

An error management culture enables organizational learning because, among other factors, it is characterized by active communications on errors (van Dyck et al., 2005). Communication in teams is thought to contribute towards team performance since it implies that information and ideas are widely shared (Homsma, van Dyck, de Gilder, Koopman, & Elfring, 2009; Hülsheger, Anderson, & Salgado, 2009; West, Borrill, & Unsworth, 1998). Through effectively communicating errors, knowledge on difficulties or problems of products and processes may spread within organizations. Error management therefore emphasizes the importance of the internal sharing of error knowledge, but also helping others in situations in which an error has occurred (van Dyck et al., 2005). Thereby, not only communication increases, but also an environment is promoted where people feel more like they can report failures. Such environments show high psychological safety, defined as the belief that a group is safe for interpersonal risk taking (Edmondson, 1999). Psychological safety reduces the fears of individuals to voice their own ideas/problems in groups. Thereby psychological safety augments team performance and communication in teams by emphasizing learning through knowledge of other member's failures (Edmondson, 1999; Edmondson, 2004). In an error management culture, knowledge of other peoples' failures spreads within the organization and makes the communication of own errors less threatening (van Dyck et al., 2005). I therefore suggest that an error management culture is highly effective for aiding organizational learning

because of increased communication on errors and potential solutions to errors in organizations.

When organizational learning happens and errors in products are detected and reduced, the success of a business should increase. High quality of products and processes are a positive indicator for future success of businesses (Rhee, 2009; Samson & Terziovski, 1999). This argument is consistent with the resource based view of the firm, which sees knowledge as an important intangible resource which prevents organizations from failing (Barney et al., 2001; Black & Boal, 1994; Ireland et al., 2003). The resource based view argues that with better knowledge, businesses can increase the speed in discovering and exploring new opportunities (Chen & Hambrick, 1995; Griffith & Sawyer, 2010), and the rate of innovations in a business (Rothaermel & Hess, 2007). Recently, it has been added to this literature that organizations not only need to have a lot of knowledge to gain a competitive advantage, but they also need to have a unique pool of knowledge (Nag & Gioia, 2012). Should organizations gain their knowledge through on the job learning of individuals, then it is likely that this circumstantial knowledge is unique, and can be used advantageously in competition between firms (Nag & Gioia, 2012). An organization with a competitive advantage may be able to increase its sales because of superior products or processes. An increase in sales is a dimension of new venture performance and an objective of venture success (Ensley, Pearce, & Hmieleski, 2006; He & Wong, 2004; Hmieleski & Ensley, 2007).

An error management culture increases unique knowledge within firms because, in addition to the before mentioned practices which increase communication, such a culture is characterized by efforts to use knowledge from errors to increase the quality of products and processes (van Dyck et al., 2005). To increase the quality of products and processes, employees analyze errors systematically, coordinate error handling, focus on effectiveness when handling errors, and detect errors quickly in an effort to control any negative consequences (van Dyck et al., 2005). Through these practices, errors in products reduce while a products' value and functionality increases. In effect, products may be placed better on markets. Additionally, error management cultures strengthen process efficiency in organizations (van Dyck et al., 2005). Through more efficient processes a greater quantity of products can be produced at lower cost, which again may increase sales. I therefore hypothesize that the extent to which an organization creates an effective error management culture shares a positive relationship with

their organizational learning. Through organizational learning then product quality and process efficiency is increased which leads to positive growth in sales.

Hypothesis 1. An error management culture increases organizational learning in organizations.

Hypothesis 2. Organizational learning increases sales of businesses.

Hypothesis 3. Organizational learning positively mediates the relationship between error management culture and sales of businesses.

3.2.2 Learning as an Individual Level Construct

Up to this point I have investigated effects of an error management culture at the organizational level. However, I define organizational learning as the development of new *individual* knowledge or insights that have the potential to influence individual and organizational behavior (Griffith & Sawyer, 2010; Slater & Narver, 1995). The definition indicates that organizational learning is only possible via learning in the individual constituents/ members (Nag & Gioia, 2012). Individual learning of tasks is defined as a process by which skills, initially acquired explicitly via cognitive processing, become automated or implicit (Maxwell, Masters, Kerr, & Weedon, 2001). The distinction between organizational and individual learning has implications for my conceptualization of learning in this study.

We suggest that organizational learning is the combined amount of individual learning within businesses. This is a valid conceptualization of learning in an error management culture, because in an error management culture the failure of one person disperses within the organization and leads to the learning of others. Therefore, error management is a mechanism to transfer knowledge of faulty practices from one individual to another; a process which has been consistently studied in detail by researchers on team learning (e.g. Kane, Argote, & Levine, 2005; for a recent review, see Goodman & Dabbish, 2011). From a multilevel-perspective, this conceptualization of learning at the organizational level is termed additive, because I conceptualize organizational learning as the sum of individuals' learning (Chan, 1998).

3.2.3 Achievement goal orientations as antecedents for individual learning

At the individual level, the willingness to learn something new at work depends on individuals' general motivation to learn, which is related to the intentionality of learning for aspired work outcomes (Maurer, Weiss, & Barbeite, 2003). Motivations and intentions to learn are key elements to the concept of achievement goal orientations; trait-like and goal directed motivational characteristics of the individual (DeShon & Gillespie, 2005). Common representations of this concept unfold across two dimensions: Individuals can approach or avoid difficult tasks, and may either want to master these situations or confirm their existing skill in these situations (Baranik, Barron, & Finney, 2007; Cannon-Bowers, Rhodenizer, Salas, & Bowers, 1998; DeShon & Gillespie, 2005; Dweck, 1986; Dweck & Leggett, 1988; Payne et al., 2007; Pintrich, 2000; Vandewalle, 1997; Vandewalle, Brown, Cron, & Slocum, 1999). In a multilevel representation of goals in life, achievement goals serve as strategies to reach higher level goals such as a positive self-image, control over indispensable parts of the own life, and affiliation with relevant others (DeShon & Gillespie, 2005).

The concept of achievement goal orientations was first developed in educational psychology to predict learning and performance among pupils (cf. Dweck & Leggett, 1988; Harackiewicz et al., 2002). It was later transferred to work settings (cf. Brett & Vandewalle, 1999; Vandewalle, 1997). Recently, achievement goal orientations have been adapted to predict individual learning and adaptive performance at the workplace (Brown, 2001; Cannon-Bowers et al., 1998; DeShon & Gillespie, 2005; Hirst et al., 2011; Hirst, van Knippenberg, & Zhou, 2009; To, Fisher, Ashkanasy, & Rowe, 2012).

For learning at work, the most important antecedent achievement goal orientation is mastery, defined as a desire to develop the self by acquiring new skills, comprehend new situations, and improving one's ability (Cannon-Bowers et al., 1998; DeShon & Gillespie, 2005; Dweck, 1986; Dweck & Leggett, 1988; Payne et al., 2007; Vandewalle, 1997; Vandewalle et al., 1999). In an achievement situation, mastery oriented individuals focus on learning and mastering the situation but are less interested in their performance relative to others. Thus the size of the relationship between a mastery orientation and other indicators of task performance varies over different studies (Harackiewicz et al., 2002; Hirst et al., 2009; Janssen & van Yperen, 2004; Payne et al., 2007). In fact there are arguments for this orientation to predict both better and worse performance. Mastery oriented individuals show better performance because they increase efforts in situations where difficulties arise (Janssen & van Yperen,

2004) and have less fears of failure in novel and innovative tasks (Cron, Slocum, Vandewalle, & Fu, 2005; Farr, 1996). They also acquire more new skills (Brown, 2001; Cannon-Bowers et al., 1998) because they have a broader range of interests (Harackiewicz et al., 2002).

When it comes to learning, I suggest that those who are mastery oriented will report increased learning of new skills compared to others. Such individuals may take on difficult new tasks, deal with complex problems and set high standards for own learning outcomes (Dweck & Leggett, 1988; Farr, 1996). Therefore, it is likely that they may be active to achieve learning of new skills, and it is this possibility to learn and develop knowledge and skills motivates mastery oriented individuals to take on a task (Darnon, Harackiewicz, Butera, Mugny, & Quiamzade, 2007; Elliot, 1999). Therefore I conclude that mastery goal oriented individuals report more individual learning at work.

Hypothesis 4: The relationship between mastery goal orientations and individual learning is positive.

3.2.4 Interactive effects of mastery and performance approach goal orientations

However, learning outcomes of those who are mastery oriented may lessen because they are not focused on external evaluations that go beyond mastering the task. For example, they do not try to compete and outperform others (Yeo, Loft, Xiao, & Kiewitz, 2009), which reduces the number of top performers among the mastery oriented. In fact, there exist accounts on situations in which mastery orientation may not result in strong learning of relevant, competitiveness enhancing information. For example, Brown (2001) did a study on individual learning in a real world training session which was announced as a preparation for an upcoming large scale exercise. No instructions were given, though it was made clear to subjects that their performance would not be evaluated. Results indicated that mastery oriented individuals in this environment focused on tasks unrelated to the training, but did not prepare themselves for the training. Afterwards, they reported less practice on the task, and less knowledge relative to individuals who have a proclivity for competition. Instead the mastery goal oriented individuals increased their knowledge of the overall structure of the training program and of additional information which could be obtained at the training venue (Brown, 2001). Causes for this finding may lie in the features of mastery goal orientations, which may lead to learning of broad and diverse contents, instead of deep and focused knowledge. Accordingly, there

is a discussion in the literature on whether the simultaneous pursuit of multiple goals may actually lead to the learning of deep task knowledge which has a more pronounced effect on performance (Button, Mathieu, & Zajac, 1996; DeShon & Gillespie, 2005; Harackiewicz et al., 2002; Pintrich, 2000).

Performance approach is an alternative achievement goal orientation to mastery. These individuals want to show their skills and obtain favorable judgments from other (Cannon-Bowers et al., 1998; DeShon & Gillespie, 2005; Dweck, 1986; Dweck & Leggett, 1988; Payne et al., 2007; Vandewalle, 1997; Vandewalle et al., 1999). Performance approach goals are ambivalent; serving both approach and avoidance motives (Elliot, 1999): Individuals with these goals approach difficult tasks if they have high competency expectations because they are success driven, although in contrast they may often avoid difficult tasks due to a fear of failure (Darnon et al., 2007). In a meta-analytic review of school-level studies, Harackiewicz and colleagues (2002) identified a consistent positive relationship between performance approach orientation and performance. However, in a meta-analysis on studies with adults in occupational or higher educational settings, Payne and colleagues (Payne et al., 2007) found no such relationships.

To resolve these contradictory findings, researchers may focus more closely on environments, in which tasks are performed. One might argue, for example, that complex tasks which need to be performed at workplaces do not suit purely mastery or performance-approach goals. Instead, performance approach goals may complement mastery goals, for example in organizational settings when certain performance standards need to be met by employees (DeShon & Gillespie, 2005), although in such environments performance standards are often not pre-defined, as they are in most school settings. In these situations, mastery goals may guide attention away from the end result, and towards the understanding of general mechanisms (Seijts & Latham, 2012). However, if employees who are goal oriented are additionally performance approach oriented, they will not necessarily only be inclined to learn new skills, rather they will also want to maximize performance. If that is the case, then those who are mastery oriented may gain further focus through being performance approach goal oriented. Consequently I suggest that those who are mastery goal oriented may profit from being additionally performance approach goal oriented when they are supposed to reach top performance on a new task at work (Elliot & Church, 1997). In these situations, performance approach goal orientation functions as a complement to mastery goal orientation, and orients

individuals toward high learning standards. I therefore suggest that at work, individuals learning of new skills increases for those who are mastery goal oriented if they are additionally performance approach goal oriented.

Hypothesis 5: Performance approach goal orientation moderates the relationship between mastery goal orientation and individual learning such that the relationship is positive for high performance approach goal orientation.

3.2.5 Interactive effects of mastery and performance approach goal orientations and error management culture

Additionally, there is evidence suggesting that situations influence whether being both mastery and performance approach goal oriented is advantageous. In an experimental environment, Yeo and Neal (2004) found a positive effect of performance approach goal orientation on performance only on the first of a number of trials of a repetitive task, whereas the effect turned negative with increased practice on that task. It is therefore questionable whether being performance approach oriented increases performance at all times. This is consistent with the argument that performance approach goal orientation may lead to a withdrawal of effort in the face of difficulties (Elliot & Church, 1997) or defensive pessimism; a cognitive strategy for setting unrealistically low goals in achievement situations (Elliot & Church, 2003). Situations, in which errors occur, are suggested to be particularly difficult contexts (Brodbeck et al., 1993). Empirical findings indicate that errors are cognitively demanding (Koehn, Dickinson, & Goodman, 2008; Lam, Masters, & Maxwell, 2010) and distort learning of new tasks (Koehn et al., 2008). This appears to be especially true in cases where the cost of errors can be high, as individuals' concerns with making them can produce stress and, in addition, reduce cognitive capacities to learn new skills (Klein & Boals, 2001). In support, Weick (1984) noted: "if the magnitude of problems is scaled upwards […], the quality of thought and action declines." (p.40). Therefore, if individuals are performance approach goal oriented in addition to being mastery oriented then they may actually hinder their capacity for learning under particularly difficult scenarios, for example when errors occur.

For those who are mastery goal oriented I see an alternative scenario in which these individuals achieve optimal learning, and this scenario is an error management culture. Mischel and Shoda (1995) describe environmental influences on individual actions as being

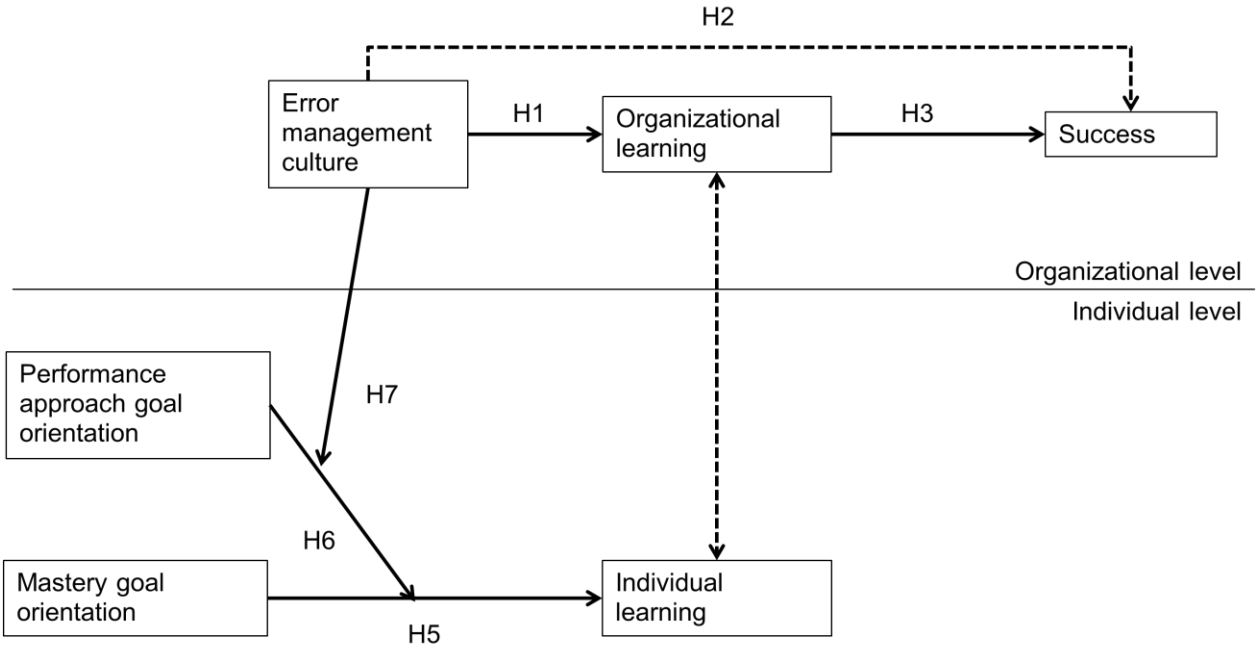
stable if-then relationships. The theory indicates that certain environmental features will regularly activate specific features of personality but deactivate others. Therefore, for each person and situation, specific situation-behavior profiles exist. In an error management culture, learning in difficult situations is activated for those who are mastery oriented through the intense communication about errors, sharing of knowledge, and offering support to others (van Dyck et al., 2005). To achieve utmost performance, errors are systematically analyzed, error handling is coordinated, and handling errors is effective. Furthermore, errors are quickly detected in an effort to control negative consequences of the error (van Dyck et al., 2005). Because the error management culture increases learning regardless of the context, rather than just being specific to simple tasks, then compared with a performance-approach orientation, it better compliments a mastery goal orientation.

Hypothesis 6: Error management culture moderates the relationship between mastery goal orientation and individual learning such that the relationship is positive in case of high error management culture.

Hypothesis 7: Error management culture and performance approach goal orientation jointly moderate the relationship between mastery goal orientation and individual learning. Specifically, in case of high error management culture, mastery goal orientation alone will suffice to achieve high learning, whereas in case of low error management culture a combination of both mastery and performance approach goal orientation will lead to highest learning.

An overview on my hypotheses can be found in Figure 3.

Figure 3: *The Proposed Model and a Summary of Hypotheses for Chapter 3*.



Note. H1 -7 refer to Hypotheses 1-7 as stated in Chapter 3.

3.3 Method

3.3.1 Sample and Procedure

We studied the hypotheses in a sample of n = 412 members of K = 40 small and medium-sized businesses. These organizations were randomly sampled from a larger population of firms in a region of Germany. Data within the businesses were gathered in 2010 and 2011 as part of a large scale survey on innovation capabilities of individuals and small or medium-sized organizations. A total of 47 small and medium-sized businesses were approached by the university research team, 5 of which refused to participate due to insufficient time. 42 businesses agreed to participate in a study on small firm innovativeness. Two firms dropped out of this initial sample (one due to bankruptcy and the other reported a lack of time), leading to a final sample size of K = 40 businesses. First, these businesses were visited by the research

team and in-depth interviews were conducted with the firms' entrepreneurs or CEOs, concerning their strategies for innovation. Secondly questionnaires were distributed to the entrepreneurs/CEOs and employees collected by members of the research team. Participation was anonymous. In exchange for participation, businesses were given feedback on psychological success factors for innovation within their company, and I offered support to those wanting to change their innovation systems. Descriptive statistics can be found in Table 6. The number of employees in each company ranged from 5 to 240. I included only full-time employees in the study reducing business sample size to a range of 5 to 143. A total of 814 employees were approached. Of these, N = 551 (68%) returned questionnaires, and a subset of n = 412 questionnaires (75%) were useful for this study as they contained information on all variables for this study. Businesses were founded between 1909 and 2009. There were 206 females and 206 males in the final sample. Tenures in the organization ranged from 0 to 34 years.

Hierarchical linear modeling was used to test the influences of individual variables and error avoidance culture on individual participation in innovation projects. Analyses were done with SPSS, Mplus, and R using the multilevel package (Bliese, 2009).

3.3.2 Measures

All items in this questionnaire were taken from existing scales (validated in German language samples) except individual learning, and were responded to on 5-point Lickert scales. Individual learning was taken from a task innovativeness scale by Tang (1998). Items were translated into German and then back-translated into English to ensure similarity of meaning (Brislin, 1970).

We performed confirmatory factor analysis on the four constructs of mastery goal orientation, performance approach goal orientation, individual learning, and error management culture (individual perception). I also compared a model with all four constructs loading separately (RMSEA = .07; CFI = .89; SRMR = .05) to a series of more parsimonious alternative models (Table 7). The data modeled at the individual level demonstrate the discriminate validity of the constructs studied.

Table 6: *Rwg_j, ICCs, Alphas, Means and Standard Deviations of Constructs Used in the Study*

Study Variable	*Rwg_j*	*ICC1*	*ICC2*	Sig. of *ICC 1*	Scale *α*	*M*	*SD*
Occupational role						.32	.47
Age (years)						36.12	10.64
Gender						1.50	.50
Tenure (years)						4.59	5.21
Age of business						22.13	17.97
Number of employees						66.52	47.43
Increase in sales 2007-2010 (in percent; accounting data)						12.13	22.84
Mastery goal orientation					.81	2.59	.67
Performance approach orientation					.78	2.07	.77
Error management culture	.92	.11	.56	(F=2.29, p<.00)	.80	2.93	.55
Individual learning	.73	.09	.54	(F=2.15, p<.00)	.73	2.67	.80

Note. n = 412. Coding: Gender: 1 = Female; 2 = male

Error management culture. Individual perceptions of organizational error management culture were assessed using six items from van Dyck et al. (2005). The original items of the scale are available in German. The items reflect group beliefs on behaviors or feelings after errors occur. An example item is: "If something went wrong, people took the time to think it through" (Cronbach's α = .80; rwg_j = 0.92; ICC 1 = .10).[5] Based on recommendations in the literature (Chan, 1998; Klein & Kozlowski, 2000; LeBreton, James, & Lindell, 2005) data were aggregated to the organizational level from individual responses.

Individual and organizational learning. In this project, individual and organizational learning is a key concept. The measure refers to individual workplace characteristics that are beneficial for individual learning, and it is additionally aggregated to the organizational level.

[5] My initial model also included organizational error aversion culture as developed by van Dyck and colleagues (2005). However, just as in the original study, error aversion culture did not predict organizational success negatively. Additionally, interaction effects of error aversion culture with individual achievement goal orientations were not significant.

Individual learning was measured with three items from Tang (1998). The three items used in this study are: "There is much knowledge to gain from the work I do for my organization." (Standardized contribution to the overall factor score in CFA: $\beta = .71$, $SE = .03$, $p < .01$), "My work is inspiring and challenging" ($\beta = .81$, $SE = .03$, $p < .01$), and "I frequently encounter ambitious and challenging work in my organization." ($\beta = .83$, $SE = .03$, $p < .01$). The scale is reliable (Cronbach's $\alpha = .83$; $rwg_j = 0.73$) and shows little empirical overlap with other scales in the CFA. In the original validation study, the scale showed acceptable internal consistency and was differentiated from other scales measuring organizational innovation potential (Tang, 1998). The items of this scale are similar to items used in other studies for measuring active on the job learning of new skills (e.g. de Jonge, Spoor, Sonnentag, Dormann, & van den Tooren, 2012; Taris, Kompier, de Lange, Schaufeli, & Schreurs, 2003).

Table 7: *Comparison of Alternative Measurement Models for All Constructs*

Goodness-of-fit indices	Model 1[a]	Model 2[b]	Model 3[c]	Model 4[d]
df	60	57	57	57
AIC	18445.02	18903.81	18887.93	18970.45
BIC	18691.71	19138.17	19122.29	19204.81
Chi^2	450.33	915.13	899.25	981.77
RMSEA	.07	.12	.11	.12
CFI	.89	.72	.73	.70
SRMR	.05	.09	.09	.11

Note. [a] 4 factors are mastery goal orientation, performance approach goal orientation, error management culture, and individual learning. [b] 3 factors are mastery goal orientation and individual learning collapsed others like Model 1. [c] 3 factors are error management culture and individual learning collapsed others like Model 1. [d] 3 factors are both goal orientations collapsed others like Model 1.

Abbreviations: AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, RMSEA = Root Mean Square Error of Approximation, CFI = Comparative Fit Index, SRMR = Standardized Root Mean Square Residual.

Goal orientation. On the individual level, I assessed goal orientations using 9 items from Vandewalle's (1997) questionnaire on mastery and performance approach goal orientation, translated into German by Heimbeck and colleagues (2003). In the questionnaire, goal orientations are conceptualized as trait-like personality facets. For mastery goal orientation,

four items were used. An example item is "I often look for new opportunities to develop new skills and knowledge" (Cronbach's α = .81). For performance approach orientation, five items were used. An example item is "I would rather prove my ability on a task that I can do well at than to try a new task" (Cronbach's α = .78). To prove similarity of my German language achievement goal orientation scales with the English original version, I compared correlation coefficients between subscales of achievement goal orientation from this study with those found in previous studies by Hirst and colleagues (2011; 2009). Correlation coefficients are similar to Hirst et al (2009) in cross-national teams of a large pharmaceutical company, but dissimilar from those in Hirst et al (2011) in a Taiwanese bureaucracy.

Organizational growth in sales. I measured organizational sales using accounting data from 2007 to 2009. Data was drawn from business records of participating organizations, either by the entrepreneur, or by employees in accounting departments. Data was reported in Euros and rounded to 100,000 Euros. Whenever possible, I cross checked data with the publicly available reports on liabilities and assets of the companies in my sample. If meaningful discrepancies appeared (as the actual growth in sales is not reported), I checked these with the entrepreneurs or accountants of the business. This procedure was not suitable for smaller businesses in the sample, as these do not report liabilities and assets. Growth was measured by comparing turnover from 2007 with 2009, and then calculating the average percentage of change. Two enterprises did not provide this data, reducing the number of organizations to 38 for all analyses at the organizational level.

We controlled for indicators which I assume to influence the relationship between goal-orientations and individual on the job learning, but were unrelated to my research question. These were the organizational role (research and development, as well as marketing and sales employees), age, gender, and tenure on the individual level. Aside from usual control variables such as age, gender and tenure, which may affect an individual's proclivity to learn something new on the job, I controlled for their occupational role insofar that work in specific organizational departments may be linked with stronger learning if they are engaging in innovation and experimentation (departments are research and development, and marketing). I control for these occupational roles because I are interested in the net effect of a current achievement goal orientation on individual learning. However, I acknowledge that reciprocal effects may have lead to a selection of individuals who are mastery goal oriented into learning-intense occupational roles. On the organizational level I controlled for the age and size of

the businesses, which were used in previous studies on organizational effects of error management and error aversion culture (van Dyck et al., 2005), and are unrelated to my research question. As my analytic strategy, I first tested the organizational level mediation model, to check whether error management culture is related to performance. This relationship should be mediated by organizational learning as indicated in van Dyck et al. (2005). Second, to predict differences in slopes between goal orientations and individual learning between different organizations, I specified a cross-level moderator model (Klein & Kozlowski, 2000). In this model all individual level variables were grand-mean centered.

3.4 Results

Table 8 and Table 9 display intercorrelations among study variables at the individual and at the organizational level.

Table 8: *Intercorrelations of Individual Level Variables*

Study variables		1	2	3	4	5	7	8
1	Occupational role							
2	Age (years)	-.12*						
3	Gender (1 = female, 2 = male)	.09*	-.15**					
4	Tenure (years)	-.11*	.44**	-.05				
5	Mastery goal orientation	.07	-.13**	.13**	-.20**			
6	Performance approach goal orientation	.10*	-.17**	.07	.10*	.29**		
8	Error management culture (individual perception)	.07	-.11*	.01	-.09^{+}	.14**	-.09^{+}	
9	Individual learning	.13**	.04	.04	-.07	.27**	-.06	.27**

Note. Listwise n = 412. Occupational role coding: 1 = Research, Development, Marketing and Sales; 0 = Production and Administration.

$^{+}$ $p < .10$, * $p < .05$, ** $p < .01$.

Table 9: *Intercorrelations of Organizational Level Variables*

Study variables		1	2	3	4
1	Number of employees				
2	Age of the business	.39*			
3	Error management culture	.04	.06		
4	Organizational learning (aggregated from individual learning)	.19	.02	.38*	
5	Increase in sales 2007-2010 (in percent; accounting data)	.31	-.22	.27	.35*

Note. Listwise k =38 – 40.

$^{+}$ $p < .10$, * $p < .05$, ** $p < .01$.

3.4.1 Organizational Level Mediation Model

In Hypotheses 1 and 2 I hypothesized that error management culture leads to an increase in organizational learning, which in turn increases the sales of businesses. Therefore I expect organizational learning to mediate the relationship between error management culture and the increase in sales (Hypothesis 3). I tested these hypotheses using structural equation modeling. Results are summarized in Table 10.

As indicated in Table 10, error management culture is significantly and positively related to organizational learning, supporting Hypothesis 1 (standardized results, STDXY-standardization in Mplus; Model 3: $\beta = .49$, $T = 4.03$). Organizational learning, in turn, is significantly and positively correlated with organizational success as predicted in Hypothesis 2 ($\beta = .33$, $T = 2.31$). For testing the proposed mediator organizational learning in the relationship between error management culture and organizational growth in sales, I first established a significant, direct path from error management culture on organizational performance when organizational learning is not in the model (Model 1: $\beta = .36$, $T = 2.31$). Next I looked for an indirect effect of error management culture on organizational success via organizational learning. A significant effect was found (Model 3: $\beta = .16$, $T = 1.95$), supporting Hypothesis 4. To test for full or partial mediation, I compared the model with direct and indirect paths from organizational success on error management culture (Model 2) with a model without direct paths (Model 3). Model fit of the more parsimonious model without a direct path (Model 3: AIC = 882.10; BIC = 899.24) was better than in the model with a direct path (Model 2: AIC =

882.58; BIC = 901.43). Therefore, I suggest that organizational learning fully mediates the relationship of error management culture and organizational success. The explained variance of the full model is for organizational learning R^2 = .27 (*T = 2.23*) and for organizational success R^2 = .27 (*T = 2.09*).

3.4.2 Cross Level Interaction Model

Table 11 summarizes the results of multilevel modeling. Of all individual variables, only the organizational role (unstandardized estimates: γ = .20, *T* = 2.18) and mastery goal orientation (γ = .30, *T* = 5.07) were significant predictors of individual learning. The data indicates that individuals who work in research & development, as well as marketing departments, report higher individual learning. Additionally, these results indicate a main effect of mastery goal orientation on individual learning, thus supporting Hypothesis 4. Of all organizational variables, only the size of businesses had a significant positive effect on individual learning (γ = .00, *T* = 1.86), with individuals working in larger companies reporting greater levels of individual learning. Additionally, error management culture had a significant positive effect on individual learning (γ = .49, *T* = 2.38), confirming results from the organizational level mediation model. The fixed effects model accounts for 6% in individual level variance and 22% of organizational level variance (small differences between this model and the organizational level model are due to individual level control variables). In Model 3 (Table 11), I estimated a random coefficient model to test cross-level interaction effects of organizational level cultures on slopes between individual goal orientations and individual learning.

Table 10: *Results at the Organizational Level*

	Model 1[a]			Model 2[b]			Model 3[c]		
Independent variables	*β*	*SE β*	*T*	*β*	*SE β*	*T*	*β*	*SE β*	*T*
	DV organizational success as increase in sales 2007-2009 (accounting data)								
Number of employees	.46	.14	3.22**	.42	.14	2.94**	.39	.15	2.65**
Age of business	-.25	.16	-1.59	-.26	.16	-1.68^{+}	-.28	.16	-1.72
Error management culture	.36	.16	2.31*	.24	.19	1.29			
Organizational learning				.22	.17	1.34	.33	.15	2.31*
R^2	*.29*	*.14*	*2.08**	*.32*	*.14*	*2.34**	*.27*	*.13*	*2.09**
	DV organizational learning								
Number of employees				.16	.16	1.04	.16	.16	1.12
Age of business				-.00	.17	-.01	.00	.17	-.01
Error management culture				.49	.12	4.03**	.49	.12	4.05**
R^2				*.27*	*.12*	*2.21**	*.27*	*.12*	*2.23**
Effects:									
Direct effect				.24	.19	1.29			
Specific indirect effect				.11	.09	1.26	0.16	0.08	1.95*
AIC/BIC					*882.58/901.43*			*882.10/899.24*	

Note. β - values are standardized regression coefficients, using STDXY-standardization-procedure in Mplus. *k* =38 as two organizations did not provide data on sales in the given period. [a] Model without organizational learning; [b] Fully saturated model; [c] Hypothesized mediation model;

$^{+}$ $p < .10$, * $p < .05$, ** $p < .01$.

It was hypothesized in Hypotheses 5 to 7 that, on the individual level, performance approach goal orientation and error management culture serve as moderators between mastery goal orientation and individual learning. These hypotheses first require a significant difference between the slopes of the relationships between individual level independent variables and dependent between organizations (Hox, 2010). These differences are then explained by cluster level variables, in my case, by error management culture. I analyzed the significance of the slope variation using a likelihood ratio test (LRT) based on comparing deviances of nested models (see http://www.statmodel.com/chidiff.shtml). The LRT compares two nested models to each other, with *DF* being the difference in degrees of freedom between both models. The one slope is fixed, and the other slope is allowed to vary between units (Bliese, 2002, Bliese, 2009; Hox, 2010; LaHuis & Ferguson, 2009). Results of LRT indicate significant slope variance between individual learning and mastery goal orientation (fixed slope model: logLik = -450.64; random slopes model: logLik = -447.53; likelihood ratio = 6.21; $p < .05$).

We then calculated all two-way interaction effects of error management culture and performance approach goal orientation on the mastery goal orientation – individual learning relationship (Table 11). None of these interaction effects were significant, initially disproving Hypotheses 5 and 6. Last, I calculated a three-way interaction effect of all three indicators. Hypothesis 7 predicted that error management culture and performance approach goal orientation jointly moderate the relationship between mastery goal orientation and individual learning. Specifically, in case of high error management culture, mastery goal orientation alone will suffice to achieve high learning, whereas in case of low error management culture a combination of both mastery and performance approach goal orientation will lead to highest learning. The interaction effect was significant ($\gamma = -.67$, $T = -2.06$). Figure 4 depicts this interaction for high (A) and low (B) error management culture respectively. I used the method outlined by Bauer and Curran (2005) for testing significance of simple slopes with the online-utility by Preacher, Curran, and Bauer (2006; http://www.quantpsy.org/interact/hlm3.htm). The simple slope for mastery goal orientation was significant at low error management culture and high performance approach goal orientation ($\gamma = 2.78$, $SE_\gamma = 1.50$, $p < .10$). The effect indicates that in low error management environments, those who are mastery and performance approach goal oriented report the strongest learning. Additionally, the simple slope at high error management culture and low performance approach goal orientation was significant ($\gamma = 1.20$, $SE_\gamma = .74$, $p < .10$). This effect indicates that in high error management environments,

those who are mastery but not performance approach oriented reported the strongest learning. These results support Hypothesis 7 as well as partially support Hypothesis 5 (supported in low error management culture environments) and Hypothesis 6 (supported for low performance approach oriented individuals). Simple slopes were not significant at all other combinations of performance approach goal orientation and error management culture. I additionally tested significance of differences between slopes. Results indicate that the slope for mastery goal orientation and low performance approach goal orientation was significantly different between high and low error management culture ($T = 2.01$, $p < .05$).

In Table 11 I display pseudo R^2 and ΔR^2 calculations for the cross-level interaction models as done in previous studies (e.g. Hirst et al., 2009). The total increase in R^2 from the null model to the fixed effects model is $\Delta R^2 = .08$. Introducing random slopes and two-way interactions to this model leads to a $\Delta R^2 = .10$. Introducing the three-way interaction term to the model further increased explained variance by 1% ($\Delta R^2 = .01$).

Table 11: *Cross-Level Results of Hierarchical Linear Modeling of Individual and Organizational Variables on Individual Learning*

Independent variables		Model 1[a]			Model 2[b]			Model 3[c]			Model 4[d]		
		γ	*SE γ*	*T*	*γ*	*SE γ*	*T*	*γ*	*SE γ*	*T*	*γ*	*SE γ*	*T*
	Intercept	2.63	.06	47.56**	.98	.62	1.59	1.33	.63	2.12*	1.20	.63	1.92*
	Gender				.08	.08	.99	.07	.08	.87	.08	.08	.92
	Age				.01	.00	1.98*	.01	.00	1.72^{+}	.01	.00	1.91^{+}
Level 1 variables	Tenure				-.01	.01	-.50	-.00	.01	-.31	-.01	.01	-.60
	Occupational role				.20	.09	2.18*	.18	.09	2.03*	.18	.09	2.05*
	MGO				.30	.06	5.07**	-.50	.84	-.59	-.05	.85	-.06
	PGO				.01	.05	.11	.48	.74	.65	.38	.76	.50
	Number of employees				.00	.00	1.86*	.00	.00	1.53	.00	.00	1.36
Level 2 variables	Age of business				-.00	.00	-.75	-.00	.00	-.63	-.00	.00	-.63
	EMC				.49	.21	2.38*	.39	.21	1.86^{+}	.44	.21	2.09*
	EMC X MGO							.28	.29	.96	.12	.29	.41
Interaction terms	EMC X PGO							-.16	.25	-.65	-.12	.26	-.48
	MGO X PGO							-.03	.07	-.38	1.95	.95	2.04*
	EMC X MGO X PGO										-.67	.32	-2.06*
Goodness-of-fit: -2 Loglikelihood			-531.51			-450.64			-447.59			-445.92	
Increase in R^2 between						22%			14%			7%	
Increase in R^2 within						6%			9%			0.3%	
Total increase in R^2 [e]						8%			10%			1%	

Note. Dependent variable is individual learning. *γ* - values are unstandardized regression coefficients. *n* = 412 individuals and *K* = 40 businesses. Coding: Gender: 1 = Female; 2 = male. Occupational role: 1 = Research & development, marketing & sales; 0 = production and administration;

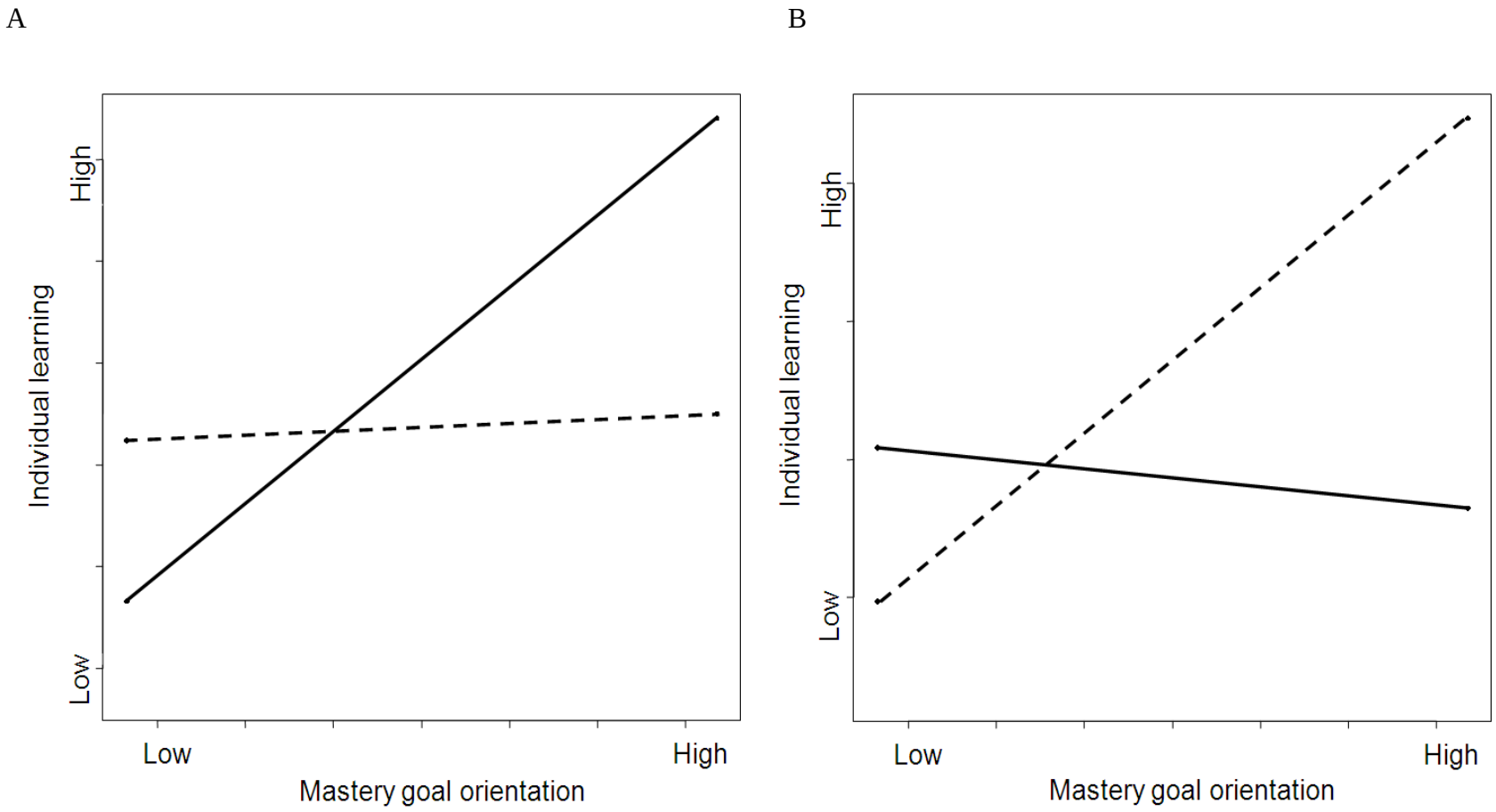
Abbreviations: MGO = Mastery goal orientation, PGO = Performance approach goal orientation, EMC = Error management culture.

[a] Null model; [b] Model with fixed effects; [c] Model with random effects and two-way interaction terms; [d] Model with random effects and three-way interaction term; [e] I computed pseudo R^2 as done in (Hirst et al., 2009);

$^{+}$ $p < .10$, * $p < .05$, ** $p < .01$.

Figure 4: *Three-Way Interaction Effect of Error Management Culture, Mastery, and Performance Prove Goal Orientation Predicting Individual Learning*

Three-way interaction effect predicting individual learning from mastery and performance approach orientation, as well as error management culture. Interaction effects are depicted separately for high error management culture (Panel A) and low error management culture (Panel B). Solid lines represent low (-1 *SD*), and dashed lines represent high (+1 *SD*) performance approach orientation.



3.5 Discussion

In this chapter I tested two basic assumptions on the function of error management culture within organizations. First, I assumed that companies are able to reach superior performance should they introduce an error management culture, because it leads to an increase in organizational learning. I support this hypothesis thereby establishing the link originally proposed by van Dyck and colleagues (van Dyck et al., 2005). Indeed, my data suggest that emphasizing a strong error management culture can lead to enhanced organizational learning, which in turn leads to better performance of the whole business. This result reinforces the importance of organizational learning, as put forth in resource based views of the firm (e.g. Grant, 1996; Levitt & March, 1988). Second, I tested whether an error management culture is positive for learning because of positive implications for employees within organizations. Specifically, I tested the moderating role of the error management culture in the relationships between individual mastery and performance approach goal orientations and a team member's learning. I hypothesized that the error management culture activates desires to learn within those who are mastery goal oriented. Additionally, I supposed that in case of low error management culture, that the performance approach goal orientation complements mastery goal orientation and leads towards increased learning. These results were supported by my analyses. However, two-way interaction hypotheses were not supported. First, I predicted that high error management culture would in general increase learning for those who are mastery goal oriented. Conversely, these results were only identified in the three-way interaction, indicating that performance approach goal orientations do make a difference in this relationship. Second, the same is true for the predicted two-way interaction effect of mastery and performance approach goal orientation. I did not find a positive effect of being both mastery and performance-approach goal oriented independent of the error management environment.

3.5.1 Theoretical Contribution

I suggest that these results add to the literature on error management culture and, in addition, on multilevel effects on individual behavior.

First, for the literature surrounding error management culture, my data indicate reasons for the effectiveness of error management culture. A number of researchers have proposed that an organization's culture has a significant influence on its learning (Schein, 1996; van Dyck et al., 2005), or that their strategies to deal with errors can influence subsequent

learning (Reason, 1990; Reason, 1997; Sitkin, 1992; van Dyck et al., 2005). In this study, I found that culture is an effective way for businesses to enhance their performance because it stimulates learning. Culture may stimulate learning because it helps organizations to underscore communication by making their errors company knowledge, thus helping each other in similar error situations. Additionally, learning may lead to better product quality and more efficient processes (Rhee, 2009). This positive outcome is achieved through systematic analysis of errors, coordinated error handling, effectiveness when handling errors, and the quick detection of errors in an effort to control their negative consequences (van Dyck et al., 2005).

Second, van Dyck and colleagues (2005) suggest that, although companies generally benefit from a strong error management approach, the magnitude of this positive effect may vary significantly between businesses. I extend this argument by focusing on individual learning, which in turn contributes towards a wider organizational learning. Results indicate that the error management culture is beneficial for those with a mastery goal orientation. These findings are in line with the suggestion that researchers need to look at specific trait-context combinations that are relevant for the dependent variable they research, since the same contextual cues may activate one personality trait and deactivate another trait (Hirst et al., 2011). I suggest that the error management culture is a contextual cue specifically supportive for learning.

I add to the literature by looking at the three-way interaction effect of both mastery and performance approach orientation with error management culture. This focus on environments has been advocated by previous research (see DeShon & Gillespie, 2005; Harackiewicz et al., 2002). For my research I used a person-in-situation approach as described by Mischel and Shoda (1995), which suggests that individual traits are activated or deactivated in specific contexts (Tett & Burnett, 2003). This theory is useful when explaining behavioral inconsistencies of individuals across situations, but also differences in empirical relationships of variables in different study environments (Mischel & Shoda, 1995). I find that the mastery goal orientation leads to different levels of learning, according to the environment and the presence of performance approach goal orientation. As an example for apparent behavioral inconsistencies, imagine an employee who has a strong desire to learn and broaden their own skills (mastery goal orientation) but is generally not interested in comparing their performance with others and obtaining favorable judgments from colleagues (low performance approach goal orientation). This employees' learning would flourish in an error man-

agement culture due to the large number of learning opportunities, accompanied by a focus on the task. Now imagine this employee changes jobs, into a low error management culture. Here, learning would reduce because learning opportunities are scarce. If situational characteristics were not considered, the employees' behavior would seem inconsistent. Instead, using the cognitive affective personality system (Cervone, Shoda, & Downey, 2007; Mischel & Shoda, 1995), I can comprehend these inconsistencies by looking at the environmental features which activate or deactivate learning.

Thirdly, I test my hypotheses by using a sample of 40 small and medium-sized businesses. Thereby, I add to the literature in providing a broader view on environmental differences, as compared to studies which analyze different teams within the same company. This focus on separate businesses differentiates my research from much of the multilevel literature. However, researchers have consistently called for more studies assessing culture and its effects on individuals across multiple companies (Miron, Erez, & Naveh, 2004). I suggest that situation-behavior profiles occur most clearly if the environments are strictly separate. Within larger organizations, this separation may not be entirely present because group or team characteristics are intertwined with those of their organization.

3.5.2 Directions for Future Research

What I have not discussed so far is the role of low error management culture. I will call this the laissez-faire error management culture, because its characteristics are similar to those of the leadership style. Laissez-faire leadership is characterized by minimal guidance from leaders, including the omission of rewards and punishments. It is characterized further by granting high freedom for followers to make their own decisions, and encouraging group members to solve problems on their own (Bass & Bass, 2008; Hinkin & Schriesheim, 2008). Empirically, laissez-faire leadership style is negatively associated to role clarity, supervisor effectiveness and satisfaction with the supervisor, all assessed within employees (Hinkin & Schriesheim, 2008). In a laissez-faire culture, no guidelines exist concerning the handling of errors. Whoever detects an error is entitled to think alone about how to solve it or to assess the necessity of whether it needs resolved at all. If the individual thinks the error needs to be solved, he or she does so without the knowledge and the participation of a colleague or a leader.

In this study, in a laissez-faire error management culture, individual learning increased among those employees who were both mastery goal and performance approach goal oriented. However, in this study, low error management culture is defined as the relative absence of facets consistent with an error management culture. Future research may conceptualize low error management culture more elaborately, also differentiating it from laissez-faire error management culture and error aversion culture. Error aversion culture was introduced by van Dyck et al. (2005) describing different cultural ways of dealing with errors. Employees are still oriented towards error free performance, but this is achieved by punishing those who commit an error. Van Dyck et al. (2005) do not find expected negative relationships of error aversion culture with performance. I suggest that the error aversion culture is conceptually distinct from a laissez-faire error culture and this differentiation provides researchers with a path for future research.

Future research may further elaborate on effects of error management culture in the relationship between achievement goal orientations and individual learning. For example, by evaluating what exactly happens in an error management culture when an error is detected? In organizational settings, learning is increased if the error is severe rather than small scale, because communication increases (Homsma et al., 2009). However, researchers suggest that learning from errors is most effective for organizations should they learn from small-scale failures (Sitkin, 1992) since they are less costly. Future research may indicate whether error management cultures increase learning from small-scale errors, which may pass unnoticed in low error management cultures. Thereby, the error management culture which is designed to handle errors after these occur may successfully reduce chances of large scale errors. Accumulated small-scale errors may even result in catastrophes because error cascades occur if hidden errors exist in a complex system (Chikudate, 2009; Hofmann & Frese, 2011; Ramanujam & Goodman, 2011).

A further aspect which is important for organizations may be how they are perceived by customers or competitors. Here, a reputation for good quality produce may be a predecessor for learning from errors, because the organization may increase their sensitivity to errors and increase motivated to solve them efficiently and quickly (Rhee, 2009). The error management culture may therefore mediate the relationship between a firms' reputation and its organizational learning from errors.

3.5.3 Practical Implications

I propose that the error management culture is a way for organizations to increase organizational learning. Therefore, the error management culture is a valuable tool for organizations, who often struggle to effectively organize learning, innovation, and business development, to benefit the sustainable growth of a business (Dougherty & Tolboom, 2008; Rothaermel & Hess, 2007). They struggle partly because job holders are not future oriented in their mindsets (Shalley & Zhou, 2008) and are not always effortful towards organizational change (Dougherty & Tolboom, 2008). In turn, the organizational ability to learn and react dynamically to the environment decreases. Unfortunately, this organizational ability is central to the long-term survival and success of organizations (Argote, 2011; Argyris, 2009; Barney et al., 2001; Easterby-Smith & Prieto, 2008; Grant, 1996; Griffith & Sawyer, 2010; Ireland et al., 2003; Levitt & March, 1988; Slater & Narver, 1995; Teece et al., 1997). Therefore, managers need practical guidance on how best to sustain learning within organizations. Thus I suggest that the error management culture can be a major target for managerial influence.

Prior research indicates that although product quality is a major concern for many businesses, means to increase product quality are often implemented superficially (Naveh & Erez, 2004). Organizations can lack the managerial effort to change cultural values which are essential for quality improvements (Naveh & Erez, 2004). An error management culture has previously been found to influence the success of businesses in this study and in a previous study (van Dyck et al., 2005). Therefore, implementing the error management culture should be of high interest for managers. Ways to assess and change the culture of a firm have been described elsewhere in the literature (Ghoshal & Bartlett, 1994; Kissack & Callahan, 2010; van de Ven & Poole, 1995).

3.5.4 Strength and Limitations

I suggest that a major strength of this study lies in the research design, through which I were able to reduce common method biases. Common method biases are a reoccurring problem in many studies of organizational phenomena, because they arise when one method is used to measure all constructs in a regression equation (Podsakoff, MacKenzie, & Podsakoff, 2012). Then, systematic variance due to the method employed may bias estimates for relationships between different constructs and become interpreted meaningfully. For this study's organizational level mediation model I used accounting data for measuring the dependent variable, whereas independent variable as well as the mediator were measured at the individual

level and aggregated to the organizational level. These ways of assessment may represent different methods (Podsakoff et al., 2012). For cross-level moderation effects, common method bias is suggested to pose less of a threat (Siemsen, Roth, & Oliveira, 2010). Therefore I are confident regarding my results in this cross-sectional study. However, some limitations in the present study need to be acknowledged and could be addressed in future research.

First, whenever studying organizational culture in a multilevel model there may be confounding effects of national culture, both on relationships between variables, and on the cultural variable that moderates the relationship. I drew a sample from Germany. According to the global leadership and organizational behavior effectiveness study (GLOBE; Brodbeck, Frese, & Javidan, 2002; Koopman, Den Hartog, Konrad, & al, 1999), Germany is among the most uncertainty avoidant countries in the world. People also tend to be highly assertive and only slightly humane oriented. As such it is more common for interpersonal interactions at work to be aggressive and confrontational (Brodbeck et al., 2002). Therefore, failure-free work performance plays a crucial role as individuals' fears of being blamed or punished are likely to be relatively high. Whether or not national culture influences the effects found in this study is difficult to tell, so I encourage others to transfer this research to different contexts and comparing the results (Rousseau & Fried, 2001).

Second, I predicted organizational learning from error management culture, neglecting that error management culture in itself may be a result of organizational learning (Holmqvist, 2004). Denrell and March (2001) described organizational development as a sequential learning endeavor. Sequential learning results from modifications in individual actions, which improve performance and become new dominant response to a problem in an organization. The new responses may lead to a better fit of the organization with the environment, but this is not necessarily the case. Instead, organizations may settle into stable suboptimal cultural configurations (Denrell & March, 2001). Therefore, the low error management culture may be a result of previous experiences with reactions to errors. Exploring the evolution of error management culture over longer periods of time, as a function of the quantity and severity of errors occurring during this time, is a direction of future research.

Third, there may be further mediators in my organizational level mediation model. For example, rigidity or flourishing mechanisms in teams, as researched by Staw et al. (1981) and Fredrickson and Losada (2005), may be additional factors in the error management culture –

organizational performance relationship, apart from organizational learning. Also, other researchers may suggest other mediators related to learning. For example, these may be processes such as sharing, storage, and retrieval of information (Goodman & Dabbish, 2011; Wilson et al., 2007). Such practices often include the use of computerized systems, which have not been the focus of this research.

Lastly, the dependent variable, organizational performance as increase in sales during a time period, is not free of external influences that could not be fully accounted for. This study shares this restriction with other work in the field, as discussed in March and Sutton (1997). However, some difficulties in measuring success which result from self-report measures could be surpassed in this study by using accounting data.

3.6 Conclusion

The present study supports error management culture as a means for organizations to achieve effective learning and future success. In this chapter, I find that a reason for this positive effect of error management culture is learning. The error management culture influences learning in two ways: First, it increases learning in all employees through the procedures associated with error management culture. Second, the error management culture further increases learning because mastery oriented individuals learn more if the environment supports it. In effect, the sales level of the businesses increased. This study therefore hints that error management may be an effective tool to promote quality and efficiency in organizations (Naveh & Erez, 2004). Thus it may be fruitful to investigate error management culture and other strategies to cope with errors in more detail (Dillon & Tinsley, 2008; Goodman et al., 2011; Ramanujam & Goodman, 2003; Sitkin, 1992), in order to provide useful strategies for companies that aim to reduce risks while increasing success in product development.

CHAPTER 4

The Occupational Role as a Predictor for Biased Responses in the Adaption-Innovation Inventory – An Investigation Using Mixture Distribution Item Response Theory Models

4.1 Introduction

Innovation is important for businesses to remain competitive. For successful innovation, companies need to recognize changes in the environment and be able to use these changes for innovation (Rothaermel & Hess, 2007). Companies' ability to innovate depends largely on their employees (Keller, 2012; Rothaermel & Hess, 2007). Therefore, valid measures for assessing employee innovation are needed in order to identify those individuals who can best work together in innovative projects (Miron-Spektor, Erez, & Naveh, 2011). For this purpose, self-report measures are commonly used, and evidence suggests that these measures are valid for predicting job performance (Ones, Viswesvaran, & Reiss, 1996).

A very popular self-assessment measure for employee and job-applicant innovativeness is the Kirton adaption-innovation inventory, which measures the innovativeness and adaptiveness of an individual's *cognitive style* (Jablokow & Kirton, 2009; Kirton, 1976; Miron, Erez, & Naveh, 2004). A cognitive style is a "consistent individual difference in preferred ways of organizing and processing information and experience" (Messick, 1976, p.4). Those individuals who have an innovative cognitive style typically prefer to solve problems in an unstructured way and are less concerned with achieving consensus when designing problem-solving strategies. On the other hand, employees with an adaptive cognitive style are more structured in their problem solving and typically achieve structure by seeking agreement with other group or team members (Kirton, 1980). Scores obtained with this measure have repeatedly been shown to predict creativity and innovation at the workplace (Bagozzi & Foxall, 1995, Bagozzi & Foxall, 1996; Foxall & Hackett, 1992; Jablokow & Kirton, 2009; Kirton, 1976; Miron et al., 2004). Moreover, the adaption-innovation inventory relates to an individu-

al's motivation to innovate (Baer, Oldham, & Cummings, 2003), which can help organizations build effective teams for innovation (Hammerschmidt, 1996; Miron-Spektor et al., 2011). The original adaption-innovation inventory by Kirton has been used in more than 250 scientific studies, as well as by many practitioners, according to the developers of the inventory (http://www.kaicentre.com/).

A vital assumption for any psychometric measure is that it validly measures the same construct(s) in the same way across different groups of individuals. Construct validity implies that the individual items of the measure trigger the same kind of psychological process(es) within all respondents, leading them to use the given response format (which is often a rating scale) in the intended, i.e., psychologically plausible, way. In the case of the adaption-innovation inventory, a higher degree of innovativeness should result in the choice of a higher response category on the rating scale, so that differences between scores on the questionnaire represent psychologically meaningful differences between individuals. Therefore, this assumption reflects an important aspect of the test scores' inner construct validity (cf. Gollwitzer, Eid, & Jürgensen, 2005). For the original Kirton adaption-innovation inventory, which was presented in 1974, this aspect of construct validity appears to be threatened, as Chan (2000) has reported problems due to differential item functioning (DIF) for different work groups (managers and employees). DIF describes when respondents from different groups have different probabilities of endorsing a certain response to an item, although they possess the same degree of the latent trait the test purports to measure (cf. Embretson & Reise, 2009). DIF can result if items have a different meaning across separate groups or when individuals belonging to distinct groups show systematic response styles that differ between groups but that are similar within groups (cf. Gollwitzer et al., 2005). While the existence of some degree of DIF between groups can be expected and does not pose an overly severe problem (Wang, 2008), meaningful DIF implies that observed test score differences between groups are not interpretable (cf. Samuelsen, 2008). In the present research, I present a theoretic rationale for the existence of DIF in the adaption-innovation inventory and thereby investigate in which situations researchers and practitioners need to take DIF into consideration on the adaption-innovation inventory.

Extant research provides a number of hypotheses regarding why response biases exist on self-report measures. Prime hypotheses concern motivational response biases, which include social desirability, faking, and self-enhancement (Eid & Zickar, 2007; Holtgraves,

2004; Paulhus, Harms, Bruce, & Lysy, 2003; Shoss & Strube, 2011; Wood, 1989). Additionally, non-meaningful biases exist (Andrich, de Jong, & Sheridan, 1997; Gollwitzer et al., 2005), as well as biases due to item wording and interpretation (de Ayala, Kim, Stapleton, & Dayton, 2002).

We propose another explanation for the existence of DIF. Cognitive schemata, which stem from occupational group membership, may elicit response biases. I suggest that DIF in the adaption-innovation inventory may be a consequence of social influence in work situations (cf. Ferris et al., 2002; Hogg & Terry, 2000), which influence cognitive processes and subsequently affect behavior. Organizational theory assumes that both a person's predispositions and the person's situation influence cognition (Frese, 1982; van Maanen, 1978; Zhang, Ilies, & Arvey, 2009). As an example of this interactive process, Frese, Garst and Fay (2007) have reported on not only the influence of individuals on their work environment but also an additional longitudinal reciprocal influence of the work environment on individuals. In their study, individuals who were highly personal initiative typically reported working in occupations that allowed for more self-determined actions. As a result of increased self-determination, their actions in the long run became increasingly self-driven (Frese et al., 2007).

The general assumption that responses on a self-report measure are influenced by the environment has been studied in previous research. Researchers have investigated differences between responses on personality questionnaires obtained with or without specific environmental cues (e.g., *at work*, Lievens, de Corte, & Schollaert, 2008). The influence of contextual cues on personality test scores has also prompted research into the impact of social context on test scores (Hunthausen, Truxillo, Bauer, & Hammer, 2003). In the present study, I suggest that cognitive schemata develop through social influences at work and then influence individual trait judgments (Klein & Loftus, 1993). Individuals develop these cognitive schemata at work through interactions with their closer professional colleagues (Ferris et al., 2002) or through prototypes that "represent the defining and stereotypical attributes of groups" (Hogg & Terry, 2000, p.123). I investigate whether an individual's proximal context (e.g., the department in which an employee works) is a predictor of biased responses on a questionnaire because this context influences the development of cognitive schemata.

With the present study, I contribute to two different streams of research. First, I contribute to research on the construct validity of the adaption-innovation inventories. Previous research on this topic (e.g., Bagozzi & Foxall, 1995; Chan, 2000; Keller & Holland, 1978) has yielded unsatisfactory results (esp. Chan, 2000). Today, a number of publications using different versions of the adaption-innovation inventory have centered on the antecedents or consequences of innovative and adaptive cognitive styles at the workplace (e.g., Keller, 2012; Miron-Spektor, Erez, & Naveh, 2007, Miron-Spektor et al., 2011; von Wittich & Antonakis, 2011) without paying attention to potential construct validity problems. Unlike other researchers, I do not base my study on manifest, a priori groups and examine differences between such groups. Instead, I use a latent class approach to first determine groups with different response styles on the questionnaire solely on the basis of their response behavior (cf. Gollwitzer et al., 2005). Second, I contribute to research on social contextual influences on questionnaire responding (Bing, Whanger, Davison, & VanHook, 2004; Hunthausen et al., 2003; Lievens et al., 2008; Schmit, Ryan, Stierwalt, & Powell, 1995; Small & Diefendorff, 2006). I suggest that examining the social context as a source of biased responses can increase my understanding of how individuals' responses to questionnaire items are generated and how relationships between test scores and related outcome measures vary.

4.2 Theory

4.2.1 History of the Adaption-Innovation Inventory

Kirton and colleagues (Buffinton, Jablokow, & Martin, 2002; Jablokow & Kirton, 2009; Kirton, 1976, Kirton, 1994, 1994) originally differentiated adaptive and innovative cognitive styles as opposite poles of a one-dimensional continuum. Theory and measurement of cognitive styles have changed since the construct was originally proposed in 1974 (Kirton, 1976). Research has focused on the dimensionality of the adaption-innovation framework (Bagozzi & Foxall, 1995, Bagozzi & Foxall, 1996; Foxall & Hackett, 1992; Im & Hu, 2005; Im, Hu, & Toh, 2003; Taylor, 1989), as well as on its stability over time (Clapp, 1993; Murdock, Isaksen, & Lauer, 1993). In sum, the framework today is suggested to be three-dimensional, rather than two-dimensional, and stable over short periods of time. The three dimensions are creative cognitive style, attentive-to-detail cognitive style, and conformity-with-group/norms cognitive style.

Individuals with a creative cognitive style identify problems, reframe them, and come up with many unique solutions (Miron-Spektor et al., 2011). They are specifically interested in the novelty aspect of creativity. In contrast, they are less attentive to a solution's utility. Therefore, creative members of an organization may initiate changes and develop new solutions, but they are less likely to improve and implement refinements to existing solutions (Kirton, 1980). It is expected that organizational innovation projects benefit from employees with a creative cognitive style because these individuals work readily in innovation projects. Individuals with an attentive-to-detail cognitive style are organized, precise, reliable, and carefully attentive to the implementation of their ideas (Goldsmith & Matherly, 1987; Miron-Spektor et al., 2011). Whenever mistakes or inaccuracies occur, they step in, thereby leading to highly reliable solutions (Kirton, 1980; Miron et al., 2004; Miron-Spektor et al., 2011). Individuals with a conformity-with-rules/norms cognitive style seek consensus and function best when complying with the rules of the groups in which they work. They work according to existing rules and generate ideas that fit into existing structures. These ideas are more likely to be accepted by their organization (Miron et al., 2004). Therefore, those who have a conformity-with-group/norms cognitive style often get rewarded for their style of work.

However, different studies have reported problems with the psychometric properties of the original scale (cf. Bagozzi & Foxall, 1995; Chan, 2000). Therefore, Miron and colleagues (Miron et al., 2004; Miron-Spektor et al., 2007, Miron-Spektor et al., 2011) developed a revised measure of cognitive style that operates with an 'easier' response format. In the original adaption-innovation inventory, the participants were asked "to imagine that he or she has been asked to present, consistently and for a long time, a certain image of himself or herself to others" (Chan, 1996, p.200). The revised version includes statements to which participants simply need to agree or disagree, such as "I have a lot of creative ideas"(Miron et al., 2004, p.199). Just as in the original version, the revised adaption-innovation inventory comprises three facets: creative cognitive style, attentive-to-detail cognitive style, and conformity-with-rules/norms cognitive style.

4.2.2 Biases Relating To the Work Environment of Individuals

Cognitive styles can be influenced by the work environment. They represent preferences for organizing and processing information and experience (Messick, 1976). These preferences can be influenced by the social environment of a person (Fiske & Linville, 1980). Different influences have been found. For instance, Chan (2000) found that the adaption-

innovation inventory shows DIF when comparing two groups with distinct occupational roles (managers vs. employees). Furthermore, differences between adaption-innovation inventory scores have consistently been found for various occupational groups (Chan, 1996). These results indicate that occupational groups differ according to their adaptive or innovative cognitive style. However, I do not know whether these differences represent true differences in cognitive styles, or whether they are due to response bias. In the following paragraphs, I present theoretical ideas on why occupational roles can exert an influence on item responses.

4.2.3 Response Biases Due To Cognitive Schemata

In the literature, cognitive schemata are defined as an influence/bias on the way in which I interpret information (Fiske & Linville, 1980). Schemata are "cognitive structures of organized prior knowledge, abstracted from experience with specific instances; schemata guide the processing of new information and the retrieval of stored information"(Fiske & Linville, 1980, p.543). Schemata exist if a person has ample experience with a task, whereas those who are less experienced rely on specific action examples when interpreting information (Klein & Loftus, 1993). Additionally, schemata can be induced by the environment through social influence (Fiske & Linville, 1980; Hogg & Terry, 2000). The functioning of schemata in response to a questionnaire has been described by Klein et al. (1993). When asked to assess a personal trait, different cognitive routes to a response may be taken (Klein & Loftus, 1993; Shoss & Strube, 2011). On one route, the response may be obtained from specific action examples, stored in memory, which match the requested information (Klein & Loftus, 1993). If this route is taken, individuals who are asked to assess their own creative cognitive style on the adaption-innovation inventory will think of recent situations where they picked a creative solution over a routine one. Then, they will reason whether this behavior is frequent or seldom and decide what response category they choose on the questionnaire. In an alternative route, 'summary knowledge' (Hirshman & Lanning, 1999; Klein & Loftus, 1993; Klein, Cosmides, Murray, & Tooby, 2004) one's own traits are supposed to be stored in memory and may be retrieved when confronted with an item. This summary knowledge is also called a schema. For example, if colleagues frequently indicate that they view a person or group to be highly creative, then this information becomes a schema and influences item responses for a person or for members of a group. When individuals with schematic summary knowledge on their own creativity are asked to assess their own creative cognitive style, these individuals may use their available schemata to respond. Thus, they will not think about re-

cent situations or about recent corresponding actions. Through this mechanism, schemata are assumed to bias questionnaire responses on individual traits because these responses do not refer to persons but rather refer to the persons' schemata of their own group. In the following paragraphs, I detail where schemata regarding cognitive styles may originate.

4.2.4 Influences of Work Roles on Schematic Summary Knowledge

We suggest that schemata on cognitive styles result from the social influence of other employees at work (Ferris et al., 2002) and from prototypes of job holders of their own work roles (Hogg & Terry, 2000). When employees work within organizations, they usually have a specific formal role. This role describes what is expected from an employee. Organizations are segmented into work roles that most frequently specialize around functions, such as production or marketing (Galbraith & Kazanjian, 1986).

When new employees are introduced to their work role, socialization processes start. In a socialization process, employees adjust to work demands and assimilate into an organization (Jokisaari & Nurmi, 2009). As a result of this process, individuals understand what is required from them in a given job and gain role clarity (Jokisaari & Nurmi, 2009). Therefore, an individual's nearest colleagues in an organization usually exert the strongest influence on each other through a number of influence tactics (Ferris et al., 2002). These nearest colleagues later evaluate a newcomer's level of adjustment to the work environment (Jokisaari & Nurmi, 2009). Over time, departments define themselves as groups, develop group roles within organizations, and act according to these roles within the organization (Hogg & Terry, 2000). Rousseau (1978) identifies the individual's formal role within an organization as a contextual factor influencing attitudes and behaviors at work. The context as an explanation for individual behavior has been put forth in research on organizational behavior (Chan, 1998; Cronin, Weingart, & Todorova, 2011; Frese, 1982; Johns, 2006; Spreitzer, 1996). Therefore, I suggest that cognitive schemata, which stem from the work role of an individual, influence the way an individual responds to a questionnaire.

Hypothesis 1: Individuals reporting their cognitive style on the adaption-innovation inventory show DIF as a result of their occupational role.

Organizational segmentation into work roles does not occur accidentally. Instead, organizations ascribe different formal roles to employees and thereby systematically construct

different environments for their employees in order to make them specialists in certain areas of work (van Maanen, 1978). The level of specialization of an employee depends on the level of functional differentiation of workplaces in an organization (Galbraith & Kazanjian, 1986). Larger companies, usually have more specialized employees than smaller companies. However, broad categories of roles are common in different organizations and national contexts: A group of employees is responsible for the production of goods, especially in manufacturing firms. A second group is responsible for administration, which includes the hiring of new employees organization of raw materials, and payment of salaries. A third group, research and development, is needed to invent new products that will attract future customers. Additionally, marketing employees attract customers to current or new products. Lastly, managers are responsible for the structuring and supervision of work. Each of these roles is connected to a role specific mind set (Dougherty & Tolboom, 2008), and I suggest that these mind sets work as cognitive schemata. In the next section, I match creative cognitive style, attentive-to-detail cognitive style, and conformity-with-group/norms cognitive style with specific work roles in organizations.

4.2.5 Schemata in Adaptive and Innovative Cognitive Styles Due To Work Roles

Literature on the three cognitive styles has gathered information on which work environments favor the different cognitive styles. Creative cognitive style has empirically been shown to be related to creative self-efficacy (Tierney, 1997) and creative role identity (Tierney & Farmer, 2002). Furthermore, creative cognitive style predicts individual job performance (Keller, 2012), individual innovative performance (Miron et al., 2004), team outputs such as project quality (Keller, 1986) and team innovation (Miron-Spektor et al., 2011).

Attentive-to-detail cognitive style is positively related to efficiency in innovation project work (Miron et al., 2004) but is negatively related to team innovativeness (Miron-Spektor et al., 2011). Individuals with an attentive-to-detail cognitive style dislike stepping into the unknown, which is a key aspect of any innovation project (Amabile, 1996). Therefore, innovation project work does not suit employees with an attentive-to-detail cognitive style. Instead, they would rather work on tasks where they can plan ahead and understand and organize processes from the beginning to the end. For organizations, those employees who have an attentive-to-detail cognitive style are valuable in routine activities. However, these individuals will rather not thrive if a project involves the exploration of something innovative.

Conformity-with-group/norms cognitive style is negatively related to individual innovativeness (Miron et al., 2004). However, as it turns out, empirically, a small proportion of group members with high conformity-with-groups/norms cognitive style within a larger group is positively related to group innovation project success (Miron-Spektor et al., 2011). Therefore, I suggest that individuals with a conformity-with-groups/norms cognitive style in general avoid innovation projects and reduce participation in innovation projects.

Extant research suggests that creative work roles within organizations are often ascribed to those working in research and development and marketing departments (Keller & Holland, 1978; Miron-Spektor et al., 2011). From the above theory on cognitive schemata, as a consequence of socialization, I infer that employees in research and development departments or marketing departments may develop summary knowledge on their own creative cognitive style, which leads to biased responses on the questionnaire if the schemata do not fit the true cognitive style of the person. On the contrary, I do not expect these employees to develop summary knowledge of the other cognitive styles—if they are confronted with conformity-with-group/norms or attentiveness-to-detail items, they have to think about specific actions. Therefore, I expect the following hypothesis to hold:

Hypothesis 2: Members of creative work units (research & development, marketing) show more biased responses on creative cognitive style measures than individuals in other work roles.

Entrepreneurs constitute another group that has been studied by researchers using an adaption-innovation framework (Buttner & Gryskiewicz, 1993). Entrepreneurs are characterized by a more innovative cognitive style than managers (Buttner & Gryskiewicz, 1993). Innovativeness as a component of entrepreneurs' personality is a core finding throughout entrepreneurship research (Kirzner, 1997; Lumpkin & Dess, 1996; Rauch & Frese, 2007). According to this research, entrepreneurs are also characterized by risk-taking (Busenitz, 1999; Sarasvathy, Simon, & Lave, 1998). A characteristic of entrepreneurial risk-taking is premature decision making, without detailed analyses of facts prior to a decision (Busenitz, 1999). I therefore suggest that entrepreneurial risk-taking counters attentiveness-to-detail at work. Thus, I suggest that entrepreneurs may have schemata available that guide them toward biased responses concerning creative cognitive styles but not attentive-to-detail cognitive styles.

Hypothesis 3: Entrepreneurs show more biased responses on creative cognitive style than individuals in other work roles but show less biased responses for attentive-to-detail cognitive style than individuals in other work roles.

There has been less research on other work groups and cognitive styles. The natural focus of work in the adaption innovation inventory is work in innovative professions, such as research and development, marketing or entrepreneurship. However, there has been research on the O*net job classification scheme and its value for fitting individuals with occupations (Converse et al., 2004; Peterson et al., 2001). Work styles are one aspect of such a classification and may be linked with occupations. In the O*net classification scheme, for example, administrative occupations are associated with work activities, such as the evaluation of information and whether this information suits the standards of the organization, or with tasks such as organizing, planning, prioritizing, or scheduling. I suggest that such jobs require attentiveness-to-detail by the job holder. Therefore, I suggest that attentive-to-detail work roles within organizations are often ascribed to employees working in administrative occupations. Other jobs in organizations are associated with the production of output. Tasks such as controlling processes or the outcomes of processes but also documenting information require conformity-with-norms at work. Therefore, I suggest that conformist-with-group/norms work roles within organizations may be ascribed to employees working in production occupations.

Hypothesis 4: Members of attentive-to-detail work units (administration, managers) show more biased responses on attentive-to-detail cognitive style measures than individuals in other work roles.

Hypothesis 5: Members of conformist-to-group/norms work units (production) show more biased responses on conformist-to-group/norms cognitive style measures than individuals in other work roles.

As a control for my hypotheses, I include undergraduate students in the sample. These students are currently not working for an organization. I suggest that students, unlike employees in organizations, should not yet have developed a vocational role identity. We, therefore,

expect that students may rely on specific action examples when responding to the questionnaire, which may lead to less response bias on the three scales of the questionnaire.

Hypothesis 6: Students show less biased responses on all cognitive style measures than individuals in other work roles.

4.2.6 Consequences of Biased Responses

As mentioned above, the adaption-innovation inventory as an instrument is frequently used in personnel selection and in scientific studies (Miron et al., 2004; Miron-Spektor et al., 2011). Therefore, it is important to investigate not only possible causes for biased responses but also potential consequences of biased responses.

One rationale for using the adaption-innovation inventory in empirical research and in personnel selection is the suggestion that those who report a creative cognitive style should show more creative work in innovation projects (Miron-Spektor et al., 2011). Innovative project work is usually done by teams, because for many innovation projects, diverse knowledge is needed to succeed (Miron-Spektor et al., 2011). Innovative project work is differentiated from adaptive project work, as the scope of the innovative project is different. Innovation projects go beyond what is currently being done in the organization and, therefore, require employees to search for solutions creatively (Farr, Sin, & Tesluk, 2003). On the contrary, in adaptive projects, current knowledge can be combined to find a solution for a problem.

We suggest that the adaption-innovation inventory is designed to investigate the preferences of individuals for innovation project work. Therefore, referring to my previously hypothesized relationships between cognitive styles and innovative work, I suggest that the direction of association between cognitive style facets and work in innovation projects should be the same for individuals with unbiased responses. These individuals possess the cognitive style as described, and only theoretic arguments apply for this group. In contrast, for those individuals who show a response bias, these relationships may not hold because their cognitive style is biased through schematic knowledge. For creative cognitive style, I therefore suggest a strong positive association with innovation project work, which is stronger for those who report their creative cognitive style without bias compared with those who report biased responses. For attentive-to-detail cognitive style and conformity-with-group/norms cognitive style, I suggest that there are negative associations with innovation project work and that these

negative associations are stronger for those who report their creative cognitive style in an unbiased fashion.

Hypothesis 7: Creative cognitive style is positively related to participation in innovation projects for individuals who show no response bias, whereas it is unrelated for those with a response bias.

Hypothesis 8: Attentive-to-detail cognitive style is negatively related to participation in innovation projects for individuals who show no response bias, whereas it is unrelated for those with a response bias.

Hypothesis 9: Conformity-with-group/norms cognitive style is negatively related to participation in innovation projects for individuals who show no response bias, whereas it is unrelated for those with a response bias.

4.3 Method

4.3.1 Sample

We collected data from employees and managers/entrepreneurs from 40 small and medium- sized German businesses, as well as from German university students. The initial sample size of the study was N = 906. Respondents were excluded from the sample if they had missing values on any variable in the study. The final sample size was N = 753, with n = 219 students, n = 477 employees (including managers), and n = 57 entrepreneurs or CEOs of the businesses.

Data from businesses were gathered in 2011 as part of a larger survey on individual innovativeness and the innovation capabilities of small and medium-sized organizations. A total of 47 small and medium-sized businesses were approached by the research team, five of which refused to participate because of insufficient time. Forty-two businesses agreed to participate in a study on small-firm innovativeness. Two firms dropped out of this initial sample (one went bankrupt, another one reported a lack of time), which led to the final sample size of 40 businesses. These businesses were first visited by the research team, and in depth interviews were conducted with entrepreneurs or CEOs of the businesses concerning their strategies for innovation. In a second step, questionnaires were distributed to the entrepreneurs/CEOs and to their employees. Participation was anonymous; the questionnaires were

distributed and collected by members of the research team. It took approximately 25 minutes to respond to the whole questionnaire. In exchange for participation, businesses were given feedback on psychological success factors for innovation within their businesses, and support was offered to those businesses from the sample who wanted to change their innovation systems. All items used in this study were part of the questionnaire. The number of employees per business ranged between 5 and 240, with a mean of M = 41.73 (SD = 48.71). I included only full-time employees in the study, which reduced the business size to a range between 5 and 143 employees (M = 31, SD = 21.29). The businesses were founded between 1909 and 2009. The mean age of the businesses was M = 21.51 years (SD = 19). In the 40 businesses, the overall response rate was 83% of all questionnaires (112 questionnaires were returned blank or not at all). Employees and entrepreneurs were on average M = 38.39 (SD = 10.82) years old, 219 were female, and 315 were male. The average tenure in the organization was M = 6.60 (SD = 6.61) years with a span between 0 and 34 years.

Data on students was gathered in 2011 within two independent samples at a medium-sized German university. Sample 1 was drawn as a comparison sample to the business sample described above (n = 172). Participants were students in a large introductory lecture on accounting and controlling. Students were given feedback on their personal cognitive styles in exchange for participation. The second student sample participated in an experimental study on innovative problem solving behavior (n = 47). Cognitive style was assessed as a control variable before the experimental manipulation was induced. Students were given class credit for participation in the study. All students studied economics, management, or related disciplines (e.g., economic psychology, law & economics). Students were on average M = 23.44 (SD = 4.65) years old, 123 were female, 96 were male, and 147 of them were in their second year at the university (25 in first and third year, 7 in fourth year).

4.3.2 Measures

Cognitive style: I measured cognitive style with 12 items from Miron et al. (2004). Employees, students, and entrepreneurs all responded to the exact same items. The questionnaire has three subscales featuring four items as follows: creative cognitive style, attentive-to-detail cognitive style, and conformity-with-rules/norms cognitive style. An example item for creative cognitive style is “I like to do things in an original way”. An example item for attentive-to-detail cognitive style is “I am thorough when solving problems”. An example item for conformity-with-rules/norms cognitive style is “I adhere to accepted rules in my area of

work". Means, standard deviations and scale Cronbach's α for the sub samples are shown in Table 12.

Table 12: *Means, Standard Deviations and Reliability Coefficients for the Scales in the Sub-samples*

	Creative CS			Attentive-to-detail CS			Conformity with groups/norms CS		
Subsample	*M*	*SD*	*α*	*M*	*SD*	*α*	*M*	*SD*	*α*
Students 1	9.08	6.61	.66	10.30	6.23	.71	9.80	3.49	.33
Students 2	9.60	12.03	.88	11.26	7.41	.83	10.50	2.78	.31
Employees	10.61	8.20	.79	12.68	5.13	.80	10.40	6.25	.62
Entrepreneurs	11.47	10.75	.82	13.09	10.06	.86	8.88	6.57	.69

Note. CS = Cognitive Style.

Group membership: Group membership in the business sample was assessed. Entrepreneurs formed a separate group. Individuals in this group all owned shares in one of the participating businesses at the time of data collection. Individuals who were identified as employees were split into separate groups. Employees indicated their functional role within the organization by their unit membership (more than one unit could be indicated). The units were production, administration, logistics, personnel management, research and development, marketing and sales, and other (these individuals were excluded from the sample). Additionally, employees indicated whether they occupied a management position. Students were used as a separate category.

To keep the number of distinct group categories to a minimum, I built larger employee groups, dependent on similarities between groups in the cognitive style most strongly associated with the group, and their coherence in functional roles. Administration, logistics, and personnel management were subsumed under the broader level of administration, because all three roles can be considered bureaucratic roles and they are coherent enough to describe a common core activity of the organization (Dougherty & Tolboom, 2008). Research and development, marketing and sales were subsumed under R&D, because both work roles are co-

herent and connect strongly to organizational creativity and innovation (Dougherty & Tolboom, 2008). Production employees formed their own, separate group. In sum, six group categories were analyzed as follows: students, entrepreneurs, managers, production employees, administrative employees, and research and development employees.

Participation in innovation projects: For all employees and entrepreneurs in my sample, I assessed participation in three recent innovation projects within the businesses. The projects were drawn from an interview with the entrepreneur on recent innovation projects that were crucial for the future of each respective business (within the last year). Of the 120 innovation projects that were named by the business owners, 76 were product-innovation projects. Another 33 innovation projects were concerned with processes. Three innovation projects were marketing innovation projects, and eight projects were concerned with the business model of the enterprise, for example, splitting the business up into two separate businesses. Employees rated their participation within these innovation projects separate for four phases of innovation projects (for a more detailed description of the phases, see Farr et al., 2003). To test whether participation in innovation project differed between phases of the innovation projects, I calculated ICCs (one-way, random) for each project. ICCs (average measure) ranged between .92 and .93 and were sufficient for aggregation. The ICC over the aggregated measures for all three innovation projects was calculated at $ICC_{average} = .74$.

We inspected whether innovation projects were truly innovative (and not merely adaptive) by asking the entrepreneurs to rate the innovativeness of the projects. I asked leaders/entrepreneurs to assess the innovativeness of the innovation projects on a single seven-point scale, ranging from completely un-innovative to highly innovative. The mean innovativeness-score was about $M = 5.02$, with a standard deviation of $SD = 1.23$. Scores on innovativeness of projects differed. In order to ensure that employee ratings of participation in innovation projects reflect the innovativeness of employee actions, I corrected self-evaluations of participation in innovation projects by multiplying them with leader/entrepreneur project innovativeness ratings. The resulting measure had a mean of $M = 12.76$ and a standard deviation of $SD = 7.69$. Tests of skew and kurtosis of the resulting measure indicated that the resulting measure was not normally distributed. Instead, a high number of employees reported low to medium participation in innovation projects, whereas only few employees indicated medium to strong participation. Taking the non-normality of my outcome measure into ac-

count, I calculated censored-inflated structural equation models in Mplus (Muthén & Muthén, 1998-2010) whenever I used this measure.

Control variables: Education, gender, tenure, and age were used as control variables. The primary reason for the use of education as a control is that it serves as a proxy for general intelligence. I therefore differentiated between individuals who did not participate in tertiary education from those who did so before or at the time of the study. Tenure was used as a control because I assumed that tenure was an indicator of the duration of contextual influence, which may have an impact on the strength of individuals' cognitive schemata.

4.3.3 DIF and Mixture Distribution IRT Models

We detected group membership in biased or unbiased groups on the measures of cognitive style by investigating DIF using Mixture-Distribution Item Response Theory models (MD-IRT). These models provide an excellent method for the detection of DIF (Eid & Zickar, 2007). In contrast to the examination of DIF for manifest subgroups, MD-IRT models do not assume that group members need to be highly similar within and dissimilar between the manifest groups (de Ayala et al., 2002). For manifest groups, the absence of DIF may be an artifact because the result can only be interpreted as a proof that the manifest groups under study do not differ, but not as a proof that no DIF exists—using other grouping variables may produce different results (de Ayala et al., 2002). MD-IRT models allow for the identification of groups on the basis of similarities and dissimilarities in response behavior alone (Gollwitzer et al., 2005; Samuelsen, 2008). To date, MD-IRT models for the detection of DIF have been treated and employed in a number of studies (de Ayala et al., 2002; Carter, Dalal, Lake, Lin, & Zickar, 2011; von Davier, Carstensen, von Davier, & Carstensen, 2007; von Davier, Rost, & Carstensen, 2007; Eid & Zickar, 2007; Gollwitzer et al., 2005, Gollwitzer et al., 2005; Mislevy & Verhelst, 1990). The subgroups identified by such models are called latent classes. Latent classes in a MD-IRT model are not defined by a certain score on an item or a scale, or a priori by group membership, but by a certain response pattern on a series of items (Gollwitzer et al., 2005).

In a MD-IRT model, the sizes of different latent classes can be determined along with item- and category-specific threshold parameters. These threshold parameters are interpreted as the points on a latent trait continuum where individuals switch from one category to another category on the ordinal response format for one item (cf. Gollwitzer et al., 2005). If a scale

is used by the respondents in the intended way, then the thresholds are ordered. If latent classes with ordered thresholds are identified, these classes can be interpreted as groups of people who used the questionnaire according to the instructions. If thresholds for the response categories are ordered, then a higher trait value evoked the choice of a higher response category. Instead, if this is not the case, responses are biased in some way, indicating the existence of response sets (Gollwitzer et al., 2005).

Items within a scale are analyzed collectively. The sequence of threshold parameters on a scale indicates whether item characteristic curves of the items in a scale are ordered. Ordered thresholds are necessary for aggregation and further analyses of a scale. Unordered thresholds indicate the presence of some kind of response bias. In an MD-IRT model, groups with ordered and unordered threshold parameters are identified and separated as latent classes of respondents. If more than one latent class is identified, DIF is present.

In sum, the advantage of this approach is that the identification of DIF is not restricted to a priori (manifest) assumptions of class membership (de Ayala et al., 2002). Additionally, if multiple latent classes are identified, class membership in these latent classes can be a starting point for additional analyses, such as identifying covariates of latent class membership. Because class membership is ordinal, I used logistic regression analyses with latent class membership as the dependent variable, for the identification of covariates (Carter et al., 2011; Gollwitzer et al., 2005; Samuelsen, 2008).

We applied MD-IRT according to the steps described in Gollwitzer et al. (2005) and Carter et al. (2011). At first, the mixture distribution model tests whether more than one latent class is needed in order to describe the response processes of all respondents in the data set. In each latent class, different psychometric properties can be expected to surface, leading to difficulties in comparing test scores across classes.

4.4 Results

Intercorrelations of study variables can be found in Table 13 and Table 14.

4.4.1 Detection of Differential Item Parameters on Cognitive Style Scales

To test Hypothesis 1, that DIF exists on the adaption-innovation inventory, I first determined the best-fitting MD-IRT models for the three scales. Goodness-of-fit statistics for

one, two, and three-class solutions are given Table 15. I used the BIC values as the main criterion for the assessment of model fit (cf. Gollwitzer et al., 2005). The results supported Hypothesis 1; regarding all three subscales of the adaption-innovation inventory, the one-class solution showed the weakest evidence for a good fit. For all three subscales, the BIC values suggested that the best solution entailed two latent classes. Therefore, these two-class solutions were used in all further analyses. However, note that other fit indices indicated slightly different best-fitting solutions. The AIC suggested that three-class solutions may be superior to two-class solutions for the scales attentiveness to detail and creativity, whereas the CAIC suggested a one-class solution to be superior for the scale conformity-with-group/norm.

Table 13: *Means (M) Standard Deviations (SD) and Intercorrelations of Variables at the Organizational Level*

		M	*SD*	1	2	3	4	5	6	7	8	9	10
1	Age	38.50	5.82										
2	Gender	.62	.24	-.15									
3	Tenure	7.07	4.32	.64**	.04								
4	Education	3.87	.93	-.11	-.02	-.05							
5	Creative CS	2.60	.25	.02	-.2	-.12	-.25						
6	Attention-to-detail CS	3.09	.24	.01	-.04	-.13	.16	.24					
7	Conformity-with-group/norm CS	2.94	.24	-.13	-.26	-.12	-.01	.09	.41*				
8	Group membership creative CS	1.20	.15	.21	-.09	.15	.06	.3	.58**	.34*			
9	Group membership attention-to-detail CS	1.18	.13	-.01	-.13	-.09	-.06	.68**	.29	.19	.41*		
10	Group membership conformity-with-group/norm CS	1.40	.21	.11	-.28	.02	.06	.3	.33*	.44**	.57**	.49**	
11	Participation in innovation projects	13.75	4.50	-.15	.31*	.05	-.03	-.14	-.22	-.12	-.18	-.12	-.17

Note. $N = 40$. CS = Cognitive Style; Coding gender: 1 = male, 2 = female; Coding group membership on CS scales: 1 = ordered class, 2 = unordered class.

$^{+}p < .10$, * $p < .05$, ** $p < .01$.

Table 14: *Means (M) Standard Deviations (SD) and Intercorrelations of Variables at the Individual Level*

			M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Control s (*N* = 738)	1	Age	33.97	11.62																
	2	Gender	.55	.50	.08*															
	3	Tenure	5.15	6.00	.59**	.10*														
	4	Education	3.78	1.42	-.01	.03	.00													
	5	Student	.29	.46	-.58**	-.14**	-.38**	.09*												
Group (*N* = 738)	6	Production	.16	.37	.20**	.17**	.22**	.06^{+}	-.29**											
	7	Administration	.26	.44	.27**	-.09*	.23**	.02	-.39**	.00										
	8	R&D	.26	.44	.17**	.17**	.11**	.02	-.38**	-.02	.07*									
	9	Management	.09	.28	.23**	.07*	.15**	.00	-.20**	.03	.11**	.17**								
	10	Entrepreneur	.08	.26	.28**	.19**	.40**	.00	-.18**	-.08**	.19**	.14**	-.09*							
Cognitive style (*N* = 738)	11	CR	2.56	.74	.15**	.15**	.08*	.00	-.24**	.05	-.05	.24**	.13**	.12**						
	12	AT	2.97	.66	.16**	-.06	.03	.03	-.34**	.14**	.17**	.10*	.03	-.12**	.22**					
	13	CO	2.89	.63	.09*	-.15**	-.02	.04	-.24**	.12**	.09*	.05	-.06^{+}	-.15**	-.02	.40**				
	14	GM CR	1.19	.39	.15**	.12**	.06^{+}	.02	-.18**	.05	.04	.19**	.17**	.11**	.52**	.21**	-.02			
	15	GM AT	1.17	.38	.16**	-.08*	.06^{+}	-.03	-.18**	.10*	.14**	.05	.05	-.06	.17**	.52**	.19**	.23**		
	16	GM CO	1.34	.47	.17**	-.06	.11**	.07^{+}	-.32**	.15**	.12**	.12**	.07*	-.03	.12**	.23**	.43**	.16**	.21**	
	17	DV:Participation in innovation projects (*N* = 463)	12.76	7.69	.10*	.24**	.23**	.01	--	-.07	-.02	.22**	.10*	.42**	.19**	-.22**	-.22**	.11*	-.07	-.08

Note. CS = Cognitive Style; Coding gender: 1 = male, 2 = female. CR = creative cognitive style. AT = Attention-to-detail cognitive style. CO = Conformity-with-group/norm cognitive style. GM = Group membership; Coding group membership on cognitive style scales: 1 = ordered class, 2 = unordered class; N in the dependent variable (DV) is lower than for all other variables because only part of the sample, the members of the 40 businesses, participated in this part of the survey;

$^{+}p < .10$, * $p < .05$, ** $p < .01$.

Table 15: *Model Fit Comparison across Scales*

	Attentive-to-detail CS			Conformity-with-group/norm CS			Creative CS		
Model	1 class	2 classes	3 classes	1 class	2 classes	3 classes	1 class	2 classes	3 classes
AIC	6167.46	6067.16	6460.01	7421.81	7258.35	7170.15	7301.63	7089.91	7065.82
BIC	6246.07	6229.01	6705.08	7500.42	7420.20	7425.22	7380.24	7251.75	7310.89
CAIC	6263.07	6264.01	6758.08	7517.42	7455.20	7468.22	7397.24	7286.75	7363.89
df	607	589	571	607	589	571	607	589	571
Pearson Chi²	5277.22	916.42	1780.84	2331.77	1904.70	782.79	7409.89	3724.81	1940.44
p	<.00	<.00	<.00	<.00	<.00	<.00	<.00	<.00	<.00
Likelihood Ratio	399.28	262.99	619.83	601.13	401.68	277.47	662.22	414.49	354.40
p	<.00	1.00	.07	.57	1.00	1.00	.06	1.00	1.00

Note. CS = Cognitive Style. For Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and Consistent Akaike's Information Criterion (CAIC) lower values indicate better model fit.

Table 16: *Threshold Parameters and Class Size for Two Latent Class Solution*

	Class 1 (ordered class)							Class 2 (unordered class)					
	τ_{i11}	τ_{i21}	τ_{i31}	τ_{i41}	$\Sigma_{\tau ix1}$	Mean	SD	τ_{i12}	τi22	τi32	τi42	Στix2	M	SD
							Creative CS							
Item 1	-3.22	-1.84	0.71	4.41	0.06	2.39	0.74	-0.31	-1.01	-0.79	-0.53	-2.64	3.64	0.56
Item 2	-5.61	-0.63	1.26	4.56	-0.42	2.4	0.81	0.77	0.56	1.40	-0.99	1.74	3.81	0.43
Item 3	-5.57	-1.10	0.44	4.42	-1.81	2.47	0.94	-0.64	2.74	4.27	-7.21	-0.85	3.4	0.86
Item 4	-3.72	-0.26	1.49	4.65	2.16	2.26	0.92	7.44	-5.58	-1.92	1.81	1.74	2.35	1.19
Expected class size				86%							14%			
Class mean				9.52							13.2			
							Attentive-to-detail CS							
Item 1	-2.07	-0.47	0.34	2.43	0.23	2.95	0.7	-0.82	-1.65	1.04	1.16	-0.28	3.79	0.61
Item 2	-3.55	-1.46	-0.51	5.32	-0.19	2.81	0.79	-0.56	-2.27	0.09	1.26	-1.48	3.47	1.14
Item 3	-2.12	-1.78	-1.20	1.60	-3.51	2.97	0.71	-5.49	-1.89	-0.50	0.38	-7.49	3.83	0.75
Item 4	-0.47	0.67	1.19	2.08	3.47	2.74	0.84	2.02	2.26	2.51	2.21	9.00	3.46	0.88
Expected class size				66%							34%			
Class mean				11.74							14.45			
							Conformity-with-group/norm CS							
Item 1	-3.48	-1.81	0.89	5.05	0.65	2.39	0.88	4.34	-12.10	-0.04	1.73	-6.07	3.08	1.03
Item 2	-3.88	-1.45	0.88	4.12	-0.32	2.66	0.58	4.90	-11.74	-0.90	0.88	-6.86	3.25	0.89
Item 3	-3.64	-0.99	0.66	2.99	-0.98	3.07	0.66	1.35	-0.71	1.19	2.05	3.88	3.53	0.74
Item 4	-3.34	-0.79	1.31	3.47	0.65	1.63	1.07	0.73	1.46	3.65	3.16	9.00	1.16	1.34
Expected class size				80%							20%			
Class mean				9.74							11.02			

Note. CS = Cognitive Style. Ordering of thresholds within a class from low to high or from high to low indicates that response categories are ordered according to item difficulty.

Table 16 details the results of the MD-IRT analyses. On each cognitive style scale, latent classes were numbered according to their size, the largest class being class 1. Indicated by ordered threshold parameters, class 1 for all three scales represented a group of people who were unbiased in their responses and who used the given rating scale appropriately. The group sizes were 86% for creative cognitive style, 66% for attentive-to-detail cognitive style, and 80% for conformity to the norms cognitive style. The second class for all three scales differed from the first class with regard to the order of the threshold parameters. Here, unordered thresholds were invariably observed, which indicates response distortions. In further analyses, I will use the labels "ordered class" for class 1 and "unordered class" for class 2.

4.4.2 Group Influences on Differential Item Parameters

We investigated the psychological meaning of class-specific response style (Table 18). It was hypothesized (Hypotheses 2-6) that differences in response styles are due to influences in occupational group. This investigation was carried out using logistic regression analysis. The dependent variable was expected class membership. I assigned the value 1 to the group of respondents showing ordered thresholds and the value 2 to the group showing unordered thresholds. Significant *B* coefficients and odds ratios (e^B) above 1 therefore indicate classification into the group exhibiting biased response styles, whereas negative *B* coefficients and odds ratios below 1 indicate classification into the group not utilizing response styles.

We attempted to explain expected group membership by using individual level covariates (gender, age, education) as predictors in the logistic regression models. The results indicated that age is not associated with any specific response style on any of the three scales. Gender, by contrast, was associated with expected membership in the unordered classes on all three scales. Males were more likely than females to belong to the unordered class in creative cognitive style ($B = .37$, $e^{(B)} = 1.45$, $p < .10$), whereas females were more likely than males to belong to the unordered classes in attentive-to-detail cognitive style ($B = -.44$, $e^{(B)} = .64$, $p < .05$) and conformity to norms cognitive style ($B = -.50$, $e^{(B)} = .61$, $p < .01$). For females, odds for belonging to the unordered class decreased by 45% for creative cognitive style, but they increased by 36% for attentive-to-detail cognitive style and by 39% for conformity-with-groups/norms cognitive style. For education, the results indicated that individuals with a higher education have a lower probability of attaining membership in the unordered class for attentive-to-detail cognitive style ($B = -.48$, $e^{(B)} = .62$, $p < .05$). Odds to belong to the unordered class were reduced by 38% for highly educated individuals on this scale.

Results on binary group membership-variables revealed a series of group level influences on individual cognitive styles. Supporting Hypothesis 2, employees in research and development units were more likely to be classified as members of the unordered class in creative cognitive style (B = .64, $e^{(B)}$ = 1.89, p < .01). Supporting Hypothesis 3, entrepreneurs were more likely to be classified into the unordered class in creative cognitive style (B = .66, $e^{(B)}$ = 1.93, p < .05), but they were also less likely to be in the unordered class in attentive-to-detail cognitive style (B = -1.03, $e^{(B)}$ = .36, p < .05). Supporting Hypothesis 4, the odds for employees in administration to belong to the unordered class for attentive-to-detail cognitive style were increased (B = .44, $e^{(B)}$ = 1.55, p < .10). However, in contrast to Hypothesis 4, the odds for mangers to belong to the unordered class for attentive-to-detail cognitive style were not increased. Instead, managers showed increased response bias on creative cognitive style scale (B = .95, $e^{(B)}$ = 2.57, p < .01). Supporting Hypothesis 5, the odds for production employees to belong to the unordered class were increased (B = .39, $e^{(B)}$ = 1.48, p < .10). Lastly, supporting Hypothesis 6, students were found to be more likely classified as members of the ordered classes on creative cognitive style than employees in organizations (B = -.66, $e^{(B)}$ = .51, p < .10), attentive-to-detail cognitive style (B = -.86, $e^{(B)}$ = .42, p < .05) and conformity-with-group/norms cognitive style (B = -1.93, $e^{(B)}$ = .15, p < .01). For students, odds for belonging to the unordered class were decreased for creative cognitive style, for attentive-to-detail cognitive style, and for conformity-with-groups/norms cognitive style.

We investigated relations between raw scores and class specific response styles (Table 16). I found that members of the unordered threshold groups exhibited on average higher mean scores on all three scales than members of ordered groups. For creative cognitive style, the mean value was M = 2.38 (SD = .65) for the ordered class and M = 3.37 (SD = .54) for the unordered class. The difference between the means was significant (t = -19.40, df = 255.48, 95% CI [-1.09, -.90], Cohen's d = -2.44, effect size r = .77). For attentive-to-detail cognitive style, the mean value was M = 2.82 (SD = .56) for the ordered class and M = 3.73 (SD = .61) for the unordered class. The difference between means was significant (t = -15.84, df = 178.11, 95% CI [-1.02, -.79], d = -2.37, effect size r = .77). For conformity to the group/norm cognitive style, the mean value was M = 2.69 (SD = .45) for the ordered class and M =3.39 (SD = .76) for the unordered class. The difference between means was significant (t = -13.64, df = 302.04, 95% CI [-.80, -.60], d = -1.57, effect size r =.62). The results

indicated that effects between groups were strong (d > .80). Of note, between 38% and 59% in the differences between scores could be explained via group membership.

Table 17: *Three-Dimensional Distribution of Class Membership*

		Class membership attentive-to-detail CS			
		ordered		unordered	
		Class membership conformity to the group/norm CS		Class membership conformity to the group/norm CS	
		ordered	unordered	ordered	unordered
Class member-ship creative CS	ordered	408	124	39	40
	unordered	60	31	20	31

Note. Ordered = ordered thresholds; unordered = unordered thresholds.

Examining the trait specificities or universalities of response styles (Table 17), 408 out of 753 (54%) individuals were classified as members of the ordered threshold groups on all three scales. Only 31 individuals (4%) exhibited an unordered response style on all three scales. Therefore, the vast majority of individuals who showed response distortion showed them on only one or two scales.

Table 18: *Results from Logistic Regression Analyses Predicting Class Membership for all Three Scales Separately*

	Creative CS				Attentive-to-detail CS				Conformity to norms CS			
Predictor	*B*	*SE B*	*p*	e^B	*B*	*SE B*	*p*	e^B	*B*	*SE B*	*p*	e^B
Controls												
Age (years)	.02	.01	.10	1.02	.03*	.01	.02	1.03	.00	.01	.78	1.00
Gender	.31	.22	.15	1.37	-.47*	.22	.03	.63	-.54**	.18	.00	.58
Education	.00	.00	.84	1.00	.00	.00	.33	1.00	.00	.00	.30	1.00
Tenure (years)	-.04*	.02	.05	.96	-.01	.02	.48	.99	.01	.02	.65	1.01
Groups												
Students	-.66$^+$	.35	.06	.51	-.86*	.37	.02	.42	-1.93**	.30	.00	.15
Production employees	.18	.27	.49	1.20	.43	.27	.11	1.53	.39$^+$	.23	.08	1.48
Administration employees	-.14	.23	.54	.87	.44$^+$	.23	.06	1.55	-.05	.19	.79	.95
R&D	.60*	.22	.01	1.81	.12	.24	.62	1.13	.15	.19	.44	1.16
Managers	.95**	.30	.00	2.57	-.09	.34	.79	.91	.05	.28	.87	1.05
Entrepreneurs	.88*	.37	.02	2.42	-1.08*	.53	.04	.34	-.49	.36	.18	.61
Constant	-2.32**	.46	.00	.10	-2.13**	.46	.00	.12	.00	.38	.99	1.00
Model statistics												
-2 Loglikelihood		653.44				626.72				838.21		
Cox & Snell R^2		.08				.07				.13		
Nagelkerke R^2		.13				.11				.18		
% correctly classified		.82				.82				.67		
Chi^2		6.67				51.03				104.04		

Note. CS = Cognitive Style. R&D = Research & Development employees (with marketing and sales employees). Group coding: 0 = no group member; 1 = group member. Education coding: 0 = no secondary; 1 = secondary. Gender coding: 0 = female; 1 = male. *N* = 753.

$^+$ $p < .10$, * $p < .05$, ** $p < .01$.

Table 19: *Results from Model Comparison Analyses using Class Membership as Grouping and Participation in Innovation Projects as Dependent Variable*

			Grouping variable		
Model	Constraints		Class membership in creative CS scale	Class membership in attention-to-detail CS scale	Class membership in conformity-with-group/norms CS scale
1	All coefficients set equal between groups (fully constrained model)	LL-value	-1767.69	-1764.88	-1837.50
		SCF	1.27	1.22	1.26
		n parameters	15.00	15.00	15.00
2	Creative CS allowed to vary between groups	LL-value	-1766.11		
		SCF	1.22		
		n parameters	16.00		
3	Attention-to-detail CS allowed to vary between groups	LL-value		-1764.80	
		SCF		1.21	
		n parameters		16.00	
4	Conformity-with-group/norms CS allowed to vary between groups	LL-value			-1837.30
		SCF			1.24
		n parameters			16.00
Model comparison					
1 vs. 2	Scaling correction factor		0.38		
	Chi² calculated from -2LL		8.33**		
1 vs. 3	Scaling correction factor			1.06	
	Chi² calculated from -2LL			0.15	
1 vs. 4	Scaling correction factor				0.97
	Chi² calculated from -2LL				0.41

Note. N = 463. CS = Cognitive Style. SCF = scaling correction factor. LL-value = estimated Log likelihood value; n parameters = number of free parameters to be estimated. Results were obtained from multilevel mixture modeling with company as upper-level variable and class membership in one of the three cognitive styles as grouping variable. Chi² difference tests were performed using the Satorra-Bentler Scaled Chi-Square (http://www.statmodel.com/chidiff.shtml).

$^{+}p < .10$, * $p < .05$, ** $p < .01$.

4.4.3 Consequences of DIF

For the employee/entrepreneur subsample, I investigated the consequences of response distortion on the three scales. I predicted that individuals with biased responses would show different correlation-patterns with participation in innovation projects, a measure that indicates an actual behavioral consequence of a cognitive style (Hypotheses 7-9).

We checked whether the regression coefficients differed between groups when regressing participation in innovation projects on cognitive styles. I predicted that for those who respond to the measure of creative cognitive style in an unbiased way, the cognitive style relates positively to participation in innovation projects, whereas for those who respond biased, creative cognitive style is unrelated to participation in innovation projects (Hypothesis 7). The results supported this hypothesis (Table 20). I found a significant positive relationship between creative cognitive style with participation in innovation projects in the unbiased group ($\gamma = 2.82$, $T = 3.18$), whereas this result was not significant for the biased group ($\gamma = .60$, $T = .53$.). The differences between both coefficients were significant, as indicated by comparing a model where both coefficients are forced equal with a model freeing this constraint (see Table 19; Chi^2-Difference = 8.33, $df = 1$, $p < .01$). For Hypotheses 8 and 9, I found no significant differences between the models (Table 19). This result disproves Hypotheses 8 and 9, which stated that class membership on attention-to-detail cognitive style and conformity-with-group/norms cognitive style scales influences the relationship of these scales to participation in innovation projects.

Table 20: *Path Coefficients for Analyses using Class Membership as Groups and Participation in Innovation Projects as Dependent Variable*

		Grouping variable: Grouping on attention-to-detail CS scale			Grouping on creative CS scale			Grouping on conformity-with-group/norms CS scale		
		γ	*SE γ*	*T*	*γ*	*SE γ*	*T*	*γ*	*SE γ*	*T*
Class 1 with ordered threshholds	Age	-.02	.04	-.51	-.02	.04	-.48	-.03	.04	-.81
	Gender	2.12	.66	3.24**	1.84	.61	3.01**	2.96	.82	3.60**
	Tenure	.11	.07	1.56	.22	.07	3.43**	.23	.08	2.81*
	Education	2.52	.82	3.09**	2.76	.87	3.17**	2.65	.85	3.11**
	Creative CS	1.76	.63	2.82*	1.84	.58	3.18**	1.38	.72	1.91+
	Attention-to-detail CS	-1.74	.78	-2.24*	-1.68	.80	-2.11*	-1.07	.84	-1.27
	Conformity-with-group/norm CS	-.88	.67	-1.32	-1.30	.56	-2.34*	-.57	1.14	-.50
Class 2 with unordered threshholds	Age	-.01	.07	-.07	-.05	.08	-.66	.00	.04	.01
	Gender	3.21	1.16	2.78*	4.35	1.54	2.82*	1.21	1.11	1.08
	Tenure	.65	.12	5.33**	.23	.10	2.22*	.23	.09	2.49*
	Education	1.59	1.49	1.07	1.58	1.20	1.32	2.27	1.02	2.22*
	Creative CS	-1.01	1.32	-.76	.60	1.14	.53	2.18	.69	3.15**
	Attention-to-detail CS	-.48	1.04	-.46	-2.63	1.65	-1.59	-2.26	.68	-3.31**
	Conformity-with-group/norm CS	-.97	.83	-1.17	-.51	1.24	-.41	-.88	.72	-1.22

Note. CS = Cognitive Style; Coding group membership on CS scales: 1 = ordered class, 2 = unordered class. Est. = unstandardized maximum likelihood estimates. *N* (attention-to-detail cognitive style): Class 1: *N* = 363; Class 2: *N* = 100. *N* (creative cognitive style): Class 1: *N* = 352; Class 2: *N* = 111; *N* (conformity with group/norms cognitive style): Class 1: *N* = 267; Class 2: *N* = 196.

$^{+}p < .10$; * $p < .05$; ** $p < .01$

4.5 Discussion

4.5.1 Theoretic Contribution

The first goal of this article was to test the construct validity of the revised version of the Kirton adaption-innovation inventory, by Miron and colleagues (2004). The results suggest that researchers using this self-report measure should be aware that individuals' responses to the questionnaire can be influenced by group membership (cf. Bliese & Hanges, 2004). Researchers investigating individual differences with regard to the adaption-innovation inventory should therefore always consider the nature of the group(s) under study. For example, I see no problems when using the revised version of the adaption-innovation inventory within samples of students, as my results indicate that students are not likely to engage in creative and innovative mind sets or schemata and therefore seem to be unbiased when responding to the questionnaire.

The second goal of this article was to start the development of a theoretical rationale for differences in response styles. Whereas empirical and methodological accounts of the phenomena detected by MD-IRTs have been developed and investigated elsewhere (e.g., Carter et al., 2011; Eid & Rauber, 2000; Eid & Zickar, 2007; Samuelsen, 2008), theoretical explanations for these effects have not yet been exhaustively treated. Traditional explanations for the phenomenon, such as different traits in subgroups, different motivations in subgroups, or simply non-meaningful influences on selected subgroups (Gollwitzer et al., 2005), may not account for the full phenomenon. In the present article, I have utilized schema theory (Fiske & Linville, 1980; Klein & Loftus, 1993) to explain the use of response sets among individuals. More specifically, I suggest that the social role of an individual in an organization influences the cognitive representation of a trait, produces response schemata, and thereby influences response styles.

Indeed, in my analyses, considerable differences in response styles surfaced. For each of the three adaption-innovation inventory sub-scales, two latent classes with DIF could be detected, one with ordered thresholds and one with unordered thresholds. Classes with ordered thresholds, can be interpreted as groups of people who completed the questionnaire according to the instructions. If thresholds for the response categories are ordered, then a higher trait value evokes the choice of a higher response category (Gollwitzer et al., 2005).

Instead, if thresholds are not ordered, responses are biased in some way. A number of explanations DIF exist in the literature.

First, item wording and understanding thereof may indicate the fact that different traits are studied in different subgroups. For example, Ayala and colleagues (2002) discuss effects of different environments on item understanding. I argue that if responses were biased because of subgroups in my sample for which the items represent different traits, I would have found multiple classes with ordered thresholds (de Ayala et al., 2002; Gollwitzer et al., 2005). Additionally, scale-specific response patterns would have been observed. People would be classified as members of different subgroups with ordered thresholds on different scales. However, in my analyses, I found only one class with ordered thresholds on all three scales. I therefore suspect that the three scales of the adaption-innovation inventory assess the same traits in the groups that I studied.

Second, motivational response biases have been discussed in the literature. These biases come from an individual's goals when answering a questionnaire. Such goals may lead to dishonest responses (Shoss & Strube, 2011). Different motivational response patterns have been discussed. For example, socially desirable responding leads to response distortion toward a profile, which is assumed to be selected positively in a given situation. For example, when individuals apply for a job as an accountant, they will try to respond to a personality questionnaire the way that they assume an accountant would do (Shoss & Strube, 2011). As another motivational response bias, self-enhancement exists when individuals claim to be better than average on a wide variety of topics, some of which may even be non-existent, for example, in knowledge assessment (Bing, Kluemper, Kristl Davison, Taylor, & Novicevic, 2011; Paulhus et al., 2003). A third motivational response bias exists if individuals feel motivated to clarify something for the researcher. Therefore, they aggravate or simulate certain facts (both negative and positive), which leads to extreme responses (Gollwitzer et al., 2005). In the present study, because of the anonymity of the questionnaire as well as the fact that no individual feedback was given to respondents, I assume that motivational biases should not have played a prominent role. Additionally, only 31 individuals belonged to the unordered response style group on all three scales and showed a general tendency to report their own traits as biased. This speaks against the motivation argument for the majority of the sample. However, there was a strong influence of educational level on latent class membership in at-

tentive-to-detail cognitive style. Individuals with a lower educational level seem to have a bias toward reporting high levels of attention-to-detail cognitive style.

Third, individuals may have a tendency to avoid extreme responses, whereas others are more likely to choose these responses (Gollwitzer et al., 2005). For example, for rating scales, there is evidence that extreme categories are more easily picked than middle ones because the cognitive representation of extremes is more straightforward (Shoss & Strube, 2011). However, I did not find more than one class with ordered thresholds for each scale, and only few individuals (N = 31) generally failed to correctly use the given response format. It, therefore, can be argued that only these individuals have a response bias on all three scales.

In conclusion, I suggest that the hypothesized reason for response distortion, namely, the use of schematic summary knowledge for responses on the questionnaire, is a more plausible reason for the patterns of response distortion that I found in the present study. Additional support for my hypotheses comes from logistic regression analyses. I found that students in my diverse sample were highly likely to be classified as belonging to the ordered class. I suggest that this tendency is due to students not yet having developed specific schemata or summary knowledge about work behavior. All other groups show some degree of response distortion due to schematic summary knowledge on at least one scale. Those individuals who work in research and development departments are likely to show response distortions in the direction of a higher creative cognitive style. Research and development activities are clearly linked to creative cognitive styles (Amabile, 1988; Keller & Holland, 1978; Keller, 2012). Entrepreneurs had an increased likelihood of being in the unordered group for creative cognitive style and a higher likelihood of belonging to the ordered class for attentive-to-detail cognitive style. Entrepreneurship is clearly connected with creativity or innovativeness (Rauch & Frese, 2007), but not with attention-to-detail. Therefore, entrepreneurs were able to use summary knowledge for creative cognitive style, but carefully considered their actions when asked about attentiveness-to-detail. In fact, although attention-to-detail is not a truly entrepreneurial trait (Rauch & Frese, 2007), it is important for entrepreneurs to focus their attention on clearly defined issues (Bird, 1988). Entrepreneurs seem to be aware of their responsibility for attention-to-detail and focus, although it is not represented in their schemata. As a drawback, entrepreneurship is also not matched with conformity (Rauch & Frese, 2007). I did not find that it was more likely for entrepreneurs to be in the unordered group for conformity-with-groups/norms. My hypotheses also hold for individuals who work in administration de-

partments and show an increased probability of response bias on attentive-to-detail cognitive style items, as well as for those working in production that show an increased probability of response bias on conformity-with-group/norms cognitive style items. Contrary to my hypotheses, managers showed an increased probability of response bias on creative cognitive style items and not, as hypothesized, on attentive-to-detail cognitive style items.

As a third goal of this article, I wanted to investigate potential consequences of group membership in ordered or unordered classes. I found that group membership on the creative cognitive style scale influenced relationships between creative cognitive style and my indicator of participation in innovation projects. This finding indicates that results from MD-IRTs are valuable for assessing the validity of a scale, because the resulting latent classes help to explain inconsistent findings on consequences of responses in different studies or environments. Other research has examined frame-of-reference effects on the validity of individual personality test scores (Bing et al., 2004; Hunthausen et al., 2003). In such a study, a frame-of-reference is given to test participants (e.g., employees were supposed to think about how they act *at work* when completing the questionnaire, Hunthausen et al., 2003). These studies find that frames-of-reference increase relationships between some personality traits and, for example, supervisory performance ratings (Bing et al., 2004; Hunthausen et al., 2003; Lievens et al., 2008). The present study extends this research by introducing cognitive biases due to prior experience as frames-of-reference. I found that cognitive biases reduce the relationships of the creative cognitive style subscale on participation in innovation projects, which may be interpreted as a reduction in the validity of the scale.

4.5.2 Practical Implications

Several practical implications for the use of the adaption-innovation inventory arise from these analyses. First, practitioners, as well as researchers, should be cautious when using the adaption-innovation inventory with samples of employees. For these individuals, the very content of the subscales may be an integral part of their work role. If this is the case, cognitive schemata may lead to biased responses. My results indicate, however, that the adaption-innovation inventory may be a valid tool to assess cognitive styles within student samples.

Second, I showed that biased responses in the creative cognitive style measure have relevant consequences for the behavior of individuals. Whereas those individuals who show a highly creative cognitive style and no biased response style tend to show increased participation in innovation projects, those individuals who have a biased response style on this scale do

not show this relationship. Therefore, if one uses the questionnaire in organizational settings, it may be worthwhile to investigate whether an individual's response was biased. Only then can an individual's score on the scale be interpreted to be meaningful.

4.5.3 Strengths, Limitations and Directions for Future Research

For future research, it may be worthwhile for researchers to consider similar analyses on other scales frequently used in the literature. Analyses exist for the job descriptive index (Carter et al., 2011), a leadership performance scale (Eid & Rauber, 2000), the state-trait anger expression inventory (Gollwitzer et al., 2005), and the Physical Self-Description Questionnaire (Tietjens, Freund, Büsch, & Strauss, 2012). A drawback is the relatively high number of individual respondents needed for these analyses (Carter et al., 2011). However, the findings from such studies are valuable because they indicate whether a questionnaire is suitable for a certain sample of respondents and what control variables are needed. I especially recommend the use of dependent variables other than response bias in studies using MD-IRTs, in order to clarify the impacts of biased responses on work outcomes.

We recognize that the use of 'participation in innovation projects' as a dependent variable leads to some limitations. First, this variable is not an objective indicator of participation in innovation projects. Second, both independent and dependent variables are assessed by the individual and therefore may suffer from a same-source bias. Future research may therefore seek to replicate and extend these results by using more objective outcome measures compared to this study's measure of participation in innovation projects. Nonetheless, I suggest that the cognitive biases that I found in this study may inform researchers who study frame-of-reference effects on individual test scores (Bing et al., 2004; Hunthausen et al., 2003; Lievens et al., 2008). This study indicates that there may be additional frames-of-reference to the ones studied by these researchers within individuals.

Future research may also address the level-style distinction mentioned in the cognitive-style literature in more detail (Jablokow & Kirton, 2009). Literature on cognitive styles posits that there is a difference between the levels of problem solving (how well a problem is solved) and the cognitive style of problem solving (how the problem is solved). I find an influence of educational level on latent class membership in attentive-to-detail cognitive style, indicating that those with low educational level were more likely to be in the unordered class. I interpret this result to indicate that individuals with low education overemphasize the importance of attentiveness-to-detail. Therefore, educational level seems to influence cognitive

style on this scale. However, future research may use more elaborate measures of level of problem solving, for example, intelligence tests.

Additionally, these results shed light on organizational innovation and the schemata that underlie it. It is frequently recognized that innovation activities need to be carried out collectively, by individuals involved in engineering, production, logistics, marketing, and so on. (Dougherty & Tolboom, 2008). However, in this study, schemata between research and development and marketing and sales employees, as well as managers, seem to be different from other groups in regard to creative cognitive style. These schemata result from shared experience characterized by the work role of individuals. Future research may extend this study to identify exact reasons for the cognitive schemata of employees. Schemata in organizations may be influenced both by emergent and contextual constructs from the organizational literature (Cronin et al., 2011; Klein & Kozlowski, 2000).

Last, although I invested effort in explaining reasons for differential item parameters in my sample, the interpretation of unordered thresholds in latent classes remains to some extent unclear because I found individuals who might have more than one response bias. Therefore, future research on the validity of this questionnaire may include experimental manipulations, for example, by giving specific faking instructions (Shoss & Strube, 2011) or including measures on social desirable responding to employees who have an established cognitive bias through socialization on a job.

4.6 Conclusion

From the research presented in this article, I conclude that cognitive schemata play a role in influencing the responses of individuals to cognitive style measures. Thus, the adaption-innovation inventory by Miron and colleagues (2004) shares some difficulties with earlier versions by Kirton (Chan, 2000). I find latent classes, suggesting the presence of meaningful DIF, and I am able to explain group membership with manifest group variables. These findings indicate a lack of construct validity for the measure with comparisons between groups. Future research may investigate whether these difficulties are common for cognitive style measures in general. However, adding to previous research, I find that the questionnaire

may be best suited for application early in a career, when individuals are not yet biased by their work role related cognitive schemata.

CHAPTER 5

General Discussion

This dissertation was based on the premise that small businesses need to engage in novelty creating activities such, as learning and innovation, in order to remain competitive. In this chapter I will briefly comment on the results from the studies and how they contribute to the literature on entrepreneurial businesses as a working environment. Instead of summating the data from the individual studies I wish to locate the common theme in them. Next, I will highlight some of the theoretical implications that these results offer in the form of a potential organizational change process.

Throughout this dissertation I have highlighted the interactive effects of individuals and their organizations, which subsequently guide individual participation in these novelty creating activities. Therefore, I will emphasize these interactive effects as a common theme, although there may be alternative motifs across the studies. The data emphasizes the importance of considering environmental influences when studying individual behavior, and considering individual processes when studying organizations and groups. In general, there seem to be combinations of individual persons and their environments which lead to increased activity in novelty creating activity.

5.1 General Comments on Results from Studies

In the chapters I investigated the influences of organizational characteristics on individuals in their work places. A first common theme, present through all chapters of the dissertation, is the notion that the behavior of individuals is variable in different contexts. This idea is likely due to individuals appraising the same contexts differently (Mischel, 2004). When looking for explanations of individuals' behavior, this factor should always in mind. More specifically, individuals appear to respond not situations per se, but to varying special characteristics that may be present in these situations. Mischel and Shoda (1995) argued that indi-

viduals respond to an "active ingredient" (Mischel, 2004, p.15) in a context. This concept refers to the facets of a situation that may be most relevant, by significantly altering the meaning of a situation for an individual (Mischel, 2004). I suggest that in all three empirical chapters, there is at least one active ingredient. These are feelings of self-determination, task focus and environmental information for a person on the self.

In Chapter 2, I used self determination theory (Deci & Ryan, 2000) to explore the impact of autonomy on individuals' effectiveness in innovation projects. This theory suggests that interest, enjoyment and inherent satisfaction at work develop if individuals' are empowered to dictate their own behavior, rather than it being determined by others. With relatedness and competence, autonomy is an aspect of self-determination (Ryan & Deci, 2000). Fulfillment of these needs results in "innate psychological nutrients that are essential for ongoing psychological growth, integrity, and well-being" (Deci & Ryan, 2000, p.229). Empirically, autonomy is thus suggested to meet the individuals' need for self-reliant decision making, since employees can choose alternative strategies with which to approach a task, thereby experiencing a direct impact on the eventual outcomes (Den Hartog & Belschak, 2012).

In Chapter 2, I found that individuals in a more autonomous environment overcome small scale barriers to innovation more easily than counterparts in a less autonomous environment. Barriers are situations which make it difficult for employees to translate their motivation into effectiveness (Peters & O'Connor, 1980). Another study conceptualizes such barriers as stressors, which exhaust individuals' energy to engage actively at work (Sonnentag, Mojza, Demerouti, & Bakker, 2012). Therefore they find that fewer barriers translate into higher levels of work engagement (Sonnentag et al., 2012). In Chapter 2, autonomy and low barriers jointly related to high effectiveness of innovation project work. Therefore, I suggest that the active ingredient, which makes autonomy a success factor for innovation projects, is a staff's feelings of self-determination. Mischel (Mischel, 2004) suggests that situational influences, for example of organizational culture, may be formulated as *if… then* relationships. For Chapter 2, an *if… then* relationship could be stated as follows: If individuals may act autonomously, and if barriers are small scale so they can be handled by employees without involving the entrepreneur, then self-determination is enhanced and innovation project efficiency increases.

In Chapter 3, I focused on the motivation of employees to participate in novelty creating activities. I explored individuals' motivation to develop new skills at their workplace. I

used the construct of goal orientations as a motivational construct, which may explain why some individuals learn at work, whereas others are not inclined to (DeShon & Gillespie, 2005). From the data I found that an individual's mastery goal orientation is closely related to their individual capacity for learning at a workplace. Moreover, the relationship was stronger in occurrences when an error management environment (van Dyck, Frese, Baer, & Sonnentag, 2005) was in place. For Chapter 3, I therefore suggest that the active ingredient, which promotes greater learning in mastery oriented individuals, is task focus. Individuals with high task focus appear to see the assignment as an end to itself, instead of being the means to reach another end (Detert, Schroeder, & Mauriel, 2000). Literature suggests that for individuals with a strong task focus, the goal of being productive gains high importance, whereas individuals with a low task focus may see constructing social relationship building as being more important goal than productivity (Detert et al., 2000). When employees want to achieve high performance they may therefore perceive an increased need to gain a deep understanding of the task. Thereby they learn specific, task relevant skills. As such, For Chapter 3, a suitable *if… then…* relationship could be stated as follows: If mastery goal oriented individuals are in an error management culture, then they experience task focus and therefore learn more new skills at work. Additionally, if mastery goal oriented individuals are not in an error management environment, then they learn less new skills [than in an error management culture] unless they are additionally performance prove goal oriented, because performance prove goal orientation also helps employees to focus on tasks.

In Chapter 4, I used the schema concept (Fiske & Linville, 1980; Klein & Loftus, 1993) from social-cognitive theory to explain employees' behavior when responding to a questionnaire, as well as their engagement in innovation projects. The theory suggests that individuals possessing a trait, for example a creative cognitive style, store this information as abstract summary knowledge, whereas individuals who do not possess a trait do not have such knowledge. Klein and colleagues call this view on trait-knowledge retention the abstraction view, and contrast it with a computational view where summary knowledge unavailable and trait self-knowledge is retrieved only through an assessment of specific episodes (Klein, Robertson, Gangi, & Loftus, 2008). I suggest that the use of abstraction or computation make a difference with regards to self-assessment of task-relevant own traits. I suggest that individuals using a computation approach are more exact in judging their own traits than those who

use abstraction because they base their assessment of own traits on recent episodes. Therefore theoretically proposed relationships between traits and related behaviors increase.

In Chapter 4, I hypothesize, in line with the abstraction view, that individuals use abstract summary knowledge to respond to a version of the adaption-innovation inventory. This occurrence not only happens if they possess a trait, but also if they work in an environment that makes them believe they possess such a trait. I suggested that those who only *believe* they possess a trait can be detected from their response pattern on the questionnaire, which I referred to as 'biased'. The cognitive style questionnaire used for these analyses comprises three factors; creative cognitive style, attentiveness-to-detail cognitive style and conformity-with-group/norms cognitive style (Miron, Erez, & Naveh, 2004). Creative cognitive style is particularly thought to relate to engagement in innovation projects. In line with my hypotheses, I found this assertion to be correct, for those responding unbiased to the questionnaire. Therefore, I suggest the active ingredient in the environment, which influences individual responses on a questionnaire and engagement in innovation projects, may be the employees' true sense of their preferred style of work. This is a facet of persons' true sense of the self; a concept with a long tradition in research on external influence upon individuals' cognitions. Individuals early in the history of social psychology were suggested to develop their sense of the self when mirroring social evaluations through others (e.g. Mead & Morris, 2000). Today individuals' reflective mechanisms are seen to be influenced both by the environment and their person (e.g. Deci & Ryan, 1991; Endler & Parker, 1992). Personal influences stem, for example, from genetic predispositions or experience, which can alter the cognitive processes involved in mirroring. In the tension between environmental demands and personal predispositions, an individual's sense of self appears to evolve. Deci and Ryan (1991) suggest, in line with my prediction, that only well-integrated personal values, and regulatory processes, can lead to a true sense of the self which. In turn, this realization increases self-determined action towards desired goals. In contrast, behaviors stemming from nonintegrated processes (e.g. environmental pressures) do not lead to such independent action (Deci & Ryan, 1991).

An *if…then…* relationship for chapter 4 could therefore be stated as follows: If individuals report a creative cognitive style, and if this style is unbiased and really represents their style of work, then they have a true sense of their own cognitive style of working, and they are able to translate this cognitive style into innovation project work.

In sum, I have identified a separate specific active ingredient in each of the three chapters; self-determination, task focus, and a true sense of the self. I suggest that these ingredients are relevant to guide individual behavior towards future oriented activities in entrepreneurial organizations. However, other active ingredients may exist and their identification should therefore be a focus for future research.

A number of additional mechanisms surrounding these interactive effects, of the context and individuals, were found in each of the chapters. In Chapter 2 I found support for the notion that the entrepreneurs' personal initiative plays an important role for employees' efficiency when working in innovation projects. More specifically, I found that their personal intuition has a positive effect which I related to the ways in which highly intuitive individuals work: self-starting, being proactive and overcoming barriers. However, the entrepreneurial orientation facet of risk-taking in decision making counters this positive effect by increasing employees' insecurity within innovation projects. These results can therefore be interpreted as an indication of how personal initiative entrepreneurs should either be involved personally in innovation projects, or introduce more elaborate mechanisms of decision making that can increase feelings of personal control among employees.

In Chapter 3, I found that organizational learning, defined as the shared (additive; Chan, 1998) learning of individuals, links an error management culture to my measure of business success; growth in sales. This relationship has been proposed previously (van Dyck et al., 2005), but not tested empirically. Taking the individual and organizational level results into account, the data highlight the benefits of an error management culture. Additionally, these results suggest that numerous concepts, which have until now been investigated at the organizational level, may have influences at the individual level. In this line of reasoning, I find that positive effects of an error management culture are stronger for those who are also mastery goal vs. (include counter) oriented. These results highlight the necessity to consider context as an influence on the magnitude of individual level relationships between concepts (e.g. Rousseau & Fried, 2001).

In Chapter 4, I found that biased responses on a questionnaire are not only the result of individuals' organizational roles, but that they also impact on their behavior in organizations. When related to a measure of active engagement in innovation projects, those individuals who reported their creative cognitive style in a biased manner did not show the expected positive relationship of the creative cognitive style score with active engagement in innovation pro-

jects. Accordingly, these results may support additional research on contextual influences as biases for questionnaire responses. Previous research in the field has focused on faking and social desirable responding (Shoss & Strube, 2011) or contextual cues (Hunthausen, Truxillo, Bauer, & Hammer, 2003; Lievens, de Corte, & Schollaert, 2008). In Chapter 4, I broaden this view to encompass individuals' prior experience as a reason for any biases.

In summation the data shed light on the complex relationships of entrepreneurs and employees within small entrepreneurial businesses. In these relationships, entrepreneurs try to increase their influence over an organization by acting according to their strategy, or by influencing its culture. Employees will assimilate into such an environment, but only under certain conditions which I will specify in the following paragraphs.

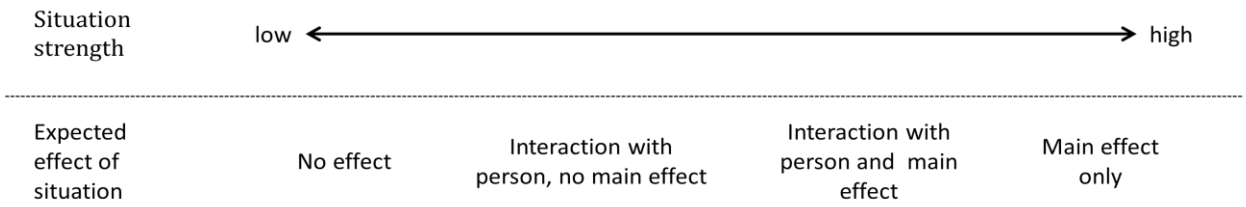
5.2 Implications for Theory

In the comments on my chapters I have centered on active ingredients of situations which can influence the actions of individuals in organizations. In the introduction, I further suggested that context may have direct and indirect influences on individual behavior because it influences the expression of personality traits (Johns, 2006). Additionally, recent literature in the field has discussed influences of strong vs. weak situations at work (Beaty, JR, Cleveland, & Murphy, 2001; Cooper & Withey, 2009; Meyer, Dalal, & Hermida, 2010; Meyer & Dalal, 2009; Meyer, Dalal, & Bonaccio, 2009). The authors suggest that the active ingredients' uniformity of meaning for individuals indicate whether a situation is strong or weak (Mischel & Shoda, 1995). In this chapter I want to clarify some relationships between active ingredients and strong situations.

Typically, strong situations are stable, have established and elaborate behavior controls, and are relatively closed from external influences (Rousseau & Fried, 2001). Situational strength is defined as the "implicit or explicit cues provided by external entities regarding the desirability of potential behaviors" (Meyer et al., 2010), p.122). Strong situations constrain behavioral sovereignty of individuals (Beaty, JR et al., 2001; Cooper & Withey, 2009; Meyer et al., 2010). In contrast, weak situations are new, emergent or dynamic and have few norms to potentially guide individual behavior (Rousseau & Fried, 2001). However, situations are not exclusively strong or weak. Instead most of them fall in-between depending on their salience for individuals (Cooper & Withey, 2009). This view is advocated by Johns (2006) who

sees situations as being "tension systems of opportunities and constraints" (p. 387). They give, to a certain degree, opportunities for organizational behavior by at the same time constraining it. In line with this understanding, I suggest it necessary to specify the active ingredients of a situation in order to determine whether it is a relatively uniform strong (main effect) situation, or a selective strong (interaction effect) situation (see Figure 5).

Figure 5: *An Approach to Categorize Situations of Different Strength According to the Expected Effects They Have For Groups of Individuals*



In Figure 5, different effects of strong situations may be categorized. First, the classic example of a strong situation is a traffic light influencing almost all vehicles on a road to stop if red (cf. Cooper & Withey, 2009). This situation exerts a main effect on the velocity of all vehicles (unless extreme groups, for example ambulances, are studied). In the second category, I expect interactions of a situation with persons and main effects in situations of moderate to high strength. If situations are of sufficient strength then it makes sense to recommend a general change of the situation to those who manage it, because there is an overall effect that happens to be more or less pronounced for certain subgroups. This category resembles the effects of error management culture and autonomy in Chapters 2 and 3. I suggest that other team level predictors for performance, such as psychological safety (Edmondson, 1999) or organizational climate (e.g. Anderson & West, 1996; Zohar & Luria, 2004), may carry similar effects. In the third category, only interaction effects are expected for situations with an overall low to moderate strength. Some individuals find an active ingredient in these situations, whereas others cannot find it or do not categorize it as being meaningful. In general, such situations occur frequently within organizations in case of change initiatives. However, good intentions to change something do not lead to positive results, since they are constrained by the influences of other situation and person variables (Johns, 2006). An example of this situa-

tional type may be found in Chapter 4, where individuals react differently to situational cues from a questionnaire, depending on the occupational role that they have in their business. Other examples include post 9/11 job seekers, only some of which report changes in job attribute preferences, whereas others do not report such changes (Lieb, 2003). A further illustration is the study by Brown (2001), as reported in Chapter 3. Here, a pre-training session did not increase learning for those who are mastery goal oriented since the situation itself was too weak to exert an influence on these individuals. The fourth category therefore evokes no effect because situations pass unnoticed, thus no active ingredients are found.

The call for a greater inclusion of situations into organizational research (Rousseau & Fried, 2001) is not only of theoretical interest, but also has empirical relevance for researchers investigating situational strength (Dumenci, Achenbach, & Windle, 2011). When investigating the effects of situations at hierarchical levels of a group, for example at the level of the group and the level of individuals within the group, situational strength determines where variance in outcomes can likely be found (Cooper & Withey, 2009). For strong situations, most variance resides at the hierarchical level of the situation; reactions of individuals to the situation depend solely on whether the situation is present or absent. As situations become increasingly weak, a greater portion of variance resides at the individual level; reactions of individuals depend on individuals' perceptions of the situation. These considerations have been acknowledged for researchers on selection instruments, where situational forces are suggested to be strong, thus reducing variance in individual responses to them (Paulhus, 2007). Therefore, I suggest that more studies should investigate contextual cues which influence individual level relationships. Over time this may provide us with a better understanding of the active ingredients that make situations strong or weak.

5.3 Implications for Entrepreneurs

I suggest, however, that due to the nature of the entrepreneurial businesses studied in my dissertation, but also the phenomena I chose to investigate, most of the results will apply for situations of medium strength. This becomes obvious for entrepreneurial autonomy and error management cultures, which have both direct and indirect influences on employee behavior. I therefore suggest that entrepreneurial businesses rarely construct particularly strong situations, though I expect that efforts to make situations strong are necessary in high risk

professions, concerning safety related behaviors (see for example Zohar & Luria, 2004). In such situations behavioral variability should reduce and safety procedures should be followed by all members of a group. In line with this reasoning, laws are often suggested to be strong situations, or act as experimental manipulations in psychological experiments (Cooper & Withey, 2009). By contrast I studied the entrepreneurial orientation construct of error management culture, and occupational roles as situational influences on individual behavior, which are not as strong.

However, I do not recommend to entrepreneurs that they should construct environments made up of largely strong situations (unless explicitly related to safety or issues highly central to the organization). Rather, I suggest that entrepreneurs need to develop awareness for the context that they construct for specific employees (Drori & Honig, 2012; Schein, 1996). I especially recommend that, they focus on the active ingredients that can help a particular employee to work better for example a person who is highly creative or has developed skills in a specific area of work. In our interviews with entrepreneurs we were sometimes told stories of employees which, for example, were said to work best if they were independent in their work at least for some time. Here the entrepreneurs discovered specific contexts for single employee. I suggest that entrepreneurs who show interest in single employees may thereby increase the long term success of a business. This may potentially be a specific advantage entrepreneurial businesses have in the competition for skilled employees over larger businesses. Larger organizations may have difficulties to handle the extraordinary needs of single employees.

5.4 Conclusion

This dissertation provides a lens through which novelty creating activities could be improved within entrepreneurial businesses. The data suggest that novelty creating activities are supported by some organizational practices in general, and that these practices have additional individualized effects on specific employees. Furthermore, in Chapter 4 I established an indirect effect of an error management culture on organizational growth in sales via learning, thereby including an important indicator of organizational success into my analyses. Recently, the Economist ("Briefing: European entrepreneurs," 2012) investigated entrepreneurship in Europe. Coming from the suggestion that old firms need to be replaced in an economic sys-

tem, in order to keep it innovative, the Economist sees a lack of entrepreneurship (and especially growth oriented entrepreneurship) in most European countries, including Germany. Aside from regulatory difficulties, it is proposed that European firms generally grow too slowly because of limited innovation. Through this research I provide guidelines through which entrepreneurs could improve their internal business organization and thereby lay the foundation for future growth through learning and innovation. In effect, such improvements could strengthen the role of entrepreneurial firms to provide employment and growth within regional and national economic systems, through increased productivity and innovation (cf. van Praag & Versloot, 2007).

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APPENDIX

A1 USE OF DATA

The data reported in this dissertation were collected as part of a larger data collection (at one o point in time). I want to clarify which variables were used in the three empirical chapters, and which were used in only one chapter. The table below displays where each data variable appears in each study, as well as the current status of each study. I mark control variables (C), independent variables (IV), mediators (M) and dependent variables (DV).

Variables in the Complete Dataset	Chapter 2	Chapter 3	Chapter 4
Individual level			
Occupational role	X (C)	X (C)	X (IV)
Age	X (C)	X (C)	X (C)
Gender	X (C)	X (C)	X (C)
Tenure	X (C)	X (C)	X (C)
Mastery goal orientation		X (IV)	
Performance approach goal orientation		X (IV)	
Personal initiative	X (IV)		
Creative cognitive style			X (IV)
Attentive-to-detail cognitive style			X (IV)
Conformity-with-group/norm cognitive style			X (IV)
Innovation projects engagement			X (DV)
Innovation projects efficiency	X (DV)		
Barriers to innovation	X (IV)		
Learning		X (DV/M)	
Business level			
Number of employees	X (C)	X (C)	
Age of the business	X (C)	X (C)	
Increase in sales 2007-2010		X (DV)	
Personal initiative	X (IV)		
Error management culture		X (IV)	
Entrepreneurial orientation	X (IV)		

A2 SCALE DOCUMENTATION

A2.1 Individual learning

Tang, H. K. 1998. An inventory of organizational innovativeness. Technovation, 19: 41-51.

Skala		M	SD	N	α
Individual learning	Item 1	2.91	0.95	547	0.83
	Item 2	2.59	0.92	547	
	Item 3	2.75	0.91	547	

A2.2 Adaption-Innovation Inventory

Miron, E., Erez, M., & Naveh, E. 2004. Do personal characteristics and cultural values that promote innovation, quality, and efficiency compete or complement each other? Journal of Organizational Behavior, 25(2): 175-199.

Employee dataset

Skala		M	SD	N	α
Conformity-with-group/norm cognitive style	Item 1	2.82	0.95	514	0.53
	Item 2	3.02	0.70	514	
	Item 3	3.33	0.68	514	
	Item 4	1.39	1.18	514	
Skala		M	SD	N	α
Attention-to-detail cognitive style	Item 1	3.27	0.69	542	0.78
	Item 2	3.13	0.77	542	
	Item 3	3.29	0.63	542	
	Item 4	3.01	0.79	542	
Skala		M	SD	N	α
Creative cognitive style	Item 1	2.77	0.80	529	0.79
	Item 2	2.74	0.90	529	
	Item 3	2.81	0.89	529	
	Item 4	2.24	0.97	529	

Entrepreneur dataset

Skala		M	SD	N	α
Conformity-with-group/norm cognitive style	Item 1	2.63	0.79	59	0.68
	Item 2	2.27	0.93	59	
	Item 3	2.83	0.85	59	
	Item 4	1.17	0.99	59	
Skala		M	SD	N	α
Attention-to-detail cognitive style	Item 1	2.90	0.79	61	0.85
	Item 2	2.69	0.96	61	
	Item 3	2.79	0.88	61	
	Item 4	2.38	1.07	61	
Skala		M	SD	N	α
Creative cognitive style	Item 1	3.08	0.89	60	0.81
	Item 2	2.95	1.03	60	
	Item 3	2.93	0.95	60	
	Item 4	2.43	1.14	60	

Student dataset 1

Skala		M	SD	N	α
Conformity-with-group/norm cognitive style	Item 1	2.10	0.98	169	0.33
	Item 2	2.63	0.63	169	
	Item 3	3.07	0.71	169	
	Item 4	1.99	1.10	169	
Skala		M	SD	N	α
Attention-to-detail cognitive style	Item 1	2.59	0.71	169	0.71
	Item 2	2.41	0.93	169	
	Item 3	2.67	0.85	169	
	Item 4	2.59	0.91	169	
Skala		M	SD	N	α
Creative cognitive style	Item 1	2.18	0.81	169	0.66
	Item 2	2.44	0.92	169	
	Item 3	2.20	1.04	169	
	Item 4	2.22	0.88	169	

Student dataset 2

Skala		M	SD	N	α
Conformity-with-group/norm cognitive style	Item 1	2.72	0.93	47	0.31
	Item 2	2.83	0.73	47	
	Item 3	3.13	0.61	47	
	Item 4	1.81	0.77	47	
Skala		M	SD	N	α
Attention-to-detail cognitive style	Item 1	3.04	0.69	47	0.83
	Item 2	2.77	0.79	47	
	Item 3	2.87	0.85	47	
	Item 4	2.57	0.99	47	
Skala		M	SD	N	α
Creative cognitive style	Item 1	2.45	0.88	47	0.88
	Item 2	2.55	0.93	47	
	Item 3	2.21	1.20	47	
	Item 4	2.38	1.03	47	

A2.3 Personal Initiative

Frese, M., Fay, D., Hilburger, T., Leng, K., & Tag, A. 1997. The concept of personal initiative: Operationalization, reliability and validity of two German samples. Journal of Occupational and Organizational Psychology, 70(2): 139-161.

Employee dataset

Skala		M	SD	N	α
Personal Initiative	Item 1	3.18	0.69	526	0.78
	Item 2	3.30	0.71	526	
	Item 3	2.94	0.78	526	
	Item 4	2.55	0.86	526	
	Item 5	2.70	0.80	526	
	Item 6	2.80	0.81	526	
	Item 7	2.70	0.77	526	

Entrepreneur dataset

Skala		M	SD	N	α
	Item 1	3.25	0.68	59	
	Item 2	3.12	0.70	59	
	Item 3	3.17	0.70	59	
Personal Initiative	Item 4	2.73	0.94	59	0.77
	Item 5	2.81	0.84	59	
	Item 6	3.20	0.87	59	
	Item 7	2.71	0.79	59	

A2.4 Goal orientations

Vandewalle, D. 1997. Development and validation of a work domain goal orientation instrument. Educational and Psychological Measurement, 57(6): 995-1015.

German Version:

Heimbeck, D., Frese, M., Sonnentag, S., & Keith, N. 2003. Integrating errors into the training process: The function of error management instructions and the role of goal orientation. Personnel Psychology, 56(2): 333-361.

Employee dataset

Skala		M	SD	N	α
Mastery goal orientation	Item 1	2.71	0.77	528	0.85
	Item 2	3.03	0.77	528	
	Item 3	2.50	0.92	528	
	Item 4	2.37	0.91	528	
	Item 5	2.60	0.81	528	
Skala		M	SD	N	α
Performance approach goal orientation	Item 1	2.71	0.82	518	0.82
	Item 2	1.59	1.08	518	
	Item 3	1.32	1.02	518	
	Item 4	2.37	1.12	518	
	Item 5	1.86	1.12	518	
	Item 6	2.47	1.06	518	
Skala		M	SD	N	α
Performance avoid goal orientation	Item 1	1.19	0.92	527	0.83
	Item 2	1.34	0.99	527	
	Item 3	0.93	1.05	527	
	Item 4	1.10	1.04	527	

A2.5 Innovation Project Work

Self-developed along phases of innovation projects by Farr and colleagues

Farr, J. L., Sin, H.-P., & Tesluk, P. E. 2003. Knowledge management processes and work group innovation. In L. V. Shavinina & L. V. Shavinina (Eds.), The international handbook on innovation: 574-586. New York, NY US: Elsevier Science.

Employee dataset

		M	SD	N	α
Project 1	Item 1	2.12	1.63	431	0.92
	Item 2	2.12	1.61	431	
	Item 3	2.12	1.56	431	
	Item 4	2.61	1.86	431	
		M	SD	N	α
Project 2	Item 1	2.08	1.64	407	0.92
	Item 2	2.04	1.60	407	
	Item 3	2.01	1.57	407	
	Item 4	2.50	1.87	407	
Skala		M	SD	N	α
Project 3	Item 1	2.12	1.60	383	0.94
	Item 2	2.12	1.60	383	
	Item 3	2.10	1.60	383	
	Item 4	2.42	1.82	383	

Entrepreneur dataset

Skala		M	SD	N	α
Project 1	Item 1	4.82	1.58	57	0.87
	Item 2	4.56	1.70	57	
	Item 3	4.61	1.58	57	
	Item 4	3.89	1.87	57	
Skala		M	SD	N	α
Project 2	Item 1	4.58	1.53	57	0.89
	Item 2	4.58	1.57	57	
	Item 3	4.30	1.63	57	
	Item 4	3.88	1.74	57	
Skala		M	SD	N	α
Project 3	Item 1	4.50	1.50	58	0.85
	Item 2	4.24	1.63	58	
	Item 3	4.09	1.75	58	
	Item 4	3.79	1.71	58	

A2.6 Efficiency in Innovation Projects

Self-developed

Employee dataset

Skala		M	SD	N	α
Efficiency in innovation projects	Project 1	4.45	1.40	301	0.53
	Project 2	4.42	1.36	301	
	Project 3	4.43	1.37	301	

Entrepreneur dataset

Skala		M	SD	N	α
Efficiency in innovation projects	Project 1	4.57	1.37	56	0.52
	Project 2	4.84	1.42	56	
	Project 3	4.79	1.42	56	

A2.7 Error Cultures

van Dyck, C., Frese, M., Baer, M., & Sonnentag, S. 2005. Organizational error management culture and its impact on performance: A two-study replication. Journal of Applied Psychology, 90(6): 1228-1240.

Employee dataset

Skala		M	SD	N	α
Error management culture	Item 1	2.60	0.86	510	0.80
	Item 2	2.80	0.83	510	
	Item 3	2.58	0.81	510	
	Item 4	3.02	0.79	510	
	Item 5	3.11	0.73	510	
	Item 6	3.27	0.75	510	
Skala		M	SD	N	α
Error aversion culture	Item 1	1.81	0.99	487	0.83
	Item 2	0.80	0.87	487	
	Item 3	0.71	0.87	487	
	Item 4	0.47	0.74	487	
	Item 5	1.25	1.05	487	
	Item 6	0.75	0.89	487	

A2.8 Organizational Constraits/Barrers to Innovation

Spector, P. E., & Jex, S. M. 1998. Development of four self-report measures of job stressors and strain: Interpersonal Conflict at Work Scale, Organizational Constraints Scale, Quantitative Workload Inventory, and Physical Symptoms Inventory. Journal of Occupational Health Psychology, 3(4): 356-367.

Employee dataset

Skala		M	SD	N	α
Organizational constraints scale	Item 1	2.28	0.97	401	0.88
	Item 2	2.33	1.06	401	
	Item 3	2.46	0.98	401	
	Item 4	2.07	0.88	401	
	Item 5	2.17	1.01	401	
	Item 6	2.18	0.85	401	
	Item 7	2.80	1.07	401	
	Item 8	2.76	1.03	401	
	Item 9	3.07	1.08	401	
	Item 10	2.19	0.91	401	
	Item 11	2.16	0.96	401	

Entrepreneurial orientation

Lumpkin, G. T., Cogliser, C. C., & Schneider, D. R. 2009. Understanding and measuring autonomy: An entrepreneurial orientation perspective. Entrepreneurship: Theory & Practice, 33(1): 47-69.

Entrepreneur dataset

Skala		M	SD	N	α
Autonomy	Item 1	2.04	1.02	57	0.54
	Item 2	3.68	0.87	57	
	Item 3	2.61	0.99	57	
	Item 4	2.74	0.97	57	
	Item 5	3.53	1.00	57	
	Item 6	3.35	0.94	57	
	Item 7	3.68	1.01	57	
	Item 8	3.68	0.91	57	
Skala		M	SD	N	α
Innovativeness	Item 1	2.95	0.97	55	0.76
	Item 2	4.15	0.85	55	
	Item 3	3.60	0.93	55	
	Item 4	3.60	0.78	55	
	Item 5	3.45	0.81	55	
Skala		M	SD	N	α
Proactiveness	Item 1	3.59	0.90	58	0.71
	Item 2	3.50	0.92	58	
	Item 3	3.09	0.98	58	
	Item 4	3.86	0.85	58	
Skala		M	SD	N	α
Risk-taking	Item 1	3.13	0.95	56	0.69
	Item 2	3.05	0.92	56	
	Item 3	3.25	0.79	56	
	Item 4	3.04	0.97	56	

EMPLOYEE QUESTIONNAIRE

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LEUPHANA
UNIVERSITÄT LÜNEBURG

Menschen machen Innovationen
-
Fragebogen zur Erfassung des Innovationsgeschehens in Unternehmen aus Mitarbeiterperspektive

Vielen Dank, dass Sie sich bereit erklärt haben an unserer Befragung im Rahmen des Forschungsprojekts 'Menschen machen Innovationen' an der Leuphana-Universität Lüneburg teilzunehmen. Wir versichern Ihnen, dass sämtliche Angaben vertraulich behandelt werden. Die Ergebnisse werden so berichtet, dass Angaben einzelner Personen nicht identifiziert werden können.

Anleitung

Die folgenden Fragen beziehen sich auf Ihren Arbeitsalltag. Dabei interessieren wir uns besonders für Ihre Mitarbeit in Innovations- und Veränderungsprojekten Ihres Unternehmens.

Ziel des Fragebogens ist eine differenzierte Erfassung einzelner Sachverhalte. Daher kann es passieren, dass Ihnen manchmal Fragen ähnlich vorkommen. Bitte beantworten Sie alle Fragen. Falls Sie eine Frage einmal nicht beantworten können, dann lassen Sie diese bitte aus.
Bitte beantworten Sie die Fragen schnell und ohne lange über die Frage nachzudenken. Wir sind daran interessiert, Ihre unmittelbaren Einschätzungen zu erfahren.

Markieren Sie so: ☒
Korrektur: ■ ☒

Verwenden Sie einen Kugelschreiber, **rote Farbe und Bleistifte unbedingt vermeiden**! Dieser Fragebogen wird maschinell erfasst. Bitte beachten Sie im Interesse einer optimalen Datenerfassung die links gegebenen Hinweise beim Ausfüllen. Vielen Dank!

Zu Beginn bitten wir Sie um persönliche und tätigkeitsbezogene Angaben.

Ihr Geschlecht ☐ w ☐ m

Ihr Alter in Jahren: ☐☐

Wie lange sind Sie schon im Unternehmen tätig (in Jahren)? ☐☐

Wie lange arbeiten Sie schon in Ihrer jetzigen Position (in Jahren)? ☐☐

Sind Sie befristet beschäftigt? ☐ nein ☐ ja

Sind sie finanziell an Ihrem Unternehmen beteiligt? ☐ nein ☐ ja

Haben Sie das Unternehmen (mit-) gegründet? ☐ nein ☐ ja

Welchen höchsten beruflichen Bildungsabschluss haben Sie erworben?

- ☐ Keinen beruflichen Bildungsabschluss
- ☐ Lehre/Berufsausbildung im dualen System
- ☐ Fachschulabschluss
- ☐ Fachhochschulabschluss
- ☐ Hochschulabschluss
- ☐ Promotion

Zu welcher MitarbeiterInnengruppe gehören Sie?

- ☐ Azubi
- ☐ MitarbeiterIn
- ☐ Mittelmanagement
- ☐ Praktikum

In welchem Fachbereich arbeiten Sie in Ihrem Unternehmen? (Sie können mehr als einen Fachbereich auswählen)

- ☐ Produktion
- ☐ Personalwirtschaft
- ☐ Verwaltung
- ☐ Rechnungswesen & Controlling
- ☐ Forschung und Entwicklung
- ☐ Marketing & Vertrieb
- ☐ Logistik & Materialwirtschaft
- ☐ Anderes und zwar

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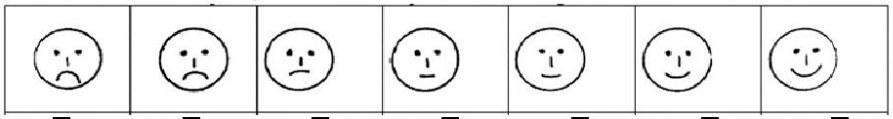
Bewerten Sie bitte in den folgenden Fragen allgemein die Aufgaben Ihrer Arbeit und die Arbeitsbedingungen.
Bitte kreuzen Sie das Feld an, das Ihrer spontanen Meinung nach am ehesten zutrifft. Versuchen Sie, die Fragen schnell und ohne viel Nachdenken zu beantworten.

	trifft gar nicht zu	trifft wenig zu	teils teils	trifft über-wiegend zu	trifft völlig zu
Meine Arbeit ist mir sehr wichtig.	☐	☐	☐	☐	☐
Ich kann weitgehend selbst bestimmen, wie ich meine Arbeitsaufgaben erledige.	☐	☐	☐	☐	☐
Ich besitze die Fähigkeiten, um meine Arbeitsaufgaben erfolgreich zu erfüllen.	☐	☐	☐	☐	☐
Durch meine Arbeitstätigkeit erwerbe ich viel neues Wissen und neue Kompetenzen.	☐	☐	☐	☐	☐
Meine Arbeit besitzt eine große Bedeutung für mich.	☐	☐	☐	☐	☐
Bei der Gestaltung meiner Arbeit besitze ich viele Freiheiten.	☐	☐	☐	☐	☐
Ich bekomme oft herausfordernde und anspruchsvolle Aufgaben übertragen.	☐	☐	☐	☐	☐
Ich habe Gestaltungsmöglichkeiten bezüglich der Vorgänge in meiner Abteilung.	☐	☐	☐	☐	☐
Meine Arbeit ist anregend und herausfordernd.	☐	☐	☐	☐	☐
Ich habe großen Einfluss auf das, was in meiner Abteilung geschieht.	☐	☐	☐	☐	☐
Ich beherrsche die Fertigkeiten, die ich für meine Arbeit benötige.	☐	☐	☐	☐	☐
Meine Arbeitstätigkeiten sind einfach zu bewältigen und sie wiederholen sich kurzfristig.	☐	☐	☐	☐	☐
Bei der Durchführung meiner Arbeitstätigkeiten kann ich feststellen, wie gut ich arbeite.	☐	☐	☐	☐	☐
Insgesamt betrachtet ist meine Arbeit nicht sehr wichtig und bedeutsam.	☐	☐	☐	☐	☐
Meine Arbeit ist so gestaltet, dass ich **nicht** die Möglichkeit habe, ein vollständiges Arbeitsprodukt von Anfang bis Ende herzustellen oder zu bearbeiten.	☐	☐	☐	☐	☐
Meine Arbeit gibt mir beträchtliche Gelegenheit, selbst zu entscheiden, wie ich dabei vorgehe.	☐	☐	☐	☐	☐
Ich habe keine Möglichkeit, persönliche Initiative und Eigenständigkeit bei meiner Arbeit einzubringen.	☐	☐	☐	☐	☐
Meine Arbeitstätigkeit selbst gibt keine Hinweise darauf, ob man die Arbeit gut oder schlecht macht.	☐	☐	☐	☐	☐
Wenn maßgebliche Veränderungen der Unternehmensziele erfolgen, sind sie mir bekannt.	☐	☐	☐	☐	☐
Bei meiner Arbeit orientiere ich mich an den Unternehmenszielen.	☐	☐	☐	☐	☐
Ich stehe häufig unter Zeitdruck.	☐	☐	☐	☐	☐
Ich habe zu viel Arbeit.	☐	☐	☐	☐	☐
Meine Arbeit verlangt von mir den Einsatz verschiedener Fähigkeiten mit hohen Anforderungen.	☐	☐	☐	☐	☐
Meine Arbeit gibt mir die Möglichkeit, eine angefangene Aufgabe auch zu Ende zu führen.	☐	☐	☐	☐	☐
Die Art und Weise, wie gut ich meine Arbeit mache, beeinflusst viele Leute.	☐	☐	☐	☐	☐

Wie zufrieden sind Sie insgesamt mit Ihrer Arbeit? (Bitte setzen Sie Ihr Kreuz in die Kästchen unter den Gesichtern)



☐ ☐ ☐ ☐ ☐ ☐ ☐

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Auf dieser Seite des Fragebogens möchten wir von Ihnen eine Einschätzung Ihrer Herangehensweise an neue Aufgaben in Ihrem Beruf erhalten.

	trifft gar nicht zu	trifft wenig zu	teils teils	trifft über-wiegend zu	trifft völlig zu
Ich versuche mich meinen KollegInnen im Allgemeinen nicht entgegen zu stellen.	☐	☐	☐	☐	☐
Ich passe mich an Systemanforderungen im Allgemeinen an.	☐	☐	☐	☐	☐
Ich halte mich an allgemein akzeptierte Regeln meiner Arbeit.	☐	☐	☐	☐	☐
Ich vermeide es, zeitsparende Abkürzungen bei der Arbeit zu nehmen.	☐	☐	☐	☐	☐
Ich bin gründlich beim Lösen von Problemen.	☐	☐	☐	☐	☐
Ich gehe auch kleine Details an, die zur Ausführung von Aufgaben notwendig sind.	☐	☐	☐	☐	☐
Ich führe Aufgaben präzise aus, auch über einen längeren Zeitraum hinweg.	☐	☐	☐	☐	☐
Ich bin gut für Aufgaben, die eine Beschäftigung mit Details erfordern, geeignet.	☐	☐	☐	☐	☐
Ich bin innovativ.	☐	☐	☐	☐	☐
Ich habe viele kreative Ideen.	☐	☐	☐	☐	☐
Ich mag am liebsten Aufgaben, bei denen ich kreativ denken kann.	☐	☐	☐	☐	☐
Ich mache Dinge lieber auf originelle Art und Weise.	☐	☐	☐	☐	☐
Ich würde mich als jemanden beschreiben, der in neuen Situationen aktiv so viele Informationen sucht, wie er nur finden kann.	☐	☐	☐	☐	☐
Wenn ich an einer Aktivität teilnehme, gehe ich häufig so darin auf, dass ich jedes Zeitgefühl verliere.	☐	☐	☐	☐	☐
Ich suche immer wieder nach neuen Möglichkeiten, um mich als Person weiterzuentwickeln.	☐	☐	☐	☐	☐
Ich bin jemand, der sich tief in unbekannte Situationen hineinversetzt.	☐	☐	☐	☐	☐
Wenn ich mich für etwas interessiere, dann braucht es schon etwas, um mich dabei zu unterbrechen.	☐	☐	☐	☐	☐
Meine Freunde würden mich als jemanden beschreiben, der voll bei der Sache ist, wenn er eine Aufgabe übernommen hat.	☐	☐	☐	☐	☐
Wo immer ich hingehe, suche ich nach neuen Eindrücken oder Erlebnissen.	☐	☐	☐	☐	☐
Ich bin mir sicher, dass ich neue und passende Ideen finden kann.	☐	☐	☐	☐	☐
Ich bin mir gewiss, ich kann angemessen mit unerwarteten Situationen umgehen.	☐	☐	☐	☐	☐
Dank meines Einfallsreichtums kann ich kreative Ergebnisse herbeiführen.	☐	☐	☐	☐	☐
Wann immer ich einem Problem gegenüberstehe probiere ich verschiedene Lösungswege aus.	☐	☐	☐	☐	☐
Ich kann unabhängig denken und muss nicht wiederholen, was andere bereits gesagt haben.	☐	☐	☐	☐	☐
Ich gehe Probleme aktiv an.	☐	☐	☐	☐	☐
Wenn etwas schief geht, suche ich sofort nach Abhilfe.	☐	☐	☐	☐	☐
Wenn sich Möglichkeiten anbieten, etwas zu gestalten, dann nutze ich diese.	☐	☐	☐	☐	☐
Ich ergreife sofort die Initiative, wenn andere dies nicht tun.	☐	☐	☐	☐	☐
Ich nehme Gelegenheiten schnell wahr, um meine Ziele zu erreichen.	☐	☐	☐	☐	☐
Ich tue meist mehr als von mir gefordert wird.	☐	☐	☐	☐	☐
Ich bin besonders gut darin, Ideen umzusetzen.	☐	☐	☐	☐	☐
Ich ziehe es vor, in einer Umgebung zu arbeiten, die viel von mir verlangt.	☐	☐	☐	☐	☐
Ich mag anspruchsvolle und schwierige Aufgaben in meiner Arbeit, bei denen ich neue Fertigkeiten lerne.	☐	☐	☐	☐	☐
Mein Leistungsvermögen weiterzuentwickeln, ist für mich so wichtig, dass ich dafür auch mal etwas riskiere.	☐	☐	☐	☐	☐

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	trifft gar nicht zu	trifft wenig zu	teils teils	trifft über-wiegend zu	trifft völlig zu
Ich suche regelrecht nach Gelegenheiten, um neue Fertigkeiten und Kenntnisse entwickeln zu können.	☐	☐	☐	☐	☐
Ich suche mir gerne anspruchsvolle Aufgaben aus, so dass ich viel lernen kann.	☐	☐	☐	☐	☐
Ich arbeite lieber bei solchen Projekten mit, bei denen ich meine Fähigkeiten unter Beweis stellen kann.	☐	☐	☐	☐	☐
Für mich ist es wichtig, dass ich bessere Leistungen zeigen kann, als meine Kollegen.	☐	☐	☐	☐	☐
Ich versuche herauszufinden, was ich tun muss, um anderen meine Fähigkeiten zu beweisen.	☐	☐	☐	☐	☐
Ich mag es, wenn Kollegen merken, wie gut ich arbeite.	☐	☐	☐	☐	☐
Ich beschäftige mich am liebsten mit Aufgaben, bei denen ich zeigen kann, wie gut ich bin.	☐	☐	☐	☐	☐
Mir ist es wichtig, dass andere mich für fähig halten.	☐	☐	☐	☐	☐
Neue Aufgaben, bei denen ich möglicherweise unfähig wirken könnte, würde ich lieber nicht angehen.	☐	☐	☐	☐	☐
Am liebsten vermeide ich solche Situationen, wo meine Leistung möglicherweise nicht so gut ist.	☐	☐	☐	☐	☐
Es ist mir wichtiger, nicht als dumm da zu stehen, als etwas Neues zu lernen.	☐	☐	☐	☐	☐
Aufgaben, bei denen ich dumm aussehen könnte, würde ich nur ungern annehmen.	☐	☐	☐	☐	☐
Ich wäre sehr froh, mein weiteres Arbeitsleben in diesem Unternehmen verbringen zu können.	☐	☐	☐	☐	☐
Ich bin stolz darauf diesem Unternehmen anzugehören.	☐	☐	☐	☐	☐
Ich fühle mich emotional nicht sonderlich mit diesem Unternehmen verbunden.	☐	☐	☐	☐	☐
Ich empfinde ein starkes Gefühl der Zugehörigkeit zu meinem Unternehmen.	☐	☐	☐	☐	☐
Ich denke, dass meine Wertvorstellungen zu denen des Unternehmens passen.	☐	☐	☐	☐	☐
Ich habe Vertrauen in dieses Unternehmen.	☐	☐	☐	☐	☐

Aus welchen Quellen schöpfen Sie Anregungen wenn Sie eigene Ideen haben?

	nie ←				→ sehr häufig
	1	2	3	4	5
KollegInnen	☐	☐	☐	☐	☐
BeraterInnen	☐	☐	☐	☐	☐
Freunde & Familie	☐	☐	☐	☐	☐
Kunden	☐	☐	☐	☐	☐
Lieferanten	☐	☐	☐	☐	☐
Allein aus mir selbst	☐	☐	☐	☐	☐
Zeitungen, Zeitschriften, Medien	☐	☐	☐	☐	☐
Messen/Ausstellungen	☐	☐	☐	☐	☐
Universitäten/Forschungseinrichtungen	☐	☐	☐	☐	☐
Sonstige und zwar:					
☐	☐	☐	☐	☐	☐

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In diesem Teil folgen einige Aussagen, die Führungshandeln beschreiben. Jede dieser Aussagen beschreibt dabei ein bestimmtes Verhalten. Lesen Sie sich diese bitte durch. Überlegen Sie, ob Ihr **direkter** Vorgesetzter/Ihre Vorgesetzte dieses Verhalten
1 = nie; 2=selten; 3=manchmal; 4=oft oder 5=immer
zeigt.
Wer ist in Ihrem Umfeld Ihre direkte Führungskraft?

☐ Unternehmensinhaber ☐ Unternehmensleiter (nicht Inhaber) ☐ mittlere Manager

Die Führungskraft, die ich einschätze...	**nie**	**selten**	**manchmal**	**oft**	**immer**
hat mir neue Wege gezeigt, an Dinge heranzugehen, die für mich vorher unverständlich waren.	☐	☐	☐	☐	☐
ist ständig auf der Suche nach neuen Möglichkeiten für unsere Abteilung/ unser Unternehmen.	☐	☐	☐	☐	☐
hat Ideen, die mich dazu gebracht haben, einige meiner eigenen Gedanken zu überdenken, die ich vorher nicht in Frage gestellt habe.	☐	☐	☐	☐	☐
zeichnet ein interessantes Bild der Zukunft unserer Arbeitsgruppe.	☐	☐	☐	☐	☐
zeigt offen, dass Sie viel von uns erwartet.	☐	☐	☐	☐	☐
gibt mir eine positive Rückmeldung, wenn ich eine gute Leistung erbringe.	☐	☐	☐	☐	☐
pflegt die Zusammenarbeit zwischen Arbeitsgruppen.	☐	☐	☐	☐	☐
handelt, ohne meine Gefühle zu beachten.	☐	☐	☐	☐	☐
ermutigt ihre MitarbeiterInnen dazu, "team player" zu sein (d.h. gruppenorientiert zu arbeiten).	☐	☐	☐	☐	☐
führt eher durch "Taten" denn durch "Anweisungen".	☐	☐	☐	☐	☐
bringt uns dazu gemeinsam für ein Ziel zu arbeiten.	☐	☐	☐	☐	☐
hat ein klares Verständnis dafür, wo wir uns hinbewegen wollen.	☐	☐	☐	☐	☐
zeigt Respekt für meine persönlichen Gefühle.	☐	☐	☐	☐	☐
hat mich dazu angeregt, alte Probleme auf eine neue Art und Weise zu denken.	☐	☐	☐	☐	☐
erkennt gute Leistungen selten an.	☐	☐	☐	☐	☐
handelt auf eine Art und Weise, die meine persönlichen Gefühle berücksichtigt.	☐	☐	☐	☐	☐
entwickelt ein Wir-Gefühl und Teamgeist bei unseren MitarbeiternInnen.	☐	☐	☐	☐	☐
inspiriert durch ihre Pläne für die Zukunft.	☐	☐	☐	☐	☐
lobt mich, wenn meine Arbeit besser ist als das Mittelmaß.	☐	☐	☐	☐	☐
besteht auf Höchstleistungen.	☐	☐	☐	☐	☐
schafft es, uns von ihren Ideen über die Zukunft zu überzeugen.	☐	☐	☐	☐	☐
ist ein gutes Vorbild, dem man leicht folgen kann.	☐	☐	☐	☐	☐
behandelt mich ohne auf meine persönlichen Gefühle Rücksicht zu nehmen.	☐	☐	☐	☐	☐
wird sich mit dem Zweitbesten nicht zufrieden geben.	☐	☐	☐	☐	☐
führt durch beispielhaftes Verhalten.	☐	☐	☐	☐	☐
beglückwünscht mich persönlich, wenn ich herausragende Arbeit leiste.	☐	☐	☐	☐	☐

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Mit der Unternehmensleitung haben wir folgende Liste von 3 (größeren) Innovations- und Veränderungsvorhaben erstellt, die im letzten Jahr in Ihrem Unternehmen realisiert wurden. **Bitte geben Sie im Folgenden Ihre Beteiligung und Ihre Bewertung der Ergebnisse dieser Projekte an.**

Idealtypisch lässt sich ein Innovationsprozess in vier unterschiedliche Phasen unterteilen, die manchmal gleichzeitig, manchmal nacheinander ablaufen. Im Folgenden stellen wir Ihnen diese vier Phasen kurz vor.

Kreativität

1. Problem-/Chancen-Identifikation: Erkennen des Problems oder Erkennen von Chancen

2. Ideen Generierung: Sammeln von neuen Lösungsansätzen und Ideen.

Implementierung

3. Evaluation und Auswahl: Bewertung von Lösungsansätzen und Auswahl einer Vorgehensweise

4. Umsetzung des Lösungsansatzes: Handlungen, um das Problem zu lösen z.B.: Ziele setzten, Handeln und Zielerreichung bewerten.

PROJEKT 1

Die Innovation imitiert die Lösungen anderer Unternehmen. ☐

Die Innovation betrifft ein Produkt/eine Dienstleistung, die für den speziellen Markt substantiell weiterentwickelt wurde. ☐

Die Innovation ist ganz und gar neu auf unserem Markt. ☐

Die Innovation ist ganz und gar neu auf der Welt. ☐

Schätzen Sie die Qualität der Zusammenarbeit in diesem Projekt zusammenfassend ein.

sehr schlecht 1	2	3	4	5	6	sehr gut 7	kann ich nicht beurteilen
☐	☐	☐	☐	☐	☐	☐	☐

In welcher der Phasen waren Sie in welcher Intensität beteiligt?

	keine Beteiligung ←					→ intensive Beteiligung
Problem/Chancen-Identifikation	☐	☐	☐	☐	☐	☐
Ideen Generierung	☐	☐	☐	☐	☐	☐
Evaluation & Auswahl	☐	☐	☐	☐	☐	☐
Umsetzung des Lösungsansatzes	☐	☐	☐	☐	☐	☐

In Projekt 1 haben wir:

viel weniger erreicht als erwartet 1	2	ungefähr erreicht was zu erwarten war 3	4	5	6	viel mehr erreicht als erwartet 7
☐	☐	☐	☐	☐	☐	☐

PROJEKT 2

Die Innovation imitiert die Lösungen anderer Unternehmen. ☐

Die Innovation betrifft ein Produkt/eine Dienstleistung, die für den speziellen Markt substantiell weiterentwickelt wurde. ☐

Die Innovation ist ganz und gar neu auf unserem Markt. ☐

Die Innovation ist ganz und gar neu auf der Welt. ☐

Schätzen Sie die Qualität der Zusammenarbeit in diesem Projekt zusammenfassend ein.

sehr schlecht 1	2	3	4	5	6	sehr gut 7	kann ich nicht beurteilen
☐	☐	☐	☐	☐	☐	☐	☐

In welcher der Phasen waren Sie in welcher Intensität beteiligt?

	keine Beteiligung ←					→ intensive Beteiligung
Problemidentifizierung	☐	☐	☐	☐	☐	☐
Ideen Generierung	☐	☐	☐	☐	☐	☐
Evaluation & Auswahl	☐	☐	☐	☐	☐	☐
Anwendung des Lösungsansatzes	☐	☐	☐	☐	☐	☐

In Projekt 2 haben wir:

viel weniger erreicht als erwartet 1	2	ungefähr erreicht was zu erwarten war 3	4	5	6	viel mehr erreicht als erwartet 7
☐	☐	☐	☐	☐	☐	☐

PROJEKT 3

Die Innovation imitiert die Lösungen anderer Unternehmen. ☐

Die Innovation betrifft ein Produkt/eine Dienstleistung, die für den speziellen Markt substantiell weiterentwickelt wurde. ☐

Die Innovation ist ganz und gar neu auf unserem Markt. ☐

Die Innovation ist ganz und gar neu auf der Welt. ☐

Schätzen Sie die Qualität der Zusammenarbeit in diesem Projekt zusammenfassend ein.

sehr schlecht 1	2	3	4	5	6	sehr gut 7	kann ich nicht beurteilen
☐	☐	☐	☐	☐	☐	☐	☐

In welcher der Phasen waren Sie in welcher Intensität beteiligt?

	keine Beteiligung ←					→ intensive Beteiligung
Problemidentifizierung	☐	☐	☐	☐	☐	☐
Ideen Generierung	☐	☐	☐	☐	☐	☐
Evaluation & Auswahl	☐	☐	☐	☐	☐	☐
Anwendung des Lösungsansatzes	☐	☐	☐	☐	☐	☐

In Projekt 3 haben wir:

viel weniger erreicht als erwartet 1	2	ungefähr erreicht was zu erwarten war 3	4	5	6	viel mehr erreicht als erwartet 7
☐	☐	☐	☐	☐	☐	☐

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Die folgenden Fragen beziehen sich auf Ihre Arbeit in Innovationsprojekten im Allgemeinen.

	trifft gar nicht zu	trifft wenig	teils teils	trifft überwiegend zu	trifft völlig zu
Unser Unternehmen betont die Bedeutung von Innovationen für den Unternehmenserfolg.	☐	☐	☐	☐	☐
Wir leben die (schriftlichen oder impliziten) Zukunftsvorstellungen unseres Unternehmens.	☐	☐	☐	☐	☐
Innovationsprojekte haben bei uns eine klare Zielsetzung und klare Arbeitspläne.	☐	☐	☐	☐	☐
Projekte werden auf ihren Fortschritt geprüft.	☐	☐	☐	☐	☐
Am Ende jedes Projekts wird geprüft, was gut und was schlecht gelaufen ist.	☐	☐	☐	☐	☐
Innovative Ideen durchlaufen einen formalen Auswahlprozess.	☐	☐	☐	☐	☐
Ich erhalte die notwendigen Ressourcen, um neue Ideen zu verfolgen.	☐	☐	☐	☐	☐
Ich habe ausreichend Zeit, um über kreative Problemlösungen nachzudenken.	☐	☐	☐	☐	☐
Ich bekomme die Informationen, die ich für meine Arbeit an neuen Ideen benötige.	☐	☐	☐	☐	☐
Radikale Innovationsprojekte sind in unserem Unternehmen sehr angesehen.	☐	☐	☐	☐	☐
Bei meiner Arbeit habe ich viel Kontakt mit Kunden.	☐	☐	☐	☐	☐
Ich besuche Konferenzen, Messen und Ausstellungen.	☐	☐	☐	☐	☐
Ich bin in regem Austausch mit Mitarbeitern anderer Unternehmen aus unserer Branche.	☐	☐	☐	☐	☐
Ich habe Kontakt zu Mitarbeitern aus wissenschaftlichen Institutionen wie zum Beispiel Universitäten oder Fachhochschulen.	☐	☐	☐	☐	☐
Unser Unternehmen ist stark in der regionalen Wirtschaft vernetzt.	☐	☐	☐	☐	☐
Wir fühlen uns als Mitarbeiter dieses Unternehmens der Region verpflichtet.	☐	☐	☐	☐	☐
Wir stehen hauptsächlich in Konkurrenz mit anderen lokalen Unternehmen.	☐	☐	☐	☐	☐
Es gibt hier in unserem Umfeld zahlreiche Unternehmen, mit denen wir uns fachlich austauschen können.	☐	☐	☐	☐	☐
Wir werden bei der Entwicklung neuer Ideen prompt und bereitwillig unterstützt.	☐	☐	☐	☐	☐
Das Unternehmen ist Veränderungen gegenüber aufgeschlossen und empfänglich.	☐	☐	☐	☐	☐
Die Personen im Unternehmen suchen ständig nach neuen Wegen, mit Problemen umzugehen.	☐	☐	☐	☐	☐
Das Unternehmen sucht ständig nach neuen Lösungswegen.	☐	☐	☐	☐	☐
KollegInnen teilen Ressourcen bereitwillig, um bei der Realisierung neuer Ideen zu helfen.	☐	☐	☐	☐	☐
In unserem Unternehmen nehmen wir uns die Zeit, die wir brauchen, um neue Ideen zu entwickeln.	☐	☐	☐	☐	☐
Personen im Unternehmen arbeiten zusammen, um neue Ideen zu entwickeln und zu verwirklichen.	☐	☐	☐	☐	☐
KollegInnen geben praktische Unterstützung für neue Ideen und deren Umsetzung.	☐	☐	☐	☐	☐

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	trifft gar nicht zu	trifft wenig	teils teils	trifft über-wiegend zu	trifft völlig zu
Meinen KollegInnen ist es ein echtes Anliegen, dass das Unternehmen den höchstmöglichen Leistungsstandard erreicht.	☐	☐	☐	☐	☐
Unser Unternehmen ist bereit, die Grundlagen des eigenen Vorgehens in Frage zu stellen.	☐	☐	☐	☐	☐
In meinem Unternehmen ist man bereit, die eigene Arbeit kritisch zu hinterfragen, um immer besser zu werden.	☐	☐	☐	☐	☐
In unserem Unternehmen baut man gegenseitig auf den Ideen Anderer auf, um bestmögliche Ergebnisse zu erzielen.	☐	☐	☐	☐	☐
Ich bin mir über die Ziele meines Unternehmens im Klaren.	☐	☐	☐	☐	☐
Ich halte die Ziele meines Unternehmens für nützlich und angemessen.	☐	☐	☐	☐	☐
Ich persönlich stimme mit den Zielen meines Unternehmens überein.	☐	☐	☐	☐	☐
Ich denke, dass meine KollegInnen mit den Zielen des Unternehmens übereinstimmen.	☐	☐	☐	☐	☐
Es gibt im Unternehmen ein echtes Bemühen, Informationen innerhalb des ganzen Unternehmens zu teilen.	☐	☐	☐	☐	☐
Wir stehen im Unternehmen in intensivem Austausch.	☐	☐	☐	☐	☐
Wir halten im Unternehmen zusammen.	☐	☐	☐	☐	☐
MitarbeiterInnen fühlen sich im Unternehmen akzeptiert und verstanden.	☐	☐	☐	☐	☐
Bei uns wird jede Ansicht angehört, auch wenn sie die Meinung einer Minderheit ist.	☐	☐	☐	☐	☐
Wenn man in unserem Unternehmen einen Fehler macht, dann erzählt man es anderen, damit die nicht denselben Fehler wiederholen.	☐	☐	☐	☐	☐
Wenn in unserem Unternehmen ein Fehler passiert, wird überlegt, wie es dazu kam.	☐	☐	☐	☐	☐
Wenn in der Arbeit etwas nicht klappt, dann nimmt man sich die Zeit, darüber nachzudenken.	☐	☐	☐	☐	☐
Wenn man bei einem Fehler nicht mehr weiter weiß, kann man sich auf die anderen verlassen.	☐	☐	☐	☐	☐
Wenn man etwas falsch gemacht hat, dann fragt man andere um Rat, wie man es besser machen könnte.	☐	☐	☐	☐	☐
Fehler zeigen uns, was man besser machen kann.	☐	☐	☐	☐	☐
In diesem Unternehmen empfinden es die Leute als belastend, wenn sie einen Fehler machen.	☐	☐	☐	☐	☐
Unser Motto ist: "Warum soll man einen Fehler zugeben, wenn er niemandem auffällt."	☐	☐	☐	☐	☐
In diesem Unternehmen haben die Leute nur Nachteile, wenn sie ihre Fehler zugeben.	☐	☐	☐	☐	☐
In diesem Unternehmen ist es besser, Fehler zu vertuschen.	☐	☐	☐	☐	☐
Viele Leute in diesem Unternehmen haben Angst davor, Fehler zu machen.	☐	☐	☐	☐	☐
In unserem Unternehmen fällt es schwer, Andere um Hilfe zu bitten.	☐	☐	☐	☐	☐

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	trifft gar nicht zu	trifft wenig zu	teils teils	trifft über-wiegend zu	trifft völlig zu
Unser Unternehmen schaut mehr auf sich selbst als dass es sich mit dem Wettbewerb auseinandersetzt.	☐	☐	☐	☐	☐
Kundenwünsche werden hier nicht mit höchster Priorität behandelt.	☐	☐	☐	☐	☐
Wir diskutieren oft über Methoden und Prozesse, die wir in unserem Unternehmen einsetzen.	☐	☐	☐	☐	☐
In diesem Unternehmen wird sich die Zeit genommen, Unternehmensziele zu überprüfen.	☐	☐	☐	☐	☐
Es gibt regelmäßig Besprechungen über die Verbesserung der Effektivität der Zusammenarbeit in unserem Unternehmen.	☐	☐	☐	☐	☐
Der ökonomische Erfolg unseres Unternehmens ist schwer vorhersagbar.	☐	☐	☐	☐	☐
Es existiert eine große Ungewissheit über die Zukunftsaussichten unseres Unternehmens.	☐	☐	☐	☐	☐
Die Nachfrage für die Produkte oder Dienstleistungen unseres Unternehmens ist schwer vorauszusagen.	☐	☐	☐	☐	☐
Unser Unternehmen wird in einem hohen Maß mit Veränderungen und Unsicherheiten konfrontiert.	☐	☐	☐	☐	☐
Die Umwelt unseres Unternehmens ist relativ stabil.	☐	☐	☐	☐	☐

Bitte bewerten Sie nun Ihr Unternehmen bezüglich seiner Kompetenzen und Herangehensweisen:

Die Kompetenzen Ihres Unternehmens:	**weitaus schlechter als andere Unternehmen unserer Branche**					**etwa auf Augenhöhe mit anderen Unternehmen unserer Branche**				**weitaus besser als andere Unternehmen unserer Branche**
	1	2	3	4	5	6	7	8	9	10
Forschung und Entwicklung	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Produkt-/Dienstleistungs-Technologie	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Entwicklung neuer Leistungsangebote	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Geschwindigkeit, neue Leistungsangebote auf den Markt zu bringen	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Kontinuierliche Prozessverbesserung	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Wissen über die Wünsche der Kunden	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Kostenoptimierung	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Branchenkenntnisse	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Qualität der Leistungsangebote	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Qualität der Prozesse	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Qualität des Marketing	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Qualität der Administration	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Weitergabe von betrieblichem Wissen im Unternehmen.	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

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Im letzten Teil des Fragebogens geht es um Probleme oder Hindernisse, die Sie bei Innovations- und Veränderungs-Vorhaben an Ihrem Arbeitsplatz erlebt haben.

	gar nicht	selten	manch-mal	häufig	immer
Inwieweit konnten Sie Ihre Sichtweisen und Empfindungen während der Innovationsvorhaben einbringen?	☐	☐	☐	☐	☐
Inwieweit hatten Sie Einfluss auf die durch Innovationsvorhaben bewirkten Veränderungen?	☐	☐	☐	☐	☐
Inwieweit basierten die Innovationsvorhaben auf zutreffenden Informationen?	☐	☐	☐	☐	☐
Inwieweit war es Ihnen möglich, gegen die durch die Innovationsvorhaben erzielten Ergebnisse (z.B. Innovation, Prozessveränderung) Widerspruch einzulegen?	☐	☐	☐	☐	☐
Inwieweit entsprechen die Gegenleistungen des Unternehmens dem Aufwand, den Sie in die Innovationsprojekte gesteckt haben?	☐	☐	☐	☐	☐
Inwieweit ist die Anerkennung im Unternehmen angemessen für die Arbeit, die Sie in Innovationsprojekten geleistet haben?	☐	☐	☐	☐	☐

Die folgenden Fragen beziehen sich auf die Personen, die die Innovationsvorhaben anleiteten:

Inwieweit sind Sie höflich behandelt worden?	☐	☐	☐	☐	☐
Inwieweit sind Sie mit Respekt behandelt worden?	☐	☐	☐	☐	☐
Inwieweit wurden die Ausgangslage/die Ziele des Vorhabens gründlich erklärt?	☐	☐	☐	☐	☐
Inwieweit waren Erklärungen zu den Vorhaben nachvollziehbar?	☐	☐	☐	☐	☐
Inwieweit wurden Sie rechtzeitig informiert?	☐	☐	☐	☐	☐
Inwieweit waren Erklärungen auf Ihre persönlichen Bedürfnisse zugeschnitten?	☐	☐	☐	☐	☐

Wie häufig fanden Sie Ihre Arbeit in Innovationsprojekten schwierig oder unmöglich zu tun aufgrund von... (Bitte kreuzen Sie auch hier die Antworten an, die Ihrer Meinung nach am ehesten zutreffen)

	nie 1	2	3	4	sehr häufig 5
1. qualitativ ungeeignetem Equipment oder Material.	☐	☐	☐	☐	☐
2. organisationalen Regeln oder Prozeduren.	☐	☐	☐	☐	☐
3. Ihren Mitarbeitern.	☐	☐	☐	☐	☐
4. Ihrem Vorgesetzten.	☐	☐	☐	☐	☐
5. dem Fehlen von Equipment oder Material.	☐	☐	☐	☐	☐
6. ungenügender Qualifikation.	☐	☐	☐	☐	☐
7. Unterbrechungen durch Andere.	☐	☐	☐	☐	☐
8. dem Fehlen wichtiger Informationen darüber, was und wann etwas zu tun ist.	☐	☐	☐	☐	☐
9. in Konflikt stehenden anderen Arbeitsaufgaben.	☐	☐	☐	☐	☐
10. ungenügender Hilfe von Anderen.	☐	☐	☐	☐	☐
11. falschen Anleitungen oder falschen Instruktionen.	☐	☐	☐	☐	☐

Wenn Sie nun an **gescheiterte oder wenig erfolgreiche** Innovationsprojekte denken: Welche von den oben genannten Störfaktoren sind Ihrer Ansicht nach die drei relevantesten?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11

☐ es gab keine wenig erfolgreichen oder erfolglosen Innovationsprojekte

Vielen Dank für Ihre Mitarbeit!

ENTREPRENEUR QUESTIONNAIRE

5185260546

LEUPHANA
UNIVERSITÄT LÜNEBURG

Menschen machen Innovationen
-
Fragebogen zur Erfassung des Innovationsgeschehens in Unternehmen aus der Perspektive der Unternehmensleitung

Vielen Dank, dass Sie sich bereit erklärt haben, an unserer Befragung im Rahmen des Forschungsprojekts 'Menschen machen Innovationen' an der Leuphana-Universität Lüneburg teilzunehmen. Wir versichern Ihnen, dass sämtliche Angaben vertraulich behandelt werden. Die Ergebnisse werden so berichtet, dass Angaben einzelner Personen nicht identifiziert werden können.

Anleitung

Die folgenden Fragen beziehen sich auf Ihren Arbeitsalltag. Dabei interessieren wir uns besonders für Ihre Herangehensweise an Innovations- und Veränderungsprojekte Ihres Unternehmens.

Ziel des Fragebogens ist eine differenzierte Erfassung einzelner Sachverhalte. Daher kann es passieren, dass Ihnen manchmal Fragen ähnlich vorkommen. Bitte beantworten Sie alle Fragen. Falls Sie eine Frage einmal nicht beantworten können, dann lassen Sie diese bitte aus.
Bitte beantworten Sie die Fragen schnell und ohne lange über die Frage nachzudenken. Wir sind daran interessiert, Ihre unmittelbaren Einschätzungen zu erfahren.

Markieren Sie so: ☒
Korrektur: ■ ☒

Verwenden Sie einen Kugelschreiber, **rote Farbe und Bleistifte unbedingt vermeiden**! Dieser Fragebogen wird maschinell erfasst. Bitte beachten Sie im Interesse einer optimalen Datenerfassung die links gegebenen Hinweise beim Ausfüllen. Vielen Dank!

Zu Beginn bitten wir Sie um persönliche und tätigkeitsbezogene Angaben.

Ihr Geschlecht ☐ w ☐ m Ihr Alter in Jahren: ☐☐

Wie lange sind Sie schon im Unternehmen tätig (in Jahren)? ☐☐

Wie lange arbeiten Sie schon in Ihrer jetzigen Position (in Jahren)? ☐☐

Sind sie finanziell an Ihrem Unternehmen beteiligt? ☐ nein ☐ ja

Gibt es Eigentümer, die nicht im Unternehmen arbeiten? ☐ nein ☐ ja

Haben Sie das Unternehmen (mit-) gegründet? ☐ nein ☐ ja

Welchen höchsten beruflichen Bildungsabschluss haben Sie erworben?

- ☐ Keinen beruflichen Bildungsabschluss
- ☐ Lehre/Berufsausbildung im dualen System
- ☐ Fachschulabschluss
- ☐ Fachhochschulabschluss
- ☐ Hochschulabschluss
- ☐ Promotion

In welchem Fachbereich arbeiten Sie in Ihrem Unternehmen? (Sie können mehr als einen Fachbereich auswählen)

- ☐ Produktion
- ☐ Personalwirtschaft
- ☐ Verwaltung
- ☐ Rechnungswesen & Controlling
- ☐ Forschung und Entwicklung
- ☐ Marketing & Vertrieb
- ☐ Unternehmensleitung
- ☐ Logistik & Materialwirtschaft
- ☐ Anderes und zwar

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Auf dieser Seite des Fragebogens möchten wir von Ihnen eine Einschätzung Ihrer Herangehensweise an neue Aufgaben in Ihrem Beruf erhalten.

	trifft gar nicht zu	trifft wenig zu	teils teils	trifft über-wiegend zu	trifft völlig zu
Ich versuche mich meinen MitarbeiterInnen im Allgemeinen nicht entgegen zu stellen.	☐	☐	☐	☐	☐
Ich passe mich an Systemanforderungen im Allgemeinen an.	☐	☐	☐	☐	☐
Ich halte mich an allgemein akzeptierte Regeln meiner Arbeit.	☐	☐	☐	☐	☐
Ich vermeide es, zeitsparende Abkürzungen bei der Arbeit zu nehmen.	☐	☐	☐	☐	☐
Ich bin gründlich beim Lösen von Problemen.	☐	☐	☐	☐	☐
Ich gehe auch kleine Details an, die zur Ausführung von Aufgaben notwendig sind.	☐	☐	☐	☐	☐
Ich führe Aufgaben präzise aus, auch über einen längeren Zeitraum hinweg.	☐	☐	☐	☐	☐
Ich bin gut für Aufgaben, die eine Beschäftigung mit Details erfordern, geeignet.	☐	☐	☐	☐	☐
Ich bin innovativ.	☐	☐	☐	☐	☐
Ich habe viele kreative Ideen.	☐	☐	☐	☐	☐
Ich mag am liebsten Aufgaben, bei denen ich kreativ denken kann.	☐	☐	☐	☐	☐
Ich mache Dinge lieber auf originelle Art und Weise.	☐	☐	☐	☐	☐
Ich würde mich als jemanden beschreiben, der in neuen Situationen aktiv so viele Informationen sucht, wie er nur finden kann.	☐	☐	☐	☐	☐
Wenn ich an einer Aktivität teilnehme, gehe ich häufig so darin auf, dass ich jedes Zeitgefühl verliere.	☐	☐	☐	☐	☐
Ich suche immer wieder nach neuen Möglichkeiten, um mich als Person weiterzuentwickeln.	☐	☐	☐	☐	☐
Ich bin jemand, der sich tief in unbekannte Situationen hineinversetzt.	☐	☐	☐	☐	☐
Wenn ich mich für etwas interessiere, dann braucht es schon etwas, um mich dabei zu unterbrechen.	☐	☐	☐	☐	☐
Meine Freunde würden mich als jemanden beschreiben, der voll bei der Sache ist, wenn er eine Aufgabe übernommen hat.	☐	☐	☐	☐	☐
Wo immer ich hingehe, suche ich nach neuen Eindrücken oder Erlebnissen.	☐	☐	☐	☐	☐
Ich bin mir sicher, dass ich neue und passende Ideen finden kann.	☐	☐	☐	☐	☐
Ich bin mir gewiss, ich kann angemessen mit unerwarteten Situationen umgehen.	☐	☐	☐	☐	☐
Dank meines Einfallsreichtums kann ich kreative Ergebnisse herbeiführen.	☐	☐	☐	☐	☐
Wann immer ich einem Problem gegenüberstehe probiere ich verschiedene Lösungswege aus.	☐	☐	☐	☐	☐
Ich kann unabhängig denken und muss nicht wiederholen, was andere bereits gesagt haben.	☐	☐	☐	☐	☐
Ich gehe Probleme aktiv an.	☐	☐	☐	☐	☐
Wenn etwas schief geht, suche ich sofort nach Abhilfe.	☐	☐	☐	☐	☐
Wenn sich Möglichkeiten anbieten, etwas zu gestalten, dann nutze ich diese.	☐	☐	☐	☐	☐
Ich ergreife sofort die Initiative, wenn andere dies nicht tun.	☐	☐	☐	☐	☐
Ich nehme Gelegenheiten schnell wahr, um meine Ziele zu erreichen.	☐	☐	☐	☐	☐
Ich tue meist mehr als von mir gefordert wird.	☐	☐	☐	☐	☐
Ich bin besonders gut darin, Ideen umzusetzen.	☐	☐	☐	☐	☐
Ich ziehe es vor, in einer Umgebung zu arbeiten, die viel von mir verlangt.	☐	☐	☐	☐	☐
Ich mag anspruchsvolle und schwierige Aufgaben in meiner Arbeit, bei denen ich neue Fertigkeiten lerne.	☐	☐	☐	☐	☐
Mein Leistungsvermögen weiterzuentwickeln, ist für mich so wichtig, dass ich dafür auch mal etwas riskiere.	☐	☐	☐	☐	☐

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	trifft gar nicht zu	trifft wenig zu	teils teils	trifft über-wiegend zu	trifft völlig zu
Ich suche regelrecht nach Gelegenheiten, um neue Fertigkeiten und Kenntnisse entwickeln zu können.	☐	☐	☐	☐	☐
Ich suche mir gerne anspruchsvolle Aufgaben aus, so dass ich viel lernen kann.	☐	☐	☐	☐	☐
Ich arbeite lieber bei solchen Projekten mit, bei denen ich meine Fähigkeiten unter Beweis stellen kann.	☐	☐	☐	☐	☐
Für mich ist es wichtig, dass ich bessere Leistungen zeigen kann, als meine Kollegen.	☐	☐	☐	☐	☐
Ich versuche herauszufinden, was ich tun muss, um anderen meine Fähigkeiten zu beweisen.	☐	☐	☐	☐	☐
Ich mag es, wenn Kollegen merken, wie gut ich arbeite.	☐	☐	☐	☐	☐
Ich beschäftige mich am liebsten mit Aufgaben, bei denen ich zeigen kann, wie gut ich bin.	☐	☐	☐	☐	☐
Mir ist es wichtig, dass andere mich für fähig halten.	☐	☐	☐	☐	☐
Neue Aufgaben, bei denen ich möglicherweise unfähig wirken könnte, würde ich lieber nicht angehen.	☐	☐	☐	☐	☐
Am liebsten vermeide ich solche Situationen, wo meine Leistung möglicherweise nicht so gut ist.	☐	☐	☐	☐	☐
Es ist mir wichtiger, nicht als dumm da zu stehen, als etwas Neues zu lernen.	☐	☐	☐	☐	☐
Aufgaben, bei denen ich dumm aussehen könnte, würde ich nur ungern annehmen.	☐	☐	☐	☐	☐
Ich wäre sehr froh, mein weiteres Arbeitsleben in diesem Unternehmen verbringen zu können.	☐	☐	☐	☐	☐
Ich bin stolz darauf diesem Unternehmen anzugehören.	☐	☐	☐	☐	☐
Ich fühle mich emotional nicht sonderlich mit diesem Unternehmen verbunden.	☐	☐	☐	☐	☐
Ich empfinde ein starkes Gefühl der Zugehörigkeit zu meinem Unternehmen.	☐	☐	☐	☐	☐
Ich denke, dass meine Wertvorstellungen zu denen des Unternehmens passen.	☐	☐	☐	☐	☐
Ich habe Vertrauen in dieses Unternehmen.	☐	☐	☐	☐	☐

Aus welchen Quellen schöpfen Sie Anregungen wenn Sie eigene Ideen haben?

	nie ←				→ sehr häufig
	1	2	3	4	5
KollegInnen	☐	☐	☐	☐	☐
BeraterInnen	☐	☐	☐	☐	☐
Freunde & Familie	☐	☐	☐	☐	☐
Kunden	☐	☐	☐	☐	☐
Lieferanten	☐	☐	☐	☐	☐
Allein aus mir selbst	☐	☐	☐	☐	☐
Zeitungen, Zeitschriften, Medien	☐	☐	☐	☐	☐
Messen/Ausstellungen	☐	☐	☐	☐	☐
Universitäten/Forschungseinrichtungen	☐	☐	☐	☐	☐
Sonstige und zwar:					
	☐	☐	☐	☐	☐

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Wir haben mit Ihnen folgende Liste von 3 (größeren) Innovations- und Veränderungsvorhaben erstellt, die im letzten Jahr in Ihrem Unternehmen realisiert wurden. **Bitte geben Sie im Folgenden Ihre Beteiligung und Ihre Bewertung der Ergebnisse dieser Projekte an.**

Idealtypisch lässt sich ein Innovationsprozess in vier unterschiedliche Phasen unterteilen, die manchmal gleichzeitig, manchmal nacheinander ablaufen. Im Folgenden stellen wir Ihnen diese vier Phasen kurz vor.

Kreativität

1. Problem-/Chancen-Identifikation: Erkennen des Problems oder Erkennen von Chancen

2. Ideen Generierung: Sammeln von neuen Lösungsansätzen und Ideen.

Implementierung

3. Evaluation und Auswahl: Bewertung von Lösungsansätzen und Auswahl einer Vorgehensweise

4. Umsetzung des Lösungsansatzes: Handlungen, um das Problem zu lösen z.B.: Ziele setzten, Handeln und Zielerreichung bewerten.

PROJEKT 1

Die Innovation imitiert die Lösungen anderer Unternehmen. ☐

Die Innovation betrifft ein Produkt/eine Dienstleistung, die für den speziellen Markt substantiell weiterentwickelt wurde. ☐

Die Innovation ist ganz und gar neu auf unserem Markt. ☐

Die Innovation ist ganz und gar neu auf der Welt. ☐

Schätzen Sie die Qualität der Zusammenarbeit in diesem Projekt zusammenfassend ein.

sehr schlecht						sehr gut
1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

In welcher der Phasen waren Sie in welcher Intensität beteiligt?

	keine Beteiligung ←					→ intensive Beteiligung
Problem/Chancen-Identifikation	☐	☐	☐	☐	☐	☐
Ideen Generierung	☐	☐	☐	☐	☐	☐
Evaluation & Auswahl	☐	☐	☐	☐	☐	☐
Umsetzung des Lösungsansatzes	☐	☐	☐	☐	☐	☐

In Projekt 1 haben wir:

viel weniger erreicht als erwartet		ungefähr erreicht was zu erwarten war				viel mehr erreicht als erwartet
1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

	schlecht						sehr gut
	1	2	3	4	5	6	7
Bitte bewerten Sie die Gesamtleistung aller Beteiligten in diesem Projekt.	☐	☐	☐	☐	☐	☐	☐
Bitte bewerten Sie die Kreativitätsleistung bezüglich der Neuigkeit der Ideen in diesem Projekt.	☐	☐	☐	☐	☐	☐	☐
Bitte bewerten Sie die Nützlichkeit der Ideen in diesem Projekt.	☐	☐	☐	☐	☐	☐	☐
Bitte bewerten Sie die Innovationsleistung insgesamt in diesem Projekt.	☐	☐	☐	☐	☐	☐	☐

PROJEKT 2

Die Innovation imitiert die Lösungen anderer Unternehmen. ☐

Die Innovation betrifft ein Produkt/eine Dienstleistung, die für den speziellen Markt substantiell weiterentwickelt wurde. ☐

Die Innovation ist ganz und gar neu auf unserem Markt. ☐

Die Innovation ist ganz und gar neu auf der Welt. ☐

Schätzen Sie die Qualität der Zusammenarbeit in diesem Projekt zusammenfassend ein.

sehr schlecht						sehr gut
1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

In welcher der Phasen waren Sie in welcher Intensität beteiligt?

	keine Beteiligung ←					→ intensive Beteiligung
Problemidentifizierung	☐	☐	☐	☐	☐	☐
Ideen Generierung	☐	☐	☐	☐	☐	☐
Evaluation & Auswahl	☐	☐	☐	☐	☐	☐
Anwendung des Lösungsansatzes	☐	☐	☐	☐	☐	☐

In Projekt 2 haben wir:

viel weniger erreicht als erwartet		ungefähr erreicht was zu erwarten war				viel mehr erreicht als erwartet
1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

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Zu Projekt 2:

	schlecht 1	2	3	4	5	6	sehr gut 7
Bitte bewerten Sie die Gesamtleistung aller Beteiligten in diesem Projekt.	☐	☐	☐	☐	☐	☐	☐
Bitte bewerten Sie die Kreativitätsleistung bezüglich der Neuigkeit der Ideen in diesem Projekt.	☐	☐	☐	☐	☐	☐	☐
Bitte bewerten Sie die Nützlichkeit der Ideen in diesem Projekt.	☐	☐	☐	☐	☐	☐	☐
Bitte bewerten Sie die Innovationsleistung insgesamt in diesem Projekt.	☐	☐	☐	☐	☐	☐	☐

PROJEKT 3

Die Innovation imitiert die Lösungen anderer Unternehmen.	Die Innovation betrifft ein Produkt/eine Dienstleistung, die für den speziellen Markt substantiell weiterentwickelt wurde.	Die Innovation ist ganz und gar neu auf unserem Markt.	Die Innovation ist ganz und gar neu auf der Welt.
☐	☐	☐	☐

Schätzen Sie die Qualität der Zusammenarbeit in diesem Projekt zusammenfassend ein.

sehr schlecht 1	2	3	4	5	6	sehr gut 7
☐	☐	☐	☐	☐	☐	☐

In welcher der Phasen waren Sie in welcher Intensität beteiligt?

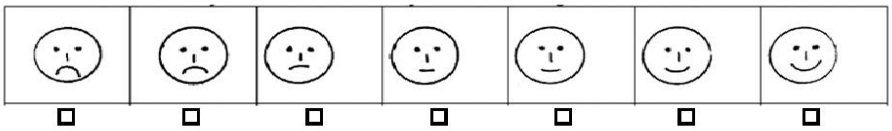
	keine Beteiligung ←					intensive Beteiligung →
Problemidentifizierung	☐	☐	☐	☐	☐	☐
Ideen Generierung	☐	☐	☐	☐	☐	☐
Evaluation & Auswahl	☐	☐	☐	☐	☐	☐
Anwendung des Lösungsansatzes	☐	☐	☐	☐	☐	☐

In Projekt 3 haben wir:

viel weniger erreicht als erwartet 1	2	ungefähr erreicht was zu erwarten war 3	4	5	6	viel mehr erreicht als erwartet 7
☐	☐	☐	☐	☐	☐	☐

	schlecht 1	2	3	4	5	6	sehr gut 7
Bitte bewerten Sie die Gesamtleistung aller Beteiligten in diesem Projekt.	☐	☐	☐	☐	☐	☐	☐
Bitte bewerten Sie die Kreativitätsleistung bezüglich der Neuigkeit der Ideen in diesem Projekt.	☐	☐	☐	☐	☐	☐	☐
Bitte bewerten Sie die Nützlichkeit der Ideen in diesem Projekt.	☐	☐	☐	☐	☐	☐	☐
Bitte bewerten Sie die Innovationsleistung insgesamt in diesem Projekt.	☐	☐	☐	☐	☐	☐	☐

Wie zufrieden sind Sie insgesamt mit Ihrer Arbeit? (Bitte setzen Sie Ihr Kreuz in die Kästchen unter den Gesichtern)



Auf den folgenden Seiten des Fragebogens möchten wir von Ihnen erfahren, wie Sie in den letzten Jahren Ihr Innovationsgeschehen gestaltet haben.

8788260548 Seite 6

Wie stark haben Sie sich im letzten Jahr mit den unten genannten Bestandteilen Ihrer Arbeitstätigkeit beschäftigt?

	wenig Beschäftigung				starke Beschäftigung
Suche nach neuen Innovations-Möglichkeiten bezogen auf Produkte/Dienstleistungen, Prozessen oder Märkten.	☐	☐	☐	☐	☐
Bewertung der Potentiale der verschiedenen Innovations-Möglichkeiten.	☐	☐	☐	☐	☐
Fokussierung auf tiefgreifende Erneuerung und Überarbeitung von Produkten/Dienstleistungen oder Prozessen.	☐	☐	☐	☐	☐
Aktivitäten, die eine starke Anpassungsleistung von Ihnen verlangt haben.	☐	☐	☐	☐	☐
Aktivitäten, bei denen Sie neue Fähigkeiten oder neues Wissen erlernen mussten.	☐	☐	☐	☐	☐
Aktivitäten, für die Sie vorher schon sehr viel Erfahrung gesammelt haben.	☐	☐	☐	☐	☐
Aktivitäten, die den bereits bestehenden externen und internen Kunden für existierende Produkte/Dienstleistungen zugutekommen.	☐	☐	☐	☐	☐
Aktivitäten, bei denen es Ihnen klar ist, wie diese durchgeführt werden.	☐	☐	☐	☐	☐
Aktivitäten, die hauptsächlich auf das Erreichen von Kurzzeitzielen ausgerichtet sind.	☐	☐	☐	☐	☐
Aktivitäten, die Sie gut mit Ihrem bisherigen Wissen durchführen können.	☐	☐	☐	☐	☐
Aktivitäten, die zur bestehenden Politik des Unternehmens passen.	☐	☐	☐	☐	☐

Wie häufig fanden Sie Ihre Arbeit in Innovationsprojekten schwierig oder unmöglich zu tun aufgrund von... (Bitte kreuzen Sie auch hier die Antworten an, die Ihrer Meinung nach am ehesten zutreffen)

	nie 1	2	3	4	sehr häufig 5
1. qualitativ ungeeignetem Equipment oder Material.	☐	☐	☐	☐	☐
2. organisationalen Regeln oder Prozeduren.	☐	☐	☐	☐	☐
3. Ihren Mitarbeitern.	☐	☐	☐	☐	☐
4. anderen Führungskräften im Unternehmen (falls vorhanden).	☐	☐	☐	☐	☐
5. dem Fehlen von Equipment oder Material.	☐	☐	☐	☐	☐
6. ungenügender Qualifikation.	☐	☐	☐	☐	☐
7. Unterbrechungen durch Andere.	☐	☐	☐	☐	☐
8. dem Fehlen wichtiger Informationen darüber, was und wann etwas zu tun ist.	☐	☐	☐	☐	☐
9. in Konflikt stehenden anderen Arbeitsaufgaben.	☐	☐	☐	☐	☐
10. ungenügender Hilfe von Anderen.	☐	☐	☐	☐	☐
11. falschen Anleitungen oder falschen Instruktionen.	☐	☐	☐	☐	☐

Wenn Sie nun an **gescheiterte oder wenig erfolgreiche** Innovationsprojekte denken: Welche von den oben genannten Störfaktoren sind Ihrer Ansicht nach die drei relevantesten?

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11

☐ es gab keine wenig erfolgreichen oder erfolglosen Innovationsprojekte

4472260544 Seite 7

	trifft gar nicht zu	trifft wenig	teils teils	trifft über-wiegend zu	trifft völlig zu
Der ökonomische Erfolg unseres Unternehmens ist schwer vorhersagbar.	☐	☐	☐	☐	☐
Es existiert eine große Ungewissheit über die Zukunftsaussichten unseres Unternehmens.	☐	☐	☐	☐	☐
Die Nachfrage für die Produkte oder Dienstleistungen unseres Unternehmens ist schwer vorauszusagen.	☐	☐	☐	☐	☐
Unser Unternehmen wird in einem hohen Maß mit Veränderungen und Unsicherheiten konfrontiert.	☐	☐	☐	☐	☐
Die Umwelt unseres Unternehmens ist relativ stabil.	☐	☐	☐	☐	☐
Wir sind zuversichtlich, dass wir die Fähigkeit haben, funktionierende Lösungen für neue Herausforderungen zu finden, indem wir vorhandene Ressourcen verwenden.	☐	☐	☐	☐	☐
Wir nehmen bereitwillig ein breiteres Spektrum an Herausforderungen an als andere Unternehmen, die mit den gleichen Ressourcen wie wir ausgestattet sind.	☐	☐	☐	☐	☐
Wir nutzen jede vorhandene Ressource, die uns nützlich erscheint, um auf neue Probleme oder Chancen zu reagieren.	☐	☐	☐	☐	☐
Wir gehen mit neuen Herausforderungen um, indem wir eine Kombination aus vorhandenen Ressourcen und anderen Ressourcen, die ohne großen Aufwand beschafft werden können, einsetzen.	☐	☐	☐	☐	☐
Wenn wir mit neuen Problemen oder Chancen umgehen, so handeln wir unter der Annahme, dass wir eine machbare Lösung finden werden.	☐	☐	☐	☐	☐
Indem wir vorhandene Ressourcen bündeln, können wir eine überraschende hohe Anzahl neuer Herausforderungen annehmen.	☐	☐	☐	☐	☐
Wenn wir neuen Herausforderungen gegenüberstehen, kommen wir zu durchführbaren Lösungen, indem wir vorhandene Ressourcen einsetzen.	☐	☐	☐	☐	☐
Radikale Innovationsprojekte sind in unserem Unternehmen sehr angesehen.	☐	☐	☐	☐	☐
Bei meiner Arbeit habe ich viel Kontakt mit Kunden.	☐	☐	☐	☐	☐
Ich besuche Konferenzen, Messen und Ausstellungen.	☐	☐	☐	☐	☐
Ich bin in regem Austausch mit Mitarbeitern anderer Unternehmen aus unserer Branche.	☐	☐	☐	☐	☐
Ich habe Kontakt zu Mitarbeitern aus wissenschaftlichen Institutionen wie zum Beispiel Universitäten oder Fachhochschulen.	☐	☐	☐	☐	☐
Unser Unternehmen ist stark in der regionalen Wirtschaft vernetzt.	☐	☐	☐	☐	☐
Wir fühlen uns als Unternehmen der Region verpflichtet.	☐	☐	☐	☐	☐
Wir stehen hauptsächlich in Konkurrenz mit anderen lokalen Unternehmen.	☐	☐	☐	☐	☐
Es gibt hier in unserem Umfeld zahlreiche Unternehmen, mit denen wir uns fachlich austauschen können.	☐	☐	☐	☐	☐

5955260541 Seite 8

In diesem Abschnitt bitten wir Sie, die Mangementkultur in Ihrem Unternehmen darzustellen.

Das Management…	tendiert stark zu dieser Seite	tendiert eher zu dieser Seite	weder noch/ beides	tendiert eher zu dieser Seite	tendiert stark zu dieser Seite	
…unterstützt die Anstrengungen von selbständig arbeitenden Einzelnen oder Gruppen.	1	2	3	4	5	…verlangt von Einzelnen oder Gruppen, sich in ihrer Arbeit durch das Management anleiten zu lassen.

Das Management…

…erwartet von Individuen/Teams, die an neuen Geschäfts-möglichkeiten arbeiten, sich im Fortgang ihrer Tätigkeiten beim Management rückzukoppeln.	1	2	3	4	5	…regt Individuen/Teams an, ihre Ideen ohne enge Rückkopplung der Handlungen auf jeder Stufe des Entwicklungsprozesses fortzusetzen.

Das Management glaubt, dass Individuen oder Arbeitsgruppen die besten Ergebnisse liefern…

…wenn sie außerhalb der normalen hierarchischen Strukturen operieren.	1	2	3	4	5	…wenn innerhalb der traditionellen hierarchischen Strukturen arbeiten.

Das Management glaubt, dass Individuen oder Teams am effektivsten arbeiten…

…wenn ihre Projekt- und Leistungsziele von Ihren Vorgesetzten vorgegeben werden	1	2	3	4	5	… wenn sie ihre Projekt- und Leistungsziele selbst setzen.

Das Management glaubt, dass Individuen oder Teams am effektivsten arbeiten…

…wenn sie selbst entscheiden, welche Geschäftschancen sie weiterverfolgen	1	2	3	4	5	…wenn das Management vorgibt, welche Geschäftschancen weiterverfolgt werden sollen.

Das Management erwartet, dass Individuen oder Teams am besten…

…bestehende Strategien und Vorgehensweisen als Basis für das Treffen von Entscheidungen verwenden.	1	2	3	4	5	…außerhalb der bestehenden Strategien und Vorgehensweisen nach möglichen Entscheidungsgrundlagen suchen.

In meinem Unternehmen werden Entscheidungen von Teams oder Gruppen…

…allein getroffen, ohne immer wieder den Vorgesetzten einzubeziehen.	1	2	3	4	5	…in enger Abstimmung mit den Vorgesetzten getroffen.

In meinem Unternehmen spielt bei der Identifizierung und Auswahl von inkrementalen Veränderungen, die dann weiterverfolgt werden…

…eher die Unternehmensleitung eine wesentliche Rolle.	1	2	3	4	5	…eher Initiativen der Mitarbeiter eine wesentliche Rolle.

Insgesamt betont das Management die Vermarktung von…

…erprobten Produkten und Dienstleistungen.	1	2	3	4	5	…Ergebnissen aus Forschung & Entwicklung, neuen Technologien und Innovationen.

8688260547

Seite 9

	tendiert stark zu dieser Seite	tendiert eher zu dieser Seite	weder noch/ beides	tendiert eher zu dieser Seite	tendiert stark zu dieser Seite	
In den letzten 5 Jahren hat mein Unternehmen…						
…keine neuen Produkten und Dienstleistungen auf den Markt gebracht.	1	2	3	4	5	…sehr viele neue Produkte und Dienstleistungen auf den Markt gebracht.
In meinem Unternehmen waren Veränderungen bei Produkten oder Dienstleistungen…						
…meist geringerer Natur.	1	2	3	4	5	…oft sehr dramatisch und tiefgreifend.
Das Management meines Unternehmens zieht …						
…Experimentierfreude und neue Herangehensweisen zur Problemlösung vor.	1	2	3	4	5	…die Nachahmung bekannter Herangehensweisen zur Problemlösung anderer Unternehmen vor.
Mein Unternehmen…						
…entwickelt eigene innovative neue Prozesse und Produktionsmethoden.	1	2	3	4	5	…adaptiert Prozesse und Produktionsmethoden, die andere entwickelt und erprobt haben.
Im Konkurrenzkampf…						
… reagiert mein Unternehmen typischerweise auf Aktionen, die Konkurrenten initiiert haben.	1	2	3	4	5	… initiiert mein Unternehmen Aktionen, auf die Konkurrenten dann reagieren müssen.
Im Verhalten im Konkurrenzkampf…						
…ist mein Unternehmen selten das erste Unternehmen, das neue oder weiterentwickelte Produkte/Dienstleistungen einführt.	1	2	3	4	5	…ist mein Unternehmen häufig das erste Unternehmen, das neue oder weiterentwickelte Produkte/Dienstleistungen einführt.
Im Verhalten gegenüber Konkurrenten…						
…versucht mein Unternehmen typischerweise, der Konkurrenz aus dem Weg zu gehen.	1	2	3	4	5	…versucht mein Unternehmen typischerweise die Konkurrenten vom Markt zu verdrängen.
Das Management meines Unternehmens…						
…hat eine starke Tendenz, der Mehrheit oder dem Marktführer bei der Einführung neuer Produkte/Dienstleistungen zu folgen.	1	2	3	4	5	…versucht, der Konkurrenz immer einen Schritt bei der Einführung neuer Produkte/Dienstleistungen voraus zu sein.
Das Management meines Unternehmens…						
…hat eine Vorliebe für wenig riskante Projekte, die normale, sichere Gewinne nach sich ziehen.	1	2	3	4	5	…hat eine Vorliebe für riskantere Projekte die Chancen auf hohe Gewinne nach sich ziehen.

7597260545 Seite 10

	tendiert stark zu dieser Seite	tendiert eher zu dieser Seite	weder noch/ beides	tendiert eher zu dieser Seite	tendiert stark zu dieser Seite	
Das Management meines Unternehmens…						
…glaubt, dass es am besten ist, die Umwelt in kleinen Schritten zu erforschen und durch vorsichtiges, kleinschrittiges Verhalten voranzukommen.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	…glaubt, dass es wichtig ist, der Umwelt furchtlos mit weitreichenden Handlungen gegenüberzutreten, um die Unternehmensziele zu erreichen.
Wenn mein Unternehmen mit unsicheren Entscheidungssituationen konfrontiert ist, …						
…wenden wir typischerweise eine vorsichtige "abwarten und Tee trinken Haltung" an, um die Wahrscheinlichkeit teurer Fehlentscheidungen zu minimieren.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	…wenden wir typischerweise eine mutige, aggressive Haltung an, um Zukunftschancen zu maximieren.
Das Management meines Unternehmens…						
…zieht es vor, ein Problem gründlich zu studieren, bevor Ressourcen für die Lösung eingesetzt werden.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	…ist eher schnell dabei, wenn es darum geht, Ressourcen für die Lösung eines Problems, das uns aufhält, bereitzustellen.
Das Management meines Unternehmens…						
…ist sehr aggressiv, kompetitiv und wachstumsorientiert.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	…macht keine besonderen Anstrengungen, Wettbewerbern Geschäfte streitig zu machen.

Bitte bewerten Sie nun Ihr Unternehmen bezüglich seiner Kompetenzen und Herangehensweisen:

Die Kompetenzen Ihres Unternehmens:	**weitaus schlechter als andere Unternehmen unserer Branche**				**etwa auf Augenhöhe mit anderen Unternehmen unserer Branche**				**weitaus besser als andere Unternehmen unserer Branche**	
	1	2	3	4	5	6	7	8	9	10
Forschung und Entwicklung	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Produkt-/Dienstleistungs-Technologie	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Entwicklung neuer Leistungsangebote	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Geschwindigkeit, neue Leistungsangebote auf den Markt zu bringen	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Kontinuierliche Prozessverbesserung	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Wissen über die Wünsche der Kunden	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Kostenoptimierung	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Branchenkenntnisse	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Qualität der Leistungsangebote	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Qualität der Prozesse	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Qualität des Marketing	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Qualität der Administration	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Vielen Dank für Ihre Mitarbeit!

STUDENT QUESTIONNAIRE 1

LEUPHANA
UNIVERSITÄT LÜNEBURG

Innovationen und Kultur an der Hochschule

Vielen Dank, dass Sie sich bereit erklärt haben an unserer kurzen Befragung im Rahmen des Forschungsprojekts 'Menschen machen Innovationen' an der Leuphana Universität Lüneburg teilzunehmen. Unsere Studie besteht aus 2 Teilen, der zweite Teil findet morgen in dieser Veranstaltung statt.

Anleitung

Ziel des Fragebogens ist eine differenzierte Erfassung einzelner Sachverhalte. Daher kann es passieren, dass Ihnen manchmal Fragen ähnlich vorkommen. Bitte beantworten Sie alle Fragen. Falls Sie eine Frage einmal nicht beantworten können, dann lassen Sie diese bitte aus.

Bitte beantworten Sie die Fragen schnell und ohne lange über die Frage nachzudenken. Wir sind daran interessiert, Ihre unmittelbaren Einschätzungen zu erfahren. Sämtliche Angaben sind anonym. Bei Fragen wenden Sie sich bitte an Sebastian Fischer, sfischer@leuphana.de. Sie finden mich in Raum C6.116.

Ihr Code [Damit wir den 1. und 2. Fragebogen zusammenbringen können]

Ihr Geschlecht _____

Ihr Alter in Jahren: _____

Welche Bildungsabschlüsse haben Sie bereits erworben? (Abitur, Fachabitur, Universitätsabschlüsse) _____

Wie lange studieren Sie bereits Ihren jetzigen Studiengang (in Semestern)? _____

Wie lange sind Sie schon an einer Universität eingeschrieben (in Semestern)? _____

Welches Hauptfach studieren Sie?

O Betriebswirtschaftslehre
O Wirtschaftsrecht
O Wirtschaftspsychologie
O Wirtschaftsinformatik
O anderes wirtschaftswissenschaftliches Fach
O anderes, nicht wirtschaftswissenschaftliches Fach

Im folgenden Teil des Fragebogens beziehen Sie sich bitte nur auf Ihre persönliche Meinung. Bitte schätzen Sie sich selbst ein!

Ich habe auf den folgenden Feldern kreativen Arbeitens mehr Talent, oder mehr Training als andere Kommilitonen der Leuphana:

O Architektur/Wohnungseinrichtung
O Musik
O bildende Kunst
O Mannschaftssport
O Spaß und Humor
O Tanz
O Individualsport (z.B. Tennis, Golf)
O Unternehmensgründung und unternehmerisches Denken
O Wissenschaftliches Untersuchen
O Theater und Film
O Erfindungen und kreatives Problemlösen
O Kulinarisches / Essenszubereitung
O kreatives Schreiben

Haben Sie im vergangenen Jahr		Nie 1	2	3	4	Sehr häufig 5
21	… über Andere in der Institution gemeckert	O	O	O	O	O
22	… absichtlich etwas gesagt was jemanden in dar Institution verletzt hat.	O	O	O	O	O
23	… absichtlich eine Regal der Institution gebeugt oder gebrochen.	O	O	O	O	O
24	… andere In der Institution kritisiert	O	O	O	O	O
25	… etwas getan, was Anderen in der Institution Nachteile gebracht hat	O	O	O	O	O
26	… sich mit jemandem in der Institution gestritten.	O	O	O	O	O
27	… gemeine Dinge über die Organisation gesagt.	O	O	O	O	O

		Trifft gar nicht zu				Trifft voll zu
1	Es bereitet mir keine Schwierigkeiten, meine Absichten und Ziele zu verwirklichen	0	0	0	0	0
2	Schwierigkeiten sehe ich gelassen entgegen, weil ich mich auf meine Fähigkeiten immer verlassen kann.	0	0	0	0	0
3	Ich versuche mich meinen Mitstreitern im Allgemeinen nicht entgegen zu stellen.	0	0	0	0	0
4	Ich passe mich an Systemanforderungen im Allgemeinen an.	0	0	0	0	0
5	Ich halte mich an allgemein akzeptierte Regeln der Aufgaben, die ich lösen muss.	0	0	0	0	0
6	Ich vermeide es, zeitsparende Abkürzungen bei der Arbeit zu nehmen.	0	0	0	0	0
7	Ich bin gründlich beim Lösen von Problemen.	0	0	0	0	0
8	Ich gehe auch kleine Details an, die zur Ausführung von Aufgaben notwendig sind.	0	0	0	0	0
9	Ich führe Aufgaben präzise aus, auch über einen längeren Zeitraum hinweg.	0	0	0	0	0
10	Ich bin gut für Aufgaben, die eine Beschäftigung mit Details erfordern, geeignet.	0	0	0	0	0
11	Ich versuche mich von bürokratischen Beschränkungen zu befreien	0	0	0	0	0
12	Ich bin innovativ.	0	0	0	0	0
13	Ich habe viele kreative Ideen.	0	0	0	0	0
14	Ich mag am liebsten Aufgaben, bei denen ich kreativ denken kann.	0	0	0	0	0
15	Ich mache Dinge lieber auf originelle Art und Weise.	0	0	0	0	0
16	Ich tue auch Dinge die meinen Wissensstand herausfordern.	0	0	0	0	0
17	Ich spreche Dinge an von denen ich denke, dass sie falsch laufen.	0	0	0	0	0
18	Die Lösung schwieriger Probleme gelingt mir immer wenn ich mich darum bemühe.	0	0	0	0	0
19	Wenn ein Problem auf mich zukommt habe ich meist mehrere Ideen wie ich es lösen kann.	0	0	0	0	0
20	Ich bin schon mit Autoritäten im Studium aneinander geraten	0	0	0	0	0

STUDENT QUESTIONNAIRE 2

LEUPHANA
UNIVERSITÄT LÜNEBURG

Konflikte als Chance - Fragebogen zur Erfassung des Konfliktverhaltens

Vielen Dank, dass Sie sich bereit erklärt haben an unserer Untersuchung im Rahmen des Seminars 'Konflikte und Konfliktmanagement ' an der Leuphana-Universität Lüneburg teilzunehmen. Wir versichern Ihnen, dass sämtliche Angaben vertraulich behandelt werden. Die Ergebnisse werden so berichtet, dass Angaben einzelner Personen nicht identifiziert werden können.

Anleitung

Ziel des Fragebogens ist eine differenzierte Erfassung einzelner Sachverhalte. Daher kann es passieren, dass Ihnen manchmal Fragen ähnlich vorkommen. Bitte beantworten Sie alle Fragen. Falls Sie eine Frage einmal nicht beantworten können, dann lassen Sie diese bitte aus.

Bitte beantworten Sie die Fragen schnell und ohne lange über die Frage nachzudenken. Wir sind daran interessiert, Ihre unmittelbaren Einschätzungen zu erfahren.

Zu Beginn bitten wir Sie um persönliche Angaben.

Ihr Geschlecht _____

Ihr Alter in Jahren: _____

Welche Bildungsabschlüsse haben Sie bereits erworben? (Abitur, Fachabitur, Universitätsabschlüsse) _____

Wie lange studieren Sie bereits Ihren jetzigen Studiengang (in Semestern)? _____

Wie lange sind Sie schon an einer Universität eingeschrieben (in Semestern)? _____

Arbeiten Sie momentan um Geld zu verdienen? _____

Sind Sie momentan in einer festen Beziehung? _____

Sind Sie momentan in einem Verein aktiv? _____

Zählen Sie bitte die Monate zusammen, in denen Sie in Ihrem Leben am längsten am Stück in folgenden Dingen involviert waren:

In Monaten, wie lange haben Sie ungefähr am längsten am Stück in Unternehmen/Organisationen? (0 falls gar nicht; incl. Zivildienst, etc.) _____

In Monaten, wie lange waren Sie am längsten am Stück in festen (Liebes-) Beziehungen? (0 falls gar nicht) _____

In Monaten, wie lange waren Sie am längsten am Stück als Funktionsträger in einem Verein aktiv? (0 falls gar nicht; z.B. Kassenwart, etc.) _____

Auf den folgenden Seiten des Fragebogens möchten wir von Ihnen eine Einschätzung Ihrer Herangehensweise an neue Aufgaben erhalten.

		Trifft gar nicht zu				Trifft voll zu
1	Ich versuche mich meinen Mitstreitern im Allgemeinen nicht entgegen zu stellen.	0	0	0	0	0
2	Ich passe mich an Systemanforderungen im Allgemeinen an.	0	0	0	0	0
3	Ich halte mich an allgemein akzeptierte Regeln der Aufgaben, die ich lösen muss.	0	0	0	0	0
4	Ich vermeide es, zeitsparende Abkürzungen bei der Arbeit zu nehmen.	0	0	0	0	0
5	Ich bin gründlich beim Lösen von Problemen.	0	0	0	0	0
6	Ich gehe auch kleine Details an, die zur Ausführung von Aufgaben notwendig sind.	0	0	0	0	0
7	Ich führe Aufgaben präzise aus, auch über einen längeren Zeitraum hinweg.	0	0	0	0	0
8	Ich bin gut für Aufgaben, die eine Beschäftigung mit Details erfordern, geeignet.	0	0	0	0	0
9	Ich bin innovativ.	0	0	0	0	0
10	Ich habe viele kreative Ideen.	0	0	0	0	0
11	Ich mag am liebsten Aufgaben, bei denen ich kreativ denken kann.	0	0	0	0	0
12	Ich mache Dinge lieber auf originelle Art und Weise.	0	0	0	0	0
13	Ich würde mich als jemanden beschreiben, der in neuen Situationen aktiv so viele Informationen sucht, wie er nur finden kann.	0	0	0	0	0
14	Wenn ich an einer Aktivität teilnehme, gehe ich häufig so darin auf, dass ich jedes Zeitgefühl verliere.	0	0	0	0	0
15	Ich suche immer wieder nach neuen Möglichkeiten, um mich als Person weiterzuentwickeln.	0	0	0	0	0
16	Ich bin jemand, der sich tief in unbekannte Situationen hineinversetzt.	0	0	0	0	0
17	Wenn ich mich für etwas interessiere, dann braucht es schon etwas, um mich dabei zu unterbrechen.	0	0	0	0	0
18	Meine Freunde würden mich als jemanden beschreiben, der voll bei der Sache ist, wenn er eine Aufgabe übernommen hat.	0	0	0	0	0
19	Wo immer ich hingehe, suche ich nach neuen Eindrücken oder Erlebnissen.	0	0	0	0	0

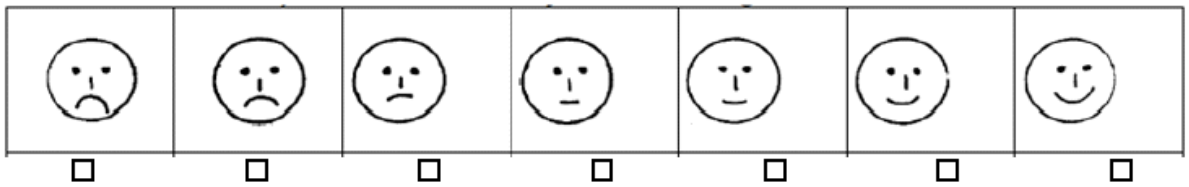
		Trifft gar nicht zu				Trifft voll zu
1	Ich bin mir sicher, dass ich neue und passende Ideen finden kann.	0	0	0	0	0
2	Ich bin mir gewiss, ich kann angemessen mit unerwarteten Situationen umgehen.	0	0	0	0	0
3	Dank meines Einfallsreichtums kann ich kreative Ergebnisse herbeiführen.	0	0	0	0	0
4	Wann immer ich einem Problem gegenüberstehe probiere ich verschiedene Lösungswege aus.	0	0	0	0	0
5	Ich kann unabhängig denken und muss nicht wiederholen, was andere bereits gesagt haben.	0	0	0	0	0
6	Ich gehe Probleme aktiv an.	0	0	0	0	0
7	Wenn etwas schief geht, suche ich sofort nach Abhilfe.	0	0	0	0	0
8	Wenn sich Möglichkeiten anbieten, etwas zu gestalten, dann nutze ich diese.	0	0	0	0	0
9	Ich ergreife sofort die Initiative, wenn andere dies nicht tun.	0	0	0	0	0
10	Ich nehme Gelegenheiten schnell wahr, um meine Ziele zu erreichen.	0	0	0	0	0
11	Ich tue meist mehr als von mir gefordert wird.	0	0	0	0	0
12	Ich bin besonders gut darin, Ideen umzusetzen.	0	0	0	0	0
13	Ich ziehe es vor, in einer Umgebung zu arbeiten, die viel von mir verlangt.	0	0	0	0	0
14	Ich mag anspruchsvolle und schwierige Aufgaben, bei denen ich neue Fertigkeiten lerne.	0	0	0	0	0
15	Mein Leistungsvermögen weiterzuentwickeln, ist für mich so wichtig, dass ich dafür auch mal etwas riskiere.	0	0	0	0	0
16	Ich suche regelrecht nach Gelegenheiten, um neue Fertigkeiten und Kenntnisse entwickeln zu können.	0	0	0	0	0
17	Ich suche mir gerne anspruchsvolle Aufgaben aus, so dass ich viel lernen kann.	0	0	0	0	0
18	Ich arbeite lieber bei solchen Projekten mit, bei denen ich meine Fähigkeiten unter Beweis stellen kann.	0	0	0	0	0
19	Für mich ist es wichtig, dass ich bessere Leistungen zeigen kann, als meine Mitstreiter.	0	0	0	0	0
20	Ich versuche herauszufinden, was ich tun muss, um anderen meine Fähigkeiten zu beweisen.	0	0	0	0	0
21	Ich mag es, wenn Mitstreiter merken, wie gut ich arbeite.	0	0	0	0	0
22	Ich beschäftige mich am liebsten mit Aufgaben, bei denen ich zeigen kann, wie gut ich bin.	0	0	0	0	0
23	Mir ist es wichtig, dass andere mich für fähig halten.	0	0	0	0	0
24	Neue Aufgaben, bei denen ich möglicherweise unfähig wirken könnte, würde ich lieber nicht angehen.	0	0	0	0	0
25	Am liebsten vermeide ich solche Situationen, wo meine Leistung möglicherweise nicht so gut ist.	0	0	0	0	0

		Trifft gar nicht zu				Trifft voll zu
1	Es ist mir wichtiger, nicht als dumm da zu stehen, als etwas Neues zu lernen.	0	0	0	0	0
2	Aufgaben, bei denen ich dumm aussehen könnte, würde ich nur ungern annehmen.	0	0	0	0	0
3	Ich habe meist Vertrauen zu den Personen mit denen ich zusammenarbeite.	0	0	0	0	0
4	Wenn sich Widerstände auftun, finde ich Mittel und Wege, mich durchzusetzen.	0	0	0	0	0
5	Die Lösung schwieriger Probleme gelingt mir immer, wenn ich mich darum bemühe.	0	0	0	0	0
6	Es bereitet mir keine Schwierigkeiten, meine Absichten und Ziele zu verwirklichen.	0	0	0	0	0
7	In unerwarteten Situationen weiß ich immer, wie ich mich verhalten soll.	0	0	0	0	0
8	Auch bei überraschenden Ereignissen glaube ich, dass ich gut mit ihnen zurechtkommen kann.	0	0	0	0	0
9	Schwierigkeiten sehe ich gelassen entgegen, weil ich meinen Fähigkeiten immer vertrauen kann.	0	0	0	0	0
10	Was auch immer passiert, ich werde schon klarkommen.	0	0	0	0	0
11	Für jedes Problem kann ich eine Lösung finden.	0	0	0	0	0
12	Wenn eine neue Sache auf mich zukommt, weiß ich, wie ich damit umgehen kann.	0	0	0	0	0
13	Wenn ein Problem auftaucht, kann ich es aus eigener Kraft meistern. .	0	0	0	0	0
14	Wenn ich mehr positive Gefühle (wie Freude oder Heiterkeit) empfinden möchte, ändere ich, woran ich denke.	0	0	0	0	0
15	Wenn ich weniger negative Gefühle (wie Traurigkeit oder Ärger) empfinden möchte, ändere ich, woran ich denke.	0	0	0	0	0
16	Wenn ich mehr positive Gefühle empfinden möchte, versuche ich über die Situation anders zu denken.	0	0	0	0	0
17	Ich halte meine Gefühle unter Kontrolle, indem ich über meine aktuelle Situation anders nachdenke.	0	0	0	0	0
18	Wenn ich weniger negative Gefühle empfinden möchte, versuche ich über die Situation anders zu denken.	0	0	0	0	0
19	Ich behalte meine Gefühle für mich.	0	0	0	0	0
20	Wenn ich positive Gefühle empfinde, bemühe ich mich, sie nicht nach außen zu zeigen.	0	0	0	0	0
21	Ich halte meine Gefühle unter Kontrolle, indem ich sie nicht nach außen zeige.	0	0	0	0	0
22	Wenn ich negative Gefühle empfinde, sorge ich dafür, sie nicht nach außen zu zeigen.	0	0	0	0	0
23	Wenn ich in eine stressige Situation gerate, ändere ich meine Gedanken über die Situation so, dass es mich beruhigt.	0	0	0	0	0

	Wenn ich in einen Konflikt gerate, dann tue ich das Folgende:	Trifft gar nicht zu				Trifft voll zu
1	Ich denke solange über das Problem nach, bis ich eine Lösung finde, mit der sowohl ich, als auch die andere Partei wirklich zufrieden sind.	0	0	0	0	0
2	Ich versuche, einen Kompromiss zu finden.	0	0	0	0	0
3	Ich vermeide eine Konfrontation über die gegensätzlichen Ansichten.	0	0	0	0	0
4	Ich setze meine eigene Meinung durch.	0	0	0	0	0
5	Ich versuche, einen Kompromiss zu finden.	0	0	0	0	0
6	Ich gebe der anderen Person Recht.	0	0	0	0	0
7	Ich sorge sowohl für meine eigenen Ziele und Interessen, als auch für die der anderen Person.zu.	0	0	0	0	0
8	Ich betone, dass wir einen Mittelweg finden müssen.	0	0	0	0	0
9	Ich umgehe die Meinungsverschiedenheiten soweit wie möglich.	0	0	0	0	0
10	Ich versuche, meinen Vorteil aus dem Konflikt zu ziehen.	0	0	0	0	0
11	Ich probiere, der anderen Person entgegen zu kommen.	0	0	0	0	0
12	Ich denke über die Ideen von beiden Parteien nach, um die für beide Parteien optimale Lösung zu finden.	0	0	0	0	0
13	Ich bestehe darauf, dass wir beide Zugeständnisse machen müssen.	0	0	0	0	0
14	Ich versuche, Gegensätze weniger scharf darzustellen.	0	0	0	0	0
15	Ich kämpfe für ein für mich günstiges Ergebnis.	0	0	0	0	0
16	Ich passe mich an die Ziele und Interessen der anderen Person an.	0	0	0	0	0
17	Ich arbeite eine Lösung aus, die sowohl meinen eigenen, als auch den Interessen der anderen Person soweit wie möglich dient.	0	0	0	0	0
18	Ich strebe, wo es nur geht, nach einem Kompromiss.	0	0	0	0	0
19	Ich versuche, eine Konfrontation mit der anderen Person zu vermeiden.	0	0	0	0	0
20	Ich tue alles, um zu gewinnen.	0	0	0	0	0

		Weniger als 1 mal im Monat	Weniger als 2 mal im Monat	Etwa 1 mal pro Woche	1 mal am Tag	Mehr als 1 mal am Tag
1	Wie oft haben Sie starke Meinungsverschiedenheiten mit einer anderen Person?	0	0	0	0	0
2	Wie oft haben Sie eine Auseinandersetzung mit einer anderen Person?	0	0	0	0	0
3	Wie oft haben Sie einen Kampf mit einer anderen Person?	0	0	0	0	0
4	Wie oft haben Sie einen wirklichen Konflikt mit einer anderen Person?	0	0	0	0	0

Wie zufrieden sind Sie insgesamt mit Ihrer momentanen Studiensituation?(Bitte setzen Sie Ihr Kreuz in die Kästchen unter den Gesichtern)



Vielen Dank!