Innovative Work Behavior: The Roles of Employee Expectations and Effects on Job Performance

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# Index

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index</td>
<td>I</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>III</td>
</tr>
<tr>
<td>List of Figures</td>
<td>VI</td>
</tr>
<tr>
<td>List of Tables</td>
<td>VII</td>
</tr>
<tr>
<td>Abbreviations</td>
<td>IX</td>
</tr>
<tr>
<td>Abstract</td>
<td>X</td>
</tr>
<tr>
<td>Zusammenfassung</td>
<td>XI</td>
</tr>
<tr>
<td>1 Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Problem Orientation</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Research Deficits and Research Questions</td>
<td>3</td>
</tr>
<tr>
<td>1.3 Methodological Approach</td>
<td>7</td>
</tr>
<tr>
<td>1.4 Structure</td>
<td>9</td>
</tr>
<tr>
<td>2 Theoretical Background</td>
<td>11</td>
</tr>
<tr>
<td>2.1 Innovative Work Behavior</td>
<td>11</td>
</tr>
<tr>
<td>2.2 Social Cognitive Theory</td>
<td>14</td>
</tr>
<tr>
<td>2.3 Job Performance</td>
<td>16</td>
</tr>
<tr>
<td>2.4 Core Self-Evaluations</td>
<td>17</td>
</tr>
<tr>
<td>2.5 Organizational Support for Innovation</td>
<td>18</td>
</tr>
<tr>
<td>2.6 Transformational Leadership</td>
<td>19</td>
</tr>
<tr>
<td>2.7 Co-Worker Exchange</td>
<td>20</td>
</tr>
<tr>
<td>3 Research Model I: Employee Expectations, Innovative Work Behavior, and Task Performance</td>
<td>21</td>
</tr>
<tr>
<td>3.1 Conceptual Framework and Hypotheses</td>
<td>21</td>
</tr>
<tr>
<td>3.2 Empirical Test</td>
<td>28</td>
</tr>
<tr>
<td>3.3 Discussion</td>
<td>47</td>
</tr>
<tr>
<td>3.4 Summary of Research Model I</td>
<td>53</td>
</tr>
<tr>
<td>4 Research Model II: Antecedents of Innovative Self-Efficacy</td>
<td>55</td>
</tr>
<tr>
<td>4.1 Conceptual Framework and Hypotheses</td>
<td>55</td>
</tr>
<tr>
<td>4.2 Empirical Test</td>
<td>65</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>4.3 Discussion</td>
<td>79</td>
</tr>
<tr>
<td>4.4 Summary of Research Model II</td>
<td>84</td>
</tr>
<tr>
<td>5 Conclusions</td>
<td>86</td>
</tr>
<tr>
<td>5.1 Theoretical Implications</td>
<td>87</td>
</tr>
<tr>
<td>5.2 Managerial Implications</td>
<td>89</td>
</tr>
<tr>
<td>5.3 Limitations and Avenues for Further Research</td>
<td>90</td>
</tr>
<tr>
<td>6 References</td>
<td>92</td>
</tr>
<tr>
<td>7 Appendix</td>
<td>108</td>
</tr>
<tr>
<td>7.1 Employee Questionnaire</td>
<td>108</td>
</tr>
<tr>
<td>7.2 Supervisor Questionnaire</td>
<td>113</td>
</tr>
<tr>
<td>7.3 Results of the Second Exploratory Factor Analysis</td>
<td>116</td>
</tr>
<tr>
<td>7.4 Factor Analysis</td>
<td>117</td>
</tr>
<tr>
<td>7.5 Structural Equation Modeling</td>
<td>118</td>
</tr>
<tr>
<td>Curriculum Vitae</td>
<td>120</td>
</tr>
</tbody>
</table>
# Table of Contents

Index ............................................................................................................................ I

Table of Contents ...................................................................................................... III

List of Figures ........................................................................................................... VI

List of Tables ............................................................................................................ VII

Abbreviations ............................................................................................................ IX

Abstract ...................................................................................................................... X

Zusammenfassung .................................................................................................... XI

1 Introduction .......................................................................................................... 1
   1.1 Problem Orientation ...................................................................................... 1
   1.2 Research Deficits and Research Questions .................................................. 3
   1.3 Methodological Approach ............................................................................ 7
   1.4 Structure ........................................................................................................ 9

2 Theoretical Background ..................................................................................... 11
   2.1 Innovative Work Behavior ......................................................................... 11
   2.2 Social Cognitive Theory ............................................................................. 14
       2.2.1 Self-Efficacy ...................................................................................... 14
       2.2.2 Outcome Expectations ....................................................................... 15
   2.3 Job Performance ......................................................................................... 16
   2.4 Core Self-Evaluations ................................................................................. 17
   2.5 Organizational Support for Innovation ....................................................... 18
   2.6 Transformational Leadership ...................................................................... 19
   2.7 Co-Worker Exchange ................................................................................. 20

3 Research Model I: Employee Expectations, Innovative Work Behavior, and Task Performance ........................................................................................................... 21
   3.1 Conceptual Framework and Hypotheses ..................................................... 21
       3.1.1 Conceptual Framework ...................................................................... 21
       3.1.2 Hypotheses ....................................................................................... 23
   3.2 Empirical Test ............................................................................................. 28
       3.2.1 Methodology .................................................................................... 28
3.2.1.1 Data Collection and Sample ......................................................... 28
3.2.1.2 Measures .................................................................................. 32
3.2.1.3 Analytical Strategy ................................................................. 35
3.2.1.4 Measurement Assessment ...................................................... 36
3.2.2 Results ......................................................................................... 42
3.3 Discussion ....................................................................................... 47
3.3.1 Theoretical Implications .............................................................. 47
3.3.2 Managerial Implications .............................................................. 50
3.3.3 Limitations and Future Research ............................................... 52
3.4 Summary of Research Model I ....................................................... 53
4 Research Model II: Antecedents of Innovative Self-Efficacy ............... 55
4.1 Conceptual Framework and Hypotheses ........................................ 55
4.1.1 Conceptual Framework .............................................................. 55
4.1.2 Hypotheses ................................................................................ 58
4.2 Empirical Test ................................................................................ 65
4.2.1 Methodology ............................................................................ 65
4.2.1.1 Data Collection and Sample ................................................. 65
4.2.1.2 Measures ............................................................................. 66
4.2.1.3 Analytical Strategy ............................................................ 70
4.2.1.4 Measurement Assessment ................................................. 71
4.2.2 Results ...................................................................................... 75
4.3 Discussion ..................................................................................... 79
4.3.1 Theoretical Implications ............................................................ 79
4.3.2 Managerial Implications ............................................................ 81
4.3.3 Limitations and Future Research ............................................. 83
4.4 Summary of Research Model II .................................................... 84
5 Conclusions ....................................................................................... 86
5.1 Theoretical Implications ............................................................... 87
5.2 Managerial Implications ............................................................... 89
5.3 Limitations and Avenues for Further Research ............................... 90
6 References ....................................................................................... 92
7 Appendix ......................................................................................... 108
7.1 Employee Questionnaire ................................................................. 108
7.2 Supervisor Questionnaire .............................................................. 113
7.3 Results of the Second Exploratory Factor Analysis ....................... 116
7.4 Factor Analysis ............................................................................ 117
7.5 Structural Equation Modeling ....................................................... 118

Curriculum Vitae .............................................................................. 120
List of Figures

Figure 1: Central Research Questions of the Dissertation ........................................... 7
Figure 2: Research Models and Related Research Questions .................................. 8
Figure 3: Structure of the Dissertation ................................................................... 10
Figure 4: Conceptual Framework of Research Model I ........................................ 22
Figure 5: Overview of Hypotheses of Research Model I ...................................... 23
Figure 6: Data Pooling ......................................................................................... 30
Figure 7: Covariance Structure Model for Analysis of the Proposed Effects of Research Model I .................................................. 43
Figure 8: Results of Structural Equation Model I ............................................... 44
Figure 9: Results of the Robustness Test .............................................................. 47
Figure 10: Conceptual Framework of Research Model II ..................................... 56
Figure 11: Overview of Hypotheses of Research Model II .................................... 59
Figure 12: Covariance Structure Model for Analysis of the Proposed Effects of Research Model II .................................................. 76
Figure 13: Results of Structural Equation Model II ............................................. 77
Figure 14: Measurement Model and Structural Equation Model .......................... 118
List of Tables

Table 1:  Research Hypotheses of Research Model I ............................................. 28
Table 2:  Sample Statistics for the First Research Model ...................................... 31
Table 3:  Scale Items for Construct Measures of Research Model I ..................... 34
Table 4:  Acceptable Levels of Goodness of Fit Criteria (based on Schumacker and Lomax 1996) ............................................................... 36
Table 5:  Exploratory Factor Analysis for the Innovative Self-Efficacy Scale ................................................................. 37
Table 6:  Alternative Measurement Models of Innovative Self-Efficacy .............. 38
Table 7:  Correlation and Discriminant Validity of the Sub-Dimensions of Innovative Self-Efficacy ................................................................. 38
Table 8:  Goodness of Fit Summary for Innovative Self-Efficacy and Outcome Expectations ................................................................. 39
Table 9:  Scale Properties of Research Model I .................................................... 40
Table 10: Descriptives of Research Model I .......................................................... 41
Table 11: Goodness-of-Fit Summary for Alternative Measurement Models of Research Model I ................................................................. 42
Table 12: Results of Hypotheses Testing for Research Model I ............................ 46
Table 13: Research Hypotheses of Research Model II ........................................... 65
Table 14: Sample Statistics of Research Model II .................................................. 66
Table 15: Scale Items for Construct Measures of Research Model II .................. 70
Table 16: Scale Properties of Research Model II ................................................... 71
Table 17: Descriptives of Research Model II .......................................................... 73
Table 18: Goodness of Fit Summary for Core Self-Evaluations and Innovative Self-Efficacy ................................................................. 74
Table 19: Goodness of Fit Summary for Alternative Measurement Models of Research Model II ................................................................. 75
Table 20: Results of Hypotheses Testing for Research Model II ............................ 78
Table 21: Results of the Exploratory Factor Analysis for Innovative Self-Efficacy with Data from the Second Part
<table>
<thead>
<tr>
<th>Abbreviations</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>approx.</td>
<td>approximately</td>
</tr>
<tr>
<td>AVE</td>
<td>Average Variance Extracted</td>
</tr>
<tr>
<td>cf.</td>
<td>compare (Latin: confer)</td>
</tr>
<tr>
<td>CFI</td>
<td>Comparative Fit Index</td>
</tr>
<tr>
<td>DF</td>
<td>Degrees of Freedom</td>
</tr>
<tr>
<td>e.g.</td>
<td>for example, for instance (Latin: exempli gratia)</td>
</tr>
<tr>
<td>i.e.</td>
<td>that is, in other words (Latin: id est)</td>
</tr>
<tr>
<td>RMSEA</td>
<td>Root Mean Square Error of Approximation</td>
</tr>
<tr>
<td>SD</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>TLI</td>
<td>Tucker-Lewis Index</td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>Chi-Square</td>
</tr>
</tbody>
</table>
Abstract

The present work is devoted to the question of how innovative work behavior of employees affects their task performance and how managers can influence innovative work behavior. Two research models approach the question: (1) research model I addresses how employee expectations influence innovative work behavior and how innovative work behavior relates to task performance; and (2) research model II deals with the factors that influence the formation of expectations.

Research model I investigates the roles that employee expectations play in innovative work behavior. It examines the effects of innovative self-efficacy and outcome expectations on innovative work behavior. Moreover, research model I reveals how innovative work behavior relates to task performance. The results from a survey of 350 employees and their direct supervisors in a Swiss insurance company show that innovative work behavior positively influences task performance. The results further show that innovative self-efficacy is a strong predictor for innovative work behavior. Moreover, the findings support that innovative self-efficacy beliefs determine outcome expectations. However, the results also show that outcome expectations do not contribute to the prediction of innovative work behavior.

Research model II examines employees’ personal characteristics and contextual factors as antecedents of innovative self-efficacy. More precisely, it determines the effects of core self-evaluations, organizational support for innovation, transformational leadership, and co-worker exchange on innovative self-efficacy. The results from a survey of 422 employees of a Swiss insurance company show that employees’ core self-evaluations and their perceptions of organizational support for innovation and co-worker exchange increase innovative self-efficacy. Contrary to the assumed relationship, transformational leadership lowers innovative self-efficacy.
Zusammenfassung

Die vorliegende Arbeit beschäftigt sich mit der Frage, wie sich das innovative Arbeitsverhalten von Mitarbeitern auf ihre Leistung auswirkt und wie Manager das innovative Arbeitsverhalten beeinflussen können. Zwei Forschungsmodelle adressieren die forschungsleitende Fragestellung: (1) Forschungsmodell I behandelt die Fragestellung, wie die Erwartungshaltungen von Mitarbeitern ihr innovatives Arbeitsverhalten und folglich ihre Leistung beeinflussen und (2) Forschungsmodell II widmet sich der Frage, welche Faktoren die Erwartungshaltungen bestimmen.


1 Introduction

1.1 Problem Orientation

In business today, firms must innovate on a continuous basis to stay competitive and to survive in the long run (Banbury and Mitchell 1995; Roberts 1999; Cefis and Marsili 2006). Many practitioners and scientists suggest that the extent to which any firm can continuously innovate is linked to innovation by individual employees (Janssen 2000; Scott and Bruce 1994; Sharma and Chrisman 1999; Van de Ven 1986; de Jong and den Hartog 2007). Employees can innovate either because it is part of their job description or by expressing voluntary innovative behavior. Katz (1964, p.132) claims that “… an organization which depends solely upon its blueprints of prescribed behavior is a very fragile social system” and that organizations rely on voluntary innovative and spontaneous behavior (i.e., actions that are not specified by role prescriptions), which facilitates the accomplishment of organizational goals. Innovative work behavior refers to behaviors that encompass both the generation or introduction of new ideas (either by oneself or adopted from others) and the realization or implementation of new ideas at work (Yuan and Woodman 2010).

3M’s employee who realized his idea for the Post-it is a prominent example of innovative work behavior (Self, Bandow, and Schraeder 2010): a 3M researcher came up with an unusual adhesive that was not very sticky. Thus, it seemed to be useless. However, another employee of 3M was experiencing problems with a bookmark that would not stay in place in his choir’s hymnbook. While searching for a solution to the problem, he came up with the idea to use the unusual adhesive to create bookmarks that stick when needed but can also be easily removed. The Post-it became so successful that 3M now offers more than 600 Post-it products (3M 2010).

In 1994, a programmer at IBM felt that IBM was missing the bigger point of the internet. Due to the programmer’s persistent arguing for the internet and how it could benefit IBM, a member of the strategy taskforce started an informal alliance of internet-savvy users at IBM. By sharing their technical expertise, they helped IBM to become an effective player in the internet industry. They laid the foundation for the position IBM holds today (Hamel 2000).

In yet another example, Amazon searched for the right loyalty program for years. A software engineer at Amazon posted the idea of a free shipping service via a suggestion box feature on Amazon’s internal website. The idea was refined by other
company members and was launched under the name Amazon Prime in 2004. Amazon Prime is a flat shipping fee for all-you-can-buy. Today, analysts say that Amazon Prime may be the most ingenious and effective customer loyalty program in all of e-commerce. In addition, it is said to be one of the main factors driving Amazon’s stock price (up 296 percent in the last two years) and the main reason Amazon’s sales grew 30 percent during the recession while other retailers flailed (Stone 2010).

These three examples are the result of innovative work behavior. Employees’ innovative work behavior is crucial in many contemporary management principles, such as continuous improvement (Fuller, Marler, and Hester 2006), kaizen (Imai 1986), corporate entrepreneurship (Sharma and Chrisman 1999) and suggestion programs (Unsworth 2001). Innovative firms consider their employees to be an important source of innovation and are constantly looking for ways to encourage employee-driven innovation. For example, the Swiss head of strategy and innovation at Swisscom, Stéphane Dufour, stated (Swisscom 2011): “Employees can and should contribute innovative ideas. The challenge is to enable every employee to also make a contribution toward improving operational processes.” The organization has launched the internal innovation program future 2.0 to take up the challenge (Swisscom 2011).

Other organizations also try to create a climate for innovation and intrapreneurship to encourage employee-driven innovations. For example, Google, IBM and 3M allow employees to spend working time on new business ideas. They arrange regular innovation jam events where employees exchange ideas in an online brainstorming session. The ideas are designed to help solve organizational and global challenges.

The question of how firms can capitalize on their employees’ innovative work behavior marks an important subject for management research. Driven by the assumption that employees’ innovative work behavior is beneficial for work outcomes, researchers have devoted increasing attention to factors that potentially promote innovative work behavior. A variety of organizational and individual factors have been studied as important determinants of innovative work behavior (e.g., Janssen, van de Vliert, and West 2004; Mumford and Licuanan 2004; Mumford et al. 2002).

Surprisingly, although common sense dictates that innovative work behavior is beneficial, research on the consequences of innovative work behavior is scarce (Janssen, van de Vliert, and West 2004). However, only if innovative work behavior actually leads to the anticipated benefits, organizations profit from encouraging it. This means that it is important to identify antecedents and consequences of innovative work behavior (Janssen, van de Vliert, and West 2004). Scholars have therefore
called for more holistic research models that treat innovative work behavior as the dependent and independent variable (Janssen, van de Vliert, and West 2004).

In this regard, the present work aims to fill the research gap by addressing the following central question:

In what way does employees’ innovative work behavior affect task performance and how can managers influence innovative work behavior?

### 1.2 Research Deficits and Research Questions

Theories that help to address the central research question are social cognitive theory as a prominent theory that explains human behavior and performance theory. Despite the fact that scholars have devoted increased attention to innovative work behavior and have advanced its understanding significantly, extant research on innovative work behavior has not focused on at least four different aspects related to a social cognitive and a performance perspective. This dissertation aims to address these four aspects, which are: (1) existing research lacks a good understanding of innovation-specific self-efficacy and how it affects innovative work behavior; (2) the sources of innovative self-efficacy formation remain unidentified; (3) how innovative self-efficacy is related to outcome expectations concerning innovative work behavior remains unclear; and (4) existing research has not empirically studied the relationship between innovative work behavior and task performance.

First, from a social cognitive perspective, scholars have underscored the pivotal role of self-efficacy in the context of innovation (Bandura 1997; Farr and Ford 1990). In particular, Farr and Ford (1990, p. 67) argue that “Since change and innovation in a work role may involve both uncertainty about future outcomes as well as possible resistance from others affected by the change, the individual who does not possess a reasonable amount of self-efficacy faces considerable barriers.”

Self-efficacy research distinguishes two types of self-efficacy: general self-efficacy and task-specific self-efficacy (Chen et al. 2000). Whereas general self-efficacy reflects a generalized competence belief in a wide variety of situations (Chen, Gully, and Eden 2004), task-specific self-efficacy refers to expectations regarding one’s ability to perform a specific behavior (Chen et al. 2000). Task-specific self-efficacy should, therefore, be tailored to the specific domain under study (e.g., Bandura 1986; Gist and Mitchell 1992).
Although scholars have advocated the importance of self-efficacy for innovation, they still lack a good understanding of innovation-specific self-efficacy and of how it affects innovative work behavior. Put differently, prior research has not examined the effects of innovation-specific self-efficacy. Empirical research has rather focused on creativity-related self-efficacy (Locke et al. 1984; Gist 1989; Gong, Huang, and Farh 2009; Redmond and Mumford 1993; Tierney and Farmer 2002) or has examined the influence of general self-efficacy on suggestion making and implementation (Axtell et al. 2000). Although the study of Axtell at al. (2000) indicates that self-efficacy is linked to innovation-related behaviors, it is interesting to note that while the authors have found support for the relationship between self-efficacy and suggestions made, they have not found support for the proposed relationship between self-efficacy and implementation. One possible explanation for this finding may be that the authors have relied on the general self-efficacy concept instead of tailoring it to the specific innovation context. Research on creativity-specific self-efficacy has found support for the relationship between creative self-efficacy and employee creativity (Locke et al. 1984; Gist 1989; Gong, Huang, and Farh 2009; Redmond and Mumford 1993; Tierney and Farmer 2002). As these results indicate, the exploration of how innovative self-efficacy may influence innovative work behavior is a fruitful endeavor. It can be formulated into the following question:

**RQ1: How does innovative self-efficacy relate to innovative work behavior?**

Second, there is currently no answer to the question of what the sources of innovative self-efficacy are. If innovative self-efficacy plays a significant role in innovative work behavior, what can organizations do to form innovative self-efficacy beliefs? Self-efficacy theory (e.g., Bandura 1986; Gist and Mitchell 1992) suggests that individuals form judgments of efficacy on the basis of their own experiences, observing role models, verbal persuasion, and evaluating their physiological and psychological arousal (e.g., anxiety). However, prior research has not investigated how these four information sources contribute to the formation of innovative self-efficacy. Research in a related research area has started to examine sources of creativity-related self-efficacy (Gong, Huang, and Farh 2009; Tierney and Farmer 2002). It has been found that creative self-efficacy is influenced by personal factors, such as job tenure and job self-efficacy (Tierney and Farmer 2002) and by contex-
tual factors, like supervisor behavior, job complexity (Tierney and Farmer 2002), and transformational leadership (Gong, Huang, and Farh 2009).

These results indicate that investigating how personal and contextual factors affect the formation of judgments on innovative self-efficacy would contribute to scholarly understanding of innovative self-efficacy. The present work aims to investigate the influence of a set of contextual and personal factors on innovative self-efficacy, thereby addressing the following question:

RQ2: Which personal characteristics and contextual factors contribute to the formation of judgments on innovative self-efficacy?

Third, research on innovative work behavior has highlighted the importance of outcome expectations, since human behavior is determined by the expected outcomes of the behavior (Yuan and Woodman 2010). Yuan and Woodman (2010) have found that expected performance improvement and expected image gain or loss influences innovative work behavior. Social cognitive theory suggests that one’s outcome expectations largely depend on one’s self-efficacy beliefs (Bandura 1986). However, so far, research has not examined the effect of innovative self-efficacy on outcome expectation. Scholarly understanding would benefit from simultaneously examining the effects of outcome expectations and innovative self-efficacy on innovative work behavior. The present work thematizes these issues by examining the roles of the two kinds of expectations concerning innovative work behavior in one study, addressing the following question:

RQ3: How does innovative self-efficacy relate to outcome expectations and how do outcome expectations relate to innovative work behavior?

Fourth, extant research has neglected to investigate the influence of innovative work behavior on ultimate task performance. Rather, it has focused on treating innovative work behavior as the dependent variable. According to the definition of innovative work behavior, individuals engage in innovative activities because of the anticipated benefits from innovative change (Janssen, van de Vliert, and West 2004). Based on the assumption that innovation is followed by positive outcomes, most prior re-
Research has treated innovative work behavior as the dependent variable (e.g., Scott and Bruce 1994; Yuan and Woodman 2010; Basu and Green 1997). Although progress regarding the identification of potential antecedents of innovative work behavior has been notable, to date, research on the link between innovative work behavior and ultimate task performance does not exist. If anything, empirical evidence suggests that innovative work behavior leads to negative outcomes in terms of conflicts with co-workers and stress reactions of employees (Janssen 2003; Janssen 2004). These results imply that innovative work behavior is rather associated with decreased performance. Similarly, one study has found that creativity is dysfunctional to performance quality because it is incongruent with conformity and attention to detail (Miron, Erez, and Naveh 2004). However, the researchers have also found that innovative performance does not impede performance quality and efficiency, but that the three performance outcomes are positively correlated (Miron, Erez, and Naveh 2004).

In line with this, Anderson, de Dreu, and Nijstad (2004, p.160) state: “This [the lack of studies that investigate innovation as an independent variable] is a significant gap in our understanding of the longer-term impacts of innovation processes. It rather leaves the reader with the inaccurate impression that innovations are the final end-product of previous processes which end abruptly at some predetermined point.” Scholars have therefore called for more holistic research models that treat innovative work behavior as the dependent and independent variable (Janssen, van de Vliert, and West 2004).

Therefore, it is important to shed more light on the effect that innovative work behavior has on employee performance. Only if this connection really is positive, efforts toward innovation can actually lead to the anticipated improvements in task performance and eventually aid organizations in achieving competitive advantages.

To comply with scholars’ calls and to clarify how innovative work behavior and task performance are related, the present work treats innovative work behavior as the independent and dependent variable. Instead of merely focusing on antecedents of innovative work behavior, the work also attempts to answer the following question:

*RQ4: How does innovative work behavior relate to task performance*?
In summary, this dissertation intends to contribute to the theoretical knowledge of innovative work behavior by addressing the identified research deficits. Figure 1 summarizes the central research questions of the present work.

**RQ:** In what way does employees’ innovative work behavior affect task performance and how can managers influence innovative work behavior?

**RQ1:** How does innovative self-efficacy relate to innovative work behavior?

**RQ2:** Which personal characteristics and contextual factors contribute to the formation of judgments on innovative self-efficacy?

**RQ3:** How does innovative self-efficacy relate to outcome expectations and how do outcome expectations relate to innovative work behavior?

**RQ4:** How does innovative work behavior relate to task performance?

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**Figure 1: Central Research Questions of the Dissertation**

### 1.3 Methodological Approach

The present work relies on mature theories and tests hypotheses in a “real” organizational setting to answer the research questions. Prior research on innovative work behavior (e.g., Scott and Bruce 1994), specific self-efficacy (e.g., Chen et al. 2000), outcome expectations (e.g., Yuan and Woodman 2010), and task performance (e.g., Williams and Anderson 1991) has theorized and empirically tested various relationships with other variables. Thus, the development of the present research questions builds on prior theoretical work. In this regard, Edmondson and McManus (2007) recommend a quantitative approach.

Two research models are developed and tested throughout the following sections to approach the research questions. The first research model addresses research questions 1, 3, and 4. It explores the roles that expectations play in innovative work behavior. Moreover, the model proposes that innovative work behavior is positively related to task performance. A theoretical framework that builds on theories of performance (e.g., Judge, Erez, and Bono 1998; Vroom 1964) and on Bandura’s (1986) social cognitive theory (and its central variables self-efficacy and outcome expectations) guides the development of research model I. The second research model addresses research question 2 by investigating employees’ personal characteristics and contextual factors as antecedents of innovative self-efficacy. Bandura’s (1986) social cognitive theory and Gist and Mitchell’s (1992) framework of work-related self-efficacy guides the development of research model II. Figure 2 illustrates the two research models and the related research questions.
Figure 2: Research Models and Related Research Questions
The work applies a survey study design, as suggested by McGrath (1981). For statistical analyses of the data from the returned questionnaires, the present work deploys structural equation modeling (Bollen 1989) for the following reasons. Since the variables under study are latent psychological variables, it is likely that they are measured with error (Baron and Kenny 1986). Structural equation modeling allows the researcher to control for measurement errors (Fornell and Larcker 1981). In addition, Steenkamp and Baumgartner (2000) argue that the use of structural equation modeling is a strong instrument in theory testing and particularly in testing hypotheses in cross-sectional models. Further, Hughes, Price, and Marrs (1986) state that the advantages of structural equation modeling enhance the exactness of theoretical statements, making theory testing more precise and enhancing the communication of theory.

1.4 Structure

The present dissertation is divided into five chapters. The following section provides a short overview of each chapter. Figure 3 depicts the chapter structure.

Chapter 1 explains the relevance of the topic and the research problem. A literature review provides the basis for the development of the specific research questions. The chapter concludes by illustrating the methodological approach and outlining the dissertation structure. After the introduction section, chapter 2 describes the theoretical background of the dissertation. It gives an overview of the central concepts and theories relevant for the present dissertation. Chapters 3 and 4 provide the empirical part of the dissertation. Chapter 3 deals with the roles that expectations play in innovative work behavior and the effect of innovative work behavior on task performance. Chapter 4 deals with antecedents of innovative self-efficacy. Both chapters are structured in the same way, starting with the development of the conceptual framework and the derivation of a number of research hypotheses. Subsequently, the chapters examine if the hypotheses can be empirically validated. The chapters present the methodology, the results, and the discussion of the results. In chapter 5, the findings of the two models serve as a basis from which implications are derived for theory as well as management practice. The dissertation ends with the main limitations and suggestions for future research.
## 1 Introduction
- Problem Orientation
- Research Deficits and Questions
- Methodological Approach
- Structure

## 2 Theoretical Background
- Innovative Work Behavior
- Social Cognitive Theory
- Job Performance
- Core Self-Evaluations
- Organizational Support for Innovation
- Transformational Leadership
- Co-Worker Exchange

## 3 Research Model I: Employee Expectations, Innovative Work Behavior, and Task Performance
- Conceptual Framework and Hypotheses
- Empirical Test
- Discussion

## 4 Research Model II: Antecedents of Innovative Self-Efficacy
- Conceptual Framework and Hypotheses
- Empirical Test
- Discussion

## 5 Conclusions
- Theoretical Implications
- Managerial Implications
- Limitations and Avenues for Further Research

### Figure 3: Structure of the Dissertation
2 Theoretical Background

The following sections provide a brief overview of the central concepts and theories relevant to the present dissertation in order of their appearance in the work. The chapter starts with an overview of the central concept of the present work, i.e., innovative work behavior. Afterwards, the second section lays the theoretical foundation of the present work, which builds on the principles of social cognitive theory including the two expectation beliefs social cognitive theory suggests that people hold concerning behavior self-efficacy and outcome expectations. Subsequently, the third section presents the concept of job performance. Finally, sections four to seven describe the potential antecedents of innovative self-efficacy: the psychological construct of core self-evaluations, the concept of organizational support for innovation, one of the most prominent theoretical perspectives in contemporary leadership research (i.e., transformational leadership), and the concept of co-worker exchange.

2.1 Innovative Work Behavior

Innovation has been considered a human behavior since research on innovation spread from administrative science, communications, and anthropology to psychology and sociology in the 1980s (West and Farr 1990). First psychological works on innovation coined the term “innovative work behavior”. It can be defined as the intentional generation, promotion and realization of new ideas within a work role, workgroup or organization in order to benefit role performance, the group or the organization (West and Farr 1990). Although closely related to employee creativity, innovative work behavior implies more than being creative. Indeed, Miron, Erez, and Naveh (2004) have found that creative people are not always highly innovative. Innovative work behavior is intended to generate some kind of benefit and has a clearer applied component (de Jong and den Hartog 2007). Consequently, researchers have agreed that innovative work behavior encompasses employee creativity, i.e., the generation of new and useful ideas concerning products, services, processes and procedures (Amabile 1988), and the implementation of the created ideas (Anderson, de Dreu, and Nijstad 2004; Axtell et al. 2000). More specifically, innovative work behavior consists of a set of behaviors (Scott and Bruce 1994; de Jong and den Hartog 2010, Janssen 2000): opportunity exploration and idea generation include looking for and recognizing opportunities to innovate and producing ideas and solutions for the opportunities. Next, championing refers to promoting the generated idea for the purpose of finding support and coalition building. Finally, appli-
Innovative work behavior can range from *incremental improvements* to developing *radically novel ideas* that affect processes or products across the whole organization (Axtell et al. 2000). While the latter are rather rare and mostly only employees working in the research and development domain are able to contribute in such a manner, the former smaller-scale suggestions and improvements are much more common and concern employees from all areas. Examples of innovative work behavior include thinking in alternative ways, searching for improvements, figuring out new ways to accomplish tasks, looking for new technologies, applying new work methods, and investigating and securing resources to make new ideas happen.

Usually, innovative work behavior is not part of the typical job of most employees. It is identified as extra-role behavior, which refers to discretionary behavior that is not specified in the job description (Katz and Kahn 1978) but nevertheless attempts to benefit the organization (Organ, Podsakoff, and MacKenzie 2006). Employees’ innovative work behavior is crucial in many contemporary management principles, such as continuous improvement (Fuller, Marler, and Hester 2006), kaizen (Imai 1986), corporate entrepreneurship (Sharma and Chrisman 1999), and suggestion programs (Unsworth 2001).

Driven by the assumption that innovative work behavior contributes to work outcomes, most of the extant research on innovative work behavior has focused on identifying its potential antecedents. A variety of organizational and individual factors have been studied as important determinants of innovative work behavior (e.g., Janssen, van de Vliert, and West 2004; Mumford et al. 2002; Mumford and Licuanan 2004):

**Organizational factors.** The first group of antecedent factors deals with the factors that organizations can determine. Researchers have devoted considerable attention to these factors. Among others, scholars have suggested supervisory behavior as a key driving force (Mumford et al. 2002; Scott and Bruce 1994; Tierney, Farmer, and Graen 1999). Particularly, previous work has intensively studied the effects of transformational leadership and leader-member exchange on innovative work behavior (e.g., Basu and Green 1997; Nederveen Pieterse et al. 2010; Scott and Bruce 1994; Yuan and Woodman 2010). Other organizational factors that research has found to be related to innovative work behavior are, for example, an organization’s culture and climate (Scott and Bruce 1994) and support for innovation (Axtell et al. 2000). Further, scholars have previously studied factors such as job autonomy.
(Axtell et al. 2000) and job challenge (de Jong and Kemp 2003), as well as task and goal interdependence (van der Vegt and Janssen 2003).

**Individual factors.** Individual differences can also affect innovative work behavior. Similar to organizational antecedents, previous work has paid much attention to these factors. Typical factors that have been investigated include personal characteristics, such as propensity to innovate (Bunce and West 1995), intrinsic interest (Yuan and Woodman 2010), and mastery orientation (Janssen and van Yperen 2004). Other studies have investigated the impact of cognitive features of individuals, such as problem-solving style (Scott and Bruce 1994) or problem ownership (Dorenbosch, van Engen, and Verhagen 2005). Further, scholars have suggested that self-efficacy plays an important role in innovative work behavior. For example, Bandura (1997, p. 239) states that “… innovativeness requires an unshakable sense of efficacy …”. Similarly, Farr and Ford (1990, p. 67) claim that “Since change and innovation in a work role may involve both uncertainty about future outcomes as well as possible resistance from others affected by the change, the individual who does not possess a reasonable amount of self-efficacy faces considerable barriers.”

Given the conceptual association of self-efficacy and innovation-related outcomes, scholars have started to test the assumed relationship empirically. Two experimental studies found that creativity-related self-efficacy beliefs are positively related to creativity (Gist 1989; Redmond and Mumford 1993). Further, Axtell et al. (2000) support that the positive relationship between self-efficacy and creativity also manifests in a workplace setting. Recently, Tierney and Farmer (2002) introduced a creative self-efficacy construct, which refers to the employees’ beliefs that they can be creative in the workplace. The authors suggest that creative self-efficacy enhances creativity and they provide empirical evidence that supports their theoretical reasoning using data from two different firms. Gong, Huang, and Farh (2009) have provided further support for the relationship between creative self-efficacy and creative outcomes.

Previous research on the potential outcomes of innovative work behavior has been sparse. Only two studies exist that have dealt with the consequences of innovative work behavior. Both of them have focused on the negative effects that innovative work behavior might have. First, assuming that innovation is always a risky endeavor, Janssen (2003) found that employees who display innovative work behavior are likely to run the risk of conflicts with co-workers who want to prevent innovative change. Second, in another study, Janssen (2004) found that innovative work behavior is related to stress reactions of employees.
2.2 Social Cognitive Theory

Bandura’s (1977; 1986) social cognitive theory provides a framework for understanding, predicting, and changing human behavior. According to social cognitive theory, people hold two expectations concerning behavior. The first relates to the expectations concerning one’s ability to perform a particular behavior, i.e., self-efficacy. The second encompasses the expected outcomes of the particular behavior.

2.2.1 Self-Efficacy

Self-efficacy is one of the most focal concepts in contemporary psychology research (Judge et al. 2007). It is defined as people’s judgment of their capabilities to accomplish a certain level of performance (Bandura 1986). Thus, self-efficacy does not reflect the skills one has but the judgment of what one can do with whatever skills one possesses (Bandura 1986). Gist and Mitchell (1992) stress that self-efficacy is task-specific. It is a conditional state (Judge et al. 2007) that is proximal to behavior (Chen et al. 2000), i.e., it directly influences behavior. In contrast to more distal traits (i.e., relatively enduring personal characteristics) that are not specific to a certain task or situation and are stable over time, state-like individual differences are specific to certain tasks or situations and tend to be malleable over time (Chen et al. 2000). This means that task-specific self-efficacy judgments can change over time as individuals derive new information and experiences (Gist and Mitchell 1992).

Self-efficacy represents a proximal determinant of human behavior (Bandura 1986). Particularly, it has important effects on a person’s choice of activities, the degree of persistence that individuals deploy when they encounter difficulties in the pursuit of accomplishing a task, and their thought patterns and emotional reactions (Bandura 1986). More precisely, social cognitive theory assumes the following (Bandura 1986): People who believe that specific tasks or situations exceed their capabilities tend to avoid them, but if they perceive high self-efficacy, they believe that they can succeed and, consequently, tend to take on a task. When facing difficulties, people with strong efficacy beliefs tend to increase their level of effort to master the challenge. On the contrary, people who are in doubt about their capabilities tend to decrease their efforts or give up early and fail at the task. Additionally, people who perceive low self-efficacy tend to believe that tasks are more difficult than they actually are and focus their thoughts on their lacking capabilities. People with strong efficacy beliefs, on the contrary, direct their attention to the task and are incited by challenges to make greater effort.
Innovative Self-Efficacy

Gist and Mitchell (1992) stress that self-efficacy is a task-specific belief and that self-efficacy measurement should therefore be tailored to the specific domain under study. As previously stated, scholars underscore the pivotal role of self-efficacy in the context of innovation (Bandura 1997; Farr and Ford 1990). However, extant literature has not introduced the concept of innovative self-efficacy so far. Based on Bandura’s (1986) general definition of self-efficacy, this dissertation defines innovative self-efficacy as a person’s belief in their capabilities to produce innovative outcomes. Innovative outcomes refer to performing innovative work behavior. Following social cognitive theory, innovative self-efficacy is supposed to determine innovative work behavior. More specifically, it is supposed to influence people’s initial decision to engage in innovative work behavior, their degree of persistence and effort expenditure when they face difficulties in the course of action, and the effective use of the competencies they possess regarding innovative work behavior. Since innovative self-efficacy is innovation-specific, it differs from general self-efficacy, which reflects a generalized competence belief in a wide variety of situations (Chen, Gully, and Eden 2004).

2.2.2 Outcome Expectations

Outcome expectations refer to the beliefs of the consequences of one’s actions (Bandura 1986). Most intentional human behavior is regulated by forethought (Bandura 1989). This means that individuals anticipate the likely outcomes of their behavior. Outcome expectations play an important role in human behavior. People are more likely to engage in specific behavior when they believe that the behavior leads to a positive, valued consequence. On the contrary, people try to avoid prospective actions if they believe that the particular action results in outcomes that are not favorable. The two kinds of expectations, self-efficacy and outcome expectations, can be differentiated since individuals may believe that a certain behavior
leads to a certain consequence, but they may doubt that they can perform the behav-
ior (Robertson and Sadri 1993).

Research on outcome expectations has found that they influence work-related out-
comes, such as knowledge sharing (Hsu, Ju, and Chang 2007), computer use
(Adams, Nelson, and Todd 1992; Davis, Bagozzi, and Warshaw 1992), and innova-
tive work behavior (Yuan and Woodman 2010).

**Innovation-Related Outcome Expectations**

Innovation-related outcome expectations refer to the beliefs of the consequences of
innovative work behavior. As with self-efficacy, outcome expectations are seen as
proximal antecedents to behavior (Yuan and Woodman 2010). Yuan and Woodman
(2010) suggest that two different forms of consequence beliefs influence innovative
work behavior: first, corresponding to an efficiency-oriented perspective, beliefs
about the positive or negative consequences of innovative work behavior on job
performance; and second, relating to a social-political perspective, beliefs about the
potential image risks and image gains.

### 2.3 Job Performance

Job performance refers to actions and behaviors that are under the control of the in-
dividual and contribute to the goals of the organization (Rotundo and Sackett 2002). As
there are many different kinds of behaviors that may contribute to organizational
goals, the literature agrees that job performance is a construct comprising different
components (e.g., Katz and Kahn 1978; Motowidlo, Borman, and Schmit 1997;
Rotundo and Sackett 2002). For example, Motowidlo, Borman, and Schmit (1997)
differentiate job performance into *task performance* and *contextual performance*. Although the two constructs are empirically related, they are distinct (Conway
1999; Hoffman et al. 2007).

Whereas task performance contributes to the core organizational processes, contex-
tual performance maintains the broader organizational, social, and psychological
environment. Contextual performance encompasses altruism, courtesy, cheerlead-
ing, peacekeeping, sportsmanship, civic virtue, and conscientiousness (Organ 1988;
Organ, Podsakoff, and MacKenzie 2006). Task performance relates to meeting or
exceeding the quantitative and qualitative standards of one’s job (Katz and Kahn
1978). It includes the activities that are formally recognized as part of the job and
that contribute to the organization’s technical core (Motowidlo, Borman, and Schmit 1997).

The present work focuses on task performance because one of its major goals is to clarify if innovative work behavior helps employees to improve their task performance or if it distracts them from their core tasks.

Theories of performance propose that performance is a function of ability and motivation (e.g., Judge, Erez, and Bono 1998; Vroom 1964). Waldman and Spangler (1989) extend this view and propose a model of determinants of performance that includes two types of variables: individual characteristics encompass experience as well as ability and motivational factors; and factors in the immediate work environment include leader behavior and group processes. They are assumed to influence performance indirectly through their effects on the individual.

2.4 Core Self-Evaluations

Core self-evaluations refer to a person’s fundamental assessments about their worth, competence, and capability (Judge et al. 2005). The concept of core self-evaluations was introduced by Judge, Locke, and Durham (1997) in order to provide a framework that integrates the effects of employee dispositions on their level of job satisfaction.

Core self-evaluations refer to a distal, trait-like construct that captures the common elements embedded in the four traits self-esteem, generalized self-efficacy, emotional adjustment, and locus of control (Judge, Locke, and Durham 1997; Judge et al. 2003). First, self-esteem refers to the evaluation an individual makes and customarily maintains in regard to himself or herself (Coopersmith 1967). Since self-esteem is the overall value that one places on oneself as a person (Harter 1990), Judge, Erez, and Bono (1998) consider it to be the most fundamental core evaluation of the self. Second, generalized self-efficacy, as mentioned before, reflects a generalized competence belief in a wide variety of situations (Chen, Gully, and Eden 2004). It constitutes a core self-evaluation because it reflects one’s perceptions of one’s fundamental ability to cope with life’s exigencies (Judge, Erez, and Bono 1998). Third, emotional adjustment reflects a propensity to feel calm and secure and show less reactivity to everyday occurrences. Emotionally stable individuals are less disposed to perceiving and recalling negative information and experiencing negatively valenced emotions (Johnson, Rosen, and Levy 2008). Fourth, locus of control represents the degree to which a person believes that he or she controls events in his
or her life (internal locus of control) or believes that the environment or fate controls events (external locus of control; Rotter 1966).

Since their introduction by Judge, Locke, and Durham (1997), core self-evaluations have been empirically linked to numerous outcomes, such as job satisfaction (Judge and Bono 2001), motivation (Chen, Gully, and Eden 2004), and organizational commitment (Bono and Colbert 2005). Further, a line of research has developed that suggests that core self-evaluations are a significant predictor of job performance (Erez and Judge 2001, Judge and Bono 2001, Judge, Erez and Bono 1998, Judge et al. 2003).

### 2.5 Organizational Support for Innovation

An organization’s climate is defined as the “relative enduring quality of an organization’s internal environment that results from the behavior and policies of members of the organization, especially in top management” (Abbey and Dickson 1983, p. 362). It refers to the organizational members’ perceptions of social contexts and their impacts (Denison 1996).

Research on climates differentiates between a psychological climate and an organizational climate. While the former refers to the perceptual measurement of individual attributes, the latter relates to the perceptual measurement of organizational attributes (Denison 1996). Since the present work focuses on the individual, it adopts the psychological climate approach in accordance with James and Jones (1974). From this perspective, a climate is defined as an individual’s summarized perceptions of their work environment (Schneider 1975). As a climate reflects organizational expectations for behavior and potential consequences of behavior, it is an important source for the formation of expectations and instrumentalities for individuals (James et al. 1977).

Research on innovation has focused on a specific aspect of an organization’s climate: the perceived support for innovation. Organizational support for innovation comprises two aspects (Scott and Bruce 1994): perceived innovation encouragement and adequate supply of resources for innovation. The first refers to the individual’s perceptions of the extent to which innovation is encouraged in the organization. It includes encouragement of risk-taking and of idea generation, as well as fair and supportive evaluation of new ideas (Amabile et al. 1996; Cummings 1965). It also encompasses the valuing of innovation throughout the whole company (Amabile et al. 1996; Kanter 1988). In addition, encouragement for innovation is also reflected in rewards and recognition for innovation and by collaborative idea
flow across the whole organization (Amabile et al. 1996; Cummings 1965). The second aspect relates to the extent to which organizations spend resources to support innovation. It includes the supply of adequate equipment, facilities and time for innovation (Kanter 1988; Scott and Bruce 1994).

### 2.6 Transformational Leadership

Transformational leadership is one of the most prominent theoretical perspectives in contemporary leadership research (Morhart, Herzog, and Tomczak 2009). Transformational leadership implies transforming or changing the basic values, beliefs, and attitudes of followers so that they are willing to perform beyond the minimum levels specified by the organization (Podsakoff et al. 1990). In other words, transformational leadership is said to elicit extra-role behaviors in addition to in-role behaviors from followers (MacKenzie, Podsakoff, and Rich 2001; Podsakoff et al. 1990; Shamir, House, and Arthur 1993). Transformational leadership behaviors are also said to have a developmental effect on followers (Shamir, House, and Arthur 1993).

Bass (1985) suggests that transformational leadership encompasses the four dimensions *charisma* (or *idealized influence*), *inspirational motivation*, *intellectual stimulation*, and *individualized consideration*. Idealized influence relates to the leader’s capability to serve as a role model. Followers want to identify with them because they are admired, respected and trusted. Idealized influence comprises two aspects: the leader’s behavior and the elements that followers attribute to the leader. Inspirational motivation refers to the leader’s ability to motivate and inspire others by articulating a compelling and attractive vision of the future. They get followers involved in envisioning the attractive future state and in showing commitment to common goals and the shared vision. They encourage followers with high expectations for excellence, quality and high performance. Moreover, by fostering the acceptance of group goals, they promote cooperation among employees. By intellectually stimulating their followers, transformational leaders challenge them to re-examine some of their assumptions about their work and rethink how they can perform their work. Individualized consideration relates to paying attention to the developmental needs and individual concerns of each follower. By acting as a mentor or coach, the leaders aim to develop each follower’s full potential.

Extant research empirically provides support for transformational leadership influencing, among others, work performance (e.g., Piccolo and Colquitt 2006; Walumbwa, Avolio, and Zhu 2008), self-concordant work goals (Bono and Judge

2.7 Co-Worker Exchange

Co-worker exchange is defined as an individual’s overall perception of exchanges with other members of the workgroup (Liden, Wayne, and Sparrowe 2000). The phrase co-worker exchange was introduced by Seers (1989) as a parallel to the leadership theory of leader-member exchange. Co-worker exchange distinguishes from leader-member exchange in that it is not dyadic, but represents an individual’s overall perception of their relationship with a group of co-workers.

Co-worker exchange indicates the effectiveness of the member’s working relationship with the peer group (Seers 1989). Similar to leader-member exchange, co-worker exchange may vary in terms of the content and process of exchange (Liden, Wayne, and Sparrowe 2000). According to Liden, Wayne, and Sparrowe (2000), high-quality relationships encompass the exchange of resources and support that extends beyond what is necessary for task completion. Mutual willingness to share ideas and work-related expertise and to provide feedback characterizes high-quality relationships. Additionally, co-workers in high-quality relationships mutually trust and respect each other (Sherony and Green 2002). They socially support and help each other. They are more cooperative and collaborative and receive more social rewards as part of the bargain (Seers, Petty, and Cashman 1995).

In conditions of low-quality relationships, on the contrary, the exchanges are limited to the minimum required for the completion of work tasks (Liden, Wayne, and Sparrowe 2000). Individuals who experience low-quality relationships are less willing to assist each other and to share ideas and knowledge. Co-workers in low-quality relationships direct fewer efforts toward the group and receive fewer social rewards (Seers, Petty, and Cashman 1995).

After the brief overview of the central concepts and theories relevant to the present dissertation, the following chapters provide the empirical part of the paper. To begin with, chapter 3 deals with the roles that expectations play in innovative work behavior and the effect of innovative work behavior on task performance.
3 Research Model I: Employee Expectations, Innovative Work Behavior, and Task Performance

Research model I aims to answer research questions 1, 3, and 4. It explores the roles that expectations play in innovative work behavior. Additionally, the model proposes that innovative work behavior relates to task performance. A theoretical framework that builds on theories of performance (e.g., Judge, Erez, and Bono 1998; Vroom 1964) and on Bandura’s (1986) social cognitive theory and its central variables self-efficacy and outcome expectations guides the development of research model I.

The following sections describe the first research model that builds on social cognitive theory. The first section develops the conceptual framework of the model and derives a number of research hypotheses on this basis. The second section presents the empirical test that examines if the hypotheses can be empirically validated. It describes the methodology and the results. Finally, the third section discusses the results.

3.1 Conceptual Framework and Hypotheses

The following sections present the theoretical framework and the hypotheses of the first research model. To begin with, the conceptual framework lays the conceptual foundation of the present research model. It identifies the variables that the model of innovative work behavior studies and provides an overview of the expected relationships of the variables. Afterwards, the second section discusses the expected relationships between the variables in detail and presents the hypotheses to be tested.

3.1.1 Conceptual Framework

The conceptual framework draws on Bandura’s (1986) social cognitive theory and on theories of performance that propose that performance is a function of ability and motivation (e.g., Judge, Erez, and Bono 1998; Vroom 1964). The line of argument is worked through backwards. The model assumes that innovative work behavior influences task performance and that innovative self-efficacy and outcome expecta-

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1 Parts of this chapter were submitted to the Academy of Management 2012 Annual Meeting (Doerner et al. forthcoming) and to the 18th International Product Development Management Conference (Doerner, Gassmann, and Morhart 2011). However, changes were made due to the progress of the research project (e.g., the link between innovative work behavior and task performance developed in section 3.1.2).
tions in turn affect innovative work behavior. Figure 4 illustrates the conceptual framework.

Performance is a function of ability and motivation (e.g., Judge, Erez, and Bono 1998; Vroom 1964). Prior work on performance has found that motivational concepts, such as job engagement (Rich, Lepine, and Crawford 2010), goal setting (Erez and Judge 2001), and extrinsic rewards (Huber 1985; Mahaney and Lederer 2006), have an important impact on performance. Similarly, research has found that different kinds of abilities, for example, general mental ability (e.g., Ferris, Witt, and Hochwarter 2001; Schmidt and Hunter 1998), social skills (Ferris, Witt, and Hochwarter 2001; Hochwarter et al. 2006), and job-specific methods and skills (Schmidt and Hunter 1998), are important determinants of performance. In line with this, the present work expects innovative work behavior to be another ability factor that is associated with performance.

Innovative work behavior reflects the individual’s ability to adapt effectively to the job by modifying themselves or the work environment through innovation (Janssen, van de Vliert, and West 2004). This means that innovative work behavior enables employees to perform. Further, each of the two sub-components of innovative work behavior (creativity and implementation) qualifies employees’ performance. Research has shown that being creative at work is likely to enable employees to enhance their personal performance (Gilson 2008; Gong, Huang, and Farh 2009). Si-
Similarly, the introduction and application of new technologies and new work methods that are “better” than existing ones is associated with increased individual performance in terms of efficiency and/or effectiveness gains (Anderson, Rungtusanatham, and Schroeder 1994; Benner and Tushman 2003; Hammer and Stanton 1999).

In turn, following social cognitive theory, expectations affect innovative work behavior. Expectations serve as a source of the motivation that employees need to persevere in a risky and uncertain endeavor (i.e., innovative work behavior). Innovative self-efficacy and outcome expectations are assumed to be proximal individual differences that affect innovative work behavior. Moreover, the model suggests that innovative self-efficacy influences outcome expectations.

### 3.1.2 Hypotheses

The following sections discuss the expected relationships between the variables and present the hypotheses of the first research model. Figure 5 graphically summarizes the hypothesized relations.

**Figure 5: Overview of Hypotheses of Research Model I**

*Notes: Solid arrows are used to depict hypothesized direct relationships; dashed arrows represent the hypothesized mediation effect.*

**Effect of Innovative Work Behavior on Task Performance**

As mentioned before, theories of performance agree that employees’ abilities affect their performance. The present work suggests that innovative work behavior is an
ability factor that is associated with employees’ task performance. Although empirical evidence that supports that innovative work behavior affects task performance is missing, there are several reasons that support the assumption that innovative work behavior results in task performance gains, such as increased productivity and work quality, decreased error rate, and increased ability to achieve goals and objectives.

First, empirical evidence suggests that creativity is positively related to individual task performance (Gilson 2008; Gong, Huang, and Farh 2009). Although Gilson (2008) points out that the few studies investigating the relationship between creativity and performance outcomes were not conducted in organizational settings, she assumes that the association between creativity and performance manifests in various settings, including the workplace. The creativity component of innovative work behavior refers to generating novel responses that are useful in dealing with the task at hand (Amabile 1996). Being creative at work may include developing new processes or procedures for accomplishing tasks, refining existing ones, or finding alternative processes or procedures that are more effective (Gong, Huang, and Farh 2009). According to Gong, Huang, and Farh (2009), this should enable employees to enhance their individual task performance. Although one study has found that creativity is dysfunctional to performance quality because it is incongruent with conformity and attention to detail (Miron, Erez, and Naveh 2004), empirical evidence for the positive relationship between creativity and task performance prevails.

Second, innovative work behavior comprises the introduction and application of new technologies and new work methods that are “better” than existing ones (Yuan and Woodman 2010). Although this may disturb job routines and cause resistance to change and stress reactions of employees (Janssen 2003; Janssen 2004), in the end, it is supposed to lead to efficiency and/or effectiveness gains (Anderson, Rungtusanatham, and Schroeder 1994; Benner and Tushman 2003; Hammer and Stanton 1999).

Third, innovative work behavior implies modifying oneself or the work environment through innovation (Janssen, van de Vliert, and West 2004). This means that innovative work behavior helps employees to adapt effectively to the job, thus leading to the anticipated task performance enhancement. Indeed, Judge et al (1999) have found that effectively coping with change is positively related to performance, thus supporting the argument above. Similarly, researchers have also found that innovative performance and performance quality and efficiency are positively correlated (Miron, Erez, and Naveh 2004). Drawing on this reasoning, overall, it is hypothesized that there is a positive relationship between innovative work behavior and task performance:
H1: Innovative work behavior positively affects task performance.

Effects of Innovative Self-Efficacy and Outcome Expectations on Innovative Work Behavior

To date, research has not looked at innovation-specific self-efficacy, but there is research on creativity-specific self-efficacy that leads to the assumption that innovative self-efficacy may influence innovative work behavior. For example, Tierney and Famer (2002) introduced the concept of creative self-efficacy that refers to the employees’ beliefs that they can be creative in the workplace. The authors suggest that creative self-efficacy enhances creativity and provide empirical evidence that supports their theoretical reasoning. Further, Gong, Huang, and Farh (2009) have found support for the relationship between creative self-efficacy and employee creativity. In addition, three former studies lend support to the importance of self-efficacy beliefs in a creativity context (Locke et al. 1984; Gist 1989; Redmond and Mumford 1993). Although these studies focused on creativity and not on innovation, they provide a foundation for exploring innovation-specific self-efficacy. Following social cognitive theory, innovative self-efficacy should affect innovative work behavior for two reasons.

First, innovation research agrees that innovation is a risky and uncertain undertaking. Innovative work behavior is bound to especially challenging and complex tasks enfolding a broad variety of cognitive and social activities, such as generating, promoting, discussing, modifying, and ultimately implementing creative ideas (Kanter 1988). Employees with high innovative self-efficacy feel confident performing a range of tasks related to innovation. Consequently, they are more likely to engage in innovative work behavior. Conversely, employees with low innovative self-efficacy tend to believe that innovative work behavior exceeds their coping skills. Accordingly, they are supposed to avoid engaging in innovative work behavior because they doubt that they will succeed in innovative undertakings.

Second, the tasks related to innovative work behavior can be very demanding (Kanter 1988). Strong efficacy beliefs enhance the level of persistence and the coping efforts that individuals put into specific tasks when encountering challenging situations (Bandura 1977). Thus, high innovative self-efficacy is likely to provide the motivation needed to persevere. Employees with high innovative self-efficacy believe that their level of effort generates a solution for the problems they face in an innovative endeavor. Hence, these employees are apt to raise their efforts to meet the challenges they face. Employees with low innovative self-efficacy, on the con-
trary, tend to view difficulties negatively. They are likely to view the problems they face as beyond their control and not manageable. Accordingly, they conclude that their efforts cannot solve the problem and they abandon their efforts. One example of such a difficulty may be resistance from other employees in the organization who want to hinder innovative change. Persuading the resisters of the benefits of innovation can be difficult and wearing. Employees with high innovative self-efficacy are likely to believe that they can overcome difficulties by putting substantial effort into the job of innovation in order to identify and apply the strategies needed to succeed. Following this line of argumentation, it is hypothesized that:

\[ H_2: \text{ Innovative self-efficacy positively affects innovative work behavior.} \]

In addition to relying solely on their self-efficacy judgments, employees may also rely on outcome expectations when they decide to engage in and pursue innovative work behavior. From the perspective of the expectancy theory of motivation (Vroom 1964), human behavior is determined by the expected outcomes of the behavior. As with self-efficacy, outcome expectations are seen as proximal antecedents to behavior (Yuan and Woodman 2010).

Yuan and Woodman (2010) suggest that two different forms of consequence beliefs influence innovative work behavior: first, corresponding to an efficiency-oriented perspective, beliefs about the positive or negative consequences of innovative work behavior on individual performance; second, relating to a social-political perspective, beliefs about the potential image risks and image gains. Yuan and Woodman (2010) found that outcome expectations related to the social-political perspective (i.e., expected image loss and gain) are negatively associated with innovative work behavior, whereas efficiency-oriented outcome expectations are positively related to innovative work behavior.\(^2\) As one of the major goals of the dissertation is to examine the influence of innovative work behavior on task performance, it adapts the efficiency-oriented perspective.\(^3\) According to this perspective, people engage in innovative work behavior when they expect positive performance outcomes in terms of performance improvement or efficacy gains for their work role (Yuan and

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\(^2\) Yuan and Woodman (2010) explain the unexpected negative effect of expected image gains on innovative work behavior by arguing that expected image gains were not related to innovative behavior but served as a suppressor variable for expected positive performance gains.

\(^3\) It should be noted that in the following sections, the term “outcome expectations” refers to efficiency-oriented outcome expectations with regard to performance gains.
Woodman 2010). This means that employees who expect that innovative work behavior will benefit their job are more likely to engage in such behavior. On the contrary, employees who do not expect such performance gains resulting from innovative work behavior are more likely to avoid the behavior. At the same time, expectations concerning the potential outcome determine whether individuals continue to exert effort or disengage from an attempt when they face difficulties (Carver and Scheier 1990). More precisely, when confronted with difficulties, people tend to pursue an activity and raise their efforts when they expect positive consequences, while they are more likely to forgo their efforts when they have negative outcome expectations. As mentioned before, innovative work behavior is associated with demanding tasks. Besides innovative self-efficacy, positive outcome expectations could represent another source of the motivation that employees need to persevere in the face of difficulties.

Recent research on the link between outcome expectations and innovative work behavior has provided empirical support for expected positive performance outcomes being positively related to innovative work behavior (Yuan and Woodman 2010). Accordingly, it is hypothesized that:

\[ H_3: \text{Outcome expectations positively influence innovative work behavior.} \]

Social cognitive theory assumes that the type of outcomes people anticipate depend largely on their judgment of how well they can perform (Bandura 1986). More precisely, people see outcomes as contingent on the adequacy of their performance and they rely on their efficacy beliefs when judging their anticipated performance: one’s behavior has an important impact on the results of one’s actions. At the same time, efficacy beliefs influence the anticipated outcomes. For example, employees who judge themselves inefficacious in innovating think that their innovative work behavior does not result in positive outcomes in terms of performance improvement but in failure. This, in turn, results in avoiding innovative work behavior. Conversely, employees who feel capable of producing innovative outcomes anticipate positive outcomes and they tend to engage in innovative work behavior. Having found that computer self-efficacy beliefs affect outcome expectations related to the use of computers (Compeau, Higgins, and Huff 1999; Hsu, Ju, and Chang 2007), previous studies in related research areas lend support for the expected effect of innovative self-efficacy on outcome expectations. In line with these arguments, it is hypothesized that:
**H4:** Innovative self-efficacy positively influences outcome expectations.

**H5:** Outcome expectations partially mediate the relationship between innovative self-efficacy and innovative work behavior.

**Summary of Research Hypotheses**

Table 1 gives an overview of the core research hypotheses of research model I.

<table>
<thead>
<tr>
<th>Hypothesis on the effect of innovative work behavior on task performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hypotheses on the effects of innovative self-efficacy and outcome expectations on innovative work behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>H2</td>
</tr>
<tr>
<td>H3</td>
</tr>
<tr>
<td>H4</td>
</tr>
<tr>
<td>H5</td>
</tr>
</tbody>
</table>

*Table 1: Research Hypotheses of Research Model I*

### 3.2 Empirical Test

Following a confirmatory research approach, the proposed model is empirically tested by means of a cross-sectional study and appropriate techniques of multivariate statistics. The following sections describe the research design, results and the contributions of the present work.

#### 3.2.1 Methodology

##### 3.2.1.1 Data Collection and Sample

The present study was conducted in an insurance company in Switzerland. Increased competitive pressure, a continuously changing regulatory framework, decreasing customer loyalty and new technological innovations such as smartphone apps increasingly force the insurance industry to innovate. Despite the obvious need for innovation, tasks related to innovation are not part of most employees’ job description. Additionally, insurance companies mostly neglect to define responsibili-
ties for innovative work clearly. With this in mind and based on the dissertation’s assumption that innovation concerns every firm member, the insurance industry provided a good setting for the survey. In order to reduce the influence of external variables, data was collected in only one company. The participating company was selected from the largest insurance companies in Switzerland according to the Swiss Market Index (SMI). The participating company chose to cooperate since its long-term strategic goal was to foster innovation.

Most data was collected by means of a cross-sectional study of the company. Due to the assumption that innovative work behavior is no longer reserved just for people doing scientific or technological work (de Jong 2007), participation was not restricted to employees of specific departments of the company. Instead, the survey targeted employees and supervisors of all divisions of the company.

The sample consisted of matched pairs of employees and their direct supervisors; thus a dyadic one-to-many-design was applied (Kenny, Kashy, and Cook 2006). Subordinates were asked to rate their own level of innovative self-efficacy and outcome expectations. Supervisors rated innovative work behavior and task performance of each of their employees. Since the supervisors provided their ratings for both variables, employees’ innovative work behavior and their task performance, common method variance\(^4\) was very likely. In order to be able to assess the impact of common method variance, the supervisors were asked to rate their employees’ task performance again six months after the first data collection.\(^5\) Figure 6 illustrates the data pooling.

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\(^4\) Common method variance refers to variance that is attributable to the measurement method rather than to the constructs the measures represent (Podsakoff et al. 2003).

\(^5\) This data was used to check whether the hypothesized relationship was robust.
In order to prevent bias (e.g., framing bias), the company’s members only participated in their roles as either supervisors or followers. Company members who fulfilled both functions were only considered in their roles as supervisors and only received the supervisor questionnaire. The company’s head of human resources preselected all members of the company in order to ensure that the employee questionnaire was only sent to those who had no managerial function.

The company’s head of human resources collected the email addresses of the employees and supervisors and handed them to the author, together with the information needed to match supervisors and employees. The company’s head of human resources announced the survey to the employees and supervisors one week before the survey started.

Data was gathered via an online survey. An email containing a link to a web-based questionnaire (located on an external server to secure anonymity), together with the author’s contact information, was sent to the addressees. Surveys were sent to 699 employees and their corresponding 119 supervisors. The questionnaire’s language was German given the fact that the corporate divisions under study operate in German. To encourage survey completion, supervisors and subordinates were given assurance that their information would be kept strictly confidential and that no indi-
individual responses would be reported to the organization. In return for participation, the participants were promised a presentation of the overall findings.

Of the 699 employees contacted, 526 completed the survey. Of the 119 supervisors, 107 returned the questionnaire. The response rates were approx. 75% for employees and approx. 89% for supervisors. The overall response rate (employees and supervisors together) was 77%. Matching employees’ questionnaires with supervisors’ questionnaires resulted in 350 pairs (out of 699 possible pairs), resulting in a response rate of approx. 50%.

The sample included respondents from a broad cross-section of jobs. Of all the respondents, 47% worked in market range provision and indemnity insurance, 15% in the finance department, 9% in the operations and development department, and the remaining 29% of the respondents worked in the strategy and sales department, as well as in human resources and actuary. Of all the respondents, 41% were female and 59% were male. The average age was 41.5 years (SD = 11.5) and the average tenure in their position at the time was 7.28 years (SD = 6.52). Table 2 summarizes the sample statistics.

<table>
<thead>
<tr>
<th>Sample Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email sent out (employees)</td>
</tr>
<tr>
<td>Email sent out (supervisors)</td>
</tr>
<tr>
<td>Failed email (employees)</td>
</tr>
<tr>
<td>Failed email (supervisors)</td>
</tr>
<tr>
<td>Effectively sent out (employees)</td>
</tr>
<tr>
<td>Effectively sent out (supervisors)</td>
</tr>
<tr>
<td>Returned (employees)</td>
</tr>
<tr>
<td>Returned (supervisors)</td>
</tr>
<tr>
<td>Employee data without corresponding supervisor’s assessment</td>
</tr>
<tr>
<td>Sample</td>
</tr>
</tbody>
</table>

In the second data collection, 86 of the 119 supervisors completed the task performance measure again. Matching the data with the data obtained in the first data collection led to 256 corresponding data sets. The data was used to check whether the hypothesized relationship between innovative work behavior and task performance
was robust. Of all the respondents, 52% worked in market range provision and indemnity insurance, 11% of the respondents worked in the finance department, 9% of the respondents worked in the operations and development department and the remaining 28% of the respondents worked in the strategy and sales department, as well as in human resources and actuary. Of all the respondents, 47% were female and 53% were male. Their average age was 42.2 years (SD = 10.9) and their average tenure in their position at the time was 7.81 years (SD = 6.69).

3.2.1.2 Measures

All variables except for innovative self-efficacy were assessed based on previously developed scales. Most of the scales were originally developed and published in English. Only a few of the scales had been previously used and validated in German. If German versions were available, they were used. In the other cases, the author first translated the scales into German and then two bilingual researchers back-translated the scales into English to ensure maximum convergence with the original items. A third bilingual researcher compared the back-translation with the original items. Human resources executives of the participating company reviewed the questionnaire to ensure that the items suited the respondents’ jobs. Sections 7.1 and 7.2 in the Appendix present the final questionnaires. Table 3 gives an overview of the scale items used in the work.

Measures Completed by Subordinates

Innovative Self-Efficacy. Ten items measured innovative self-efficacy. Three of the items refer to the creative self-efficacy measure developed by Tierney and Farmer (2002). The remaining seven items were developed for the present work in order to gauge efficacy beliefs related to championing and implementation and, therefore, to capture all capability beliefs related to producing innovative outcomes. To develop the seven additional items, the literature on self-efficacy (e.g., Bandura 1997) and innovation (e.g., de Jong and den Hartog 2010; Janssen 2000; Yuan and Woodman 2010) was examined and subsequently a set of items that reflect employees’ beliefs in their capabilities to be innovative at work was generated. A focus group consisting of 11 employees working in the organization under study discussed the items. The discussion led to the rephrasing of some of the items in order to ensure better understanding of the items. Employees rated their innovative self-efficacy on a 5-point scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). Since innovative self-efficacy taps different efficacy beliefs related to innovation, the present
work suggests that innovative self-efficacy is a second-order construct consisting of creativity-related efficacy beliefs and implementation-related efficacy beliefs.

**Outcome Expectations.** Outcome expectations were assessed using four items adapted from Venkatesh et al. (2003), Compeau and Higgins (1995), and Compeau, Higgins, and Huff (1999). Employees rated their anticipated outcomes of innovation on a 5-point scale (1 = strongly disagree to 5 = strongly agree).

**Measures Completed by Supervisors**

*Innovative Work Behavior.* Innovative work behavior was assessed using the ten-item innovative work behavior scale developed by de Jong and den Hartog (2010). The scale measures four facets of innovative work behavior: idea exploration, generation, championing, and implementation. The supervisors rated their subordinates on a 5-point scale (1 = not at all to 5 = frequently, if not always).

*Task Performance.* Task performance was measured with the four-item measure developed by Wayne and Liden (1995) and used by Bolino and Turnley (2003) and Golden, Veiga, and Dino (2008). Supervisors rated their subordinates on a 5-point scale (1 = strongly disagree to 5 = strongly agree).

**Controls**

The study included gender, age (in years), tenure (in years and months), and level of education (divided into three levels: (1) “high school degree”; (2) “bachelor degree”; and (3) “university degree”) to control for socio-demographics and for information on the knowledge that an employee can draw on to perform in his or her job.
### Table 3: Scale Items for Construct Measures of Research Model I

<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Innovative Self-Efficacy</strong></td>
<td>- I feel that I am good at generating novel ideas.</td>
<td>the first three items refer to the creative self-efficacy scale (Tierney and Farmer 2002); the remaining items were developed for the present study</td>
</tr>
<tr>
<td></td>
<td>- I have confidence in my ability to solve problems creatively.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- I have a knack for further developing the ideas of others.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- I have a knack for making others enthusiastic for new ideas.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- I have confidence in my ability to convince others of the benefit of new ideas.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- I have the social contacts needed to find backers for realizing new ideas.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- I have confidence in my ability to implement new methods at work.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- I have confidence in my ability to implement new products at work.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- I feel that I am good at adopting new methods at work.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- I feel that I am good at adopting new products at work.</td>
<td></td>
</tr>
<tr>
<td><strong>Outcome Expectations</strong></td>
<td>- Being innovative at work increases my flexibility for changing jobs.</td>
<td>adapted from Venkatesh et al. (2003)</td>
</tr>
<tr>
<td></td>
<td>- Being innovative at work increases my opportunity for more meaningful work.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Being innovative at work increases my opportunity for preferred future job assignments.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Being innovative at work increases my opportunity to gain job security.</td>
<td></td>
</tr>
<tr>
<td><strong>Innovative Work Behavior</strong></td>
<td>How often does this employee ...</td>
<td>de Jong and den Hartog (2010)</td>
</tr>
<tr>
<td></td>
<td>- pay attention to issues that are not part of their daily work?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- wonder how things can be improved?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- search out new working methods, techniques or instruments?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- generate original solutions for problems?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- find new approaches to execute tasks?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- make important organizational members enthusiastic for innovative ideas?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- attempt to convince people to support an innovative idea?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- systematically introduce innovative ideas into work practices?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- contribute to the implementation of new ideas?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- put effort into the development of new things?</td>
<td></td>
</tr>
<tr>
<td><strong>Job Performance</strong></td>
<td>- This employee is superior to others that I have supervised.</td>
<td>Wayne and Liden (1995)</td>
</tr>
<tr>
<td></td>
<td>- This employee’s overall level of performance is excellent.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- This employee is highly effective.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- This employee effectively fulfills his/her roles and responsibilities.</td>
<td></td>
</tr>
</tbody>
</table>
### 3.2.1.3 Analytical Strategy

The present work follows Anderson and Gerbing’s (1988) widely recommended two-step approach to structural equation modeling. In the first step, exploratory and confirmatory factor analyses validate the innovative self-efficacy scale. Afterwards, confirmatory factor analysis validates the overall measurement model. In the second step, structural equation modeling tests the proposed structural model that specifies the relations of the constructs based on theory. Afterwards, the mediation testing procedures of Mathieu and Taylor (2006) are followed.

Various goodness of fit indices help to assess the fit of the measurement model and the structural model. The $\chi^2$ compares the actual observed matrix with the estimated matrix. The $\chi^2$ divided by its degrees of freedom ($\chi^2$/DF ratio) is a means to assess the fit of the model. A $\chi^2$/DF ratio less than 2 or 3 indicates acceptable model fit (Carmines and McIver 1981). The root mean square error of approximation (RMSEA) index constitutes a parsimony measure that depicts the discrepancy between the observed and estimated covariance matrices per degree of freedom. RMSEA values below .08 are considered good fit (Browne and Cudeck 1993; Schumacker and Lomax 1996). The comparative fit index (CFI) is a non-centrality parameter-based index used to overcome the limitation of sample size effects (Bentler 1990). CFI values close to .9 indicate good model fit (Schumacker and Lomax 1996). The Tucker-Lewis index (TLI) compares a proposed model’s fit to a nested baseline or null model. Again, a value close to .9 indicates good model fit (Schumacker and Lomax 1996). Table 4 provides an overview of the thresholds of the goodness of fit criteria.

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6 Please refer to the sections 7.4 and 7.5 in the Appendix for a short overview of factor analysis and structural equation modeling.
36  Innovative Work Behavior: The Roles of Employee Expectations and Effects on Job Performance

<table>
<thead>
<tr>
<th>Goodness of Fit Criteria</th>
<th>Range</th>
<th>Acceptable Level</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$/DF</td>
<td>0 to infinite</td>
<td>$3 \geq x \geq 1$</td>
<td>Ratio of chi square to its degrees of freedom</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Value between 1 and 3 reflects good fit</td>
</tr>
<tr>
<td>CFI</td>
<td>0 (no fit) to 1 (perfect fit)</td>
<td>$x \approx .9$</td>
<td>Comparative Fit Index</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Value close to .9 reflects good fit</td>
</tr>
<tr>
<td>TLI</td>
<td>0 (no fit) to 1 (perfect fit)</td>
<td>$x \approx .9$</td>
<td>Tucker-Lewis Index</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Value close to .9 reflects good fit</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0 (perfect fit) to 1 (no fit)</td>
<td>$x \leq .08$</td>
<td>Root Mean Square Error of Approximation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Value below .08 reflects good fit</td>
</tr>
</tbody>
</table>

Table 4: Acceptable Levels of Goodness of Fit Criteria (based on Schumacker and Lomax 1996)

For measurement assessment, different measurement models were compared following the suggestions of various scholars (Podsakoff and Organ 1986; Cunningham 2006). Besides the aforementioned goodness of fit indices, $\chi^2$ values served as a means to compare models. A $\chi^2$ value lower than the $\chi^2$ value of the basic model indicates better fit with the data. The chi-square difference ($\Delta \chi^2$) test that examines if the chi-square difference of two models is significant (Loehlin 1992) provides an additional check.

3.2.1.4 Measurement Assessment

Innovative Self-Efficacy Measurement

Exploratory Factor Analysis. Exploratory factor analysis with principal component extraction\(^7\) and varimax rotation\(^8\) was applied to the 10 innovative self-efficacy items using PASW Statistics 18.0 (Norušis 2010). Table 5 reports the results of the analysis. As mentioned before, this work assumes that innovative self-efficacy is a construct that encompasses the two dimensions creativity-related efficacy beliefs and implementation-related efficacy beliefs. The results of the exploratory factor analysis show that the items load on two factors, thus supporting the assumption. Nine of the items had substantial loadings on a single factor (higher than .68). Addi-

---

\(^7\) Principal component extraction aims to account for the variance in the observed measures (Brown 2006).

\(^8\) Varimax rotation refers to orthogonal rotation. This means that the factors are constrained to be uncorrelated. Varimax rotation maximizes the variance of the squared factor loadings of a factor (Kaiser 1958).
tionally, no item had a cross-loading value above the critical value of .4 suggested by Ford, MacCallum, and Tait (1986). One item was eliminated (item ise6: “I have the social contacts needed to find backers for realizing new ideas.”).

<table>
<thead>
<tr>
<th>Item</th>
<th>Creativity-related self-efficacy</th>
<th>Implementation-related self-efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>ise1 (I feel that I am good at generating novel ideas.)</td>
<td>.806</td>
<td>.108</td>
</tr>
<tr>
<td>ise2 (I have confidence in my ability to solve problems creatively.)</td>
<td>.725</td>
<td>.171</td>
</tr>
<tr>
<td>ise3 (I have a knack for further developing the ideas of others.)</td>
<td>.685</td>
<td>.275</td>
</tr>
<tr>
<td>ise4 (I have a knack for making others enthusiastic for new ideas.)</td>
<td>.823</td>
<td>.127</td>
</tr>
<tr>
<td>ise5 (I have confidence in my ability to convince others of the benefit of new ideas.)</td>
<td>.806</td>
<td>.108</td>
</tr>
<tr>
<td>ise6 (I have the social contacts needed to find backers for realizing new ideas.) - deleted</td>
<td>.426</td>
<td>.157</td>
</tr>
<tr>
<td>ise7 (I have confidence in my ability to implement new methods at work.)</td>
<td>.179</td>
<td>.778</td>
</tr>
<tr>
<td>ise8 (I have confidence in my ability to implement new products at work.)</td>
<td>.157</td>
<td>.825</td>
</tr>
<tr>
<td>ise9 (I feel that I am good at adopting new methods at work.)</td>
<td>.179</td>
<td>.820</td>
</tr>
<tr>
<td>ise10 (I feel that I am good at adopting new products at work.)</td>
<td>.186</td>
<td>.835</td>
</tr>
</tbody>
</table>

*Table 5: Exploratory Factor Analysis for the Innovative Self-Efficacy Scale*

**Confirmatory Factor Analysis.** Confirmatory factor analysis was applied using AMOS 18.0 (Arbuckle 2009) to confirm the two-factor solution. Two measurement models were compared: (1) a two-factor model of innovative self-efficacy that suggests that innovative self-efficacy is a second-order construct that consists of two dimensions (creativity-related efficacy beliefs and implementation-related efficacy beliefs); and (2) a one-factor model that suggests that innovative self-efficacy is a first-order construct. Confirmatory factor analysis indicated that the two-factor solution provides a better fit with the data than the one-factor model. Table 6 reports the
goodness of fit indices of the two models. In addition, the chi-square difference ($\Delta \chi^2$) test (Loehlin 1992) provides support for the superiority of the two-factor model. The value for the difference in $\chi^2$ of 409 is significant since it exceeds the recommended level of 10.83 for one degree of freedom and $p < 0.001$. This indicates that the two-factor model fits the data significantly better than the one-factor model.

<table>
<thead>
<tr>
<th>Goodness of Fit Index</th>
<th>$\chi^2$</th>
<th>DF</th>
<th>$\chi^2$/DF</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-factor model¹</td>
<td>56</td>
<td>23</td>
<td>2.47</td>
<td>.98</td>
<td>.97</td>
<td>.06</td>
</tr>
<tr>
<td>One-factor model²</td>
<td>465</td>
<td>24</td>
<td>19.39</td>
<td>.74</td>
<td>.61</td>
<td>.23</td>
</tr>
</tbody>
</table>

Table 6: Alternative Measurement Models of Innovative Self-Efficacy

Notes: ¹innovative self-efficacy is modeled as a second-order construct consisting of the two dimensions creativity-related efficacy and implementation-related efficacy; ²innovative self-efficacy is modeled as a first-order construct.

Discriminant Validity⁹. The discriminant validity of the two sub-dimensions was assessed on the basis of the suggestion of Fornell and Larcker (1981) that the average variance extracted (AVE) value should be higher than the squared correlation among the dimensions. The results indicate that the criterion was met (Table 7).

<table>
<thead>
<tr>
<th>Mean*</th>
<th>SD</th>
<th>AVE</th>
<th>Correlation (squared correlation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Creativity-related self-efficacy</td>
<td>3.81</td>
<td>.60</td>
<td>.53</td>
</tr>
<tr>
<td>2. Implementation-related self-efficacy</td>
<td>4.06</td>
<td>.56</td>
<td>.67</td>
</tr>
</tbody>
</table>

Table 7: Correlation and Discriminant Validity of the Sub-Dimensions of Innovative Self-Efficacy

Notes: * all values refer to a 5-point scale format; ** $p < 0.01$.

⁹ Discriminant validity tests whether concepts or measurements that are supposed to be unrelated actually are unrelated (Campbell and Fiske 1959).
In order to assess the discriminant validity of the overall innovative self-efficacy construct, again the Fornell-Larcker criterion (Fornell and Larcker 1981) was used. Table 10 shows that the AVE value of innovative self-efficacy was higher than the squared correlation among innovative self-efficacy and the other constructs. In addition, the procedure recommended by various scholars (e.g., Anderson and Gerbing 1988; Chen, Gully, and Eden 2001) was followed: a confirmatory factor analysis was conducted to test whether innovative self-efficacy was distinct from outcome expectations. Specifically, the fits of two different models were compared: (1) a two-factor model in which innovative self-efficacy and outcome expectations were independent of one another; and (2) a one-factor model in which the two variables were set to correlate at 1. Table 8 shows that the results of the confirmatory factor analysis indicate that the two-factor model provides better fit with the data. The chi-square difference ($\Delta \chi^2$) test (Loehlin 1992) provides further support for the superiority of the two-factor model. The value for the difference in $\chi^2$ of 34 is significant since it exceeds the recommended level of 10.83 for one degree of freedom and $p < 0.001$. This indicates that the two-factor model fits the data significantly better than the one-factor model. Therefore, the results provide support for innovative self-efficacy being distinct from outcome expectations.

<table>
<thead>
<tr>
<th>Goodness of Fit Index</th>
<th>$\chi^2$</th>
<th>DF</th>
<th>$\chi^2$/DF</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-factor model $^1$</td>
<td>28</td>
<td>6</td>
<td>4.7</td>
<td>.97</td>
<td>.93</td>
<td>.10</td>
</tr>
<tr>
<td>One-factor model $^2$</td>
<td>62</td>
<td>7</td>
<td>8.88</td>
<td>.92</td>
<td>.84</td>
<td>.15</td>
</tr>
</tbody>
</table>

Table 8: Goodness of Fit Summary for Innovative Self-Efficacy and Outcome Expectations

Notes: $^1$the two factors innovative self-efficacy and outcome expectations are free to correlate; $^2$the two factors correlate at 1.

Overall Measurement Model

The measurement model consisted of the four focal variables. In a first step, confirmatory factor analysis was run for each factor individually to assess reliability and validity. Table 9 reports that the results indicate good psychometric properties. More specifically, no coefficient alpha ($\alpha$) value is lower than .7, thus meeting or exceeding the threshold recommended by Bagozzi and Yi (1988).
In a second step, the discriminant validity of the measures was assessed on the basis of the Fornell-Larcker criterion (Fornell and Larcker 1981). Besides reporting the means, standard deviations, and the correlations, Table 10 presents the AVE values of the scales, as well as the squared correlations. The results indicate that there are no problems with respect to discriminant validity.

Table 9: Scale Properties of Research Model I

<table>
<thead>
<tr>
<th></th>
<th>Innovative Self-Efficacy</th>
<th>Outcome Expectations</th>
<th>Innovative Work Behavior</th>
<th>Task Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\alpha$</td>
<td>.85</td>
<td>.83</td>
<td>.94</td>
<td>.90</td>
</tr>
<tr>
<td>AVE</td>
<td>.42</td>
<td>.58</td>
<td>.63</td>
<td>.69</td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>56</td>
<td>6</td>
<td>74</td>
<td>17</td>
</tr>
<tr>
<td>DF</td>
<td>23</td>
<td>1</td>
<td>32</td>
<td>2</td>
</tr>
<tr>
<td>$\chi^2/DF$</td>
<td>2.47</td>
<td>6</td>
<td>2.32</td>
<td>8.5</td>
</tr>
<tr>
<td>CFI</td>
<td>.98</td>
<td>.99</td>
<td>.99</td>
<td>.98</td>
</tr>
<tr>
<td>TLI</td>
<td>.97</td>
<td>.95</td>
<td>.98</td>
<td>.95</td>
</tr>
<tr>
<td>RMSEA</td>
<td>.06</td>
<td>.12</td>
<td>.06</td>
<td>.14</td>
</tr>
<tr>
<td>Variable</td>
<td>Mean*</td>
<td>SD</td>
<td>AVE</td>
<td>1</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------</td>
<td>----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>1. Gender</td>
<td>1.446</td>
<td>.49</td>
<td>.52</td>
<td>.052</td>
</tr>
<tr>
<td>4. Education</td>
<td>1.96</td>
<td>.854</td>
<td>.42</td>
<td>.42</td>
</tr>
<tr>
<td>5. Innovative Self-Efficacy</td>
<td>3.93</td>
<td>.48</td>
<td>.74</td>
<td>.74</td>
</tr>
<tr>
<td>6. Outcome Expectations</td>
<td>3.91</td>
<td>.74</td>
<td>.58</td>
<td>.58</td>
</tr>
<tr>
<td>7. Innovative Work Behavior</td>
<td>3.29</td>
<td>.82</td>
<td>.63</td>
<td>.63</td>
</tr>
<tr>
<td>8. Task Performance</td>
<td>3.82</td>
<td>.78</td>
<td>.69</td>
<td>.69</td>
</tr>
</tbody>
</table>

Table 10: Descriptives of Research Model I

Notes: * all values refer to a 5-point scale format; the lower-left triangle elements are correlations among the latent variables (* = p < .05 and ** = p < .01); the upper-right triangle elements are squared correlations. Education was dummy coded.
In order to further assess the discriminant validity of the measurements, the study followed various scholars (e.g., Anderson and Gerbing 1988; Chen, Gully, and Eden 2001) and compared the measurement model with different constrained models. The fits of three models were checked against each other by means of a confirmatory factor analysis. In the measurement model, items were loaded according to their scales on the second-order construct innovative self-efficacy and on the first-order constructs outcome expectations, innovative work behavior, and task performance. All four variables were independent of one another. The second model was a two-factor model in which the correlations between innovative self-efficacy and outcome expectations (both assessed by the employees), and between innovative work behavior and task performance (both assessed by the supervisors) were constrained to be 1. The third model was a single-factor model in which all variables were set to correlate at 1. The results indicate that the measurement model is superior to the alternative models (Table 11).

<table>
<thead>
<tr>
<th>Goodness of Fit Index</th>
<th>$\chi^2$</th>
<th>DF</th>
<th>$\chi^2$/DF</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four-factor model (i.e., measurement model)</td>
<td>517</td>
<td>308</td>
<td>1.68</td>
<td>.97</td>
<td>.96</td>
<td>.044</td>
</tr>
<tr>
<td>Two-factor model</td>
<td>1070</td>
<td>310</td>
<td>3.45</td>
<td>.88</td>
<td>.87</td>
<td>.084</td>
</tr>
<tr>
<td>Single-factor model</td>
<td>1551</td>
<td>311</td>
<td>4.99</td>
<td>.81</td>
<td>.78</td>
<td>.11</td>
</tr>
</tbody>
</table>

Table 11: Goodness-of-Fit Summary for Alternative Measurement Models of Research Model I

Notes: 1 the four factors are free to correlate; 2 innovative work behavior and task performance correlate at 1, innovative self-efficacy and outcome expectations correlate at 1; 3 all factors correlate at 1.

### 3.2.2 Results

#### Main Effects

In order to test the proposed relationships between innovative self-efficacy, outcome expectations, innovative work behavior, and task performance, structural equation modeling was applied using AMOS 18.0 (Arbuckle 2009). Figure 7 depicts the corresponding covariance structure model that translates hypotheses $H_1$-$H_4$ into a testable statistical structure. As outlined in the measurement section, innovative self-efficacy was modeled as a second-order construct with two indicators (one for creativity-related self-efficacy and one for implementation-related self-efficacy).
The goodness of fit measures indicate an acceptable fit for the model ($\chi^2 = 529; \text{DF} = 243; \chi^2/\text{DF} = 2.28; \text{CFI} = .94; \text{TLI} = .94; \text{and RMSEA} = .06$).

Figure 7: Covariance Structure Model for Analysis of the Proposed Effects of Research Model I
Figure 8 presents the structural equation model and the pathway estimates. In line with the proposed hypotheses, Figure 8 shows that the hypothesized paths for the relationships between innovative work behavior and task performance, and between innovative self-efficacy, outcome expectations and innovative work behavior, were significant at \( p < .001 \) level and in the predicted directions.

**Figure 8: Results of Structural Equation Model I**

*Notes: Standardized estimates are reported. *** = \( p < .001 \); n.s. = not significant.*
Consistent with hypothesis 1, innovative work behavior was positively related to task performance ($\beta_1 = .74, p < .001$). In line with hypothesis 2, innovative self-efficacy was associated positively with innovative work behavior ($\beta_2 = .44, p < .001$). Innovative self-efficacy had a significant positive effect on outcome expectations ($\beta_3 = .56, p < .001$), supporting hypothesis 4. Outcome expectations had no significant effect on innovative work behavior. Thus, no support was found for hypothesis 3. To summarize, the results support three of the four hypotheses after controlling for gender, age, tenure, and education (Table 12).

**Mediation Effect**

To test for mediation, the procedures of Mathieu and Taylor (2006) were followed, which test: (1) whether there is a significant relationship between independent and dependent variables; (2) whether the relationship between independent and mediator variables is significant; (3) whether there is a significant relationship between mediator and dependent variables; and (4) whether the relationship between independent and dependent variables becomes less or non-significant when the influence of the mediator is controlled.

The results of the main effects show that Mathieu and Taylor’s (2006) preconditions (1) and (2) were met. Innovative self-efficacy was significantly related to innovative work behavior ($\beta_2 = .44, p < .001$) and to outcome expectations ($\beta_4 = .56, p < .001$). However, the results also show that the relationship between outcome expectations and innovative work behavior was not significant. Thus, precondition (3) for mediation was not met. Therefore, the results do not support hypothesis 5. Table 12 summarizes the results of the hypotheses testing for research model I.
Innovative Work Behavior: The Roles of Employee Expectations and Effects on Job Performance

<table>
<thead>
<tr>
<th>No.</th>
<th>Hypothesis</th>
<th>Standardized Coefficient</th>
<th>Result</th>
</tr>
</thead>
</table>

**Hypothesis on the effect of innovative work behavior on task performance**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Coefficient</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>.742***</td>
<td>supported</td>
</tr>
</tbody>
</table>

**Hypotheses on the effects of innovative self-efficacy and outcome expectations on innovative work behavior**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Coefficient</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H2</td>
<td>.437***</td>
<td>supported</td>
</tr>
<tr>
<td>H3</td>
<td>-.089 (p = .298)</td>
<td>not supported</td>
</tr>
<tr>
<td>H4</td>
<td>.562***</td>
<td>supported</td>
</tr>
<tr>
<td>H5</td>
<td></td>
<td>not supported</td>
</tr>
</tbody>
</table>

*Table 12: Results of Hypotheses Testing for Research Model I*

*Note: *** = p < .001*

**Assessment of Common Method Variance**

As mentioned before, the supervisors provided their ratings for both variables, employees’ innovative work behavior and their task performance. Therefore, common method variance was very likely. In order to assess the impact of common method variance, the supervisors were asked to rate their employees’ task performance again six months after the first data collection. By introducing this time lag as suggested by Podsakoff et al. (2003), a temporal separation between the measurement of the independent and dependent variables was created. The hypothesized relationship between innovative work behavior and task performance was tested again using the employees’ task performance data obtained in the second data collection to check whether it was robust. Again, structural equation modeling was deployed to test the hypothesized relationship. Figure 9 reports the results that support the hypothesized relationship (β = .58, p < 0.001). The results indicate that the relationship between innovative work behavior and task performance is very robust.
3.3 Discussion

Theories of performance assume that employees’ abilities determine performance. The present work examined innovative work behavior as an ability factor of individual task performance. The present work is the first study that empirically examined the effect of innovative work behavior on task performance. In addition, the work investigated two kinds of expectations as antecedents of innovative work behavior. Social cognitive theory suggests that people hold two kinds of expectations in regard to behavior (Bandura 1977; 1986). Expectations in terms of self-efficacy and outcome expectations are important determinants of innovative work behavior (Bandura 1997; Farr and Ford 1990; Yuan and Woodman 2010). The present work introduced an innovation-specific self-efficacy construct and examined its effect on innovative work behavior. Further, the present work is the first attempt to examine the roles of both kinds of expectations concerning innovative work behavior in one study. The following sections present the contributions of the work with implications for theory and practicing managers.

3.3.1 Theoretical Implications

Overall, the findings support social cognitive theory and contribute to the innovation literature in four major ways.

First, the findings of the present work support that employee innovative work behavior positively relates to task performance. Prior research has mostly built on the assumption that innovation is followed by positive outcomes and has treated innovative work behavior as the dependent variable (e.g., Scott and Bruce 1994; Yuan and
Woodman 2010). However, research that has empirically supported the assumed positive link between innovative work behavior and ultimate task performance has been missing. The present work is the first attempt to test the relationship empirically. Thus, the present work complied with scholars that have called for more holistic research models that treat innovative work behavior as the dependent and independent variable (Janssen et al. 2004).

Prior studies have found that innovative work behavior may result in negative outcomes in terms of conflicts with co-workers and stress reactions of employees (Janssen 2003; 2004), indicating that innovative work behavior may be associated with decreased task performance. The findings of the present work point out that innovative work behavior actually positively affects task performance. The present work indicates that innovative work behavior is an ability factor that is associated with employee task performance. This implies that efforts toward innovation actually lead to the anticipated improvements in task performance and eventually aid organizations in achieving competitive advantages.

Besides this important contribution to the innovation literature, linking innovative work behavior to employee performance also supports prior work on individual performance that suggests that extra-role behavior contributes to task performance. The major part of the performance literature views overall performance as a multidimensional construct that consists of contextual performance (i.e., extra-role performance) and task performance (i.e., in-role performance). It claims that the combination of both contributes to overall performance (e.g., Allen and Rush 1998; MacKenzie, Podsakoff, and Fetter 1993; Motowidlo and van Scotter 1994). However, some scholars assume that extra-role behaviors positively affect task performance (e.g., Choi 2007; Podsakoff et al. 2000; van Dyne and LePine 1998). More precisely, Choi (2007) assumes that change-oriented organizational citizenship behavior improves employee task performance. Similarly, Podsakoff et al. (2000, p.524) state that “voluntary acts of creativity and innovation [are] designed to improve one’s task or the organization’s performance”. In addition, van Dyne and LePine (1998) have empirically linked the extra-role behaviors of voice and helping to individual task performance. The present study supports the perspective that extra-role behaviors positively affect task performance by showing that innovative work behavior, which constitutes another form of extra-role behavior, positively affects task performance.

Second, the findings of the present work indicate that the concept of self-efficacy may be important in research in innovative work behavior. Building on the general concept of self-efficacy (Bandura 1977; 1986; 1997) and the creative self-efficacy
concept (Tierney and Farmer 2002), an innovative self-efficacy concept was developed. In addition, the present work provided evidence for the validity of innovative self-efficacy as a distinct construct. Providing direct support for social cognitive theory, the present piece of research found that employees were more innovative when they judge themselves efficacious in innovating. Put differently, the work indicates that innovative self-efficacy may be a key personal characteristic for innovative work behavior.

Third, the present work brought together the two kinds of expectations regarding behavior that social cognitive theory suggests that people hold. More precisely, building on the seminal work on outcome expectations in the context of innovation of Yuan and Woodman (2010), the present work extends their work by examining the roles of self-efficacy and outcome expectations in the context of innovation in one study. In particular, although prior research has found that outcome expectations constitute an important determinant of innovative work behavior (Yuan and Woodman 2010), this work found that innovative self-efficacy may be a key determinant of outcome expectations. Contrary to the assumed relationship, the effect of outcome expectations on innovative work behavior was not significant. This is consistent with studies in other research areas that have found that self-efficacy is a robust predictor of behavior, while outcome expectations play a marginal role or no role at all (Bandura 1986; Barling and Beattie 1983; Lee 1984). Consequently, outcome expectations did not mediate the relationship between innovative self-efficacy and innovative work behavior. Thus, although innovative self-efficacy does seem to determine employees’ outcome expectations, it may be that high innovative self-efficacy is more important to innovative work behavior than outcome expectations.

One possible explanation for the non-significant relationship between outcome expectations and innovative work behavior is that people may only rely on their perceived self-efficacy when deciding which course of action to pursue because their outcome expectations depend largely on the adequacy of their performance (Bandura 1986). Therefore, outcome expectations may not independently contribute to the prediction of innovative work behavior over and above self-efficacy beliefs. At least, outcome expectations do not provide employees with unique motivational incentives that are not already provided by innovative self-efficacy. Another possible explanation for this finding is that individuals with high innovative self-efficacy may engage in innovative work behavior regardless of what the consequences of this behavior are. When individuals with high self-efficacy face an environment that rewards their efforts, the environment fosters aspiration, productive engagement, and a sense of fulfillment (Bandura 1997). On the contrary, when individuals with high self-efficacy experience that their environment is unresponsive to their efforts,
they will not stop trying (Bandura 1997). Instead, they will seek to change the existing institutional practices or they will leave the environment and pursue their activities elsewhere (Bandura 1978). In the context of innovation, this means that when employees with high innovative self-efficacy are confronted with an environment that does not value their innovative work behavior, they will try to change the environment or leave the environment. Consequently, strong innovative self-efficacy beliefs will cause people to show innovative work behavior regardless of whether this behavior will result in negative or positive consequences.

This raises the question as to whether outcome expectations really have an effect on innovative work behavior. The present study’s participants reported relatively high levels of outcome expectations. Therefore, it should be noted that the findings do not mean that outcome expectations are unimportant in the context of innovation. Rather, the relationship between outcome expectations and innovative work behavior may be more complex. For example, Yuan and Woodman (2010) found that outcome expectations have a positive effect on innovative work behavior. However, they also suggest that expected image gains may have served as a suppressor variable for expected positive performance gains. Therefore, further understanding of when and how outcome expectations relate to innovative work behavior is needed.

Fourth, the present study is the first attempt to examine an innovation-specific self-efficacy construct in direct relation to employees’ innovative work behavior in an ongoing corporate setting.

### 3.3.2 Managerial Implications

The findings of the present study imply that employees’ innovative work behavior actually leads to increased task performance and, thus, may eventually aid organizations in achieving competitive advantages. The message for managers is that they should encourage their employees to think in alternative ways, search for improvements, figure out new ways to accomplish tasks, look for new technologies, apply new work methods, and investigate and secure resources to make new ideas happen.

The findings imply that employees’ innovative self-efficacy should be stimulated in order to enhance innovative work behavior. More precisely, the present work showed that innovative self-efficacy might be a key characteristic for employees’ innovative work behavior. Managers should build up the innovative self-efficacy of their employees to bring forth innovative endeavors. Social cognitive theory provides a typology of self-efficacy antecedents. It suggests that past experiences, observing role models, verbal persuasion, and evaluating one’s physiological and psy-
chological arousal (e.g., anxiety) impact one’s self-efficacy (Bandura 1997). Building on social cognitive theory, managers can influence employees’ innovative self-efficacy especially through transformational leadership behaviors that correspond with persuasion and vicarious experiences.

First, leaders may increase their followers’ self-efficacy through persuasion. Applying a transformational leadership approach, managers communicate high performance expectations and express confidence in their followers’ ability to meet the expectations at the same time (Eden 1992; Shamir, House, and Arthur 1993). Similarly, transformational leaders may express their faith in the capabilities of their followers to accomplish tasks related to innovative work behavior. This helps employees to raise their innovative self-efficacy beliefs and to maintain them when struggling with difficulties. Managers can exert another form of persuasive influence on their followers by providing them with feedback on innovative acts, which can help to form the efficacy beliefs of the followers (Gardner and Pierce 1998; van Knippenberg et al. 2004). Reassuring feedback that highlights personal capabilities is an important source of efficacy beliefs (Bandura 1997). Again, the transformational leadership approach meets this aspect. Transformational leaders provide their followers with individual consideration by supporting and encouraging them. As such, they can give their followers positive feedback on innovative acts, which helps to raise the followers’ innovative self-efficacy. On the contrary, when managers are unduly critical in their feedback on innovative acts, they may risk destroying their employees’ innovative self-efficacy (Baron 1988). Managers should therefore bear in mind that their feedback on the innovative acts of their employees shapes their efficacy beliefs and consequently their innovative work behavior.

Second, managers may also serve as role models for their followers. Through role modeling and the associated process of identification, transformational leaders influence their followers’ development (Kark, Shamir, and Chen 2003). Transformational leaders are described as proactive and good at developing new ideas (Gong, Huang, and Farh 2009). As such, they provide their followers with the opportunity to observe a skilled model. As the followers identify themselves with the leaders, the observations elevate the employees’ self-efficacy beliefs by implying that they are also capable of mastering similar activities (Bandura 1997). Empirical support indicates that transformational leadership indeed has the suggested positive developmental effects on employees in terms of increased general self-efficacy (Dvir, Avolio, and Shamir 2002; Walumbwa, Avolio, and Zhu 2008). Additionally and more specifically regarding the innovation-related perspective, Gong, Huang, and Farh (2009) have confirmed that transformational leadership enhances creative self-efficacy.
Third, managers can create an innovation-supportive environment that provides employees with the possibility to observe other members of the organization as role models for innovative work behavior. The information they gain by observing others successfully engaging in innovative work behavior helps employees to form their own innovative self-efficacy beliefs.

In addition, managers can also provide their followers with vocational training and experience opportunities, as domain-specific knowledge is suggested to be a stable, personal factor that forms self-efficacy beliefs (Gist and Mitchell 1992).

### 3.3.3 Limitations and Future Research

The contributions of the present work should be interpreted in light of its limitations. The empirical study faces the usual limitations inherent in survey designs. As mentioned before, the supervisors provided their ratings for both variables, employees’ innovative work behavior and their task performance. Thus, common method variance was very likely. In order to assess the impact of common method variance, the supervisors were asked to rate their employees’ task performance again six months after the first data collection. The hypothesized relationship between innovative work behavior and task performance was tested again using this data to check whether it was robust. Nevertheless, the data for both variables may involve self-serving bias. For example, supervisors may have thought that their employees’ results would reflect their own leadership performance. To validate the two measures of innovative work behavior and task performance, objective data from the participating firm would have been desirable. Furthermore, the present work established the proposed relationships between innovative self-efficacy, outcome expectations, innovative work behavior, and task performance at a single moment in time. More appropriate conclusions about causality would require a longitudinal study approach and should be undertaken in future research. The survey also only addressed members of a single firm and in a single country. The results might therefore have limited potential for generalization for other industries and for other cultures. Consequently, future research should explore the effects of these factors in other settings in terms of different industries and cultures.

Beyond these limitations, additional fruitful research directions and important research implications have emerged from this work.

First, although innovative self-efficacy clearly has a strong impact on innovative work behavior, further research should include moderator variables to test whether the relationship is stable across different situations. For example, trait activation
theory suggests that personality traits are latent potentials residing in a person that can be triggered into actions by situational, trait-relevant cues (Ng, Ang, and Chan 2008). This means that individuals show the behavioral expression of a trait only when situational cues signal that it is appropriate to do so (Tett and Guterman 2000). It may be that the conditions needed for innovative self-efficacy to result in innovative work behavior were present in the research setting under study but not in others. Future research should explore whether the relationship between innovative self-efficacy and innovative work behavior is contingent on third variables.

Second, the present piece of research raised the question of whether outcome expectations really have an effect on innovative work behavior. As the study’s participants reported relatively high levels of outcome expectations, it should be noted that the findings do not mean that outcome expectations are unimportant in the context of innovation. Rather, further research should broaden scholarly understanding of when and how outcome expectations relate to innovative work behavior.

Third, the present work supports that employees’ innovative self-efficacy may be a powerful predictor of innovative work behavior. Future studies might extend the work by examining potential antecedents of innovative self-efficacy.

3.4 Summary of Research Model I

In business today, a firm’s ability to develop new products or services continuously is essential. Many practitioners and scholars suggest that the extent to which a firm can continuously innovate is linked to innovation by individual employees. The present study aimed to investigate whether innovative work behavior actually contributes to employees’ task performance. Additionally, the present study aimed to investigate what factors induce employees’ innovative work behavior. Building on social cognitive theory, the study focused on the roles of innovative self-efficacy and outcome expectations. Social cognitive theory suggests that the level of self-efficacy determines an individual’s choice to engage in a certain behavior. Although prior research already proposed self-efficacy as an important determinant of innovative work behavior, no research exists that examines the effects of innovation-specific self-efficacy on innovative work behavior.

Research model I confirmed the importance of innovative work behavior for task performance and the importance of innovative self-efficacy for innovative work behavior in turn. Social cognitive theory also suggests that outcome expectations depend on self-efficacy. The present work examined the roles of both kinds of expectations concerning innovative work behavior in one study. The findings support that
self-efficacy beliefs determine outcome expectations. However, the results also show that outcome expectations do not contribute to the prediction of innovative work behavior.

While research model I identified that innovative self-efficacy is an important predictor of innovative work behavior, it does not answer the question of what the sources of innovative self-efficacy are. Chapter 4 is devoted to uncovering potential antecedents of innovative self-efficacy.
4 Research Model II: Antecedents of Innovative Self-Efficacy

Research model II addresses research question 2 by investigating employees’ personal characteristics and organizational factors as antecedents of innovative self-efficacy. Bandura’s (1977; 1986; 1997) social cognitive theory and Gist and Mitchell’s (1992) framework of work-related self-efficacy guides the development of research model II.

The following sections describe the second research model. The first section develops the conceptual framework of the model and derives a number of research hypotheses on this basis. The second section empirically tests whether these hypotheses can be validated. It describes the methodology and the results. This chapter concludes with the discussion of the results in the third section.

4.1 Conceptual Framework and Hypotheses

The following sections present the conceptual framework and the hypotheses of the model of antecedents of innovative self-efficacy. The conceptual framework lays the theoretical foundation for the present work. It identifies the variables that will be studied and provides an overview of the expected relationships of these variables. Afterwards, the second section discusses the expected relationships between the variables in detail and presents the hypotheses to be tested.

4.1.1 Conceptual Framework

The conceptual framework draws on Bandura’s (1977; 1986; 1997) social cognitive theory and its central variable self-efficacy, as well as on Gist and Mitchell’s (1992) framework of work-related self-efficacy development. It assumes that core self-evaluations, organizational support for innovation, transformational leadership, and co-worker exchange influence innovative self-efficacy. Figure 10 depicts the conceptual model with the assumed relationships.
Social cognitive theory (Bandura 1977; 1986; 1997) suggests four ways through which self-efficacy beliefs can be shaped: enactive attainment, vicarious experiences, verbal persuasion, and physiological and psychological state. First, *enactive attainment* provides valuable self-efficacy information (Bandura 1986). When individuals succeed, they raise their self-efficacy judgments, whereas failure lowers self-efficacy. When an individual usually successfully accomplishes a specific task, he or she develops a strong sense of self-efficacy that an occasional failure does not diminish very easily. Rather than ascribing failure to inability, individuals with high self-efficacy are likely to explain the failure through situational factors or insufficient effort.

*Vicarious experiences* are the second source of information in judging one’s capabilities (Bandura 1986): people judge their self-efficacy through social comparison. Seeing or visualizing other people similar to oneself that successfully perform a specific task can raise one’s own self-efficacy in terms of believing that one too possesses the capabilities to master a comparable task successfully. At the same
time, seeing others fail can lower one’s own efficacy beliefs. Vicarious experiences are an especially important source of efficacy information when individuals are uncertain about their competences. For example, this might be the case when individuals have little prior experience to rely on when assessing their abilities. In this case, individuals depend on social comparative information. Individuals with more prior experience, either of inefficacy or of efficacy, also use the information provided by social models to re-formulate or to boost their efficacy beliefs.

The third way of shaping self-efficacy beliefs is verbal persuasion by convincing someone to believe that he or she possesses the capabilities to successfully perform a specific activity (Bandura 1986). Individuals who are persuaded of being competent raise their efforts when facing difficulties. Put in other words, persuasion can provide individuals with the motivation needed to persevere and to succeed. On the contrary, people can also undermine someone’s self-efficacy. Individuals who have been told that they are inefficacious concerning specific behavior tend to avoid the behavior and give up early when facing difficulties.

Fourth, an individual’s physiological and affective state can serve as an information source for efficacy beliefs (Bandura 1986): in stressful situations, individuals may view their body’s signs of heavy arousal as an indication for failure. On the contrary, people believe in succeeding when they feel that they are not stricken with heavy arousal. Emotional reactions to subjective threads can also result in lower self-efficacy. Further, mood states influence efficacy judgments.

While Bandura (1986) presents general ways that help individuals when they evaluate their capabilities, Gist and Mitchell (1992) assume that enactive attainment, vicarious experiences, verbal persuasion, and physiological and psychological state contribute a variety of external and internal information cues that can influence self-efficacy. The authors further specify Bandura’s general suggestions with regard to a specific organizational context. They propose a model of work-related self-efficacy development in an organizational context that assumes that personal, task-related, and contextual information contributes to the comprehensive assessment of capability (Gist and Mitchell 1992). Personal information includes emotional arousal (e.g., excitement, enthusiasm and anxiety), personality factors (e.g., self-esteem and Type A vs. Type B personalities), and a person’s affect or mood. Task-related information comprises task attributes (e.g., degree of interdependence and amount of resources), task complexity (e.g., number of component parts involved in completing the task, uncertainty, and the sequential or coordinative steps required to perform the task), and task environment (e.g., distractions and amount of risk and danger). Consider, for example, people who assess if they are capable of accomplishing
a specific task. The person takes into consideration the evaluation of task-specific attributes and the environment in which they would perform the task while judging their actual capability to accomplish the task. Contextual information includes modeling (e.g., observing performance strategies and psychological strategies) and verbal persuasion (e.g., feedback or instruction about capabilities and emotional or cognitive appeals).

Since innovation is no longer just reserved for people doing scientific or technological work (de Jong 2007) but is important for employees in all positions and jobs, task-related factors (as suggested by Gist and Mitchell (1992)) are not examined within the scope of the present study. Accordingly, the present work includes variables that relate to personal and contextual information. Regarding the personal information used in judging one’s abilities, the psychological construct core self-evaluations (Judge, Locke, and Durham 1997) is particularly interesting. Regarding the contextual information that help employees to form their self-efficacy judgments, the present work focuses on factors that provide employees with vicarious experiences and verbal persuasion because it aims to identify efficacy formation sources that an organization can influence. In this respect, particularly interesting constructs are: organizational support for innovation (Yuan and Woodman 2010) to represent a salient organizational factor; transformational leadership (Bass and Riggio 2005) to represent a salient managerial factor; and co-worker exchange (Scott and Bruce 1994) to represent a salient collegial factor. The present work concentrates on these specific factors since they are conceptually associated with innovative self-efficacy, as well as with innovative work behavior. In addition, an organization can influence these factors and, therefore, exert an effect on its employees’ innovative self-efficacy beliefs. Further, the selection of potential antecedents of innovative self-efficacy ensures that personal and contextual variables, as suggested by Gist and Mitchell (1992), are addressed.

4.1.2 Hypotheses

The following section discusses the expected relationships between the variables and presents the hypotheses of the present work. Figure 11 summarizes the hypothesized relationships.
Core Self-Evaluations

As mentioned in the previous section, personality factors constitute an information source for the formation of self-efficacy beliefs. Core self-evaluations refer to a person’s fundamental assessments about their worth, competence, and capabilities (Judge et al. 2005). Core self-evaluations theory provides several reasons for the assumption that core self-evaluations affect innovative self-efficacy.

From a general point of view, positive core self-evaluations make individuals more confident that they can respond successfully to challenging situations (Kammeyer-Mueller, Judge, and Scott 2009). Positive core self-evaluations are related to an individual’s beliefs in them personally being able to master their environment and to generate change (Judge, Erez, and Bono 1998). Put differently, people with positive core self-evaluations generally feel more capable than people with negative core self-evaluations. Srivastava et al. (2010) state that an individual with more positive core self-evaluations tends to view challenges (e.g., challenges associated with innovative work behavior) as opportunities. Hence, it seems reasonable that a person
with more positive core self-evaluations generally tends to view the challenges that come with innovative work behavior as opportunities and to hold more positive expectations than a person with more negative core self-evaluations does.

While the expected effects of core self-evaluations have been discussed on a rather broad and general level thus far, by decomposing core self-evaluations, four relationships between the individual components and innovative self-efficacy can be assumed.

First, people with high self-esteem have a positive sense of self-worth. This helps them to maintain an improved mood when facing difficulties and to feel more confident that they can exert control over potential stressors (Kammeyer-Mueller, Judge, and Scott 2009). Accordingly, a person with high self-esteem generally expects to succeed, whereas a person with low self-esteem expects failure (McFarlin and Blascovich 1981). By the same token, individuals with low self-esteem who tend to be anxious in various task performance situations are claimed to have depressed self-efficacy beliefs when compared to individuals with high self-esteem (Gist and Mitchell 1992). A person who is anxious across a variety of task performance situations also tends to be anxious about innovative work behavior. Therefore, low self-esteem is associated with low innovative self-efficacy, while high self-esteem is supposed to relate to high innovative self-efficacy.

Second, generalized self-efficacy, i.e., the tendency to feel efficacious across tasks and situations, spills over into specific situations (Chen et al. 2000). As individuals with high generalized efficacy beliefs expect to succeed across various task domains, they tend to have high task-specific self-efficacy. This means that a person who generally feels capable is also supposed to feel efficacious concerning innovative work behavior. By contrast, people who generally doubt their capabilities are apt to doubt their innovative self-efficacy too.

Third, emotionally unstable people (i.e., people with high neuroticism) tend to be worried, nervous, not temperamental, and to pity themselves (Christensen, Danko, and Johnson 1993). They are usually apt to be rather anxious, self-conscious, and shy (Wiggins 1996). Since innovation is highly uncertain, being involved in innovative endeavors may amplify the self-consciousness of emotionally unstable people. Thus, when compared to emotionally stable individuals, emotionally unstable people are likely to expect to fail in innovative endeavors. For example, Thoms, Moore, and Scott (1996) state that individuals high in neuroticism are likely to lack self-confidence in their abilities to effectively perform a given task. This suggests that emotionally unstable people tend to have low innovative self-efficacy. Con-
versely, emotionally stable people are more likely to have high innovative self-efficacy.

Finally, people with a more internal locus of control have the feeling of being able to exert control over events (Rotter 1966). As such, they are likely to be motivated to fully exercise their personal efficacy, whereas individuals who approach situations as largely uncontrollable are supposed to exercise their efficacy weakly and abortively (Wood and Bandura 1989). Empirical evidence supports that a more internal locus of control has been found to be related to higher self-efficacy (Phillips and Gully 1997; Wood and Bandura 1989). Accordingly, with regard to the present research context, it is posited that:

\[ H_6: \quad \text{Core self-evaluations positively affect innovative self-efficacy.} \]

**Organizational Support for Innovation**

Organizational support for innovation represents a salient organizational factor that provides contextual information for the formation of self-efficacy beliefs. In an organizational context that supports innovation, vicarious experiences may provide important contextual information for self-efficacy beliefs. This is especially true when employees’ own past experiences provide insufficient information for appraising whether they have the capabilities to perform a certain task. Models demonstrating the successful performance of an activity may provide the information needed (Gist and Mitchell 1992). People that observe others similar to themselves performing successfully usually raise their own self-efficacy beliefs: seeing or visualizing someone else successfully performing a specific activity makes observers believe that they too possess the capabilities to master comparable activities.

In addition, Bandura (1997) states that vicarious experiences are strengthened when a person can observe various others performing the behavior. In the context of learning self-efficacy, support has been found that observing multiple skilled models results in higher perceived efficacy than observing only one single skilled model (Schunk, Hanson, and Cox 1987). In a work environment where innovation is encouraged and valued throughout the whole organization, employees will have plenty of possibilities to observe people that successfully engage in innovative work behavior. This helps them to elevate their own innovative self-efficacy beliefs (Bandura 1986).
Thus, even though previous research linking organizational support for innovation to self-efficacy beliefs is lacking, it seems reasonable that the relationship manifests. Drawing on this reasoning, it is hypothesized that:

\[ H_7: \text{Organizational support for innovation positively influences innovative self-efficacy.} \]

**Transformational Leadership**

Transformational leadership (Bass and Riggio 2005) represents a salient managerial factor that is assumed to provide contextual information concerning efficacy beliefs. According to transformational leadership theory, transformational leadership behaviors (idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration) have a developmental effect on followers (Dvir, Avolio, and Shamir 2002). Increasing their followers’ self-efficacy is an especially crucial part of developing followers (Avolio and Gibbons 1988). Transformational leadership behaviors seem to match with two of the major ways of shaping self-efficacy: persuasion and vicarious experiences.

First, transformational leaders may increase their followers’ self-efficacy through persuasion, which is a major determinant of self-efficacy (Bandura 1997). Transformational leaders communicate high performance expectations and express confidence in their followers’ ability to meet the expectations at the same time (Eden 1992; Shamir, House, and Arthur 1993). This implies that transformational leaders also express their faith in the capabilities of their followers to accomplish the tasks related to innovative work behavior. This helps employees to raise their innovative self-efficacy beliefs and to maintain them when struggling with difficulties. Managers can also exert persuasive influence on their followers by providing them with feedback concerning innovative behaviors in the workplace. Reassuring feedback that highlights personal capabilities is an important source of efficacy beliefs (Bandura 1997). Transformational leaders provide their followers with individual consideration by supporting and encouraging them. As such, they can give their followers positive feedback on innovative acts, which helps to raise their followers’ innovative self-efficacy.

Second, transformational leaders may also serve as role models for their followers. Through role modeling and the associated process of identification, transformational leaders influence their followers’ development (Kark, Shamir, and Chen 2003).
Transformational leaders are described as proactive and good at developing new ideas (Gong, Huang, and Farh 2009). As such, they provide their followers with the opportunity to observe a skilled model. As the followers identify themselves with the leaders, these observations raise the employees’ self-efficacy beliefs, since they imply the followers that they are also capable of mastering similar activities (Bandura 1997).

Empirical support indicates that transformational leadership indeed has the suggested positive developmental effects on employees in terms of increased self-efficacy (Dvir, Avolio, and Shamir 2002; Pillai and Williams 2004; Walumbwa, Avolio, and Zhu 2008). Additionally and more specifically regarding the innovation-related perspective, Gong, Huang, and Farh (2009) have confirmed that transformational leadership enhances creative self-efficacy. Consequently, regarding the present research context, it is hypothesized that:

$$H_8: \text{Transformational leadership positively affects innovative self-efficacy.}$$

**Co-Worker Exchange**

Co-worker exchange is a salient collegial factor that provides contextual information for the formation of self-efficacy beliefs. Proximal co-worker relationships are said to have powerful implications for employee beliefs, feelings and behaviors (Hackman 1976; Ilgen 1999). Thus, in addition to employees’ individual characteristics, organizational factors, and supervisory behaviors, their co-workers may also shape innovative self-efficacy.

Co-worker exchange is expected to have an effect on a person’s innovative self-efficacy through persuasion, vicarious experiences, and influence on the person’s psychological state, which are three important sources of efficacy beliefs (Bandura 1997). More precisely, as mentioned before, a person more easily raises and/or maintains a sense of self-efficacy when important others state their faith in one’s capabilities (Bandura 1997). In high-quality relationships, co-workers provide the conditions that are necessary for raising an employee’s perception of competence through persuasion in terms of work-related feedback and social support (Liden, Wayne, and Sparrowe 2000). As high-quality relationships result in trust and credibility, members in high-quality relationships have more influence among their peers (Ford and Seers 2006). Thus, individuals rely on their feedback and capability judgments. On the contrary, in low-quality relationships, exchanges are limited to
the minimum required for the completion of work tasks (Liden, Wayne, and Sparrowe 2000). In such relationships, employees lack the feeling of being supported and believed. In addition, a co-worker to whom one relates in a low-quality way is not as trustworthy as a co-worker to whom one relates in a high-quality way. Accordingly, an individual does consider the first co-worker’s feedback and capability judgments as less credible. Consequently, the person is not provided with the necessary conditions for raising their self-efficacy.

Co-workers can also influence innovative self-efficacy through vicarious experiences. People judge their self-efficacy through social comparison (Bandura 1986). In particular, other people who one conceives as being similar to oneself represent a good benchmark. High-quality relationships are assumed to affirm perceptions of congruence and cohesiveness (Ford and Seers 2006). Thus, co-workers in high-quality relationships conceive themselves as being similar. Observing co-workers, to whom one relates in a high-quality way, successfully engaging in innovative work behavior, therefore, raises one’s own innovative self-efficacy beliefs. Similarly, a person’s innovative self-efficacy can be elevated when co-workers, to whom the person relates in a high-quality way, tell the person about the successful performance of innovative work behavior.

In addition, co-workers can affect self-efficacy through their influence on an individual’s psychological state. High-quality relationships with co-workers are related to positive emotions (Tse and Dasborough 2008). Positive emotions, in turn, trigger thoughts of accomplishment that enhance perceived self-efficacy (Bandura 1986). High-quality relationships further provide a safe and supportive network (Boies and Howell 2006) that helps co-workers to reduce physiological and psychological arousal, such as fear, anxiety, and stress when they approach a challenging task (Liao and Subramony 2008). This, in turn, helps employees to maintain or enhance their self-efficacy beliefs (Bandura 1986).

Although empirical support for the link between co-worker exchange and innovative self-efficacy is lacking, empirical research in related areas has found a supportive environment to be positively linked to entrepreneurial self-efficacy (Chen, Greene, and Crick 1998), general self-efficacy (Liao, Liu, and Loi 2010), and team-conflict self-efficacy (Stone and Bailey 2007). This indicates that co-worker exchange may also affect innovative self-efficacy. Accordingly, it is posited that:

\[ H_9: \text{ Co-worker exchange positively influences innovative self-efficacy.} \]
Summary of Research Hypotheses

Table 13 gives an overview of the core research hypotheses of the second research model.

<table>
<thead>
<tr>
<th>Hypotheses on the potential antecedents of innovative self-efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>H6 Core self-evaluations positively affect innovative self-efficacy.</td>
</tr>
<tr>
<td>H7 Organizational support for innovation positively influences innovative self-efficacy.</td>
</tr>
<tr>
<td>H8 Transformational leadership positively affects innovative self-efficacy.</td>
</tr>
<tr>
<td>H9 Co-worker exchange positively influences innovative self-efficacy.</td>
</tr>
</tbody>
</table>

Table 13: Research Hypotheses of Research Model II

4.2 Empirical Test

Following a confirmatory research approach, the proposed model is empirically tested by means of a cross-sectional study and appropriate techniques of multivariate statistics. The following sections describe the research design, results and the contributions of the present work.

4.2.1 Methodology

4.2.1.1 Data Collection and Sample

The data for the second study was collected within the scope of the first study. Section 3.2.1.1 describes the data collection procedure in detail. In contrast to the first study that used data collected from both the employees and their direct supervisors, the present study only uses employee data sets. Employees were asked to rate their own level of core self-evaluations and innovative self-efficacy, as well as their perceptions of organizational support for innovation, transformational leadership, and co-worker exchange.

Of the 699 employees contacted, 526 completed the survey, resulting in a response rate of approx. 75%. Since it takes time for leaders to take hold of their followers (Gong, Huang, and Farh 2009), data sets of employees that reported to have worked for their present leader for less than one year were excluded from the analyses. This resulted in a final sample of 422 data sets, resulting in a response rate of approx. 60%.
The sample included respondents from a broad cross-section of jobs. Of all the respondents, 51% worked in market range provision and indemnity insurance, 12% in the finance department, 9% in the operations and development department, and the remaining 28% of the respondents worked in the strategy and sales department. Of all the respondents, 44% were female and 56% were male. The average age was 42 years (SD = 11.7) and the average tenure in their position at the time was 7.7 years (SD = 6.2). The average tenure with the present leader was 3.8 years (SD = 3.1). Table 14 summarizes the sample statistics.

<table>
<thead>
<tr>
<th>Sample Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email sent out</td>
</tr>
<tr>
<td>Failed email</td>
</tr>
<tr>
<td>Effectively sent out</td>
</tr>
<tr>
<td>Returned</td>
</tr>
<tr>
<td>Supervisor-follower relationship less than one year</td>
</tr>
<tr>
<td>Final sample</td>
</tr>
</tbody>
</table>

Table 14: Sample Statistics of Research Model II

4.2.1.2 Measures

All variables except for innovative self-efficacy were assessed based on previously developed scales. Most of the scales were originally developed and published in English. Only a few of the scales had been previously used and validated in German. If German versions were available, they were used. In the other cases, the author first translated the scales into German and then two bilingual researchers back-translated the scales into English to ensure maximum convergence with the original items. A third bilingual researcher compared the back-translation with the original items. Human resources executives of the participating company reviewed the questionnaire to ensure that the items suited the respondents’ jobs. Sections 7.1 and 7.2 in the Appendix present the final questionnaire. Table 15 gives an overview of the scale items used in the work.

Core Self-Evaluations. Core self-evaluations were assessed with 12 items adapted from the German version (Heilmann and Jonas 2010) and a modified version (Simsek, Heavey, and Veiga 2010) of the core self-evaluations scale developed and validated by Judge et al. (2003). The scale measures the four core traits self-esteem, generalized self-efficacy, emotional adjustment, and locus of control. Since the
measures of core self-evaluations and innovative self-efficacy both refer to a self-assessment of the employees, the potential for common method variance seemed to be relatively high. Following Spreitzer (1995; 1996), using a different scale format for core self-evaluations should help to minimize the potential for response bias. The core self-evaluations scale was the only scale that used a scale format different from the 5-point response format. Employees rated their own level of core self-evaluations on a seven-point scale ranging from 1 (“very strongly disagree”) to 7 (“very strongly agree”).

Innovative Self-Efficacy. Ten items measured innovative self-efficacy. Three of the items refer to the creative self-efficacy measure from Tierney and Farmer (2002). The remaining seven items were developed for the present dissertation in order to gauge the efficacy beliefs related to implementation and to capture all capability beliefs related to producing innovative outcomes. Section 3.2.1.2 describes the development of the additional items and section 3.2.1.4 provides a detailed measurement assessment of the innovative self-efficacy scale. The exploratory factor analysis to assess the proposed two-dimensionality of the construct was rerun with the data from the second part of the present work. Section 7.3 in the Appendix presents the results, which further support that innovative self-efficacy is a second-order construct consisting of creativity-related efficacy beliefs and implementation-related efficacy beliefs.

Organizational Support for Innovation. Organizational support for innovation was measured with 13 items from Scott and Bruce’s (1994) 16-item measure for support for innovation. The original scale measured three dimensions of organizational support for innovation: support for creativity, tolerance of differences, and reward-innovation dependency. Following Yuan and Woodman (2010), the items of reward-innovation dependency were not included because the support for creativity and tolerance of differences items are more established measures of support for innovation and they seem to represent the construct well. Accordingly, in the present study, the 13 items reflecting support for creativity and tolerance of differences (which measure perceived organizational support for innovation) were included. Employees rated their perceptions of organizational support for innovation on a five-point scale (1 = strongly disagree to 5 = strongly agree).

Transformational Leadership. Transformational leadership was assessed with 20 items from the transformational leadership scale of the Multifactor Leadership Questionnaire Form 5X (Bass and Avolio 1995). The scale measures five dimensions of transformational leadership, including idealized influence (attributed), idealized influence (behavior), inspirational motivation, intellectual stimulation, and in-
Individual consideration. Previous German studies have provided evidence of the construct validity and high internal consistency of the scale (e.g., Felfe and Schyns 2002). Employees rated their direct supervisors on a 5-point scale, ranging from 1 ("not at all") to 5 ("frequently, if not always").10

Co-Worker Exchange. Co-worker exchange was assessed with 10 items adapted from Seers (1989). The only wording change was “co-worker” was used instead of “team member” (which focuses solely on a specific team and not co-workers in general). Employees rated their perception of co-worker exchange on a 5-point scale (1 = strongly disagree to 5 = strongly agree).

To control for socio-demographics, gender, age (in years), and level of education (divided into three levels: (1) “high school degree”; (2) “bachelor degree”; and (3) “university degree”) were included.

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10 The items were reproduced with special permission from the publisher, MIND GARDEN, Inc. (www.mindgarden.com) from the Multifactor Leadership Questionnaire for Research by Bernard M. Bass and Bruce J. Avolio. Copyright 1995 by Bernard M. Bass and Bruce J. Avolio. All rights reserved. Further reproduction is prohibited without the publisher’s written consent.
<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Self-Evaluations</td>
<td>• I am confident I get the success I deserve in life.</td>
<td>adapted from the German version of Heilmann and Jonas (2010) and the modified version of the original scale of Simsek, Heavey, and Veiga (2010)</td>
</tr>
<tr>
<td></td>
<td>• When I try, I generally succeed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sometimes when I fail, I feel worthless.*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• I complete tasks successfully.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Sometimes I do not feel in control of my work.*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Overall, I am satisfied with myself.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• I rarely have doubts about my competence.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• I determine what will happen in my life.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• I always feel in control of success in my career.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• I am capable of coping with most of my problems.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• There are times when things look pretty bleak and hopeless to me.*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• I rarely feel pessimistic.</td>
<td></td>
</tr>
<tr>
<td>Organizational Support for Innovation</td>
<td>• Creativity is encouraged here.</td>
<td>Scott and Bruce (1994)</td>
</tr>
<tr>
<td></td>
<td>• Our ability to function creatively is respected by the leadership.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Around here, people are allowed to try to solve the same problems in different ways.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The main function of members in this organization is to follow orders which come down through channels.*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Around here, a person can get in a lot of trouble by being different.*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• This organization can be described as flexible and continually adapting to change.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• A person can’t do things that are too different around here without provoking anger.*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The best way to get along in this organization is to think the way the rest of the group does.*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• People around here are expected to deal with problems in the same way.*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• This organization is open and responsive to change.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The people in charge around here usually get credit for others’ ideas.*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• In this organization, we tend to stick to tried and true ways.*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• This place seems to be more concerned with the status quo than with change.*</td>
<td></td>
</tr>
</tbody>
</table>
I often make suggestions about better work methods to co-workers.  
My co-workers let me know when I do something that makes their jobs easier (or harder).  
I let co-workers know when they have done something that makes my job easier (or harder).  
My co-workers recognize my potential.  
My co-workers understand my job problems and needs.  
I am flexible about switching job responsibilities to make things easier for my co-workers.  
In busy situations, my co-workers often ask me to help them out.  
In busy situations, I often volunteer my efforts to help my co-workers.  
I am quite willing to help finish work that was assigned to other co-workers  
Co-workers are quite willing to help finish work that was assigned to me.

adapted from Seers (1989)

I feel that I am good at generating novel ideas.  
I have confidence in my ability to solve problems creatively.  
I have a knack for further developing the ideas of others.  
I have a knack for making others enthusiastic for new ideas.  
I have confidence in my ability to convince others of the benefit of new ideas.  
I have the social contacts needed to find backers for realizing new ideas.  
I have confidence in my ability to implement new methods at work.  
I have confidence in my ability to implement new products at work.  
I feel that I am good at adopting new methods at work.  
I feel that I am good at adopting new products at work.

the first three items refer to the creative self-efficacy scale (Tierney and Farmer 2002); the remaining items were developed for this study

Table 15: Scale Items for Construct Measures of Research Model II

Notes: *=reverse scored; due to copyright protection, the items used to measure transformational leadership are not shown.

4.2.1.3 Analytical Strategy

The present work follows Anderson and Gerbing’s (1988) widely recommended two-step approach to structural equation modeling. In the first step, the measurement model is validated by means of a confirmatory factor analysis using AMOS 18.0 (Arbuckle 2009). In the second step, the proposed structural model that specifies the relations of the constructs based on theory is tested, again using AMOS
Table 4 in section 3.2.1.3 provides an overview of the thresholds of the goodness of fit criteria, which helped to assess the fit of the measurement model and the structural model.

For measurement assessment, following the suggestions of various scholars (Podsakoff and Organ 1986; Cunningham 2006), different measurement models were compared. Besides the aforementioned goodness of fit indices, $\chi^2$ values served as a means to compare models. A $\chi^2$ value lower than the $\chi^2$ value of the basic model indicates a better fit with the data. The chi-square difference ($\Delta\chi^2$) test that examines the significance of the chi-square difference (Loehlin 1992) provides an additional check.

### 4.2.1.4 Measurement Assessment

The measurement model consisted of the five focal variables innovative self-efficacy, core self-evaluations, organizational support for innovation, transformational leadership, and co-worker exchange. In a first step, confirmatory factor analysis was run for each factor individually to assess reliability and validity. Table 16 reports the results, which indicate good psychometric properties. More specifically, no coefficient alpha ($\alpha$) values are lower than .7, thus meeting or exceeding the threshold recommended by Bagozzi and Yi (1988).

<table>
<thead>
<tr>
<th></th>
<th>Core Self-Evaluations</th>
<th>Transformational Leadership</th>
<th>Organizational Support for Innovation</th>
<th>Co-Worker Exchange</th>
<th>Innovative Self-Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\alpha$</td>
<td>.77</td>
<td>.97</td>
<td>.86</td>
<td>.80</td>
<td>.85</td>
</tr>
<tr>
<td>AVE</td>
<td>.27</td>
<td>.70</td>
<td>.33</td>
<td>.29</td>
<td>.28</td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>115</td>
<td>402</td>
<td>198</td>
<td>100</td>
<td>59</td>
</tr>
<tr>
<td>DF</td>
<td>47</td>
<td>156</td>
<td>52</td>
<td>27</td>
<td>21</td>
</tr>
<tr>
<td>$\chi^2$/DF</td>
<td>2.46</td>
<td>2.58</td>
<td>3.81</td>
<td>3.7</td>
<td>2.85</td>
</tr>
<tr>
<td>CFI</td>
<td>.94</td>
<td>.97</td>
<td>.92</td>
<td>.94</td>
<td>.98</td>
</tr>
<tr>
<td>TLI</td>
<td>.92</td>
<td>.96</td>
<td>.89</td>
<td>.90</td>
<td>.97</td>
</tr>
<tr>
<td>RMSEA</td>
<td>.06</td>
<td>.06</td>
<td>.08</td>
<td>.08</td>
<td>.07</td>
</tr>
</tbody>
</table>

Table 16: Scale Properties of Research Model II

---

11 Please refer to sections 7.4 and 7.5 in the Appendix for a short overview of factor analysis and structural equation modeling.
In a second step, discriminant validity of the measures was assessed on the basis of the Fornell-Larcker criterion (Fornell and Larcker 1981). This criterion requires that the average variance extracted (AVE) of the constructs should be greater than the squared correlations among the constructs. The results indicate that the value of the squared correlation among core self-evaluations and innovative self-efficacy (.26) was nearly as high as the AVE values for core self-evaluations (.27) and innovative self-efficacy (.28) (Table 17). In order to further assess whether core self-evaluations and innovative self-efficacy actually are distinct, a confirmatory factor analysis was conducted following the procedure recommended by various scholars (e.g., Anderson and Gerbing 1988; Chen, Gully, and Eden 2001). Specifically, the fits of two different models were compared: (1) a two-factor model in which innovative self-efficacy and core self-evaluations were independent of one another; and (2) a one-factor model in which the two variables were set to correlate at 1. Table 18 shows that the results of the confirmatory factor analysis indicate that the two-factor model provides a better fit with the data. The chi-square difference ($\Delta \chi^2$) test (Loehlin 1992) provides further support for the superiority of the two-factor model. The value for the difference in $\chi^2$ of 6 is significant since it exceeds the recommended level of 3.84 for one degree of freedom and $p < 0.05$. This indicates that the two-factor model fits the data significantly better than the one-factor model. Therefore, the results provide support for innovative self-efficacy being distinct from core self-evaluations.
Table 17: Descriptives of Research Model II

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean*</td>
<td>1.44</td>
<td>42.25</td>
<td>1.91</td>
<td>5.46</td>
<td>3.63</td>
<td>3.42</td>
<td>3.66</td>
<td>3.93</td>
</tr>
<tr>
<td>SD</td>
<td>.49</td>
<td>-216**</td>
<td>-1.03*</td>
<td>.047</td>
<td>-.152**</td>
<td>-.079</td>
<td>-0.05</td>
<td>.49</td>
</tr>
<tr>
<td>AVE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notes:</td>
<td>* all values refer to a 5-point scale format except for core self-evaluations, which refers to a 7-point scale-format; the lower-left triangle elements are correlations among the latent variables (* = p &lt; .05 ** = p &lt; .01); the upper-right triangle elements are squared correlations. Education was dummy coded.</td>
<td></td>
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</tr>
</tbody>
</table>
## Table 18: Goodness of Fit Summary for Core Self-Evaluations and Innovative Self-Efficacy

<table>
<thead>
<tr>
<th>Goodness of Fit Index</th>
<th>$\chi^2$</th>
<th>DF</th>
<th>$\chi^2$/DF</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two-factor model$^1$</td>
<td>184</td>
<td>70</td>
<td>2.6</td>
<td>.92</td>
<td>.9</td>
<td>.06</td>
</tr>
<tr>
<td>One-factor model$^2$</td>
<td>200</td>
<td>71</td>
<td>2.7</td>
<td>.91</td>
<td>.89</td>
<td>.06</td>
</tr>
</tbody>
</table>

Notes: $^1$the two factors innovative self-efficacy and core self-evaluations are free to correlate; $^2$the two factors correlate at 1.

In order to further assess the discriminant validity of the overall measurement model, the study followed various scholars (e.g., Anderson and Gerbing 1988; Chen, Gully, and Eden 2001) and compared the measurement model with different constrained models. The fits of four models were checked against each other by means of a confirmatory factor analysis. First, in the measurement model, items were loaded according to their scales on the second-order constructs organizational support for innovation, transformational leadership and innovative self-efficacy and on the first-order constructs core self-evaluations and co-worker exchange. All five variables were independent of one another. Second, in a two-factor model, the correlations between the antecedent variables (core self-evaluations, organizational support for innovation, transformational leadership, and co-worker exchange) were constrained to be 1. Third, in yet another two-factor model, the correlations between the two self-assessment measures innovative self-efficacy and core self-evaluations and between the remaining variables organizational support for innovation, transformational leadership, and co-worker exchange were constrained to be 1. Fourth, in a single-factor model, all variables were set to correlate at 1. The results indicate that the measurement model is superior to the alternative models (Table 19).
Table 19: Goodness of Fit Summary for Alternative Measurement Models of Research Model II

Notes: 1 the five factors are free to correlate; 2 all antecedents correlate at 1; 3 innovative self-efficacy and core self-evaluations correlate at 1, organizational support for innovation, transformational leadership, and co-worker exchange correlate at 1; 4 all factors correlate at 1.

4.2.2 Results

Structural equation modeling using AMOS 18.0 (Arbuckle 2009) was applied to test the proposed relationships between core self-evaluations, transformational leadership, organizational support for innovation, co-worker exchange, and innovative self-efficacy. Figure 12 depicts the corresponding covariance structure model that translates hypotheses H6–H9 into a testable statistical structure. As outlined in the measurement section, innovative self-efficacy was modeled as a second-order construct with two indicators (one for creativity-related self-efficacy and one for implementation-related self-efficacy). Likewise, transformational leadership was modeled as a second-order construct with five indicators (idealized influence (attributed), idealized influence (behavior), inspirational motivation, intellectual stimulation, and individual consideration) following various scholars (e.g., Bono and Judge 2003; Morhart, Herzog, and Tomczak 2009) and organizational support for innovation was modeled as a second-order construct with two indicators (support for creativity and tolerance of differences) following Yuan and Woodman (2010). The goodness of fit measures indicate an acceptable fit for the model ($\chi^2 = 1092; DF = 506; \chi^2/DF = 2.15; CFI = .89; TLI = .88; and RMSEA = .05$).
Figure 13 presents the structural equation model and the pathway estimates. In line with the proposed hypotheses, Figure 13 shows that the hypothesized paths for the relationships between core self-evaluations, co-worker exchange and innovative self-efficacy were significant at $p < .001$ level and in the predicted directions. The
relationship between organizational support for innovation and innovative self-efficacy was significant at $p < .05$ level and in the predicted direction. The relationship between transformational leadership and innovative self-efficacy was significant at $p < .05$ level, yet not in the predicted direction.

Consistent with hypothesis 6, core self-evaluations were positively related to innovative self-efficacy ($\beta_6 = .68, p < .001$). In line with hypothesis 7, organizational support for innovation was positively associated with innovative self-efficacy ($\beta_7 = .16, p < .05$). Contrary to hypothesis 8, transformational leadership had a significant yet negative effect on innovative self-efficacy ($\beta_8 = -.18, p < .05$). Co-worker exchange had a significant positive effect on innovative self-efficacy ($\beta_9 = .39, p < .001$). Thus, support was found for hypothesis 9. To summarize, the results support
three of the four hypotheses after controlling for gender, age, and education (Table 20).

<table>
<thead>
<tr>
<th>No.</th>
<th>Hypothesis</th>
<th>Standardized Coefficient</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H6</td>
<td>Core self-evaluations positively affect innovative self-efficacy.</td>
<td>.678***</td>
<td>supported</td>
</tr>
<tr>
<td>H7</td>
<td>Organizational support for innovation positively influences innovative self-efficacy.</td>
<td>.158*</td>
<td>supported</td>
</tr>
<tr>
<td>H8</td>
<td>Transformational leadership positively affects innovative self-efficacy.</td>
<td>-.181*</td>
<td>not supported</td>
</tr>
<tr>
<td>H9</td>
<td>Co-worker exchange positively influences innovative self-efficacy.</td>
<td>.392***</td>
<td>supported</td>
</tr>
</tbody>
</table>

*Table 20: Results of Hypotheses Testing for Research Model II*

*Notes: * = p < .05; *** = p < .001*

**Assessment of Common Method Variance**

Since the data was collected cross-sectionally from one source (i.e., the employees), the impact of common method variance was checked. Two distinct methods were deployed: Harman’s single factor test and controlling for the effects of an unmeasured latent methods factor (Korsgaard and Roberson 1995; Mossholder et al. 1998; Podsakoff et al. 2003). First, the fit of a model in which all items were loaded on one factor (a single-factor model) was compared with a model in which the items were loaded on the latent variables according to their scales (a five-factor model). If method variance was responsible for the covariation among the measures, the single-factor model should provide good fit with the data (Mossholder et al. 1998; Podsakoff et al. 2003). The results of the CFA show that the single-factor model did not fit the data well, whereas the five-factor model did (see Table 19 in section 4.2.1.4).

Second, the structural equation model was re-estimated with an added same source factor represented by the indicators of all constructs included (cf. Podsakoff et al. 1990; Podsakoff et al. 2003). Examination of the corrected parameter estimates showed that there is some effect of common method variance. In fact, the hypothesized relationship between transformational leadership and innovative self-efficacy was reduced to the point of non-significance. However, none of the other hypothesized relationships were reduced to the point of non-significance. Their standardized
estimates changed only marginally, with differences between .01 and .05 (Figure 13). Considered together, the findings suggest that a methodological artifact did not drive most of the relationships observed in the present study. Thus, the conceptual model without the same source factor is retained. Figure 13 displays the results of the hypotheses tests related to H6-H9. The estimates of the relationships after correcting for common method variance are shown in italics and parentheses.

4.3 Discussion

Social cognitive theory suggests that enactive attainment, vicarious experiences, verbal persuasion, and physiological and psychological state contribute a variety of personal and contextual factors that can influence work-related self-efficacy (Bandura 1986; Gist and Mitchell 1992). The present work is the first study that examines employees’ personal characteristics and contextual factors as sources for the formation of innovative self-efficacy beliefs. Thereby, the present work broadens the scope of self-efficacy application. The following sections present the implications of the work for theory and practicing managers.

4.3.1 Theoretical Implications

The present work has tested a network of sources for the formation of innovative self-efficacy beliefs, drawn directly from social cognitive theory (Bandura 1986) and an existing model of self-efficacy development (Gist and Mitchell 1992). It suggests a subset of determinants of innovative self-efficacy. The findings of the work broaden the scope of self-efficacy application in the following ways.

Overall, the findings support theories suggesting that state-like individual differences (e.g., specific self-efficacy) tend to be malleable (Chen et al. 2000; Kanfer 1992). They lend support for Gist and Mitchell’s (1992) suggestion that personal and contextual factors influence the formation of work-related self-efficacy beliefs. More precisely, the results suggest that core self-evaluations, organizational support for innovation, transformational leadership, and co-worker exchange influence innovative work behavior. Although the salient personal characteristic core self-evaluations was the strongest predictor of innovative self-efficacy, in the present study, contextual factors in terms of organizational support for innovation, transformational leadership, and co-worker exchange contributed to the formation of innovative self-efficacy judgments.

The present study found that employees judge themselves efficacious in innovating when they have positive core self-evaluations. Employees’ core self-evaluations
were the strongest predictor of innovative self-efficacy. This means that employees who are generally more confident in their ability to respond successfully to challenging situations also believe that they have the capabilities needed to master the challenges implied by innovating in the workplace. This finding contributes to core self-evaluations theory by broadening the scope of core self-evaluations application. Further, the finding supports some scholars’ proposals that trait-like constructs affect state-like constructs (Chen et al. 2000; Kanfer 1992). More precisely, the results provide further support for general self-efficacy spilling over into specific situations (i.e., innovation) (Chen et al. 2000). This implies that a general sense of efficacy is essential for innovative self-efficacy.

The results of the present work show that organizational support for innovation is a salient organizational factor that provides important contextual information for innovative self-efficacy judgments. In a work environment where innovation is encouraged and valued throughout the whole organization, employees’ innovative self-efficacy beliefs are enhanced through observing people that successfully engage in innovative work behavior.

Co-worker exchange is a salient collegial factor that elevates innovative self-efficacy. The findings suggest that employees in high-quality relationships judge themselves efficacious in innovating. Nurturing and supportive co-workers seem to help employees to feel more capable of innovative work behavior and to maintain a sense of innovative self-efficacy when struggling with difficulties. This finding is consistent with research in related areas that has found that a supportive environment is positively linked to entrepreneurial self-efficacy (Chen, Greene, and Crick 1998) and team-conflict self-efficacy (Stone and Bailey 2007). The findings suggest that co-worker exchange was the second strongest predictor of innovative self-efficacy. One possible explanation is that proximal co-workers have more powerful implications for employee beliefs, feelings and behavior (Hackman 1976; Ilgen 1999) than leaders or more distal co-workers because the former interact with the employee more often and develop closer relationships. Another explanation is that co-workers in high-quality relationships are perceived as being more similar to oneself (Ford and Seers 2006). Employees may be more likely to choose these co-workers as social models over other more distal organizational members.

Contrary to the work’s expectations and prior work on the relationship between transformational leadership and self-efficacy, transformational leadership was significantly, yet negatively, related to innovative self-efficacy. One reason for this may be that close followers are more likely to perceive some inconsistent behaviors of their supervisors (Avolio et al. 2004). For example, when supervisors also apply
transactional leadership behaviors, they monitor and reprimand followers, and they use negative contingent reinforcement or corrective transaction (Morhart 2008). As such, they may give employees negative, deconstructive feedback on failed attempts to engage in innovation. Thereby, they may destroy their employees’ innovative self-efficacy (Baron 1988). As Bandura (1986) points out, it is easier to undermine self-efficacy than to increase it by verbal persuasion; the negative reactions may outweigh the effects of positive feedback on innovative work behavior, thus leading to a negative overall effect. Another possible reason for this finding is that employees turn a deaf ear to their persuaders when their personal experience counters what they have been told (Bandura 1986). Transformational leaders articulate high performance expectations and express confidence in their followers’ abilities to meet the expectations at the same time (Eden 1992; Shamir, House, and Arthur 1993). However, when employees do not experience what they have been told (i.e., that they are capable of innovating), they develop skepticism that results in a decrease of their self-efficacy beliefs (Bandura 1986). An empirical effect can be another probable explanation for this finding. Transformational leadership theory suggests that transformational leaders have a developmental effect on followers (Dvir, Avolio, and Shamir 2002). In particular, increasing their followers’ self-efficacy is an especially crucial part of developing followers (Avolio and Gibbons 1988). However, the transformational leadership scale of the Multifactor Leadership Questionnaire Form 5X (Bass and Avolio 1995) lacks items that refer to this specific leadership behavior (Yukl 1999). More precisely, items referring to the leaders’ expression of confidence in their followers’ ability to meet the high expectations are missing. That is why the exercise of persuasive influence may be missing in the data of the present study. However, items referring to the communication of high performance expectations are included in the transformational leadership scale. In this way, the measurement of transformational leadership tends to capture the pressure that transformational leaders put on their followers while it lacks to capture the expression of the leader’s faith in their subordinates’ abilities. High performance pressure is associated with employee stress and with psychological and physiological arousal (Offermann and Hellmann 1996; Parasuraman and Alutto 1984). Consequently, the negative effect of transformational leadership on innovative self-efficacy may be an empirical effect.

4.3.2 Managerial Implications

The findings of the present study imply that core self-evaluations, organizational support for innovation, and co-worker exchange positively influence an employee’s innovative self-efficacy judgment. The message for managers here is that they
should influence these factors in order to boost their employees’ innovative self-efficacy.

Managers should pay attention to employees’ core self-evaluations. The findings suggest that an employee’s fundamental assessments about their worth, competence, and capabilities are the strongest determinants of innovative self-efficacy. However, core self-evaluations refer to a relatively enduring personal characteristic that is assumed to be stable over time (Chen et al. 2000). This implies that managers may not be able to shape their employees’ core self-evaluations. However, managers can consider a person’s core self-evaluations while recruiting future employees. Many companies already include personality inventories in the selection of employees (Kluemper and Rosen 2009). Similarly, organizations can include instruments to measure a person’s core self-evaluations in personality inventories. Considering a person’s core self-evaluations may help managers to select personnel that are dispositionally prone to innovative self-efficacy. Obviously, this measure may only pay off in the end. Meanwhile, but not limited to the short term, managers may focus more on other factors that influence innovative self-efficacy.

For example, managers can attempt to encourage employees to establish high-quality relationships with co-workers. Managers can encourage employees to be trained in communication and interpersonal skills that may help them to build high-quality relationships. Managers can also encourage activities that result in positive emotions, which in turn lead to the bonding of individuals (Harter, Schmidt, and Keyes 2003). For example, they can arrange teambuilding seminars and social team gatherings, such as indoor and outdoor sports activities, after work socials, and parties. In addition, prior research has found that leader-member exchange supports bonding among employees (Tse, Dasborough, and Ashkanasy 2008). Employees who have experienced affective bonding in the exchange process with their leader tend to be more motivated to extend or transform the relationship with their co-workers into friendship. In addition, high-quality leader-member exchange was found to be positively related to shared identity and values among the employees, which leads to strong emotional attachment (Ellemers, De Gilder, and Haslam 2004). This also helps employees to build high-quality relationships with their co-workers. In this regard, previous work on the trainability of leader-member exchange has shown that supervisors can be trained to have better quality relationships with their subordinates (Graen, Liden, and Hoel 1982; Scandura and Graen 1984). Further, managers can contribute to the development of high-quality relationships among their employees by creating an environment that encourages social bonding. For example, an autonomous work setting, where co-workers take responsibility for directing and coordinating their work activities, fosters the development of high-
quality relationships (Seers 1989; Seers, Petty, and Cashman 1995). Similarly, a building (or workplace) architecture that promotes communication may encourage the development of high-quality relationships.

Managers can also contribute to elevating employees’ perceptions of organizational support for innovation. For example, they should reward innovative work behavior, risk taking, experimenting and generating ideas. They can implement an internal innovation platform that stimulates employees to communicate their ideas and to develop the suggested ideas. Further, they can arrange regular innovation jam events where employees exchange ideas in an (online) brainstorming session. They can also implement idea contests throughout the whole organization. In addition, managers should be aware that encouraging a culture that tolerates mistakes signals to employees that creativity and innovation is supported (Martins and Terblanche 2003). Managers should also allow employees to spend time thinking creatively and experimenting (Shattow 1996). In contrast, when managers control employees they inhibit risk taking and accordingly creativity and innovation (Judge, Fryxell, and Doolley 1997).

4.3.3 Limitations and Future Research

The contributions of research model II should be interpreted in light of its limitations. The empirical study faces the usual limitations inherent in survey designs. All the data was obtained from the same source (i.e., the employees) and collected cross-sectionally. To address these issues, the work followed recommendations to improve data validity (e.g., confidentiality, incentives, clear explanation of usefulness and tests for common method variance). Inspection of common method variance revealed that a methodological artifact might, to some extent, drive the relationship between transformational leadership and innovative self-efficacy observed in the study. Since the observed direction of the relationship between transformational leadership and innovative self-efficacy is in contrast to prior research and theoretical reasoning to a certain degree, future research should test the relationship again. In this regard, future studies should ensure that they include items that refer to the leaders’ expression of confidence in their followers’ ability to meet the high expectations. Furthermore, the present piece of research established the proposed relationships between core self-evaluations, organizational support for innovation, transformational leadership, co-worker exchange, and innovative self-efficacy at a single moment in time. More appropriate conclusions about causality, for example the innovative self-efficacy of a given employee shifting from low to high or vice versa, require a longitudinal study approach that should be undertaken in future re-
search. The survey also only addressed members of a single firm and in a single country. The results might have limited potential for generalization for other industries and for other cultures. Consequently, future research should explore the effects of these factors in the settings of other industries and cultures.

Beyond these limitations, additional fruitful research directions and important research implications have emerged from the investigation.

The goal of the present work was not to develop and test a comprehensive model of all potential antecedents of innovative self-efficacy. Rather, the purpose was to test a network of sources for the formation of innovative self-efficacy beliefs, drawn directly from social cognitive theory (Bandura 1986) and an existing model of self-efficacy development (Gist and Mitchell 1992). The work examined core self-evaluations, organizational support for innovation, transformational leadership, and co-worker exchange because they represent salient personality, organizational, managerial, and collegial factors, thereby ensuring that personal and contextual variables (as suggested by Gist and Mitchell (1992)) were addressed. Given the importance of these factors for the formation of innovative self-efficacy beliefs, other personal or contextual factors may also be important sources of innovative self-efficacy. For example, in view of the fact that co-worker exchange was the second strongest predictor of the studied subset of antecedents, leader-member exchange (e.g., Dansereau, Graen, and Haga 1975; Graen 1976) may be another managerial factor that elevates innovative self-efficacy. Another personal characteristic that could be important for innovative self-efficacy is an employee’s learning orientation, since it has already been found to be linked to creative self-efficacy (Gong, Huang, and Farh 2009). Future research should explore the impact of these factors on innovative self-efficacy.

4.4 Summary of Research Model II

To date, the question of what the sources of innovative self-efficacy formation are still remains unanswered. That is, assuming that innovative self-efficacy plays a significant role in innovative work behavior, what can organizations do to form efficacy beliefs? The present work aimed to investigate a network of sources for the formation of innovative self-efficacy beliefs, drawn directly from social cognitive theory (Bandura 1986) and an existing model of self-efficacy development (Gist and Mitchell 1992). The present work suggested a subset of determinants of innovative self-efficacy, including salient personality, organizational, managerial, and col-
legal factors. These refer to core self-evaluations, organizational support for innovation, transformational leadership, and co-worker exchange.

Research model II confirmed that core self-evaluations, organizational support for innovation, and co-worker exchange elevate innovative self-efficacy. Contrary to the assumed relationship, transformational leadership had a significant, yet negative, effect on innovative self-efficacy.
5 Conclusions

Employees’ innovative work behavior is being increasingly recognized as an important underpinning of organizational success (Janssen 2000; Scott and Bruce 1994; Sharma and Chrisman 1999; Van de Ven 1986; de Jong and den Hartog 2007). Therefore, both theory and practice are increasingly interested in identifying factors that promote innovative work behavior. A variety of organizational and individual factors have been studied as important determinants of innovative work behavior (e.g., Janssen, van de Vliert, and West 2004; Mumford and Licuanan 2004; Mumford et al. 2002).

Surprisingly, based on the common sense that innovative work behavior is beneficial, researchers have shown much less interest in the consequences of innovative work behavior (Janssen, van de Vliert, and West 2004). However, only if innovative work behavior actually leads to the anticipated benefits, organizations profit from encouraging it. This means that it is important to identify antecedents and consequences of innovative work behavior (Janssen, van de Vliert, and West 2004). Scholars have therefore called for more holistic research models that treat innovative work behavior as the dependent and independent variable (Janssen, van de Vliert, and West 2004). The present dissertation aimed to fill this gap. Instead of merely focusing on antecedents of innovative work behavior, the work also empirically examined the effect of innovative work behavior on task performance.

In addition, the dissertation investigated two kinds of expectations as antecedents of innovative work behavior. Social cognitive theory suggests that people hold two kinds of expectations in regard to behavior (Bandura 1977; 1986). Expectations in terms of efficacy and outcome expectations are important determinants of innovative work behavior (Bandura 1997; Farr and Ford 1990; Yuan and Woodman 2010). The present study is the first attempt to introduce an innovation-specific self-efficacy construct and to examine its effects on innovative work behavior. Further, the dissertation investigated the roles of both kinds of expectations concerning innovative work behavior in one study.

Assuming that innovative self-efficacy plays a significant role in innovative work behavior, what can organizations do to form efficacy beliefs? The present dissertation investigated a network of sources for the formation of innovative self-efficacy beliefs, drawn directly from social cognitive theory (Bandura 1986) and an existing model of self-efficacy development (Gist and Mitchell 1992). The dissertation suggested a subset of determinants of innovative self-efficacy, including salient personality, organizational, managerial, and collegial factors. These refer to core self-
evaluations, organizational support for innovation, transformational leadership, and co-worker exchange. The present work is the first study that examines employees’ personal characteristics and contextual factors as sources for the formation of innovative self-efficacy beliefs.

The following sections summarize the contributions of the dissertation with implications for theory and practicing managers.

5.1 Theoretical Implications

The findings of the present dissertation make the following contributions to social cognitive theory (e.g., Bandura 1977; 1986; 1997) and innovation literature (e.g., Axtell et al. 2000; Janssen 2000; Nederveen Pieterse et al. 2010; Scott and Bruce 1994; Yuan and Woodman 2010):

- Research that empirically supports the assumed positive link between innovative work behavior and ultimate task performance did not exist. The findings of the present work suggest that the innovative work behavior of employees positively relates to their task performance. The present work is the first attempt to test the fundamental assumption that innovative work behavior benefits performance (Janssen, van de Vliert, and West 2004).

- By linking innovative work behavior to employee task performance, the present dissertation supports prior work on individual performance that suggests that extra-role behavior contributes to task performance (e.g., Choi 2007; Podsakoff et al. 2000; van Dyne and LePine 1998).

- The findings indicate that the concept of self-efficacy may be important in research on innovative work behavior. The present dissertation introduced an innovative self-efficacy concept and provided evidence for the validity of innovative self-efficacy as a distinct construct. Providing direct support for social cognitive theory (e.g., Bandura 1977; 1986; 1997), the work found that innovative self-efficacy might be a key personal characteristic for innovative work behavior. Thereby, the present work broadens the scope of self-efficacy application in organizational settings (e.g., Gist and Mitchell 1992; Tierney and Farmer 2002).

- The present dissertation is the first attempt to examine an innovation-specific self-efficacy construct in direct relation to employees’ innovative work behavior in an ongoing corporate setting.
• Social cognitive theory suggests that people hold two kinds of behavioral expectations: self-efficacy and outcome expectations. Building on the seminal work on outcome expectations in the context of innovation of Yuan and Woodman (2010), the present work extended their work by bringing together the two expectations and examining their roles in the context of innovation in one study. It shows that innovative self-efficacy may be a key determinant of outcome expectations. Contrary to the assumed relationship between outcome expectations and innovative work behavior and to prior research, the effect of outcome expectations on innovative work behavior was found to be not significant. Consequently, outcome expectations did not mediate the relationship between innovative self-efficacy and innovative work behavior. Put differently, outcome expectations may not independently contribute to the prediction of innovative work behavior over and above self-efficacy beliefs.

• The present work supports Gist and Mitchell’s (1992) suggestion that personal and contextual factors influence the formation of work-related self-efficacy beliefs. It shows that personal and contextual factors influence the formation of innovative self-efficacy beliefs. More precisely, the results show that core self-evaluations, organizational support for innovation, transformational leadership, and co-worker exchange influence innovative self-efficacy.

• The present dissertation shows that employees judge themselves efficacious in innovating when they have positive core self-evaluations. This finding contributes to core self-evaluations theory (e.g., Judge, Locke, and Durham 1997; Judge et al. 2003) by broadening the scope of core self-evaluations application.

• The results show that organizational support for innovation is a salient organizational factor that provides important contextual information for innovative self-efficacy judgments. This finding contributes to the literature on organizational support for innovation (e.g., Amabile et al. 1996; Cummings 1965; Scott and Bruce 1994) by shedding some additional light on how organizational support for innovation influences innovation.

• The dissertation shows that co-worker exchange is a salient collegial factor that elevates innovative self-efficacy. The findings suggest that co-worker exchange is the second strongest predictor of innovative self-efficacy. The findings contribute to the literature on co-worker exchange (e.g., Liden, Wayne, and Sparrowe 2000; Seers, Petty, and Cashman 1995) by broadening the scope of co-worker exchange application.
Contrary to the assumed relationship between transformational leadership and self-efficacy and to prior work, transformational leadership was found to be significantly, yet negatively, related to innovative self-efficacy. Thereby, the dissertation contributes to the literature on the potential effects of transformational leaders on their followers (e.g., Dvir, Avolio, and Shamir 2002; Pillai and Williams 2004; Walumbwa, Avolio, and Zhu 2008).

### 5.2 Managerial Implications

The results of the present dissertation lead to the following recommendations for managers:

- **Innovative work behavior leads to task performance improvement.** Managers should encourage their employees to think in alternative ways, search for improvements, figure out new ways to accomplish tasks, look for new technologies, apply new work methods, and investigate and secure resources to make new ideas happen. In order to do so, managers should elevate employees’ innovative self-efficacy.

- **In order to boost employees’ innovative self-efficacy,** managers should influence core self-evaluations, organizational support for innovation, and co-worker exchange.

- **When recruiting future employees,** managers should consider a person’s core self-evaluations in order to select personnel that are dispositionally prone to innovative self-efficacy. Including instruments to measure a person’s core self-evaluations in personality inventories can help managers in this regard.

- **Managers should attempt to encourage employees to establish high-quality relationships** with co-workers by getting them trained in communication and interpersonal skills and by organizing activities that result in positive emotions and teambuilding. Managers should also create an environment that encourages social bonding through communication-promoting building architecture.

- **Managers should elevate employees’ perceptions of organizational support** for innovation by rewarding innovative work behavior, risk taking, experimenting and generating ideas, and by tolerating mistakes. By doing so, they provide employees with the possibility to observe various role models. The information they gain by observing others successfully engaging in innova-
Innovative work behavior helps employees to form their own innovative self-efficacy beliefs.

5.3 Limitations and Avenues for Further Research

The contributions of the dissertation should be interpreted in light of its limitations. The empirical studies face the usual limitations inherent in survey designs. As mentioned before, the supervisors provided their ratings for both variables, employees’ innovative work behavior and their task performance. Thus, common method variance was very likely. In order to assess the impact of common method variance, the supervisors were asked to rate their employees’ task performance again six months after the first data collection. The hypothesized relationship between innovative work behavior and task performance was again tested using this data to check whether it was robust.

Further, all data obtained from the employees was collected cross-sectionally. To address this issue, the work followed recommendations to improve data validity (e.g., confidentiality, incentives, clear explanation of usefulness and tests for common method variance). Inspection of common method variance revealed that a methodological artifact might, to some extent, drove the relationship between transformational leadership and innovative self-efficacy observed in the study. Since the observed direction of the relationship between transformational leadership and innovative self-efficacy contrasts prior research and theoretical reasoning to a certain degree, future research should test the relationship again.

Moreover, the data collected from both the employees and their supervisors may involve self-serving bias. For example, supervisors may have thought that their employees’ results would reflect their own leadership performance. To validate the two measures of innovative work behavior and task performance, objective data from the participating firm would have been desirable. Furthermore, the piece of research established the proposed relationships between the focal variables at a single moment in time. More appropriate conclusions about causality, for example the innovative self-efficacy of a given employee shifting from low to high or vice versa, would require a longitudinal study approach that should be undertaken in future research. The survey also only addressed members of a single firm and in a single country. The results might have limited potential for generalization for other industries and for other cultures. Consequently, future research should explore the effects of these factors in settings of other industries and cultures.
Beyond these limitations, additional fruitful research directions and important research implications have emerged from the investigation.

First, the work analyzed the effects of a network of sources for the formation of innovative self-efficacy beliefs, drawn directly from social cognitive theory (Bandura 1986) and an existing model of self-efficacy development (Gist and Mitchell 1992). The work examined core self-evaluations, organizational support for innovation, transformational leadership, and co-worker exchange because they represent salient personality, organizational, managerial, and collegial factors, thereby ensuring that personal and contextual variables (as suggested by Gist and Mitchell (1992)) were addressed. Given the importance of these factors for the formation of innovative self-efficacy beliefs, other personal and contextual factors may also be important sources of innovative self-efficacy. For example, as co-worker exchange was the second strongest predictor of the studied subset of antecedents, leader-member exchange (e.g., Dansereau, Graen, and Haga 1975; Graen 1976) may be another managerial factor that elevates innovative self-efficacy. Another possible personal characteristic that could be important for innovative self-efficacy might be an employee’s learning orientation, since it has already been found to be linked to creative self-efficacy (Gong, Huang, and Farh 2009). Future research should therefore explore the impact of these factors on innovative self-efficacy.

Second, although innovative self-efficacy had a strong impact on innovative work behavior, further research should include moderator variables to test whether the relationship is stable across different situations. For example, trait activation theory suggests that personality traits are latent potentials residing in a person that can be triggered into actions by situational, trait-relevant cues (Ng, Ang, and Chan 2008). This means that individuals show the behavioral expression of a trait only when situational cues signal that it is appropriate to do so (Tett and Guterman 2000). It may be that the conditions needed for innovative self-efficacy to result in innovative work behavior were present in the research setting under study, but not in other settings. Future research should explore whether the relationship between innovative self-efficacy and innovative work behavior is contingent on third variables.

Third, the present work raised the question as to whether outcome expectations really have an effect on innovative work behavior. As the study’s participants reported relatively high levels of outcome expectations, it should be noted that the findings do not mean that outcome expectations are unimportant in the context of innovation. Rather, the relationship between outcome expectations and innovative work behavior may be more complex. Future research should broaden scholarly understanding of when and how outcome expectations relate to innovative work behavior.
6 References


7 Appendix

7.1 Employee Questionnaire

Fragebogen zum Forschungsprojekt "Innovation, Mitarbeiter, Management bei [Unternehmen XXX]"

Sehr geehrte Teilnehmerin, sehr geehrter Teilnehmer


Für Fragen stehe ich Ihnen gerne unter dem untenstehenden Kontakt zur Verfügung. Seitens [Unternehmen XXX] wenden Sie sich bitte an [Ansprechpartner XXX].

Herzlichen Dank für Ihre Unterstützung.

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Tel: 071 224 7216
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**Teil 1**
Dieser Teil des Fragebogens bezieht sich darauf, wie Sie sich selbst wahrnehmen.

<table>
<thead>
<tr>
<th>Aussage</th>
<th>lehne sehr stark ab</th>
<th>stimme sehr stark zu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ich bin zuversichtlich, in meinem Leben das zu erreichen, was mir zusteht.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wenn ich etwas anpacke, bin ich meistens erfolgreich.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manchmal fühle ich mich nutzlos, wenn mir etwas nicht gelingt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich erledige Aufgaben erfolgreich.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manchmal habe ich das Gefühl, dass mir die Arbeit über den Kopf wächst.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Im Großen und Ganzen bin ich mit mir zufrieden.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich zweifle selten an meiner Kompetenz.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich bestimme selbst, was in meinem Leben passiert.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich glaube daran, meine Karriere aktiv beeinflussen zu können.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich bin in der Lage, mit den meisten meiner Probleme fertig zu werden.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Es gibt Zeiten, in denen mir alles düster und hoffnungslos erscheint.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich bin selten pessimistisch.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich glaube, dass ich gut darin bin, neue Ideen zu entwickeln.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich bin mir sicher, dass ich Probleme kreativ lösen kann.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich glaube, dass ich gut darin bin, Ideen anderer Leute weiterzuentwickeln.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich glaube, dass ich andere Leute für neue Ideen begeistern kann.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich bin mir sicher, dass ich andere Leute von den Vorteilen neuer Ideen überzeugen kann.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich bin mir sicher, dass ich neue Arbeitsweisen gut einsetzen kann.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich bin mir sicher, dass ich neue Arbeitsmittel gut einsetzen kann.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich glaube, dass ich neue Arbeitsweisen problemlos annehme.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich glaube, dass ich neue Arbeitsmittel problemlos annehme.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Teil 2
Dieser Teil des Fragebogens bezieht sich darauf, wie Sie Ihr Arbeitsumfeld und den Umgang mit den Kollegen bei [Unternehmen XXX] wahrnehmen.

<table>
<thead>
<tr>
<th>Sollte</th>
<th>lehne stark ab</th>
<th>stimme stark zu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kreativität wird bei uns gefördert.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
</tr>
<tr>
<td>Unsere Führungsetage erkennt unsere Fähigkeit kreativ zu arbeiten an.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
</tr>
<tr>
<td>Bei uns dürfen die Leute versuchen, die gleichen Probleme auf unterschiedliche Art und Weise zu lösen.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
</tr>
<tr>
<td>Wenn jemand anders ist, kann er/sie hier viel Ärger bekommen.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
</tr>
<tr>
<td>[Unternehmen XXX] lässt sich als flexibel und sich kontinuierlich an Veränderungen anpassend beschreiben.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
</tr>
<tr>
<td>Eine Person kann hier nicht zu sehr aus dem Rahmen fallen, ohne Ärger zu provozieren.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
</tr>
<tr>
<td>Am besten kommt man bei [Unternehmen XXX] zurecht, wenn man genau so denkt wie der Rest der Leute.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
</tr>
<tr>
<td>Bei uns wird erwartet, dass jeder die Probleme auf die gleiche Art und Weise angeht.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
</tr>
<tr>
<td>[Unternehmen XXX] ist offen und empfänglich für Veränderungen.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
</tr>
<tr>
<td>Die Verantwortlichen hier kassieren gewöhnlich die Lorbeeren für die Ideen anderer.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
</tr>
<tr>
<td>Bei [Unternehmen XXX] tendieren wir dazu, an bewährten und korrekten Abläufen festzuhalten.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
</tr>
<tr>
<td>[Unternehmen XXX] scheint eher mit dem Status quo beschäftigt zu sein als mit Veränderung.</td>
<td>☐ ☐ ☐ ☐ ☐ ☐</td>
<td></td>
</tr>
<tr>
<td>Statement</td>
<td>lehne stark ab</td>
<td>stimme stark zu</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Ich empfehle meinen Arbeitskollegen oft bessere Arbeitsmethoden.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meine Arbeitskollegen teilen mir mit, wenn ich etwas mache, das ihnen die Arbeit erleichtert (oder erschwert).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich teile meinen Arbeitskollegen mit, wenn sie etwas machen, das mir die Arbeit erleichtert (oder erschwert).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meine Arbeitskollegen erkennen mein Potenzial.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meine Arbeitskollegen verstehen meine Arbeitsaufgaben und -anforderungen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich bin flexibel darin Arbeitsverantwortlichkeiten zu tauschen, um es meinen Arbeitskollegen leichter zu machen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In hektischen oder stressigen Situatioen bitten mich meine Arbeitskollegen oft, ihnen auszuhelfen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In hektischen oder stressigen Situationen biete ich meinen Arbeitskollegen meine Hilfe an.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ich helfe Arbeitskollegen ziemlich bereitwillig, ihnen zugewiesene Arbeit fertigzustellen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meine Arbeitskollegen helfen mir ziemlich bereitwillig, mir zugewiesene Arbeit fertigzustellen.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Teil 3
Dieser Teil des Fragebogens bezieht sich auf Ihre Wahrnehmung des Führungsverhaltens Ihres/r direkten Vorgesetzten.

Teil 4
Dieser Teil des Fragebogens bezieht sich darauf, wie Sie Ihre eigene Arbeitssituation wahrnehmen.

<table>
<thead>
<tr>
<th></th>
<th>lehne stark ab</th>
<th>stimme stark zu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bei der Arbeit innovativ zu sein, machtmich flexibler für wechselnde Aufgaben.</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Bei der Arbeit innovativ zu sein, erhöht meine Chancen auf sinnvollere Arbeit.</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Bei der Arbeit innovativ zu sein, erhöht meine Chancen, in Zukunft bevorzugte Aufgaben erteilt zu bekommen.</td>
<td>☐</td>
<td>☑</td>
</tr>
<tr>
<td>Bei der Arbeit innovativ zu sein, erhöht meine Chancen auf Arbeitsplatzsicherheit.</td>
<td>☐</td>
<td>☑</td>
</tr>
</tbody>
</table>

Zum Abschluss bitten wir Sie noch um ein paar Angaben zu Ihrer Person. Die Informationen benötigen wir zu reinen Klassifikationszwecken.

Bitte geben Sie Ihr Geschlecht an.
☐ weiblich ☐ männlich

Wie alt sind Sie?

Bitte geben Sie Ihren höchsten Bildungsabschluss an.
☐ obligatorischer Schulabschluss ☐ Hochschulreife ☐ Hochschulabschluss

Wieviele Jahre arbeiten Sie schon bei [Unternehmen XXX]? 
Jahre: ☐ Monate:

Wie lange arbeiten Sie schon für Ihren direkten Vorgesetzten?
Jahre: ☐ Monate:

Wie lange arbeiten Sie schon in Ihrer jetzigen Position?
Jahre: ☐ Monate:
7.2 Supervisor Questionnaire

Fragebogen zum Forschungsprojekt "Innovation, Mitarbeiter, Management bei [Unternehmen XXX]"

Sehr geehrte Teilnehmerin, sehr geehrter Teilnehmer


Für Fragen stehe ich Ihnen gerne unter dem untenstehenden Kontakt zur Verfügung. Seitens [Unternehmen XXX] wenden Sie sich bitte an [Ansprechpartner XXX].

Herzlichen Dank für Ihre Unterstützung.

Nadin Dörner
Universität St.Gallen
Tel: 071 224 7216
E-Mail: nadin.doerner@unisg.ch
Dieser Teil des Fragebogens bezieht sich darauf, wie Sie das Verhalten Ihrer Mitarbeitenden wahrnehmen.

Bitte beziehen Sie sich bei Ihren Antworten einzeln auf jede Mitarbeiterin bzw. jeden Mitarbeiter ohne eigene Führungsverantwortung, die oder der direkt an Sie berichtet.

Bitte bewerten Sie alle Ihre Mitarbeitenden. Damit gewährleisten Sie, dass wir Ihre und die Rückmeldungen Ihrer Mitarbeitenden auswerten können. Rückmeldungen, die nicht sowohl von Vorgesetzten und ihren direkt zugeordneten Mitarbeitenden erfolgen, können nicht verwendet werden.


Name der Mitarbeiterin bzw. des Mitarbeiters:

<table>
<thead>
<tr>
<th>Bitte schätzen Sie ein, wie oft diese Person...</th>
<th>nie</th>
<th>regelmässig, fast immer</th>
</tr>
</thead>
<tbody>
<tr>
<td>... sich Fragen widmet, die nicht zu seiner täglichen Arbeit gehören.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>... sich Gedanken darüber macht, wie Sachen verbessert werden können.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>... sich neue Arbeitsmethoden, -techniken oder -geräte ausdenkt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>... originelle Lösungen für Probleme findet.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>... neue Herangehensweisen findet, um Aufgaben auszuführen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>... wichtige Personen im Unternehmen für innovative Ideen begeistert.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>... versucht, Leute zu überzeugen, innovative Ideen zu unterstützen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>... systematisch innovative Ideen in Arbeitspraktiken überführt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>... dazu beiträgt, neue Ideen umzusetzen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>... sich bemüht, neue Sachen zu entwickeln.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Das Gesamtniveau der Leistung dieses/er Mitarbeiters/in ist hervorragend. |      |                        |
| Diese/r Mitarbeiter/in ist äusserst effektiv. |      |                        |
| Diese/r Mitarbeiter/in erfüllt erfolgreich seine Rollen und Verantwortlichkeiten. |      |                        |

lehne stark ab | stimme stark zu
Zum Abschluss bitten wir Sie noch um ein paar Angaben zu Ihrer Person. Die Informationen benötigen wir zu reinen Klassifikationszwecken.

Bitte geben Sie Ihr Geschlecht an.
☐ weiblich  ☐ männlich

Wie alt sind Sie?

Bitte geben Sie Ihren höchsten Bildungsabschluss an.
☐ obligatorischer Schulabschluss  ☐ Hochschulreife  ☐ Hochschulabschluss

Wieviele Jahre arbeiten Sie schon bei [Unternehmen XXX]?
Jahre:                   Monate:

Wie lange arbeiten Sie schon in Ihrer jetzigen Position?
Jahre:                   Monate:
### 7.3 Results of the Second Exploratory Factor Analysis

<table>
<thead>
<tr>
<th>Item</th>
<th>Creativity-related self-efficacy</th>
<th>Implementation-related self-efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>ise1 (I feel that I am good at generating novel ideas.)</td>
<td>.818</td>
<td>.057</td>
</tr>
<tr>
<td>ise2 (I have confidence in my ability to solve problems creatively.)</td>
<td>.726</td>
<td>.143</td>
</tr>
<tr>
<td>ise3 (I have a knack for further developing the ideas of others.)</td>
<td>.669</td>
<td>.204</td>
</tr>
<tr>
<td>ise4 (I have a knack for making others enthusiastic for new ideas.)</td>
<td>.828</td>
<td>.106</td>
</tr>
<tr>
<td>ise5 (I have confidence in my ability to convince others of the benefit of new ideas.)</td>
<td>.810</td>
<td>.131</td>
</tr>
<tr>
<td>ise6 (I have the social contacts needed to find backers for realizing new ideas.) - deleted</td>
<td>.361</td>
<td>.251</td>
</tr>
<tr>
<td>ise7 (I have confidence in my ability to implement new methods at work.)</td>
<td>.154</td>
<td>.829</td>
</tr>
<tr>
<td>ise8 (I have confidence in my ability to implement new products at work.)</td>
<td>.153</td>
<td>.846</td>
</tr>
<tr>
<td>ise9 (I feel that I am good at adopting new methods at work.)</td>
<td>.126</td>
<td>.833</td>
</tr>
<tr>
<td>ise10 (I feel that I am good at adopting new products at work.)</td>
<td>.178</td>
<td>.844</td>
</tr>
</tbody>
</table>

*Table 21: Results of the Exploratory Factor Analysis for Innovative Self-Efficacy with Data from the Second Part*
7.4 Factor Analysis

Factor analysis is one of the most widely used multivariate statistical procedures in applied research across a multitude of domains. Factor analysis aims to determine the number and nature of factors (latent variables) that account for the variation and covariation among a set of observed measures, commonly referred to as indicators (Brown 2006). This means that a factor is an unobservable variable that causes the observed measures to correlate because they share a common cause. The observed measures are indicators of a common underlying factor.

Based on the concept of the common factor model, two types of analyses emerged: exploratory factor analysis (EFA) and confirmatory factor analysis (CFA: Jöreskog 1969). The main goal of EFA is to determine the dimensionality of a set of multiple observed measures by uncovering the smallest number of interpretable factors needed to explain the correlations among them (Brown 2006). This implies that EFA is a data-driven approach. In EFA, the researcher makes no specifications regarding the number of underlying constructs (factors) or to the pattern of relationships between the common factors and the indicators (i.e., the factor loadings). There is no prior theory and the researcher uses factor loadings to explore the appropriate number and nature of common factors influencing a set of measures. In addition, the researcher can uncover which measured variables are reasonable indicators of the various latent factors by assessing the strength of the relationship between each factor and each observed measure.

While researchers typically use EFA in the early stages of scale development and construct validation, they rely on CFA in later stages after the underlying structure has been established on prior empirical (e.g., EFA) and theoretical grounds (Brown 2006). CFA is used to evaluate whether a predefined factor model fits the observed data. This means that in CFA, the researcher specifies the number of factors and the pattern of indicator-factor loadings in advance based on a strong empirical or conceptual foundation (Brown 2006). The acceptability of the CFA model is evaluated by descriptive fit statistics (goodness of fit indices) that indicate whether the proposed model fits the relationships among the observed indicators (Brown 2006).
7.5 Structural Equation Modeling

Structural equation modeling (SEM) is a statistical methodology that takes a confirmatory (i.e., hypothesis testing) approach to the analysis of a structural theory bearing on some phenomenon (Byrne 2010). It can be described as a combination of factor analysis and regression or path analysis. SEM is often illustrated by using path models in which the factors are viewed as latent variables (Schumacker and Lomax 1996).

SEM typically consists of a measurement model and structural equation model (Schumacker and Lomax 1996): the measurement model specifies how the latent variable is measured and the structural equation model specifies the direct and indirect relationships between the latent variables (Figure 14). Associated with each observed variable is an error term (δ1 - δ3 and ε1 - ε4). One-way arrows represent structural regression coefficients and thus indicate the impact of one variable on another.

In SEM, the regression processes are translated into structural equations. Regression equations represent the influence of one or more variables on another variable, and the influence in SEM is conventionally symbolized by a single-headed arrow pointing from the variable of influence to the variable of interest. Each equation summarizes the impact of all relevant variables in the model (observed and unobserved) on one specific variable (observed or unobserved) (Byrne 2010). Basically, fitting the
model to the data means solving a set of equations. To maximize the fit of the model, SEM software uses complex algorithms. In this regard, maximum likelihood estimation is most widely used.

To assess how well the model fits with the observed data, various goodness of fit indices can be used. The goodness of fit indices used to evaluate the fits of the models in the present dissertation are described in section 3.2.1.3.
Curriculum Vitae

Personal Information
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Educational Background
2011 - 2012  Leeds University (UK)
             Visiting Academic at Leeds Business School
2008 - 2012  University of St. Gallen (Switzerland)
             Doctoral Student at the Institute of Technology Management
2004 - 2008  Dresden University of Technology, Germany
             Graduate in Business Administration (Dipl.-Kffr.)