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Unleashing the Organizational Potential: Extra-Role Creativity, Innovation, and Performance in the Context of Social Influences

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Jana Sophia Michiko Keil, M. Sc. Psychologie

aus Bonn-Bad Godesberg

Gutachterinnen: Prof. Dr. Kathleen Otto & Dr. Tabea Scheel

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Erstgutachterin: Prof. Dr. Kathleen Otto

Zweitgutachterin: Dr. Tabea Scheel

Think left and think right and think low and think high.
Oh, the things you can think up if only you try.
Dr. Seuss

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English Summary

New ideas are important for companies to evolve and overcome problems (Barkema, Baum, & Mannix, 2002). This dissertation focuses on utilizing the companies' potential for these ideas: their employees. It examines in detail extra-role creativity as a subdimension of creativity. Extra-role creativity describes the discretionary generation of new and useful ideas beyond one's job role expectations (Potočnik & Anderson, 2016). This subdimension has, to our knowledge, only been theoretically proposed, but not empirically assessed. The dissertation further evaluates its relation to innovation—the implementation of ideas (Amabile, Conti, Coon, Lazenby, & Herron, 1996)—and performance. In addition, it examines social factors relevant to fostering extra-role creativity, innovation, and performance. It specifically looks at the influences of the direct social environment of an employee exerted through leadership behavior and different team climate dimensions. Taken together, this dissertation addresses three research questions. Each manuscript relates to one or more of the following research questions: 1) How is extra-role creativity perceived by employees? 2) What is the connection between extra-role creativity and innovation as well as between extra-role creativity and performance? 3) Which leadership behaviors or team climate dimensions are relevant for extra-role creativity, innovation, and performance?

Manuscript 1 assesses extra-role creativity in detail, as well as its relation to innovation and the social factors influencing this relation. It comprises two studies. First, a qualitative interview study was conducted with 10 employees from a large German transport and logistics company to get in-depth information. This led to a model that was subsequently validated in the second study with 121 employees from that company. Results highlighted that voice—the expression of constructive suggestions (Liang, Farh, & Farh, 2012)—seems to be an important mediator between extra-role creativity and innovation. In addition, results suggested that first the colleagues are relevant for extra-role ideas to be voiced and then leader support is important for voiced ideas to be implemented. This was demonstrated in the

first study and underlined through the subsequent analysis. The team's support for innovation moderated the relationship between extra-role creativity and voice; leader support moderated the relationship between voice and innovation. When both moderators were included in a dual moderated mediation, especially leader support proved to be important.

Manuscript 2 assesses leadership as a predictor of extra-role creativity. As there were inconsistent findings in previous studies regarding leadership and creativity, it approaches the relation in a new way. It examines in detail ambidextrous leadership with extra-role creativity. Ambidextrous leadership—the interplay of opening and closing leadership behavior—was recently established as a counteraction to the ambiguous relationships between leadership, creativity, and innovation (Rosing, Frese, & Bausch, 2011). Leaders who engage in opening leadership behavior give freedom to experiment and allow errors. When leaders set the focus on goal attainment and routine behavior, they engage in closing leadership behavior (Rosing et al., 2011). In Manuscript 2 we distinguished the effects of ambidextrous leadership on extra-role creativity from the effects of ambidextrous leadership on in-role creativity. In-role creativity refers to the generation of new and useful ideas that are required or expected as part of performing job duties and responsibilities (Potočnik & Anderson, 2016). A multilevel analysis with 205 daily responses from 73 employees from various occupations demonstrated the unique relationships between the two leadership behaviors and in-role and extra-role creativity. Results highlighted that daily opening leadership behavior was positively related to both types of creativity. There was no moderation effect with daily closing leadership behavior on daily in-role creativity, but there was a detrimental effect on daily extra-role creativity. We also found a positive main effect of daily closing leadership behavior on daily in-role creativity. Thus, both creativity dimensions profited from opening leadership behavior; however, when also integrating closing leadership behavior, the results were different. In addition, we detected a positive relation between daily in-role creativity and daily job

performance and a marginal positive one between daily extra-role creativity and daily job performance.

In Manuscript 3 the relationship between transformational leadership and team performance was examined by combining it with insights from innovation research. Team climate for innovation was tested in its subdimensions as a mediator of the relationship between transformational leadership and team performance. To account for the fact that some teams may and others may not have the freedom to use the team climate dimensions to make changes in their work and thereby enhance performance, the team members' autonomy was included as a moderator between the team climate dimensions and team performance. The resulting model was tested through a multisource study with 609 employees from 84 teams and their 84 leaders. Regression analyses revealed that the relationship between transformational leadership and team performance was mediated by two dimensions of team climate for innovation: vision and task orientation. This effect was stronger in teams with low job autonomy. Participative safety was only a mediator of this relationship in teams with low job autonomy. Support for innovation was not a significant mediator independent of job autonomy. The results highlight that integrating findings from innovation research with team performance theories can provide insights into the processes underlying the transformational leadership–team performance relationship.

Taken together, this dissertation examines extra-role creativity more closely. In addition, it gives insights on the relationship between extra-role creativity and innovation. It demonstrates how extra-role creativity and innovation can be managed through leadership and team climate. It further underlines the extent to which performance is related to extra-role creativity and can benefit through a team climate for innovation. All in all, it addresses how organizations can prosper from utilizing their employees' potential for new, useful ideas. Ideas form the starting point for positive changes. As a result, employees and the company as a whole can benefit from them. Thus, results are of theoretical and practical benefit.

Deutsche Zusammenfassung

Neue Ideen sind wichtig für Unternehmen, um sich kontinuierlich weiter zu entwickeln und Probleme zu überwinden (Barkema et al., 2002). Diese Dissertation befasst sich mit der Nutzung des internen Potenzials der Unternehmen für diese Ideen: die Ideen der Mitarbeiterinnen und Mitarbeiter. Sie untersucht im Detail Extra-Rollen Kreativität als Subdimension von Kreativität. Extra-Rollen Kreativität beschreibt die Entwicklung neuer und nützlicher Ideen jenseits der Berufsrolle (Potočnik & Anderson, 2016). Diese Subdimension ist nach unserem Wissen bisher nur theoretisch dargelegt, aber noch nicht empirisch erfasst worden. Die Dissertation untersucht weiterhin die Beziehung von Extra-Rollen Kreativität zu Innovation – der Umsetzung von Ideen (Amabile et al., 1996) – und Leistung. Darüber hinaus erfasst sie soziale Faktoren, die für die Förderung von Extra-Rollen Kreativität, Innovation und Leistung von Bedeutung sind. Sie befasst sich dabei mit den Einflüssen aus dem direkten sozialen Umfeld einer Mitarbeiterin oder eines Mitarbeiters, welche durch Führung und unterschiedliche Teamklima-Dimensionen ausgeübt werden. Durch diese Dissertation werden drei übergeordnete Fragestellungen addressiert: 1) Wie wird Extra-Rollen Kreativität von Mitarbeiterinnen und Mitarbeitern wahrgenommen? 2) Was ist die Beziehung zwischen Extra-Rollen Kreativität und Innovation sowie zwischen Extra-Rollen Kreativität und Leistung? 3) Welches Führungsverhalten oder welche Teamklima Dimensionen sind relevant für Extra-Rollen Kreativität, Innovation und Leistung?

Manuskript 1 erfasst Extra-Rollen Kreativität im Detail, ihre Beziehung zu Innovation und soziale Faktoren, welche diese Beziehung beeinflussen. Es besteht aus zwei Studien: Zuerst wurde eine qualitative Interviewstudie mit 10 Mitarbeiterinnen und Mitarbeitern eines großen deutschen Transport- und Logistikunternehmens durchgeführt, um ausführliche Informationen zu erhalten. Dies führte zu einem Modell, das zum Teil in der zweiten Studie mit 121 Mitarbeiterinnen und Mitarbeitern dieser Firma nachträglich validiert wurde. Die Ergebnisse zeigten, dass Voice, der Ausdruck konstruktiver Anregungen (Liang et al., 2012),

vermittelnd zwischen Extra-Rollen Kreativität und Innovation zu wirken scheint. Darüber hinaus fanden wir heraus, dass zuerst die Kolleginnen und Kollegen für die Äußerung der Extra-Rollen Kreativität relevant sind und dann die Unterstützung von Führungskräften wichtig ist, damit geäußerte Ideen auch anschließend umgesetzt werden. Dies wurde in der ersten Studie demonstriert und unterstrichen durch die anschließende Analyse in der zweiten Studie. Die Unterstützung von Innovationen durch das Team moderierte die Beziehung zwischen Extra-Rollen Kreativität und Voice; Unterstützung durch die Führungskraft moderierte die Beziehung zwischen Voice und Innovation. Als beide Moderatoren in einem dual moderierten Modell aufgenommen wurden, erwies sich vor allem die Unterstützung durch die Führungskraft als wichtig.

Manuskript 2 befasst sich mit der Führungskraft als Prädiktor für Extra-Rollen Kreativität. Da es in früheren Studien zu Führung und Kreativität widersprüchliche Erkenntnisse gab (Rosing et al., 2011), nähert es sich der Beziehung mit einem neuen Ansatz. Ambidextrous Leadership – das Zusammenspiel von öffnendem und schließendem Führungsverhalten – wurde vor Kurzem als neues Führungskonstrukt etabliert. Führungskräfte, die Raum für Fehler zulassen und zum Experimentieren anregen, zeigen öffnendes Führungsverhalten. Wenn die Führungskraft Routinen etabliert oder die Zielerreichung kontrolliert, zeigt sie hingegen schließendes Führungsverhalten (Rosing et al., 2011). Ambidextrous Leadership wurde postuliert als Reaktion auf die uneindeutigen Beziehungen zwischen Führung, Kreativität und Innovation (Rosing et al., 2011).

Der Zusammenhang zwischen Ambidextrous Leadership und Extra-Rollen Kreativität wurde in Manuskript 2 untersucht. Des Weiteren wurde dieser Zusammenhang von dem Zusammenhang von Ambidextrous Leadership und In-Rollen Kreativität unterschieden. In-Rollen Kreativität beschreibt die Entwicklung neuer und nützlicher Ideen, die erforderlich sind oder erwartet werden, um Jobaufgaben zu erfüllen (Potočnik & Anderson, 2016). Eine mehrstufige Analyse mit 205 täglichen Angaben von 73 Mitarbeiterinnen und Mitarbeitern

aus verschiedenen Berufen zeigte verschiedene Beziehungen zwischen den beiden Führungsverhalten und Kreativität.

Die Ergebnisse verdeutlichen, dass sich das tägliche öffnende Führungsverhalten positiv auf beide Arten von Kreativität auswirkte. Es gab keine signifikante Interaktion von täglichem öffnendem Führungsverhalten mit täglichem schließendem Führungsverhalten auf tägliche In-Rollen Kreativität, aber es gab eine nachteilige Auswirkung auf die tägliche Extra-Rollen Kreativität. Darüber hinaus fanden wir einen positiven Haupteffekt des täglichen schließenden Führungsverhaltens auf die tägliche In-Rollen Kreativität. So profitierten beide Kreativitätsdimensionen von öffnendem Führungsverhalten, doch bei der zusätzlichen Betrachtung von schließendem Führungsverhalten waren die Ergebnisse unterschiedlich. In einer zusätzlichen Analyse wurde deutlich, dass tägliche In-Rollen Kreativität signifikant positiv mit täglicher Leistung im Zusammenhang steht. Extra-Rollen Kreativität hatte einen marginal positiven Zusammenhang mit täglicher Leistung.

In Manuskript 3 wurde die etablierte Beziehung zwischen Transformationaler Führung und Teamleistung durch die Kombination mit Befunden aus der Innovationsforschung untersucht. Teamklima für Innovation wurde in seinen Dimensionen als Vermittler der Beziehung zwischen Transformationaler Führung und Teamleistung getestet. Um zu berücksichtigen, inwiefern Teams die Freiheit haben, Veränderungen bezüglich ihrer Arbeit zu machen, wurde zusätzlich die Autonomie der Teammitglieder als Moderator zwischen den Teamklimadimensionen und der Teamleistung aufgenommen. Das resultierende Modell wurde durch eine Multi-Source-Studie mit 609 Mitarbeiterinnen und Mitarbeitern von 84 Teams und ihren 84 Führungskräften getestet.

Regressionsanalysen zeigten, dass die Beziehung zwischen Transformationaler Führung und Teamleistung durch zwei Dimensionen des Teamklimas für Innovation vermittelt wird: Vision und Aufgabenorientierung. Dieser Effekt war in Teams mit geringer Autonomie stärker. Partizipative Sicherheit war nur ein Mediator dieser Beziehung in Teams

mit geringer Autonomie. Die Unterstützung für Innovation war kein signifikanter Mediator, unabhängig von der Autonomie. Die Ergebnisse verdeutlichen, dass die Integration von Erkenntnissen aus der Innovationsforschung Einblicke in die Prozesse geben kann, die der Beziehung zwischen Transformationaler Führung und Teamleistung zugrunde liegen.

Zusammengefasst bekräftigt diese Dissertation die theoretischen Annahmen zu Extra-Rollen Kreativität. Zusätzlich zeigt sie die Beziehung von Extra-Rollen Kreativität zu Innovation und Leistung auf sowie inwiefern alle drei Konstrukte durch Führungsverhalten und Teamklima profitieren. Theoretisch erweitert sie die Erkenntnisse zu Kreativität, Innovation und Leistung. Sie legt dar, inwiefern die Unterstützung neuer Ideen durch Mitarbeiterinnen und Mitarbeiter ein Unternehmen voranbringen kann. So können sowohl die Mitarbeiterinnen und Mitarbeiter als auch das Unternehmen als Ganzes von diesen Befunden profitieren. Entsprechend sind die Ergebnisse von theoretischem und praktischem Nutzen.

Introduction

The intense global competition, fast industry lifecycles, and continual change in technology urge organizations to constantly develop (Barkema et al., 2002). Failure to adapt and evolve leads to organizational demise (Fairbank & Williams, 2001). To survive, organizations need to use their resources effectively (West, Hirst, Richter, & Shipton, 2004). A huge resource to tackle these demands is already inherent in organizations: their employees' *creativity* (Gleich, Möbus, Schmidt, Simon, & Stolarski, 2009; Mayfield & Mayfield, 2008). Creativity, the generation of new and useful ideas, builds the basis for *innovations*, the implementation of ideas to improve processes, products, or services (Amabile et al., 1996).

However, part of this resource has much been neglected and to our knowledge has not been examined empirically: *extra-role creativity*. It describes the ideas that employees develop discretionary beyond formal role expectations which are beneficial for the organization (Potočnik & Anderson, 2016). Be it the loading dock attendant who has an idea to stock trucks more efficiently or an administrative assistant thinking about sending e-cards instead of traditional holiday cards to save money on shipping (Ligon, Graham, Edwards, Osburn, & Hunter, 2012). Although it is not the job of these employees to come up with ideas, companies see potential in these ideas for improved work procedures, efficiency, and cost reductions (Oeij, Dhondt, Žiauberytė-Jakštienė, Corral, & Totterdill, 2017). Thus, this focus on fostering employees' creativity and innovation may also enhance *performance*.

So far knowledge is missing on this resource inherent in employees and also how to *manage* it (Jeberien, Stephan, & Schneider, 2013). If the employees' ideas are neither used nor supported, they pass by unnoticed and organizations miss an opportunity for improvement. As this employee engagement is not required to fulfill job tasks, there are no prefabricated paths on how to deal with it. However, there are already specific *leadership behaviors* and *team climate dimensions* targeted at creativity and innovation. Thus, they could

be a starting point for understanding how to support extra-role creativity, the implementation of extra-role ideas, and performance so that employees show their full potential.

This dissertation aims to address the outlined issues, and, in particular, it provides approaches to three research questions: 1) How is extra-role creativity perceived by employees? 2) What is the connection between extra-role creativity and innovation as well as between extra-role creativity and performance? 3) Which leadership behaviors or team climate dimensions are relevant for extra-role creativity, innovation, and performance? Three manuscripts are presented, each of which relate to one or more of these research questions. Within four studies, different methodological approaches are applied: effects are analyzed within-persons, between-persons and between teams. Additionally, qualitative and quantitative examinations are used.

Through the three manuscripts both research and practitioner calls are addressed. In research, extra-role creativity has to our knowledge not been examined empirically and most research has focused on predictors of creativity (Montag, Maertz, & Baer, 2012), ignoring the processes following creativity, such as how it relates to innovation and performance. Even when it comes to predictors, such as leadership or team climate, there were inconsistent findings with creativity and innovation (e.g., Rosing et al., 2011). In addition, research has mainly concentrated on what is needed for employees in highly creative occupations such as Research and Development (R&D), but not how creative engagement can be fostered throughout the workforce (Bain, Mann, & Pirola-Merlo, 2001; Chen, Farh, Campbell-Bush, Wu, & Wu, 2013; Gupta & Singh, 2014).

In practice, integrating the creativity of employees is seen as a key factor for organizational development and success (Bechmann & Ortner, 2013). However, as much as practitioners want to foster it, knowledge of the processes and management often is missing. The aim here is to uncover the unused employee's creativity potentials and create the conditions to foster it (Gleich et al., 2009).

In the next sections I first will introduce new perspectives on the organizational creative potential and shortcomings of previous approaches towards it. Then I will outline the theoretical background of the dissertation, explaining the core constructs. After that the three research questions are explained and embedded in a conceptual framework. Next, I will introduce the manuscripts and explain how they address each research question. After the manuscripts follows a general discussion on whether and in which way the three research questions were answered. Then future research aims and practical implications are discussed.

New Perspectives on Organizational Creative Potential

Even though not every employee is as creative as the other, everyone has the potential to create valuable ideas for his or her work and for the organization (Fairbank & Williams, 2001). Amabile (1996) highlights that every employee has the potential to be creative.

It is not enough anymore to only focus on employees whose main job is to develop new ideas. Early studies on creativity were about, for example, creativity in the R&D laboratory (Amabile & Gryskiewicz, 1987) or managing for creativity in R&D (Glassman, 1986). Still now, much research focuses on R&D activity when it comes to creativity and innovation research (Chen et al., 2013; Gupta & Singh, 2015; Paulsen, Callan, Ayoko, & Saunders, 2013). Accordingly, previous studies mainly considered internal development strategies, such as R&D activities (Damanpour & Gopalakrishnan, 1998). However, Høyrup (2010, p. 143) states that "societies and firms should not restrict themselves to relying exclusively on experts and special departments (R&D innovation)." Shalley and Gilson (2004) add that for performance and survival as a company, "it is important, if not critical, that employees are creative" (p. 33).

New perspectives arise that aim to integrate the whole employees' potential to participate in change and renewal (Oeij et al., 2015). Research has demonstrated that every employee—including the ones traditionally not considered as being creative—can have good ideas (e.g., Axtell et al., 2000; Frese, Teng, & Wijnen, 1999). When comparing highly and

less successful organizations it was found that in the strategic focus of the most successful organizations is the single employee, as she or he enables with her or his abilities to create new ideas (Gleich et al., 2009). Employees in the organization have the potential to generate ideas that otherwise no one would think of. They have the necessary skills, knowledge, internal information and contact with products, customers, and the market (Høyrup, 2010).

Shortcomings of Previous Approaches

Initiatives such as suggestion systems were founded and focused on embracing all employees' creativity for organizational improvement (van Dijk & van den Ende, 2002). These initiatives, however, are only one possibility of how employees can become creatively involved. As the low participation rate of only 30% indicates (Jeberien et al., 2013), it is not enough to concentrate only on these systems to handle the creative potential within the organization. Employees can generate ideas and implement them without adding them to these systems. Research on suggestion systems is further mainly directed towards the submission of suggestions (Fairbank & Williams, 2001; Frese et al., 1999; van Dijk & van den Ende, 2002) without understanding the underlying creativity. However, focusing on the generation of ideas is paramount because ideas first need to be generated and only then can be implemented (Ohly & Stelzer, 2007).

A recent special issue of European Work and Organizational Psychology in Practice was targeted at this new approach. Oeij et al. (2017) addressed in it what can be done to ensure that employees play an active part. They concluded that "merely implementing employee-friendly HR-measures, like innovation competitions, performance interviews or company suggestion boxes while leaving a top-down structure intact, will therefore, result in disappointment rather than satisfaction, in the long run" (p. 58). This highlights that an active management of a bottom-up approach is needed. Thus, a new approach is called for which assesses the employee herself or himself in her or his direct environment as the root of every creative endeavor (Oeij et al., 2017).

Theoretical Background

The main concepts of the dissertation are presented and the current research is addressed below.

Extra-Role Creativity

Creativity has the goal "to develop and introduce new and improved ways of doing things" (Anderson, Potočnik, & Zhou, 2014, p. 1298). It is defined as the generation of new and useful ideas (Amabile, 1988; Amabile et al., 1996; Oldham & Cummings, 1996). Accordingly, creativity is mostly not observable (James & Drown, 2012) but rather a cognitive process (van Dyne & LePine, 1998). New is considered in the sense that it is new to the specific application. It does not require absolute novelty (West, 2002). When an employee thinks about a new, helpful change in the production system she or he can be considered creative, even if another department has already established this change.

The subjects of the ideas can vary. They can relate to products, processes, technologies, or services (West, 2002). The ideas can further range from radical transformations such as major breakthroughs to incremental ideas, for instance refinements or improvements. In addition, "creativity (…) can occur at the level of the individual, work team, organization, or at more than one of these levels combined but will invariably result in identifiable benefits at one or more of these levels of analysis" (Anderson et al., 2014, p. 1298).

More recent attempts for creativity research have emphasized there are different dimensions of the construct that need consideration. Unsworth has already highlighted in 2001 that some employees have jobs that require them to come up with new and useful ideas whereas other employees might come up with good ideas regardless of their jobs. Montag et al. (2012) picked up on this differentiation. They distinguished between (a) creativity being shown due to situational constraints, such as when there is a job role expecting employees to be creative and (b) creativity in which employees engage without any requirement such that

there is no fear of punishment for nonperformance. Montag et al. (2012) refer to in-role and extra-role behaviors when distinguishing between these two dimensions. A review picked up on this distinction again. It underlined again that creativity can be shown both as in-role and as extra-role behavior (Potočnik & Anderson, 2016). The review further addressed that for conceptual clarity the subdimensions should be assessed (Potočnik & Anderson, 2016).

Extra-role behavior refers to "behavior which benefits the organization and/or is intended to benefit the organization, which is discretionary and which goes beyond existing role expectations" (van Dyne, Cummings, & Parks, 1995, p. 218). Thus, extra-role creativity can be defined as the discretionary generation of new and useful ideas (in the sense that the ideas benefit the organization) that go beyond formal role expectations. The employee helping the organization to save money due to the reduction of costs for postal stamps is one such example. It was not her or his job to think of it, but she or he had an idea that benefited the organization.

Extra-role creativity can be distinguished from in-role creativity. In-role behavior is defined as "behavior which is required or expected as part of performing the duties and responsibilities of the assigned role" (van Dyne et al., 1995, p. 222). Accordingly, creativity as in-role behavior refers to new and useful ideas that are developed to perform the duties and responsibilities of the assigned role (Potočnik & Anderson, 2016). Examples are an engineer developing an idea for a new machine, a marketing specialist having an idea about how to design a new campaign, or an R&D employee generating an idea about a new product.

The description of the different subdimensions of creativity are still only theoretical (Montag et al., 2012; Potočnik & Anderson, 2016). However, there are a lot of studies which focus mainly on R&D creativity (e.g., Gupta & Singh, 2015; Paulsen et al., 2013), which has been described by Unsworth (2001) as required creativity that is shown because job descriptions call for it. Accordingly, they can be classified as mainly in-role creativity assessments. The extra-role side of creativity is less studied. Research has so far only

demonstrated that creativity can be generated in different jobs throughout the organization (e.g., Axtell et al., 2000) but not examined whether it was extra-role creativity that was assessed.

Innovation

If ideas are only generated but not implemented, then they are of little use. Thus, creativity is oftentimes seen as the first step towards an innovation (Amabile et al., 1996). The latter is defined as "the intentional introduction and application within a job, work team or organization of ideas, processes or products which are new to that job, work team or organization" (West & Farr, 1990, p. 9). As the interrelation between the two constructs is apparent, some scholars even combine them under terms such as innovative behavior or the innovation process. However, "creativity and innovation are distinct concepts" (Zhou & Hoever, 2014, p. 334). When, for example, a new design for a car is developed, creativity is needed. The production of the new car depends on innovation (Mumford, Hester, & Robledo, 2012). Accordingly, creativity can be seen as a prerequisite to innovation. However, most research has concentrated on the predictors of creativity (Montag et al., 2012); less research has studied its connection with outcomes such as innovation (Anderson et al., 2014). Thus, Anderson et al. (2014) call for more research attempts that combine knowledge on creativity and innovation.

It was highlighted that employees as sources for innovation are a lot of times overlooked (Høyrup, 2010). Høyrup (2010) compared R&D innovation with the innovations by other employees. He demonstrated that the latter ones might be more incremental; however, in their entirety they provide the organization with much needed change to tackle changing demands and procedures that are not effective. As these benefits are apparent, managers see the value in their employees' innovation and want to use it. However, they do know how to provide the necessary conditions and support to foster it (Jeberien et al., 2013).

Performance

Ultimately, creativity and innovation are means to enhance performance. "The adoption of innovation is generally intended to contribute to the performance or effectiveness of the adopting organization" (Damanpour, 1991, p. 556). This is also implied when describing creativity as it will "invariably result in identifiable benefits" (Anderson et al., 2014, p. 1298). Performance is defined as "actions, behavior and outcomes that employees engage in or bring about that are linked with and contribute to organizational goals" (Viswesvaran & Ones, 2000, p. 216). While behavior refers to what people do at work, performance includes an evaluative component regarding whether this behavior has contributed to individual or organizational effectiveness (Motowidlo, Borman, & Schmit, 1997).

When it comes to creativity and performance, Mumford and Licuanan (2004) argued that it is either creativity or performance that can be enhanced, not both. In line with this reasoning, there was no detection of a relationship between performance and creativity in a sample of service jobs (van Dyne, Jehn, & Cummings, 2002). Others argued that when ideas are implemented, they can improve performance as they enhance the efficiency of executing tasks (Choi, 2007). Thus, in another study creativity was positively related to performance (Madjar, Greenberg, & Chen, 2011). When the relationship was addressed via a meta-analytical approach, creativity was related to performance (Harari, Reaves, & Viswesvaran, 2016). However, the meta-analysis did not differentiate between creativity as in-role and extra-role behavior. Accordingly, what is needed is a stronger integration of creativity and performance research to demonstrate which of the constructs related to new ideas also can be beneficial to performance.

Social Influences

Ford (1996) stresses in the model of individual creative action that individuals only exhibit creativity when it seems favorable to them to do so. As it is a deliberate process, the

question is how and when do employees choose creativity over easier, habitual behavior. Ford (1996) assumes that as a person acts within a domain, this domain exerts influence upon the person. Thus, to understand how creativity evolves, one must take into consideration the domain surrounding this person. In a similar vein, Shalley and Gilson (2004) summarized that "there is an increasing need for a greater understanding of the contextual factors that may enhance or discourage employees' creativity" (p. 34).

In the model of creativity and innovation in organizations, Amabile (1988) underlines that the environmental factors stimulating creativity are also important for innovation. This also is reflected in a review on innovation, which underlines that support from the environment is needed for implementing ideas (Damanpour, 1991).

Also for performance, the job demands–resources model (Bakker & Demerouti, 2007) highlights that different work environmental factors are relevant. They are assumed to be motivational, increase effort and engagement, and offer a better handling of demands that improves performance (Bakker & Demerouti, 2007). Thus, creativity, innovation, and performance seem to be influenced through environmental factors.

From the different factors present in the environment, it is especially the social encounters that can influence a person's behavior (Aronson, Wilson, Akert, 2008). Employees' interactions with others are used as clues on whether behavior, such as creativity, is welcomed and determines whether it is perceived as worth the effort (Unsworth & Clegg, 2010). The biggest influence is exerted by the interactions that are most salient (Ford, 1996).

Interactions in the workplace are mostly encountered with leaders and colleagues (Madjar, 2005). They have a direct impact on the employee's behavior due to their proximity (Zhou & Hoever, 2014). For example, both leader and colleague support contribute to creativity (Madjar, Oldham, & Pratt, 2002), leaders and the exchange with colleagues are relevant for innovation (Janssen, 2005; Rank, Nelson, Allen, & Xu, 2009; Scott & Bruce, 1994), and also when it comes to performance, leader behaviors and colleague support are

seen as important (Chiaburu & Harrison, 2008; Chiaburu, Smith, Wang, & Zimmerman, 2014; Wang, Oh, Courtright, & Colbert, 2011). Taken together, behavior exerted by leaders and colleagues seems to be relevant for creativity, innovation, and performance.

Leadership. The behavior leaders show in regard to their followers can be described by the term leadership behavior. Leadership behavior refers to the different behaviors leaders engage in that affect employees' actions and team functioning (Ceri-Booms, Curşeu, & Oerlemans, 2017). Various theories on leadership behavior exist. There have been theories on leadership with a general approach and more specific ones, for example, theories targeted at change, such as *transformational leadership*, and theories specifically targeted at creativity and innovation such as *ambidextrous leadership*.

Transformational leaders help followers to react flexibly to change by paying attention to their needs, stimulating them to critically question assumptions, or providing meaning to their work (Bass, 1985; Bass, Avolio, Jung, & Berson, 2003). The concept of transformational leadership was proposed more than 40 years ago (Burns, 1978) and since then used in a variety of ways to explain employee behavior (e.g., Podsakoff, MacKenzie, Moorman, & Fetter, 1990; Wang et al., 2011). Thereby, transformational leadership has not only been proposed to be beneficial to individual outcomes but also for team outcomes, especially team performance (Dionne, Yammarino, Atwater, & Spangler, 2004). The relation has also been underlined in a recent meta-analysis (Ceri-Booms et al., 2017).

Transformational leadership includes different dimensions, such as a) idealized influence (charisma) which describes acting as a role-model for followers, b) inspirational motivation which centers on motivating and inspiring followers by providing meaning to their work, c) intellectual stimulation which centers on critically questioning assumptions and beliefs and reframing problems, and d) individualized consideration, which means leaders pay attention to the individual follower's needs and growth potential (Bass & Riggio, 2006). However, the dimensions are strongly correlated and they have many times not differed in

their relationship with criterions (Bass, 1999). Therefore, transformational leadership has oftentimes been used as a unitary construct (Dong, Bartol, Zhang, & Li, 2017; Holstad, Rigotti, & Otto, 2013; Schaubroeck & Cha, 2007).

When it comes to the relationship between transformational leadership and creativity, there are mixed and inconsistent results. Therefore, Rosing et al. (2011) proposed a new approach: ambidextrous leadership. The term ambidexterity refers to balancing two opposing behaviors. Thus, it describes that two complementary leadership behaviors are necessary: opening and closing leadership behavior. While opening leadership behavior includes giving room for ideas or allowing errors, closing leadership behavior is related to establishing routines or controlling goal attainment (Rosing et al., 2011). It also explains that a temporal flexibility is needed from leaders to switch between these two behaviors. Therefore, diary studies are suited to examine it as they can capture short-time fluctuations (Zacher & Wilden, 2014).

The ambidextrous leadership theory was originally proposed as beneficial for innovative behavior which includes both creativity in the sense of generating ideas and innovation in the sense of implementing ideas (Rosing et al., 2011). Different studies have examined it and demonstrated the link between ambidextrous leadership and innovative behavior (Zacher, Robinson, & Rosing, 2014; Zacher & Rosing, 2015; Zacher & Wilden, 2014). Whether and in which way the new theory also helps to explain in detail inconsistent findings between leadership and creativity has not been examined.

Team climate. The collective influences from the colleagues surrounding an employee can be subsumed under the term *team climate*. Team climate demonstrates what is valued and supported by the team the employee interacts with (Elovainio, Kivimäki, Eccles, & Sinervo, 2002). It can affect how individual employees behave and teams work together (Bain et al., 2001; Naumann & Bennett, 2000). The impact of leadership behaviors and team climate can be viewed either separately or together as leaders can actively influence a team

climate (Eisenbeiss, van Knippenberg, & Boerner, 2008; Pirola-Merlo, Härtel, Mann, & Hirst, 2002).

West (1990) summarized different findings on team climate conducive to innovation under the term *team climate for innovation*. It can be described as a specific team environment that is directed towards change and adaptability (West, 1990). It includes four subdimensions: (a) *vision* as in having a common and valued goal, (b) *task orientation* as in thriving for high performance and critically appraising weaknesses, (c) *participative safety* as in feeling safe when proposing new ideas, and (d) *support for innovation* as in supporting each other's attempts for generating and implementing new ideas (West, 1990).

Previous findings have studied team climate for innovation extensively with regard to R&D teams (Bain et al., 2001; Eisenbeiss et al., 2008; Pirola-Merlo et al., 2002). Studies have either included team climate for innovation as a unitary construct or examined the different dimensions. Contrary to transformational leadership, different and unique relations between the subdimensions and other constructs were revealed. For example, the magnitude of the relationships between the team climate dimensions and team performance differed in height (Pirola-Merlo et al., 2002). In which way the team climate dimensions are also important for teams outside the specific R&D context has, however, not been studied.

Conceptual Framework of the Dissertation

The previous sections highlighted the core concepts of the dissertation. The conceptual model that arises through integrating the main constructs in the way they are examined in the dissertation is depicted in Figure 1.

The model demonstrates that extra-role creativity is assumedly related to innovation and performance. In addition, each of these constructs is again influenced through different leadership behaviors or team climate dimensions. As the main focus of the dissertation is extra-role creativity, the path from innovation towards performance is only demonstrated for the sake of completion, but not examined in the dissertation.

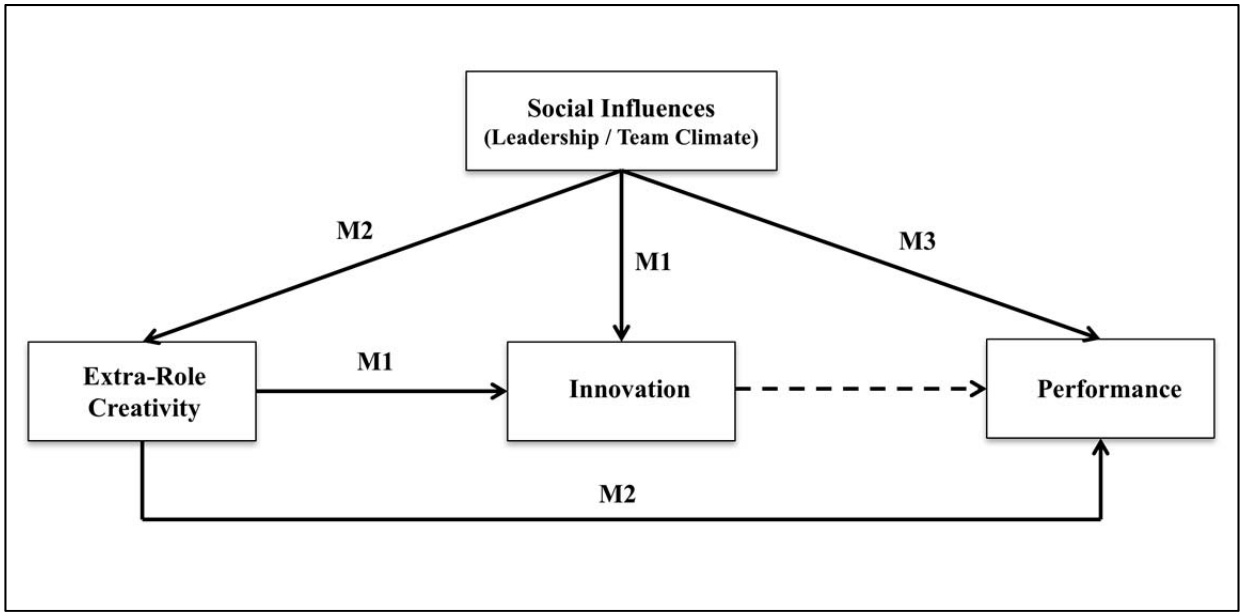


Figure 1. Conceptual model of the dissertation. The depicted connections are tested within the three manuscripts. M1 demonstrates the relations tested in Manuscript 1, M2 refers to the relations tested in Manuscript 2, and M3 refers to the relation tested in Manuscript 3. The dotted line indicates that a connection is assumed, but not tested in this dissertation.

It is adapted, based on a model by Rank, Pace, and Frese (2004) that was established for future research attempts. The model is still applicable today, as some of the research gaps demonstrated in 2004 are still there, such as a missing integration of research on creativity and innovation (Anderson et al., 2014) or the integration of discretionary concepts such as extra-role creativity (Potočnik & Anderson, 2016). The research questions of the dissertation center on paths of this model. They are described in detail in the following paragraphs.

Research Question 1: How is Extra-Role Creativity Perceived by Employees?

Although the published papers on creativity are constantly growing (James & Drown, 2012), the assessment of the creativity construct has moved to the background (Montag et al., 2012; Potočnik & Anderson, 2016). This has led to ambiguous and inconsistent results (Potočnik & Anderson, 2016). Thus, more research should focus again on the construct.

Extra-role creativity as one aspect of the creativity construct has, to our knowledge, not been assessed empirically. Understanding the extra-role creativity construct is, however,

of major importance. As this relates to the creativity in which every employee can get involved, it enables capturing the underlying creativity potential of organizations. It can further help address practitioners' calls that it is desired that all employees are creative (Oeij et al., 2015; Mayfield & Mayfield, 2008). Thus, there needs to be an in-depth assessment of extra-role creativity.

Furthermore, to construct the nomological net around extra-role creativity, its unique influences with predictors and outcomes need to be assessed. Montag et al. (2012) have, for example, argued that the detailed assessment is needed because there are different predictors with regard to extra-role creativity in comparison to in-role creativity. Examining the construct empirically allows understanding it better and constructing a nomological net around it. Therefore, Research Question 1 addresses the empirical examination of extra-role creativity by asking how extra-role creativity is perceived by employees.

Research Question 2: What Is the Relationship Between Extra-Role Creativity and Innovation and Between Extra-Role Creativity and Performance?

The second research question concerns the process initiated through extra-role creativity. Creativity is a means to an end. It is not sufficient for employees to have ideas; for them to be beneficial they have to be implemented (Amabile et al., 1996). This might be especially relevant when it comes to extra-role creativity. When ideas are developed beyond the person's responsibilities, there is little knowledge about them. There is no one else keeping track of them or knowing about them unless the employee decides to talk about them or implements them. When the employees' creative potential wants to be used, this connection of the generation of ideas with its implementation is crucial. There is to our knowledge no previous research on combining extra-role creativity with innovation, thus also in this regard, an in-depth analysis is needed.

When it comes to creativity and performance, there exists theoretically a paradox between creativity and standardized, routine behavior that is needed for performance (Ford,

1996). Thus, in past times, only specific employees were asked to be creative, in the remaining organization there was a rather hostile approach to it (Ford, 1996). In more recent times, the view towards creativity has changed and it is seen as something beneficial (Oeij et al., 2017). However, the question remains whether this engagement in new ideas contributes to performance or is competing with the standardized procedures leading to less performance. Especially when it comes to extra-role creativity and performance, the dilemma might be even bigger. Employees can either engage in their standardized work procedures or show extra-role behavior and engage in new ideas that are, however, not required. As these are seemingly two contradictory behaviors, it is questionable whether the extra-role attempts can still relate and be beneficial for performance or whether they take capacities away from performance.

Research Question 3: Which Leadership Behaviors or Team Climate Dimensions Are Relevant for Extra-Role Creativity, Innovation, and Performance?

Besides understanding extra-role creativity and its relation to innovation and performance, the next question is what can leaders and colleagues do to support extra-role creativity, innovation, and performance?

The threshold for developing and implementing extra-role ideas is probably higher as they are not expected. It is always risky to have new ideas that may change the status quo as others may not like it and reject the person for it (Staw, 1995). When these ideas are not even required, other cues are required underlining it is okay to spend time on new ideas. The leader is the main person distributing tasks and demonstrating what is accepted and not accepted behavior (Shalley & Gilson, 2004). Thus Mayfield and Mayfield (2008) stress in their theoretical paper that for employees to become creative beyond their work requirements appropriate leadership behavior is needed.

The inconclusive findings on leadership and creativity (Rosing et al., 2011) highlight there is more to it than previous approaches. Ambidextrous leadership as a new approach was developed specifically for the creativity and innovation context. This new theory could help

enlighten the inconsistent findings on leadership and creativity. Understanding how opening and closing leadership behaviors interact with regard to extra-role creativity can be a helpful step towards understanding what needs to be done and what needs to be avoided to foster extra-role creativity.

As extra-role creativity has not yet been studied, neither have the social influences needed so that extra-role ideas are implemented. For ideas to get implemented, resources are needed. Therefore, innovation has been described as a mainly sociopolitical process (Janssen, 2003). Accordingly, social influences, such as leadership or team climate, are probably important. However, as we do not know the process from extra-role creativity towards innovation, we also do not know which of these social influences come into play. Research is, therefore, needed to address this research gap.

Regarding the connection between social influences and performance, a lot of studies have connected leadership with team performance (Ceri-Booms et al., 2017). In particular, the relationship between transformational leadership and team performance was many times examined (Bass et al., 2003; Braun, Peus, Weisweiler, & Frey, 2013; Howell & Avolio, 1993). However, “the processes explaining how and under which conditions leaders affect team performance need further examination” (Ceri-Booms et al., 2017, p. 189). Thus, research is needed which looks more closely at how transformational leaders impact team performance.

Inherent in transformational leadership is an inclination towards change and innovation. Bass and Riggio (2006) stress that transformational leadership can be beneficial for implementing change. More recently, transformational leadership has been connected with the team climate for innovation; however, this was mainly in contexts that are required to be creative such as R&D teams (Eisenbeiss et al., 2008; Paulsen et al., 2013). Whether transformational leadership also enhances team climate for innovation dimensions in other teams and thereby heightens performance, has not yet been addressed.

Overview of the Manuscripts

In the following section, the three manuscripts are introduced. Every manuscript relates to aspects of one or more research questions. It will be explained in detail which research question(s) they address. Figure 1 demonstrates graphically which relations of the conceptual model were tested in each manuscript.

Manuscript 1: Going the Extra Mile: From Extra-Role Creativity to Innovation and the Impact of Social Influences

Manuscript 1 lays the ground for understanding extra-role creativity with an in depth-examination on extra-role creativity, its relation to performance, and social influences throughout this process. As this was, to our knowledge, the very first attempt to capture extra-role creativity, we conducted a qualitative analysis to get in-depth, unbiased information and to build upon the results with a second quantitative study to validate part of the results. Thus, Manuscript 1 addresses Research Questions 1, 2, and 3. It addresses Research Question 1 as it examines in depth extra-role creativity, adding knowledge to how it is understood by employees. It examines how the process from extra-role creativity unfolds into innovation, thereby addressing Research Question 2, which centers on the relation between extra-role creativity and innovation. In addition, Manuscript 1 addresses which social factors are relevant for extra-role creativity to become an innovation, thus also giving answers to Research Question 3 which is concerned with the social influences leading to innovation.

To address these topics, we cooperated with a large German transport and logistics organization. For the first study of Manuscript 1, qualitative interviews were conducted. In cooperation with the innovation management department we identified 10 employees for interviews. The interviews were conducted, transcribed and in a stepwise approach reduced to categories to form a model.

The results highlighted that the employees' view on extra-role creativity matched the theoretical assumptions. These ideas were described as discretionary, spontaneous ideas that

were potentially beneficial for the organization. They were related most of the time to the direct work environment. It was further shown that the expression of constructive suggestions, which can be described by the term *voice* (Liang et al., 2012), seems to be an important mediator between extra-role creativity and innovation. Additionally, data revealed that most ideas were, after they were developed, first discussed with colleagues. Colleagues seem to exert a large influence on the employee to whether an extra-role idea will be dismissed or subsequently voiced to the leader. After voicing an idea, *leader support* seems to be another influence as the leader decides on the resources and allocation of help so that the employee could realize the idea. Colleague support for innovation seems to moderate the relationship between extra-role creativity and voice; leader support seems to moderate the relationship between voice and innovation. This assumption was tested subsequently in the second study of that manuscript.

To validate the findings, part of the model was then assessed using a quantitative approach with 121 employees from the organization. The influence of the leader and team's support for innovation on the process from extra-role creativity via voice towards innovation was tested in a cross-sectional study. The previously described support by colleagues matched the support for innovation dimension of the team climate for innovation (West, 1990). It describes a team climate in which new ideas are actively searched for, welcomed, and colleagues support each other with them (West, 1990). Thus, support for innovation and leader support were examined as moderators of the extra-role–voice–innovation relationship. As there was no scale to assess extra-role creativity, this was developed for the study.

Results revealed that both social influences moderated the process from extra-role creativity via voice to innovation in the hypothesized positions: It was first support for innovation that moderated the relation between extra-role creativity and voice and then leader support that moderated the relation between voice and innovation. When both moderators were included in a dual moderated mediation, leader support moderated the indirect effect of

extra-role creativity via voice on innovation, but support for innovation was not significant anymore.

Manuscript 2: Leading Ideas: A Diary Study on the Effect of Ambidextrous Leadership on In-Role and Extra-Role Creativity

Whereas Manuscript 1 concentrated on the process from extra-role creativity towards innovation, in Manuscript 2 we looked at ambidextrous leadership as a predictor of extra-role creativity. We additionally contrasted this relation to ambidextrous leadership as a predictor of in-role creativity. Manuscript 2 thereby addresses Research Question 1, understanding how extra-role creativity is perceived—this time in a daily approach—and in comparison to in-role creativity. This extends the nomological network of extra-role creativity as predictors of the construct in contrast to predictors of in-role creativity are assessed. In addition, it addresses Research Question 3, the social influences on extra-role creativity through the way in which ambidextrous leadership is related to extra-role creativity. The manuscript includes an additional analysis connecting daily in-role and daily extra-role creativity to daily job performance. This gives insights on Research Question 2, the connection between extra-role creativity and performance.

A diary study approach was applied. The results were based on a multilevel analysis with 205 daily responses from 73 employees from various occupations. The advantage of diary studies is that they allow to assess short term fluctuations (Ohly, Sonnentag, Niessen, & Zapf, 2010). To capture the volatility of ideas, previous to the study employees were given an idea sheet to make notes of ideas as they occurred. In the evening, they were asked to state the number of extra-role ideas and in-role ideas they had each day. This was taken as a measure for extra-role and in-role creativity. On a minor note, we controlled for daily time pressure and the amount of creativity required in each job. However, as this is not the focus of the dissertation, the control variables are not discussed in greater detail.

Daily opening leadership behavior was positively related to both types of creativity. There was no moderation effect with daily closing leadership behavior on daily in-role creativity, but there was a detrimental effect on daily extra-role creativity. In addition, we found a positive main effect of daily closing leadership behavior on daily in-role creativity. Our findings underline that, in order to understand the leadership–creativity relationship, both leadership behaviors and creativity constructs should be considered in depth.

Manuscript 3: Transformational Leadership and Team Performance: Illuminating Team Climate for Innovation as a Mediator

In Manuscript 3 we looked in more detail at performance. We addressed the question how transformational leaders affect team performance (Ceri-Booms et al., 2017). We integrated theories from innovation research to answer this question. We included the team climate for innovation in its dimensions (a) vision, (b) participative safety, (c) task orientation, and (d) support for innovation as a new approach towards explaining the relationship between the established transformational leadership–team performance relationship. Manuscript 3 therefore addresses Research Question 3 as it centers on the effect of leadership and team climate on performance.

To account for the fact that some teams may and others may not be able to make changes to enhance performance, the team members' *autonomy* was included as a moderator between the team climate dimensions and team performance. Hackman and Oldham (1975) defined autonomy as freedom in scheduling work and determining how it is carried out. Job autonomy may limit the behavioral range employees can engage in (Fuller, Hester, & Cox, 2010). It may thus influence how much of the team climate can actually be used to strengthen performance. However, as autonomy is not the focus of the dissertation, I will not go into more detail in this regard.

The assumptions were tested in a multisource, two wave study with teams from several German organizations and departments. Thus, whereas the other two studies focused

on between-person or within-person effects, this study added knowledge on the team level. Team structures are more and more implemented when it comes to facing changing demands, helping to stay flexible and adaptive (Kozlowski & Bell, 2008). Thus, it is important to assess teams as they are more and more implemented as a tool to manage the changing work environments to reach high performance (West et al., 2004). At T1 609 employees from 84 teams participated and at T2, one year later, their 84 leaders were questioned. The leaders rated the team's performance of the last year. The measures from the team members were aggregated to the team level to link them with the outcome variable team performance.

Regression analyses revealed that the relationship between transformational leadership and team performance was mediated by two dimensions of team climate for innovation: vision and task orientation. Contrary to our expectation, this effect was stronger in teams with low job autonomy. Participative safety was only a mediator of this relationship in teams with low job autonomy. Support for innovation was not a significant mediator independent of job autonomy. The results highlight that integrating findings from innovation research with team performance theories can provide insights into the processes underlying the transformational leadership–team performance relationship.

General Discussion

Due to the increasing competition and turbulent changes in the work environment creative employees are of major importance (Bettencourt, 2004; Frese et al., 1999). When employees become creative beyond their formal role requirements, one speaks of extra-role creativity (Montag et al., 2012; Potočnik & Anderson, 2016). The aims of the dissertation were to understand and offer empirical insight into this kind of creativity, its connection to innovation and performance, and to illustrate the social environment (leadership behaviors and team climate dimensions) influencing it.

Discussion of Research Question 1

The first research question centered on how employees perceive extra-role creativity. In Manuscript 1 employees described a kind of creativity that is shown beyond formal requirements to potentially help the organization. This supports the previous theoretical assumptions that there is an extra-role dimension of creativity (Montag et al., 2012; Potočnik & Anderson, 2016). The further distinct relationships between in-role and extra-role creativity with ambidextrous leadership and performance in Manuscript 2 support the assumption that it is important to examine both creativity dimensions differently to understand unique relations with other constructs. This underlines the reasoning by Montag et al. (2012) that both dimensions have distinct relations with predictors and outcomes. Not acknowledging its differences can lead to obscured findings. It further stresses the assumption that the dimensional assessment of creativity is needed for conceptual clarity of the construct (Potočnik & Anderson, 2016). In addition, through the qualitative study, further characteristics of extra-role ideas were revealed such as them arising mostly spontaneously. This helps refine and understand the construct above previous theoretical assumptions.

The empirical assessment of extra-role creativity was new and differed between studies. In Manuscript 1 extra-role creativity was assessed in a cross-sectional approach, in Manuscript 2 it was part of a diary study. Thus, in Manuscript 1 the concept was approached with a multi-item scale capturing various aspects of extra-role creativity and in Manuscript 2 it was oriented on an event sampling approach as we asked participants to make a note each time she or he had an idea and at the end of the day write down the number of extra-role (and in-role) ideas developed per day. Both approaches to capture extra-role creativity were thus based on the definition of extra-role creativity, although their conceptualization was different.

Results, however, highlighted similarities stressing that both times extra-role creativity was captured. The ideas mentioned as examples in Manuscript 2 matched the characteristics of extra-role creativity described in Manuscript 1. Repositioning of files, helping a colleague

with a presentation or advancements for personnel management are examples for extra-role ideas taken from Manuscript 2. They are also concerned with facilitations and better functioning of processes as mentioned in Manuscript 1. In future studies, to heighten the comparability across studies, daily approaches could use short questionnaires. To ensure an economical assessment, a shortened scale of the extra-role creativity could be used, such as the four items with the highest factor loadings demonstrated in Manuscript 1.

In both studies, we have collected data on extra-role creativity through self-reports. We did so as creativity relates to the generation of new and useful ideas (Amabile et al., 1996); others might not notice it. This, however, has the downfall that there are no general guidelines to what is perceived as extra-role and what is perceived as in-role. As roles are changing, in-role and extra-role behavior can change too. Role requirements depend on the individual interpretation of the breadth of the job. Furthermore, job roles evolve with time (Graen & Uhl-Bien, 1995) and thus the perception of in-role and extra-role will likely change accordingly.

Thus, our depiction of extra-role creativity is related to what a specific person sees as this, without stating that this concept will be the same between persons. To ensure that we did not only get a limited view from employees in specific occupations on extra-role creativity, we included employees from various fields in our studies. Our samples are far from being exhaustive; however, our results show that extra-role creativity can be assessed in different contexts. In Manuscript 1 our samples comprised mostly drivers, technical officers, administrators, and workshop employees. In Manuscript 2 we assessed mostly middle management from various occupations, senior executives, and skilled workers. Thus, it seems that extra-role creativity can be assessed across a broad range of employees from different occupations and different positions. However, the ideas that each employee considers as extra-role will likely differ between the assessed employees. An idea regarding the

improvement of the internal IT-structure would be an extra-role idea for an engineer, however, an in-role idea for a computer scientist.

Van Dyne et al. (1995, p. 219) even stated that the "dynamic and relative nature of extra-role behavior (…) is an important characteristic of the construct." It depends on who is rating the behavior and can change over time (van Dyne et al., 1995). Even if the behaviors collected as extra-role change between persons, such as some ideas could be seen as in-role for some employees but extra-role for others, it does not undermine the importance of the construct but rather is a characteristic inherent in the construct (van Dyne et al., 1995).

Discussion of Research Question 2

After refining the construct empirically, the second research question concerned the relationships between extra-role creativity and innovation as well as between extra-role creativity and performance.

Results depicted in Manuscript 1 underlined a connection between extra-role creativity and innovation. The results and the upcoming results are only correlational, thus not allowing any causal interpretation. However, the found relations speak for the theoretical reasoning that creativity is a first step towards innovation (Rank et al., 2004). The positive relation to innovation highlights that it can be conducive for organizations to invest time and resources in extra-role creativity. Then, innovation is not restricted to certain individuals, roles, or departments but is spread throughout the whole organization, leading to organization-wide innovation.

The relationship between extra-role creativity and innovation was further mediated through voice. Voice is an extra-role construct targeted at the expression of constructive suggestions to improve the functioning of a team or an organization (Liang et al., 2012). While extra-role creativity focuses on the generation of ideas, the main focus of voice is the expression of ideas (van Dyne, Ang, & Botero, 2003). Voice adds another variable to the creativity–innovation relationship (Potočnik & Anderson, 2016) and extends it to an extra-

role creativity–voice–innovation process. This underlines assumptions by Rank et al. (2004), who have already assumed that creativity is related to innovation via voice behavior.

We assessed creativity as an extra-role construct and also voice is defined as an extra-role construct (van Dyne & LePine, 1998); innovation, however, has not been split into these two subdimensions. Theoretically, innovation also consists of extra-role and in-role aspects (Potočnik & Anderson, 2016), as it can either be part of the job tasks or shown beyond that (West, 2002). Accordingly, to fully understand the creativity-innovation relationship, one needs to also consider innovation as in-role and extra-role behavior. This may be especially interesting when comparing idea generation with idea implementation that is in one-way extra-role and in the other in-role such as extra-role ideas and in-role innovations.

For example, an engineer works at improving the efficiency of a machine. As the insufficiency of the machine is also obvious to the shop floor employees working on that machine, one of them may come up with an idea for an improvement. The employee maps out the idea, the execution of it, however, depends on the engineer of the company as she or he has the necessary tools and knowledge to implement it. In this scenario, the engineer has to act upon an extra-role idea of the shop floor employee. For the engineer, it is, however, an in-role innovation. It is part of her or his job to implement these improvements. This could lead to tension as the shop floor employee gets praise to have thought of such an idea, however the engineer may feel frustrated because a shop floor employee was “better” at her or his job than she or he. Future research could look into this and examine what can be done that employees do not feel threatened or intimidated by someone else’s ideas. Highlighting common organizational goals and shifting attention and praise from the employee who had the idea to the one executing it could be part of the solution.

When looking at creativity in relation to performance, it was found (Manuscript 2) that extra-role creativity is marginally related to performance, in-role creativity is significantly related to it. This does not seem surprising as in-role behavior is assumed to be a central part

to performance (van Dyne et al., 1995). When employees become creative, they can develop new methods for their tasks or improve existing procedures (Gong, Huang, & Farh, 2009). The still significant relation of extra-role creativity with performance highlights that the fear that creativity might take away capacity for fulfilling work (Mumford & Licuanan, 2004) is rather unfounded. However, the relation is only marginal. Extra-role creativity may be less strongly related to performance because of mediating factors. Instead of directly influencing performance, extra-role ideas might first enhance other factors such as health or job satisfaction. Then through this impact performance is influenced as both health and job satisfaction are related to performance (Cropanzano & Wright, 1999; Wright & Cropanzano, 2000). Another possibility for the found relationship between extra-role creativity and job performance is that it is not necessarily extra-role creativity leading to higher performance, but the other way around. When performance goals are achieved, employees may have time and resources to think about improvements beyond their jobs, leading to more extra-role creativity.

Besides the relationship between extra-role creativity and innovation and extra-role creativity and performance, it is also likely that innovation and performance are connected. This was also depicted in the theoretical framework. However, as this was not the focus of the dissertation, I did not examine it. There are already empirical investigations which relate innovation to performance, stressing that there is a connection (Jiménez-Jiménez & Sanz-Valle, 2011). This could be more refined in future studies, especially when integrating the in-role and extra-role side of innovation. Regarding extra-role innovation, it may be especially important to find a balance between implementing new ideas but also not spending too much time and resources on that, otherwise standardized job routines may suffer. The same as balancing creativity and standardization (Ford, 1996; Shalley & Gilson, 2017) it is probably also relevant to balance innovation and standardization to reach an optimum of performance.

Discussion of Research Question 3

The third research question centered on the social influences—leadership behaviors and team climate dimensions—that surround and influence extra-role creativity, innovation, and performance. In particular, we examined transformational leadership and ambidextrous leadership as well as dimensions of the team climate for innovation. In addition, we found in Manuscript 1 colleague support to be relevant for ideas to get voiced. Colleague support was described similar to the support for innovation dimension of the team climate for innovation (West, 1990). It also centered on employees supporting and helping each other with new ideas. Additionally, we also detected an influence we had not thought of before. Another kind of leadership behavior—leader support—was mentioned as important for extra-role ideas to get implemented.

Leader support is "a cluster of leader behaviors that are supportive of subordinates' innovative behaviors" (Rosing et al., 2011, p. 964). In previous studies, leader support was not significantly related to creativity nor to suggestions (Oldham & Cummings, 1996) but was found to be related to implemented ideas (Frese et al., 1999). Thus, also in other studies leader support seems to be especially relevant when it comes to innovation. The particularity of leader support for ideas to get implemented further emphasizes that different social influences come into play at different stages of the innovation process. While Shin (2015) questions whether leadership exerts a main or moderating effect, our studies underline that it is both. Leaders have multiple roles during the innovation process such as opening leadership behavior being relevant for extra-role ideas to be generated and leader support being important for ideas to be implemented. This is in line with Mumford, Scott, Gaddis, and Strange (2002) who also emphasized that leaders of innovative endeavors must fulfill multiple roles. They further differentiated between behaviors of leaders that they have to show according to the stages of the idea process, similar to what we found.

When combining the results on the social influences from the different manuscripts, comprehensive insights can be gained. Opening leadership behavior was related as a predictor to extra-role creativity (Manuscript 2) and leader support functioned as a moderator regarding whether voiced ideas will get implemented (Manuscript 1). Both opening leadership behavior and leader support focus on the employee, giving her or him freedom, support, and empowering her or him. These descriptions match the characteristics that Burke et al. (2006) have defined as a person-focused leadership behavior. Person-focused leadership behaviors center on the employee himself or herself and the interaction of the employee with others (Burke et al., 2006). Thus, opening leadership behavior and leader support can be classified as person-focused leadership behaviors. This underlines that for extra-role creativity it is especially this person-focus that is needed so that employees feel safe and supported in thinking about new ideas and implementing them.

Besides person-centered leadership behaviors there are also task-centered ones. Task-centered leadership behaviors focus on task accomplishment (Burke et al., 2006). Closing leadership behavior can be considered as such as it centers on controlling goal attainment and implementing guidelines (Rosing et al., 2011). Manuscript 2 underlined that closing leadership behavior was directly related to in-role creativity with an effect that was even stronger than the one opening leadership behavior had on in-role creativity. This implies that a leader making her or his employees focus on the tasks at hand and controlling goal attainment, can be beneficial for employees coming up with ideas within the job tasks.

These findings highlight the previous assumptions that leaders need to demonstrate a full range of leadership instead of relying exclusively on task- or person-centered approaches (Bass, 1999). When it comes to creativity as a unitary construct it had been highlighted that both person- and task-centered leadership behaviors are important (Amabile, Schatzel, Moneta, & Kramer, 2004). The results of the manuscripts provide a guideline on how to

decide which ones to engage in. Person-centered leadership behaviors seem to be of major relevance for extra-role creativity and task-centered ones for in-role creativity.

Besides the behavior of the leader we further looked at the influences of the team climate. We examined the team climate dimension support for innovation as a moderator on the relation between extra-role creativity and voice (Manuscript 1) and all four team climate for innovation dimensions—vision, participative safety, task orientation, and support for innovation (West, 1990)—as a predictor of performance (Manuscript 3). Results of Manuscript 1 underlined that it is relevant for employees to have support for innovation so that extra-role ideas are voiced. This goes again hand in hand with the finding regarding leadership theories. It centers again more on the person as it focuses on helping and supporting each other with ideas, underlining that a person focus is also on the team climate level relevant for extra-role ideas to be voiced.

Contrary to that, when examining in Manuscript 3 which team climate dimensions are relevant for performance, support for innovation was the only one that was not a mediator between transformational leadership and performance. The other dimensions were more important, at least when also examining autonomy as a moderator. This underlines the importance of considering team climate for innovation in its subdimensions. Although correlated, the dimensions seem to exert unique influences. Anderson and West (1998, p. 254) highlighted that it "is likely in addition to be useful in measuring climate dimensions predictive of other types of group output, but further research is called for to examine this issue." It seems that especially vision, task orientation, and participative safety (when including autonomy as a moderator) are directly relevant for performance. Support for innovation is more crucial for extra-role ideas than directly for performance. As, however, extra-role creativity is also related to performance (Manuscript 2), the influence of this team climate dimension should not be neglected.

In addition, the results regarding the different team climate for innovation dimensions were found on different levels: the individual level (Manuscript 1) and the team level (Manuscript 3). It may be that support for innovation is more important for individual performance as new ideas may impact more the direct work of one employee instead of influencing the conditions for all team members, thus not leading to higher overall team performance. New ideas due to support for innovation may lead to more changes within the team, thus might reduce performance for a while. In this sense, research showed that change can result in health impairment (Rigotti & Otto, 2012) stressing that changes may first lead to costs before they can be beneficial.

We concentrated especially on the social influences from the direct work environment as they are the ones an employee interacts with on a daily basis. However, there are also other social influences, such as from the organizational context or even from the context outside work such as family and friends (Madjar, 2005). There are possible spill-over effects in the way that family and friends can influence behavior at work and vice versa (Rodríguez-Muñoz, Sanz-Vergel, Demerouti, & Bakker, 2014). Accordingly, it would be interesting to see how much they exert influence on extra-role creativity and in what way. As extra-role creativity is related to extra-effort, employees who have trouble at home or with friends might be less creative than those who have a lot of support. On the contrary, employees who have solved with extra-role effort a problem at work might transmit this positive feeling to their family and friends.

Within the work context it is relevant to not only consider the direct influences but also be aware that these come into play in boundaries that are set by the organization. "Strategy and structure set the boundaries for the organizational behaviour exhibited by leaders/managers and employees" (Karanika-Murray & Oeij, 2017, p. 21). Thus, organizations need to create conditions in which employees and leaders feel they are welcome to experiment with ideas, implement them, and support each other to do so. As it is highly

unlikely that every idea will be implemented, there is the potential for not functioning ideas, errors may be created.

To effectively deal with potential errors and still ensure organizational performance, organizational error management can be helpful (Scheel & Hausmann, 2013). To improve the handling of errors, it is important that they are not only detected but communicated to others (van Dyck, Frese, Baer, & Sonnentag, 2005). This may be especially important regarding extra-role creativity as it may go unnoticed. When ideas do not work and this is not communicated, other employees may try the same approach that has already led to errors. This results in a waste of time and resources. Accordingly, organizational constructs such as organizational error management culture should be included in future studies. To examine this organizational level factor together with team and individual ones, multilevel studies may be interesting. Then, the effect of a person within a team or teams within different organizations can be included.

To take it one step further, also the environment in which the organization functions could be taken into consideration. The environment may determine how fast new innovations are needed. Innovation speed "is most appropriate in environments characterized by competitive intensity, technological and market dynamism and low regularity restrictiveness" (Kessler & Chakrabarti, 1996, p. 1143). Thus, it is further important to pay attention to environmental factors that can influence the rate and speed organizations have to come up with new ideas. This innovation speed may have an impact until the individual employee as it can determine how often employees need to adapt to new machinery or new processes.

Future Research Directions

While this dissertation focuses especially on social factors, personal ones should not be neglected. They can determine the impact contextual influences have, leading to an interaction between person and environment (Woodman, Sawyer, & Griffin, 1993). In this sense, we looked at employees having an idea and voicing it and the social environment

exerting influence upon this. However, personal characteristics have not been included. Uncertainty tolerance (Dalbert, 2002) or self-efficacy regarding creativity (Tierney & Farmer, 2002) may be inherent in employees who are particularly keen on being creative beyond their job roles. Uncertainty tolerance refers to persons who view uncertain situations as challenges and like to engage in them (Dalbert, 2002). Self-efficacy refers to the belief that a person "can successfully execute the behavior required to produce the outcomes" (Bandura, 1977, p. 193). Instead of employees with high uncertainty tolerance or a specific change related self-efficacy changing occupations (Otto, Dette-Hagenmeyer, & Dalbert, 2010) and as a consequence withdrawing expertise and knowledge from the organization, it would be possible to utilize these employees' affinity towards change by giving them room to become creative beyond their job role. This may lead to a more fulfilled working life without changing the job.

In this way extra-role creativity may also be an antecedent of job crafting which is defined as changes employees make in their own job demands and resources to align the job more to their personal goals (Tims, Bakker, & Derks, 2012). Through extra-role creativity employees may generate new ideas, execute them, and thereby broaden the responsibilities they have at work. An example would be an employee of an online clothing retailer who is interested in accessories. She or he may come up with the idea for a new bracelet-segment the online-company she or he works for could sell. If the idea gets implemented and proves to be successful, the employee may be responsible for the new segment thereby expanding her or his previous job responsibilities. Then, job crafting would take place. Supporting extra-role creativity could thereby help employees to get a better person-job fit when they can align their abilities and interests more with job demands (Edwards, 1991). This enhanced person-job fit can increase their performance and satisfaction (Kristof-Brown, Zimmerman, & Johnson, 2005).

In this regard it may not be enough for leaders to only take the situation into account when adjusting their leader behavior—as ambidextrous leadership highlights (Rosing et al.,

2011)—but also take the single employee in consideration when deciding how to best support her or him in her or his needs. Thus, a leadership behavior which focuses on the dyadic relationship between leader and employee such as Leader-Member Exchange (Graen & Uhl-Bien, 1995) may be interesting for future studies. The Leader-Member Exchange perspective underlines that it is not only the leader that needs to be examined for successful leadership, but also the follower and the relationship between leader and follower (Graen & Uhl-Bien, 1995).

While this focus on the individual employee may lead to more extra-role creativity, it is the question whether extra-role creativity will always be beneficial. Creativity refers to novel and useful ideas (Amabile et al., 1996), but it stands in the eye of the beholder which ideas are characterized as such. The definition of extra-role defines that these ideas are beneficial to the organization. However, it is imaginable that employees also generate ideas which may benefit themselves but harm others (Høyrup, 2010), for example, when an employee comes up with a strategy to steal software. Malevolent creativity refers to the kind of creativity which is intended to deliberately harm others (Cropley, Kaufman, & Cropley, 2008). However, research into this dark side of creativity is scarce (Anderson et al., 2014).

Future research could, for example, try to detect moderating effects that lead to beneficial creativity instead of malevolent creativity. It may depend on the commitment of the employee towards the organization or on how well the employee feels treated. Thus, the leader and the team might play an important function again as a moderator indicating that employees are valued and appreciated, making malevolent creativity probably less likely. Contrary to that, conditions such as job insecurity may lead to more malevolent creativity. When an employee perceives job insecurity she or he may see a violation of the psychological contract (Robinson & Rousseau, 1994) because then the exchange between her or his contributions and returns by the employer is misaligned. As this equity is violated, employees feel treated unfairly (Robinson & Rousseau, 1994). To gain equity again, this negative

experience may lead to a corresponding behavior in the employee. Previous research has underlined that job insecurity is associated with less job involvement (Otto, Mohr, Kottwitz, & Korek, 2016). While the involvement in the job tasks is lessened, the employee may feel that the unfair treatment needs some further compensation, leading to more engagement in malevolent creativity. Ideas how to enrich herself or himself on the costs of the organization may be developed.

Not only for the organization, but also for the employee himself or herself there are negative consequences imaginable due to extra-role creativity. According to the effort-reward imbalance model (Siegrist, 1996) there should be a balance between efforts and rewards. Otherwise, strain can arise (Siegrist et al., 2004). However, extra-role ideas might go unnoticed when they are not voiced. And even if they are voiced, they might not get implemented. Thus, employees potentially invest a lot of time and effort into something for which they might not get a reward. Accordingly, organizations have to pay attention what to do about that.

Rewards can be given in different forms, such as money, status control (i.e., control over the continuity of occupational positions), or esteem and approval (Siegrist, 1996). Research on rewards indicated that monetary rewards play a subordinate role for expressing ideas (Ohly & Stelzer, 2007). Thus, when money does not seem to be the matching reward for extra-role creativity, esteem or status control should get more attention. In line with this, research has suggested that it is important to get recognition and feedback regarding these ideas (Leach, Stride, & Wood, 2006; Ohly & Stelzer, 2007). Accordingly, independently of whether ideas are implemented and performance increases, leaders should give feedback and appreciation for the effort the employee had. Future research could look into this and how it can be achieved. Then, it may lead to a positive upward spiral resulting in employees who get feedback and recognition—independently whether ideas got implemented or not—feel

empowered to do so and even think of more ideas. As this appreciation does not need to come only from the leaders, also colleagues could praise each other for good ideas.

When ideas get implemented and lead to changes, it is further important that these changes are managed as well. Even small changes can lead to negative effects such as health impairments, increasing when more changes take place (Rigotti & Otto, 2012). Social support from colleagues and leaders can buffer these negative effects (Rigotti & Otto, 2012). Accordingly, when implementing ideas and change takes place, leaders and colleagues should be actively involved in supporting this change. In addition, a corresponding communication is needed for change to be successful. Transparency helps that employees feel informed and less insecure about what is going on (Rigotti & Otto, 2012). For employees being willing to engage in change, it is further important to not only notify them about it but demonstrate the benefits of the change such as better career prospects or job security (Otto & Dalbert, 2012). This may be especially important when these changes are results of extra-role efforts as these are not even required. Colleagues may feel that the employee with the idea actively impedes or hampers their work when they need to adapt to new routines. Thus, it is necessary to demonstrate the overall value of these changes and not only implement them without informing others. Future studies could examine the particular preconceptions and risks that employees associate with changes due to extra-role ideas. Then, it will be possible to actively counter-steer them by making corresponding adjustments.

Practical Implications

In order to stay competitive, organizations need to continuously change (Gleich et al., 2009). To reach this progress, the creative potential has to be unlocked and the right conditions must be created (Gleich et al., 2009). It is the aim to get away from centralized systems to more decentralized approaches to do so (Bechmann & Ortner, 2013). The dissertation aimed to find some insights on this regard. Then, creativity, innovation, and

performance in these demanding times are no longer happenstance results but can be managed.

Our results underlined the assumption that by creating the right conditions it is possible to influence creativity, innovation, and performance (Madjar, 2005). Thus, it is not organizations either having a workforce that is creative or not. The findings of the three manuscripts point out that it depends on management and support.

A change in thinking is needed to reach this. Instead of implementing new systems, the focus shifts to the root of the creative potential: the employee in her or his direct surroundings. Everyone within the organization can help boost creativity, innovation, and performance. This approach may not seem as modern as implementing a new method or new systems, but it has the potential to be even more effective. The same as "awakening" the creative potential organizations already possesses, it is further needed to "awake" the conditions needed to foster it. It is not something new that organizations need; it is more about supporting and empowering employees in everyday activities. It is a solution that does not need high costs to change something fundamentally, however, it involves one of the biggest changes: the thinking and behavior of leaders and employees themselves.

Instead of passing on the responsibility to others, everyone can make a change. Be it that employees within a team support each other, listen to each other's ideas and thus create a climate of support for innovation or leaders that give freedom and support to think outside the box. It underlines what Basadur (2004) calls a process leader who considers the process the employee is in and acts accordingly. Instead of only giving orders or executing creativity themselves, leaders need to support their employees and trust in their potential (Basadur, 2004). This can help that extra-role creativity arises and ideas are further discussed with teams and get implemented. This is probably especially needed for employees who have little experience with creativity because they are not used to the uncertainty and risk taking that comes with it (Mayfield & Mayfield, 2008).

However, what is further needed is that employees and leaders flexibly change between this support for extra-role attempts to controlling that rules are applied and goals are achieved to foster in-role creativity. This focus on achieving goals and being committed to high performance is further inherent in the team climate dimensions vision and task orientation which both lead to team performance. Thus, it needs a balance between different behaviors to get different desired results. This spectrum of different, partly contradictory, behaviors underlines that the working world is more complex than "one fits it all." It needs changing behaviors and support depending on what—for example, rather in-role or extra-role creativity—is needed. This highlights the view that depending on whether ideas are discretionary or required, differing interventions are needed (Ligon et al., 2012). Thus, one of the biggest challenges is that employees throughout the whole organization can behave differentiated and that also trainings do not postulate one behavior but demonstrate a behavioral repertoire and the result that can be considered to emerge due to it.

To get leaders and teams ready, they need to know that they are important and how they can be of help. Trainings have been described as one success factor for creativity (Gleich et al., 2009). When implementing the trainings, one has to take into consideration what the exact goals of the trainings are and in which domains creativity should have an effect (Baer & Kaufman, 2005). For instance, Ligon et al. (2012) stress that the exercises and criteria to evaluate creativity training success will likely change regarding whether it is R&D personnel doing the training or production employees on the shop floor. The specific elements of the training can be chosen accordingly, such as based on the experience the leader and the team already have with ill-defined problems. Accordingly, in less-experienced employees and teams, it would be necessary to first establish the expectancy that applying opening leadership behavior or supporting each other's ideas will result in desired outcomes (Vroom, 1964). A more detailed overview of training and development interventions for creativity can be found in Ligon et al. (2012).

The transfer of the training depends on multiple influences such as the chance to engage in the behavior (Noe, 2002). Here again the leader is important as she or he provides the working environment and can decide about resource allocation (Mumford et al., 2002; Shalley & Gilson, 2004). Furthermore, every employee and team is embedded within an organization that exerts influence upon them. Thus, the whole organization has to stand behind it. There, human resource strategies play an important role (Madjar, 2005). Instead of following a top-down approach, which may be accepted by management but not by the employees, they should act on their employees' potential and try to tend and foster to it. A first step would be to create possibilities for employees to become creative and create environments conducive to innovation such as the team climate for innovation (West, 1990). To actually make innovations happen, organizations need to acknowledge their employees' effort even if some ideas might seem risky or challenge the status quo in ways that management did not expect.

Conclusion and Outlook

Through the realization of the dissertation, findings on extra-role creativity, innovation, and performance as well as their relation have been collected. The dissertation further looked at possibilities for promoting all three constructs through team climate for innovation and leadership. In addition, it is one of the few examinations of creativity that does not focus on a specific area in the organization or on specific systems to collect ideas, but operates at the root of every idea as it focuses on the employee and her or his direct environment. To capture and examine the creative potential, the dissertation includes different methodical assessments as well as involves employees from different departments.

In practice, the dissertation is intended to provide the basis for acknowledging the creative potential of the work force within organizations. Resulting innovations offer both employees and the organization a benefit. Ideas can be used to improve workplaces, products and services, thereby increasing performance and in the end competitiveness.

References

Amabile, T. M. (1988). A model of creativity and innovation in organizations. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior* (Vol. 10, pp. 123–167). Greenwich, CT: JAI Press.

Amabile, T. M. (1996). *Creativity in context: Update to the social psychology of creativity*. Boulder, CO: Westview Press.

Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal, 39*, 1154–1184. doi:10.2307/256995

Amabile, T. M., & Gryskiewicz, S. S. (1987). *Creativity in the R&D laboratory* (Technical Report No. 30). Greensboro, NC: Center for Creative Leadership.

Amabile, T. M., Schatzel, E. A., Moneta, G. B., & Kramer, S. J. (2004). Leader behaviors and the work environment for creativity: Perceived leader support. *The Leadership Quarterly, 15*, 5–32. doi:10.1016/j.leaqua.2003.12.003

Anderson, N., Potočnik, K., & Zhou, J. (2014). Innovation and creativity in organizations: A state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management, 40*, 1297–1333. doi:10.1177/0149206314527128

Anderson, N., & West, M. A. (1998). Measuring climate for work group innovation: Development and validation of the team climate inventory. *Journal of Organizational Behavior, 19*, 235–258. doi:10.1002/(SICI)1099-1379(199805)19:3<235::AID-JOB837>3.0.CO;2-C

Aronson, E., Wilson, T. D., & Akert, R. M. (2008). *Sozialpsychologie* [Social psychology] (4th ed.). Munich, Germany: Pearson.

Axtell, C. M., Holman, D. J., Unsworth, K. L., Wall, T. D., Waterson, P. E., & Harrington, E. (2000). Shopfloor innovation: Facilitating the suggestion and implementation of ideas. *Journal of Occupational and Organizational Psychology, 73*, 265–285. doi:10.1348/096317900167029

Baer, J., & Kaufman, J. C. (2005). Bridging generality and specificity: The amusement park theoretical (APT) model of creativity. *Roeper Review, 27*, 158–163. doi:10.1080/02783190509554310

Bain, P. G., Mann, L., & Pirola-Merlo, A. (2001). The innovation imperative: The relationships between team climate, innovation, and performance in research and development teams. *Small Group Research, 32*, 55–73. doi:10.1177/104649640103200103

Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of Managerial Psychology, 22*, 309–328. doi:10.1108/02683940710733115

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191–215. doi:10.1037/0033-295X.84.2.191

Barkema, H. G., Baum, J. A. C., & Mannix, E. A. (2002). Management challenges in a new time. *Academy of Management Journal, 45*, 916–930. doi:10.2307/3069322

Basadur, M. (2004). Leading others to think innovatively together: Creative leadership. *The Leadership Quarterly, 15*, 103–121. doi:10.1016/j.leaqua.2003.12.007

Bass, B. M. (1985). *Leadership and performance beyond expectations*. New York, NY: Free Press.

Bass, B. M. (1999). Two decades of research and development in transformational leadership. *European Journal of Work and Organizational Psychology, 8*, 9–32. doi:10.1080/135943299398410

Bass, B. M., Avolio, B. J., Jung, D. I., & Berson, Y. (2003). Predicting unit performance by assessing transformational and transactional leadership. *Journal of Applied Psychology, 88*, 207–218. doi:10.1037/0021-9010.88.2.207

Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership* (2nd ed.). Mahwah, NJ: Erlbaum.

Bechmann, R., & Ortner, M. (2013). *Ideenmanagement und betriebliches Vorschlagswesen* [Idea management and employee suggestion systems]. Frankfurt am Main, Germany: Bund-Verlag.

Bettencourt, L. A. (2004). Change-oriented organizational citizenship behaviors: The direct and moderating influence of goal orientation. *Journal of Retailing, 80*, 165–180. doi:10.1016/j.jretai.2003.12.001

Braun, S., Peus, C., Weisweiler, S., & Frey, D. (2013). Transformational leadership, job satisfaction, and team performance: A multilevel mediation model of trust. *The Leadership Quarterly, 24*, 270–283. doi:10.1016/j.leaqua.2012.11.006

Burke, C. S., Stagl, K. C., Klein, C., Goodwin, G. F., Salas, E., & Halpin, S. M. (2006). What type of leadership behaviors are functional in teams? A meta-analysis. *The Leadership Quarterly, 17*, 288–307. doi:10.1016/j.leaqua.2006.02.007

Burns, J. M. (1978). *Leadership.* New York, NY: Harper & Row.

Ceri-Booms, M., Curşeu, P. L., & Oerlemans, L. A. G. (2017). Task and person-focused leadership behaviors and team performance: A meta-analysis. *Human Resource Management Review, 27*, 178–192. doi:10.1016/j.hrmr.2016.09.010

Chen, G., Farh, J.-L., Campbell-Bush, E. M., Wu, Z., & Wu, X. (2013). Teams as innovative systems: Multilevel motivational antecedents of innovation in R&D teams. *Journal of Applied Psychology, 98*, 1018–1027. doi:10.1037/a0032663

Chiaburu, D. S., & Harrison, D. A. (2008). Do peers make the place? Conceptual synthesis and meta-analysis of coworker effects on perceptions, attitudes, OCBs, and performance. *Journal of Applied Psychology, 93*, 1082–1103. doi:10.1037/0021-9010.93.5.1082

Chiaburu, D. S., Smith, T. A., Wang, J., & Zimmerman, R. D. (2014). Relative importance of leader influences for subordinates' proactive behaviors, prosocial behaviors, and task performance. *Journal of Personnel Psychology, 13*, 70–86. doi:10.1027/1866-5888/a000105

Choi, J. N. (2007). Change-oriented organizational citizenship behavior: Effects of work environment characteristics and intervening psychological processes. *Journal of Organizational Behavior, 28*, 467–484. doi:10.1002/job.433

Cropanzano, R., & Wright, T. A. (1999). A 5-year study of change in the relationship between well-being and job performance. *Consulting Psychology Journal: Practice and Research, 51*, 252–265. doi:0.1037/1061-4087.51.4.252

Cropley, D. H., Kaufman, J. C., & Cropley, A. J. (2008). Malevolent creativity: A functional model of creativity in terrorism and crime. *Creativity Research Journal, 20*, 105–115. doi:10.1080/10400410802059424

Dalbert, C. (2002). Die Ungewissheitstoleranzskala [The uncertainty tolerance scale]. In E. Brähler, J. Schumacher, & B. Strauß (Eds.), *Diagnostische Verfahren in der Psychotherapie* (pp. 374–377). Göttingen, Germany: Hogrefe.

Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal, 34*, 555–590. doi:10.2307/256406

Damanpour, F., & Gopalakrishnan, S. (1998). Theories of organizational structure and innovation adoption: The role of environmental change. *Journal of Engineering and Technology Management, 15*, 1–24. doi:10.1016/S0923-4748(97)00029-5

Dionne, S. D., Yammarino, F. J., Atwater, L. E., & Spangler, W. D. (2004). Transformational leadership and team performance. *Journal of Organizational Change Management, 17*, 177–193. doi:10.1108/09534810410530601

Dong, Y., Bartol, K. M., Zhang, Z.-X., & Li, C. (2017). Enhancing employee creativity via individual skill development and team knowledge sharing: Influences of dual-focused transformational leadership. *Journal of Organizational Behavior, 38*, 439–458. doi:10.1002/job.2134

Edwards, J. R. (1991). Person-job fit: A conceptual integration, literature review, and methodological critique. In C. L. Cooper & I. T. Robertson (Eds.), *International review of industrial and organizational psychology* (Vol. 6, pp. 283–357). Oxford, United Kingdom: Wiley.

Eisenbeiss, S. A., van Knippenberg, D., & Boerner, S. (2008). Transformational leadership and team innovation: Integrating team climate principles. *Journal of Applied Psychology, 93*, 1438–1446. doi:10.1037/a0012716

Elovainio, M., Kivimäki, M., Eccles, M., & Sinervo, T. (2002). Team climate and procedural justice as predictors of occupational strain. *Journal of Applied Social Psychology, 32*, 359–372. doi:10.1111/j.1559-1816.2002.tb00220.x

Fairbank, J. F., & Williams, S. D. (2001). Motivating creativity and enhancing innovation through employee suggestion system technology. *Creativity and Innovation Management, 10*, 68–74. doi:10.1111/1467-8691.00204

Ford, C. M. (1996). A theory of individual creative action in multiple social domains. *Academy of Management Review, 21*, 1112–1142. doi:10.5465/AMR.1996.9704071865

Frese, M., Teng, E., & Wijnen, C. J. (1999). Helping to improve suggestion systems: Predictors of making suggestions in companies. *Journal of Organizational Behavior, 20*, 1139–1155. doi:10.1002/(SICI)1099-1379(199912)20:7<1139

Fuller, J. B., Hester, K., & Cox, S. S. (2010). Proactive personality and job performance: Exploring job autonomy as a moderator. *Journal of Managerial Issues, 22*, 35–51. Retrieved from http://www.jstor.org/stable/25822514

Glassman, E. (1986). Managing for creativity: Back to basics in R&D. *R&D Management, 16*, 175–183. doi:10.1111/j.1467-9310.1986.tb01170.x

Gleich, R., Möbus, S. A., Schmidt, T., Simon, H., & Stolarski, V. (2009). *Innovationsbarometer: Ergebnisbericht 2008/2009* [Innovation barometer: Results report 2008/2009]. Stuttgart, Germany: Dekra AG.

Gong, Y., Huang, J.-C., & Farh, J.-L. (2009). Employee learning orientation, transformational leadership, and employee creativity: The mediating role of employee creative self-efficacy. *Academy of Management Journal, 52*, 765–778. doi:10.5465/AMJ.2009.43670890

Graen, G. B., & Uhl-Bien, M. (1995). Relationship-based approach to leadership: Development of leader-member exchange (LMX) theory of leadership over 25 years: Applying a multi-level multi-domain perspective. *The Leadership Quarterly, 6*, 219–247. doi:10.1016/1048-9843(95)90036-5

Gupta, V., & Singh, S. (2015). Leadership and creative performance behaviors in R&D laboratories: Examining the mediating role of justice perceptions. *Journal of Leadership & Organizational Studies, 22*, 21–36. doi:10.1177/1548051813517002

Hackman, J. R., & Oldham, G. R. (1975). Development of the job diagnostic survey. *Journal of Applied Psychology, 60*, 159–170. doi:10.1037/h0076546

Harari, M. B., Reaves, A. C., & Viswesvaran, C. (2016). Creative and innovative performance: A meta-analysis of relationships with task, citizenship, and counterproductive job performance dimensions. *European Journal of Work and Organizational Psychology, 25*, 495–511. doi:10.1080/1359432X.2015.1134491

Holstad, T. J., Rigotti, T., & Otto, K. (2013). Prozedurale Fairness als Mediator zwischen transformationaler Führung und psychischer Beanspruchung am Arbeitsplatz: Eine Mehrebenenstudie [Procedural fairness as a mediator between transformational leadership and followers' strain: A multilevel study]. *Zeitschrift für Arbeits- und Organisationspsychologie, 57*, 163–176. doi:10.1026/0932-4089/a000120

Howell, J. M., & Avolio, B. J. (1993). Transformational leadership, transactional leadership, locus of control, and support for innovation: Key predictors of consolidated–business–unit performance. *Journal of Applied Psychology, 78*, 891–902. doi:10.1037/0021-9010.78.6.891

Høyrup, S. (2010). Employee-driven innovation and workplace learning: Basic concepts, approaches and themes. *Transfer: European Review of Labour and Research, 16*, 143–154. doi:10.1177/1024258910364102

James, K., & Drown, D. (2012). Organizations and creativity: Trends in research, status of education and practice, agenda for the future. In M. D. Mumford (Ed.), *Handbook of organizational creativity* (pp. 17–38). San Diego, CA: Elsevier.

Janssen, O. (2003). Innovative behaviour and job involvement at the price of conflict and less satisfactory relations with co-workers. *Journal of Occupational and Organizational Psychology, 76*, 347–364. doi:10.1348/096317903769647210

Janssen, O. (2005). The joint impact of perceived influence and supervisor supportiveness on employee innovative behaviour. *Journal of Occupational and Organizational Psychology, 78*, 573–579. doi:10.1348/096317905X25823

Jeberien, B., Stephan, M., & Schneider, M. J. (2013). *Management von Ideen: Stand in der Praxis* [Idea management: State-of-the-art in current practice] (Report No. 13-01). Marburg, Germany: Philipps-University Marburg.

Jiménez-Jiménez, D., & Sanz-Valle, R. (2011). Innovation, organizational learning, and performance. *Journal of Business Research, 64*, 408–417. doi:10.1016/j.jbusres.2010.09.010

Karanika-Murray, M., & Oeij, P. R. (2017). The role of work and organizational psychology for workplace innovation practice: From short-sightedness to eagle view. *European Work and Organizational Psychology in Practice, 1*, 19–30. Retrieved from http://www.eawop.org/ckeditor_assets/attachments/835/specialissue_part1_2017_full.pdf

Kessler, E. H., & Chakrabarti, A. K. (1996). Innovation speed: A conceptual model of context, antecedents, and outcomes. *Academy of Management Review, 21*, 1143–1191. doi:10.5465/AMR.1996.9704071866

Kozlowski, S. W. J., & Bell, B. S. (2008). Team learning, development, and adaptation. In V. I. Sessa & M. London (Eds.), *Work group learning: Understanding, improving & assessing how groups learn in organizations* (pp. 15–44). New York, NY: Lawrence Erlbaum Associates.

Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of individuals' fit at work: A meta-analysis of person–job, person–organization, person–group, and person–supervisor fit. *Personnel Psychology, 58*, 281–342. doi:10.1111/j.1744-6570.2005.00672.x

Leach, D. J., Stride, C. B., & Wood, S. J. (2006). The effectiveness of idea capture schemes. *International Journal of Innovation Management, 10*, 325–350. doi:10.1142/S1363919606001521

Liang, J., Farh, C. I. C., & Farh, J.-L. (2012). Psychological antecedents of promotive and prohibitive voice: A two-wave examination. *Academy of Management Journal, 55,* 71–92. doi:10.5465/amj.2010.0176

Ligon, G. S., Graham, K. A., Edwards, A., Osburn, H. K., & Hunter, S. T. (2012). Performance management: Appraising performance, providing feedback, and developing for creativity. In M. D. Mumford (Ed.), *Handbook of organizational creativity* (pp. 633–666). San Diego, CA: Elsevier.

Madjar, N. (2005). The contributions of different groups of individuals to employees' creativity. *Advances in Developing Human Resources, 7*, 182–206. doi:10.1177/1523422305274525

Madjar, N., Greenberg, E., & Chen, Z. (2011). Factors for radical creativity, incremental creativity, and routine, noncreative performance. *Journal of Applied Psychology, 96*, 730–743. doi:10.1037/a0022416

Madjar, N., Oldham, G. R., & Pratt, M. G. (2002). There's no place like home? The contributions of work and nonwork creativity support to employees' creative performance. *Academy of Management Journal, 45*, 757–767. doi:10.2307/3069309

Mayfield, M., & Mayfield, J. (2008). Leadership techniques for nurturing worker garden variety creativity. *Journal of Management Development, 27*, 976–986. doi:10.1108/02621710810901318

Montag, T., Maertz, C. P., & Baer, M. (2012). A critical analysis of the workplace creativity criterion space. *Journal of Management, 38*, 1362–1386. doi:10.1177/0149206312441835

Motowidlo, S. J., Borman, W. C., & Schmit, M. J. (1997). A theory of individual differences in task and contextual performance. *Human Performance, 10*, 71–83. doi:10.1207/s15327043hup1002_1

Mumford, M. D., Hester, K. S., & Robledo, I. C. (2012). Creativity in organizations: Importance and approaches. In M. D. Mumford (Ed.), *Handbook of organizational creativity* (pp. 3–16). San Diego, CA: Elsevier.

Mumford, M. D., & Licuanan, B. (2004). Leading for innovation: Conclusions, issues, and directions. *The Leadership Quarterly, 15*, 163–171. doi:10.1016/j.leaqua.2003.12.010

Mumford, M. D., Scott, G. M., Gaddis, B., & Strange, J. M. (2002). Leading creative people: Orchestrating expertise and relationships. *The Leadership Quarterly, 13*, 705–750. doi:10.1016/S1048-9843(02)00158-3

Naumann, S. E., & Bennett, N. (2000). A case for procedural justice climate: Development and test of a multilevel model. *Academy of Management Journal*, *43*, 881–889. doi:10.2307/1556416

Noe, R. A. (2002). *Employee training and development*. Boston, MA: McGraw-Hill.

Oeij, P. R., Dhondt, S., Žiauberytė-Jakštienė, R., Corral, A., & Totterdill, P. (2017). Implementing workplace innovation across Europe: Why, how and what? *European Work and Organizational Psychology in Practice, 1*, 46–60. Retrieved from http://www.eawop.org/ckeditor_assets/attachments/835/specialissue_part1_2017_full.pdf

Oeij, P., Žiauberyté-Jakštiené, R., Dhondt, S., Corral, A., Totterdill, P., & Preenen, P. (2015). *Third European company survey: Workplace innovation in European companies.* Luxembourg City, Luxembourg: Publication Office of the European Union.

Ohly, S., Sonnentag, S., Niessen, C., & Zapf, D. (2010). Diary studies in organizational research: An introduction and some practical recommendations. *Journal of Personnel Psychology, 9*, 79–93. doi:10.1027/1866-5888/a000009

Ohly, S., & Stelzer, F. (2007). Über die Motivation zur Teilnahme am Ideenmanagement [About the motivation to participate in the idea management]. *Wirtschaftspsychologie, 9(2)*, 25–33. Retrieved from http://www.psychologie-aktuell.com/index.php?id=wirtschaftspsychologie

Oldham, G. R., & Cummings, A. (1996). Employee creativity: Personal and contextual factors at work. *Academy of Management Journal, 39,* 607–634. doi:10.2307/256657

Otto, K., & Dalbert, C. (2012). Willingness to accept occupational change when offered incentives: Comparing full-time and part-time employees. *European Journal of Work and Organizational Psychology, 21*, 222–243. doi:10.1080/1359432X.2010.550734

Otto, K., Dette-Hagenmeyer, D. E. & Dalbert, C. (2010). Occupational mobility in members of the labor force: Explaining the willingness to change occupations. *Journal of Career Development, 36*, 262–288. doi: 10.1177/0894845309345842

Otto, K., Mohr, G., Kottwitz, M. U., & Korek, S. (2016). The joint impact of microeconomic parameters and job insecurity perceptions on commitment towards one's job, occupation and career: A multilevel approach. *Economic and Industrial Democracy, 37*, 43–71. doi:10.1177/0143831X14535822

Paulsen, N., Callan, V. J., Ayoko, O., & Saunders, D. (2013). Transformational leadership and innovation in an R&D organization experiencing major change. *Journal of Organizational Change Management, 26*, 595–610. doi:10.1108/09534811311328597

Pirola-Merlo, A., Härtel, C., Mann, L., & Hirst, G. (2002). How leaders influence the impact of affective events on team climate and performance in R&D teams. *The Leadership Quarterly, 13*, 561–581. doi:10.1016/S1048-9843(02)00144-3

Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. (1990). Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *The Leadership Quarterly, 1*, 107–142. doi:10.1016/1048-9843(90)90009-7

Potočnik, K., & Anderson, N. (2016). A constructively critical review of change and innovation-related concepts: Towards conceptual and operational clarity. *European Journal of Work and Organizational Psychology, 25*, 481–494. doi:10.1080/1359432X.2016.1176022

Rank, J., Nelson, N. E., Allen, T. D., & Xu, X. (2009). Leadership predictors of innovation and task performance: Subordinates' self-esteem and self-presentation as moderators. *Journal of Occupational and Organizational Psychology, 82*, 465–489. doi:10.1348/096317908X371547

Rank, J., Pace, V. L., & Frese, M. (2004). Three avenues for future research on creativity, innovation, and initiative. *Applied Psychology, 53*, 518–528. doi:10.1111/j.1464-0597.2004.00185.x

Rigotti, T., & Otto, K. (2012). Organisationaler Wandel und die Gesundheit von Beschäftigten [Organizational change and health of employees]. *Zeitschrift für Arbeitswissenschaft, 66*, 253–267. doi:10.1007/BF03373885

Robinson, S. L., & Rousseau, D. M. (1994). Violating the psychological contract: Not the exception but the norm. *Journal of Organizational Behavior, 15*, 245–259. doi:10.1002/job.4030150306

Rodríguez-Muñoz, A., Sanz-Vergel, A. I., Demerouti, E., & Bakker, A. B. (2014). Engaged at work and happy at home: A spillover-crossover model. *Journal of Happiness Studies, 15*, 271–283. doi:10.1007/s10902-013-9421-3

Rosing, K., Frese, M., & Bausch, A. (2011). Explaining the heterogeneity of the leadership-innovation relationship: Ambidextrous leadership. *The Leadership Quarterly, 22*, 956–974. doi:10.1016/j.leaqua.2011.07.014

Schaubroeck, J., K, S., & Cha, S. E. (2007). Embracing transformational leadership: Team values and the impact of leader behavior on team performance. *Journal of Applied Psychology, 92*, 1020–1030. doi:10.1037/0021-9010.92.4.1020

Scheel, T., & Hausmann, U. (2013). Impact of error management culture on knowledge performance in professional service firms. *Horizons of Psychology: Psihološka obzorja, 22*, 66–79. doi:10.20419/2013.22.372

Scott, S. G., & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal, 37*, 580–607. doi:10.2307/256701

Shalley, C. E., & Gilson, L. L. (2004). What leaders need to know: A review of social and contextual factors that can foster or hinder creativity. *The Leadership Quarterly, 15*, 33–53. doi:10.1016/j.leaqua.2003.12.004

Shalley, C. E., & Gilson, L. L. (2017). Creativity and the management of technology: Balancing creativity and standardization. *Production and Operations Management, 26*, 605–616. doi:10.1111/poms.12639

Shin, S. J. (2015). Leadership and creativity: The mechanism perspective. In C. E. Shalley, M. A. Hitt & J. Zhou (Eds.), *The Oxford handbook of creativity, innovation, and entrepreneurship* (pp. 17–30). New York, NY: Oxford University Press

Siegrist, J. (1996). Adverse health effects of high-effort/low-reward conditions. *Journal of Occupational Health Psychology, 1*, 27–41. doi:10.1037/1076-8998.1.1.27

Siegrist, J., Starke, D., Chandola, T., Godin, I., Marmot, M., Niedhammer, I., & Peter, R. (2004). The measurement of effort–reward imbalance at work: European comparisons. *Social Science & Medicine, 58*, 1483–1499. doi:10.1016/S0277-9536(03)00351-4

Staw, B. M. (1995). Why no one really wants creativity. In C.M. Ford & D.A. Gioia (Eds.), *Creative action in organizations: Ivory tower visions and real world voices (*pp. 161–166). Thousand Oaks, CA: Sage.

Tierney, P., & Farmer, S. M. (2002). Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of Management Journal, 45*, 1137–1148. doi:10.2307/3069429

Tims, M., Bakker, A. B., & Derks, D. (2012). Development and validation of the job crafting scale. *Journal of Vocational Behavior, 80*, 173–186. doi:10.1016/j.jvb.2011.05.009

Unsworth, K. (2001). Unpacking creativity. *Academy of Management Review, 26*, 289–297. doi:10.5465/AMR.2001.4378025

Unsworth, K. L., & Clegg, C. W. (2010). Why do employees undertake creative action? *Journal of Occupational and Organizational Psychology, 83*, 77–99. doi:10.1348/096317908X398377

van Dijk, C., & van den Ende, J. (2002). Suggestion systems: Transferring employee creativity into practicable ideas. *R&D Management, 32*, 387–395. doi:10.1111/1467-9310.00270

van Dyck, C., Frese, M., Baer, M., & Sonnentag, S. (2005). Organizational error management culture and its impact on performance: A two-study replication. *Journal of Applied Psychology, 90*, 1228–1240. doi:10.1037/0021-9010.90.6.1228

van Dyne, L., Ang, S., & Botero, I. C. (2003). Conceptualizing employee silence and employee voice as multidimensional constructs. *Journal of Management Studies, 40*, 1359–1392. doi:10.1111/1467-6486.00384

van Dyne, L., Cummings, L. L., & Parks, M. J. (1995). Extra- role behaviors: In pursuit of construct and definitional clarity. In L. L. Cummings & B. M. Shaw (Eds.), *Research in organizational behavior* (Vol. 17, pp. 215–285). Greenwich, CT: JAI Press.

van Dyne, L., Jehn, K. A., & Cummings, A. (2002). Differential effects of strain on two forms of work performance: Individual employee sales and creativity. *Journal of Organizational Behavior, 23*, 57–74. doi:10.1002/job.127

van Dyne, L., & LePine, J. A. (1998). Helping and voice extra-role behaviors: Evidence of construct and predictive validity. *Academy of Management Journal, 41*, 108–119. doi:10.2307/256902

Viswesvaran, C., & Ones, D. S. (2000). Perspectives on models of job performance. *International Journal of Selection and Assessment, 8*, 216–226. doi:10.1111/1468-2389.00151

Vroom, V. H. (1964). *Work and motivation*. New York, NY: Wiley.

Wang, G., Oh, I.-S., Courtright, S. H., & Colbert, A. E. (2011). Transformational leadership and performance across criteria and levels: A meta-analytic review of 25 years of research. *Group & Organization Management, 36*, 223–270. doi:10.1177/1059601111401017

West, M. A. (1990). The social psychology of innovation in groups. In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work: Psychological and organizational strategies* (pp. 309–333). Oxford, United Kingdom: Wiley.

West, M. A. (2002). Sparkling fountains or stagnant ponds: An integrative model of creativity and innovation implementation in work groups. *Applied Psychology, 51*, 355–387. doi:10.1111/1464-0597.00951

West, M. A., & Farr, J. L. (1990). Innovation at work. In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work: Psychological and organizational strategies* (pp. 3–15). Oxford, United Kingdom: Wiley.

West, M. A., Hirst, G., Richter, A., & Shipton, H. (2004). Twelve steps to heaven: Successfully managing change through developing innovative teams. *European Journal of Work and Organizational Psychology, 13*, 269–299. doi:10.1080/13594320444000092

Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *Academy of Management Review, 18*, 293–321. doi:10.5465/AMR.1993.3997517

Wright, T. A., & Cropanzano, R. (2000). Psychological well-being and job satisfaction as predictors of job performance. *Journal of Occupational Health Psychology, 5*, 84–94. doi:10.1037/1076-8998.5.1.84

Zacher, H., Robinson, A. J., & Rosing, K. (2014). Ambidextrous leadership and employees' self-reported innovative performance: The role of exploration and exploitation behaviors. *The Journal of Creative Behavior, 50*, 24–46. doi:10.1002/jocb.66

Zacher, H., & Rosing, K. (2015). Ambidextrous leadership and team innovation. *Leadership & Organization Development Journal, 36*, 54–68. doi:10.1108/LODJ-11-2012-0141

Zacher, H., & Wilden, R. G. (2014). A daily diary study on ambidextrous leadership and self-reported employee innovation. *Journal of Occupational and Organizational Psychology, 87*, 813–820. doi:10.1111/joop.12070

Zhou, J., & Hoever, I. J. (2014). Research on workplace creativity: A review and redirection. *Annual Review of Organizational Psychology and Organizational Behavior, 1*, 333–359. doi:10.1146/annurev-orgpsych-031413-091226

Appendix

Manuscript 1

Going the Extra Mile:

From Extra-Role Creativity to Innovation and the Impact of Social Influences

Jana S. Keil, Judith Kampa, & Kathleen Otto

University of Marburg, Germany

Abstract

Creativity is an important resource for companies. Even employees, who are not required to be creative, can develop valuable ideas. However, there is still limited knowledge about these ideas. To address this issue, we investigated extra-role creativity, a theoretically assumed creativity dimension which is discretionary and goes beyond existing job role expectations. We further aimed to understand its link to innovation and the impact of social influences as boundary conditions. To do so, we applied a mixed-method approach with two studies: (a) a qualitative interview study to get in-depth insights and develop a model of extra-role creativity and its connection to innovation with 10 employees from a German transport and logistics organization, and (b) a questionnaire study with 121 employees from that organization in which we tested quantitatively parts of our previously developed model. Results support the theoretical assumptions about extra-role creativity. They further highlight the particular function of employees and leaders as social influences: First, the team's support for innovation is an essential boundary condition for extra-role creativity to be voiced and, second, a leader's support is essential for voiced ideas to get implemented. Limitations and implications are discussed.

Keywords: extra-role creativity; innovation; support for innovation; leader support; mixed methods

Constant change and global competition are omnipresent in organizations. High performance organizations stand out because they have acknowledged that it is not enough to rely on employees in specific job positions to counter these challenges (Shalley, Gilson, & Blum, 2009). *Extra-role behavior*—behavior which exceeds defined job roles—is needed to adapt to dynamic environments, e.g., when employees suggest new ways of doing things (van Dyne, Cummings, & Parks, 1995). An example is a Starbucks shop assistant who came up with an idea to overcome the low consumption of hot coffee during summer days: iced coffee. Although it was not part of his job, this idea has secured Starbuck's adaption to market needs and thereby ensured organizational success (Schultz, 1999). The example underlines that a huge potential lies within companies to counter today's challenges: *extra-role creativity* (Balkin, Roussel, & Werner, 2015)—the new and potentially useful ideas that are developed beyond one's job role (Montag, Maertz, & Baer, 2012; Unsworth, 2001). These ideas have been proposed as being even more relevant than planned improvement approaches such as Reengineering and Six Sigma, as they are a far larger resource (Getz & Robinson, 2003). Accordingly, the Dana Corporation and Pirelli have found out that 80% of improvement ideas come from employees and only 20% through planned management activities (Getz & Robinson, 2003). When these ideas are implemented and thus become an innovation, they can help the organization stay adaptive and flexible. Hence, employees' ideas are considered one of the most valuable resources an organization has (Kinkel, Lay, & Wengel, 2004).

As organizations have realized this huge potential, initiatives have been installed to manage employees' extra-role creativity. However, a recent survey of 193 German organizations across industries showed that only 30% of all employees participate in idea management systems, leaving the ideas of the remaining 70% untouched (Jeberien, Stephan, & Schneider, 2013). It has also been shown that organizations mainly collect ideas without having the knowledge to actively manage them (Jeberien et al., 2013). Sometimes, managers even think that ideas cannot be managed (Boeddrich, 2004). Due to this lack of knowledge,

employees might be deprived of resources or support to pursue their extra-role ideas and convert them into successful innovations. Managing ideas "is key to high corporate productivity, quality and growth, and to creating a work environment that is fulfilling to work in" (Getz & Robinson, 2003, p. 134). Creating these conditions is one of the most important management challenges (Fairbank & Williams, 2001).

To date, research has examined creativity as a unitary construct, or focused on creativity in fulfilment of particular job roles, such as within Research and Development (R&D) departments. The theoretical calls for creativity as extra-role behavior to be considered (Montag et al., 2012; Potočnik & Anderson, 2016; Unsworth, 2001) have not yet been answered by empirical investigation. Thus, knowledge is lacking, of what the characteristics of these extra-role ideas are, and of how they can be developed into successful innovations.

It is our aim to illuminate this research area and examine 1) what are the characteristics of extra-role creativity, 2) how does extra-role creativity evolve into an innovation, and 3) boundary conditions of this process. We look specifically at *social influencing factors* in the work environment because innovation is "primarily an inter-individual social process" (Rank, Pace, & Frese, 2004, p. 520). To address this issue, we have used a mixed-method approach. First, we conducted qualitative interviews to get in depth insights on extra-role creativity. Our aim was, first, to establish a model of extra-role creativity which elucidates its relation to innovation and the role of social contexts in this process. Second, we aimed to validate part of the model quantitatively with cross-sectional questionnaire data. This mixed-method approach helps triangulate our findings. Our analysis extends the nomological net and provides organizations with insights how to actively manage extra-role creativity.

Study 1: Qualitative Interview Study

Creativity is defined as the generation of new and useful ideas (Amabile, 1996; Woodman, Sawyer, & Griffin, 1993). It is a process which "'stays' with the employee unless he or she decides to promote it in order to secure support for its implementation" (Potočnik & Anderson, 2016, p. 485). Hence, creativity can be considered as the first stage of the innovation process, with innovation encompassing the subsequent implementation of ideas (West & Farr, 1990). Creative ideas do not have to be entirely new, but "new to the relevant unit of adaption, designed to significantly benefit the individual, group, organization or society" (West & Farr, 1990, p. 9).

Extra-role creativity is a subdimension of creativity. It has been argued that to understand creativity, the construct itself should receive more research attention (Montag et al., 2012; Unsworth, 2001) because it currently lacks conceptual clarity, which has led to construct confusion, drift, and contamination (Potočnik & Anderson, 2016). For example, terminology is used ambiguously and constructs are operationalized inconsistently. Studies are needed which center more on the conceptualization of creativity (Anderson, Potočnik, & Zhou, 2014).

Montag et al. (2012) as well as Unsworth (2001) have addressed this issue. They explained to understand creativity, subdimensions must be acknowledged. They divided creativity along the lines of the broader performance literature, which distinguishes between in-role and extra-role behavior (van Dyne et al., 1995). While in-role behavior is behavior that is required to perform the duties and responsibilities of one's job, extra-role behavior is defined as "behavior which benefits the organization and / or is intended to benefit the organization, which is discretionary and which goes beyond existing role expectations" (van Dyne et al., 1995, p. 218). Potočnik and Anderson (2016) have highlighted this distinction again in their recent review of the conceptual and operational clarity of the innovation literature. They further state that a simple, uniconstructual nomological net is not enough to

capture the complexity of the creativity construct (Potočnik & Anderson, 2016). Subdimensions need to be addressed (Potočnik & Anderson, 2016).

Creativity as extra-role behavior fits within the class of challenging-promotive extra-role behaviors which are aimed at improvements within the organization (van Dyne et al., 1995). However, unlike other forms of challenging-promotive behaviors, such as voice, it centers mainly on the generation of ideas (Unsworth, 2001). Voice is related to idea promotion, which according to Janssen (2000) encompasses the second stage in the innovation process. Rank et al. (2004) highlight this as well in a process model: the first stage is creativity, the second voice, and the third innovation. First an idea has to be developed, which only then can be voiced (Ohly & Stelzer, 2007). Whereas voice focuses on the expression of suggestions, creativity is a cognitive process (van Dyne & LePine, 1998). Even when employees generate ideas, they could stay silent about them, thus withholding information (Morrison & Milliken, 2000). In that situation, extra-role creativity would be present, but not voice, highlighting again that these constructs are different.

Extra-role creativity is further distinguishable from in-role creativity. A job with a task description which requires a lot of creativity is the R&D field (Unsworth, 2001). The activity of the R&D department is "focused on producing specific innovations" (Bain, Mann, & Pirola-Merlo, 2001, p. 58). It is a domain where innovation—the intentional introduction and application of new ideas, processes, products or procedures within a job, team, or organization (West & Farr, 1990)—is the central performance outcome (Bain et al., 2001). Because creativity is crucial for success in this department, a lot of research has concentrated on employees in R&D (Eisenbeiss, van Knippenberg, & Boerner, 2008; Shin & Zhou, 2003; Tierney, Farmer, & Graen, 1999).

Other research has already shown that we can find creativity in every employee regardless of the function they have (Madjar, Oldham, & Pratt, 2002; Shalley et al., 2009). It was argued that "creative work can be generated by employees in any job and at any level of

the organization, not just in jobs that are traditionally viewed as necessitating creativity" (Madjar et al., 2002, p. 757) and that "these (environmental) changes have increased the need for creativity from workers at all levels and different types of jobs, including those that may not have traditionally required employees to be creative" (Shalley et al., 2009, p. 489). Creativity was even shown in jobs that consist of routine work and do not require creativity, e.g., manufacturing (Axtell et al., 2000). This underlines that creativity does not only develop when it is required. However, front-line employees are often overlooked as a resource of creativity (Balkin et al., 2015), even though they have unique knowledge to solve certain problems (Getz & Robinson, 2003). This is exactly what extra-role creativity is about. It captures the creativity which every employee can show, beyond his or her job responsibilities, that can potentially benefit the organization (Balkin et al., 2015), such as the above-mentioned Starbucks employee who came up with the idea about iced coffee.

So far, we do not know much about extra-role creativity. Even though studies speak of creativity as either being part of the job or as being shown beyond that (e.g., Madjar et al., 2002), they have not distinguished between these two dimensions within their study nor conceptualized their creativity measures in different ways. Creativity was assessed as a unitary construct. Hence, it is not possible to know whether it was indeed in-role or extra-role creativity, or a combination of both, that the study assessed. This may be one reason for ambiguities, measurement problems and inconsistent findings in creativity research (Potočnik & Anderson, 2016). Our first aim is to obtain better insights into creativity as extra-role behavior. In order to retrieve unbiased information, we did not formulate any specific hypotheses but based our work on three research questions. Our first research question was:

RQ1: What are the characteristics of extra-role creativity?

We further aimed to understand the process from extra-role creativity to innovation. If new and novel ideas get implemented, innovation takes place (West & Farr, 1990). Accordingly, creativity is oftentimes seen as the first step towards an innovation (Amabile, 1996; West, 2002). It is even said that this implementation of ideas is needed: "If ideas remain in the brains of employees there will be no effective use of the key competencies. This leads to a waste of human capital" (Boeddrich, 2004, p. 278). Accordingly, Anderson et al. (2014) put emphasis on the need for research which combines creativity and innovation.

As we focus on extra-role creativity this is even more important. Extra-role behaviors are not formally required (van Dyne et al., 1995). Hence, it is likely that there are no direct regulations or rules on how to deal with them. The emergence of innovation is a multi-stage process (Ohly & Stelzer, 2007), but much of the process might go unnoticed. When managers do not see the potential in the ideas of their employees (Boeddrich, 2004), or the organizational culture is not supportive of innovation (Hueske & Guenther, 2015), no one may get to know the ideas. Potentially good solutions might be dismissed by employees without the organization even noticing. Hence, only by asking employees, it is possible to understand the process from extra-role creativity to innovation. Then, different sub-stages of the innovation process can be revealed. Following from this, our second research question was:

RQ 2: How does the process of extra-role creativity unfold to innovation?

For each of these steps from creativity to innovation there are specific promoting and hindering conditions (Ohly & Stelzer, 2007). The latter can impede, delay, or inhibit innovation (Mirow, Hölzle, & Gemünden, 2007). Employees do not implement their ideas if it does not seem attractive to do so (Ford, 1996). In such circumstances employees will stick to tried and tested methods (Shalley & Gilson, 2004). There are different influences which can make the development and realization of ideas attractive (Ford, 1996). Only when these

conditions are known can organizations successfully manage the innovation process (Hueske & Guenther, 2015).

The interactionist perspective on organizational creativity highlights the constant interplay between a person and his or her environment (Woodman et al., 1993). Employees are exposed to the opinions and reactions of their social environment. Creative employees need the support from others to protect and realize their ideas. Then innovation can take place. Hence Janssen (2003) speaks of innovation as a sociopolitical process. When there is social support, new ideas are perceived attentively and in a supportive way by others. This constructive and positive atmosphere can help encourage each other's creative attempts (Ekvall, 1996). Thus, Potočnik and Anderson (2016) conclude that receiving support is essential for the implementation of ideas.

This social support might be especially important for extra-role creativity because these ideas are generated beyond task requirements. Speaking up and implementing ideas entails a high risk of being rejected (Staw, 1995). That is because an employee with an idea to change something challenges the existing practices. This can lead to uncertainty and insecurity when established routines and processes are changed (Janssen, 2003). It may take a lot of factors to convince an employee to engage in this risky process of implementing an extra-role idea. Getz and Robinson (2003, p. 135) highlight that an environment has to be established in which "everybody is encouraged to express and act upon ideas".

So far, we do not know precisely which social influences are important and at what stage. It could even be that different ones come into play at different stages, as innovation has been argued to be influenced by differing factors at different stages (Anderson et al., 2014). By analyzing the process from extra-role creativity to innovation, we can depict which social factors come into play when. Hence, our third research question was:

RQ 3: Which social factors are relevant to the innovation process; and at what stage?

Method

Sample, Procedure, and Measures

We designed a qualitative interview study in two steps. In a first step, we developed a questionnaire which we tested on a random sample with five employees from different occupations and different organizations (three male, two female employees). We used these interviews to further refine our interview guidelines according to the insights we gained.

Then, in step two, we cooperated with the innovation management department of a large German transport and logistics organization to identify relevant interview partners from different positions and occupations. The final sample consisted of 10 employees; the majority was male (n = 7). Four employees (three male, one female) additionally held a leadership position and one employee worked in idea management within the organization. The employee who worked in idea management provided us with general information about the topic which helped us to give context to the statements from the remaining employees. All participants were employed in Germany.

We conducted structured, explorative interviews based on our previously developed interview guidelines. The guide covered different aspects: (a) characteristics of extra-role ideas, (b) circumstances under which ideas were developed and refined, and (c) the process from extra-role ideas to innovation. Finally, (d) employees with an additional leadership function were further asked how they handle ideas when they receive them from their employees. Our interview guideline is attached in the appendix.

All interviews were conducted by one female interviewer via telephone. On average, one interview lasted about 45 minutes. At the beginning of each interview, participants were briefly informed about the study's intentions and the interview procedure, and anonymity was guaranteed. Participation was voluntary and no compensation was offered. With the consent of the participants, the interviews were audiotaped for further data analysis.

Data Analysis

Our data analysis followed the procedure by Gioia et al. (2013). First, all interviews were transcribed. Then they were imported into MAXQDA (Version 12), which is a computer-aided qualitative data analysis program. It helps to systematically review and code data. The 10 interview transcripts were inspected sentence-by-sentence by two female raters independently. The interview with the idea manager was not rated, but was used to understand the system in the organization and thus give context to the findings. After the remaining nine interviews, repetition was found and no new issues were addressed. This indicates that saturation was reached. The number of interviews before saturation is similar to a study on innovation barriers, which included 10 interviews (Hueske, Endrikat, & Guenther, 2015).

Both raters did a first-order analysis on the remaining nine interviews that resulted in 83 codes (rater 1) / 100 codes (rater 2). Afterwards, the raters looked for similarities and differences between the categories and reduced them to 32 second order constructs (rater 1) / 35 second order constructs (rater 2). They then met and discussed their results. To condense categories, they compared similarities and differences in the second-order categories and summarized them into second-order aggregates. If agreements about categories were low, they discussed them to develop a mutual understanding. Then they developed together a dynamic inductive model based on the discussed second-order aggregates and how they relate to the research questions. The model is depicted in Figure 1 and explained in detail below.

Results

The interviews revealed that when asked whether employees had to come up with ideas to fulfill their work tasks, most employees said they did not. However, all interviewees stated they developed ideas to enable a better functioning of processes and procedures within their organization. They said, for example, “No, it is not part of my job to develop ideas. However, I have a tremendous amount of ideas” (employee 2), and, “Everyone tries to facilitate work for herself or himself and his or her colleagues which leads to the generation of

ideas" (employee 1). Accordingly, it seems that many employees are not required to develop ideas within their regular work tasks, but they do so nonetheless to facilitate and simplify processes, products, and services or to increase security. Extra-role ideas which they mentioned included: installation aids to improve safety (employee 3), information signs for customers highlighting different zones in transportation to avoid chaos (employee 1), introducing tablets to facilitate information sharing (employee 9), or changing the fuel to make use of tax reductions (employee 2).

Sometimes, those ideas are unrealistic about how to change things, "there are many (ideas) where one would say that realistically they cannot be implemented because certain requirements cannot be met" (employee 2). However, others can be implemented and are pursued further, "I always strive for improvements (...) as there are then facilitations" (employee 1). The focus of these ideas is on improvements and facilitations, "in every activity there is a thought 'ok, that could be done better'"(employee 3). When developing an idea, employees are aware that they must be efficient for the organization. When asked whether the ideas have a financial benefit, it was said: "For sure, otherwise I would not do that (developing ideas), it would be a waste of effort" (employee 1), and, "at the end of the day it's the question about what is the price, everything is directed towards remaining competitive" (employee 9). However, the exact calculation of savings due to the idea seemed to be problematic for them, "for certain (there is a financial use), however, I cannot define it" (employee 1). One reason for that is that savings may be indirect, for example, "employees who like going to work are less sick (…) it is therefore an indirect cost saving" (employee 6).

Regarding the subject of the ideas, most are related to the surrounding work environment. They are generated whenever new stimuli arise or problems are noticed, e.g., "wherever you work together with others" (employee 9); "when I notice that something has not worked" (employee 2). Usually, they are developed unplanned, spontaneously on site, e.g., when a person "picks up something by observation and this makes him or her develop

ideas" (employee 5) or "when I walk through my life with open eyes and see a situation" (employee 2). Therefore, an idea is "either (...) in the head, or it is not in the head" (employee 3). Accordingly, it was not possible for the interviewees to specify times or places in which extra-role ideas are developed.

After an extra-role idea is developed, it is forgotten, discarded, or pursued: "Here and there I have an idea, which I do not pursue" (employee 3). Some ideas even "need weeks to mature" (employee 4), while others "can be implemented immediately" (employee 1). In cases where ideas are pursued, colleagues were mentioned as the first people to be consulted because with them one can talk about whether ideas are useful, feasible, and should be developed further: "I can have the idea on my own, but I need the help of colleagues to put them into practice" (employee 4); "If I have an idea I talk to my colleagues about whether they think it is possible to implement it" (employee 1); "I confer with my colleagues because I find it soothing to know what others think about it. And if the other ones say 'man, that's good', then I know I'm on the right way" (employee 6). It seems that only after consultation with colleagues will ideas be passed on to the management: "If the colleagues say, great idea, let's think about what we write, what information must be considered for the customer, then I speak to my leader and try to convince him or her" (employee 1).

Further progress of the idea hinges on the leader: "...it goes to the boss first. There it is decided whether it (the idea) will go on or will not go on" (employee 3). Often it takes some time for a decision to be made, "and then wait and see what my boss will say" (employee 2). The position of the leader enables him or her to promote or actively hinder ideas: "And then the leader says 'no, I would like to do it in a different way' and then it will be rejected" (employee 7).

The leader decides whether the idea is implemented or handed on to a suggestion system. Before an employee passes an idea into the formal system, she or he feels that it needs to be fully matured, so that "the suggestion will evolve to something decent" (employee

4). In the interviews, it was further said that “ideas always exist, but the idea does not have to be so good that it is entered into (the suggestion system)” (employee 3). Once again, the leader plays an important role as a gate keeper to the suggestion system: “we sit down in my office and enter the idea together (into the suggestion system)” (employee 2).

Summing up, the qualitative interviews provide evidence about the process an extra-role idea undergoes. Colleagues have a special role during the elaboration and refinement of an idea. They are the first gateway when deciding whether an idea is valuable enough to think further about. Subsequently, the second gateway is the leader, whose support is necessary to implement an idea, and, if necessary, incorporate it into a suggestion system. The results from Study 1 were summarized into an extra-role creativity process model (see Figure 1).

Insert Figure 1 about here

Discussion

Study 1 was guided by three research questions: First, to analyse extra-role creativity in depth, second, to explore its relation to innovation, and third, to reveal social factors influencing its role in the innovation process.

Our analysis showed that employees have ideas which are intended to benefit the organization but are generated beyond role expectations. Most interviewees said it was not their job to come up with ideas, but they did so nonetheless. Examples of extra-role ideas were related to facilitating and improving work processes, products, or services. Employees knew that the ultimate aim was to improve efficiency of the organization; however, it was difficult for them to calculate resultant monetary savings. All ideas were generated out of the daily experiences of the employee. Accordingly, most of the ideas were based on their area of expertise. This finding mirrored that of Jeberien et al. (2013) which showed that most suggestions are related to the employee’s own or adjacent departments. This result could be explained with the componential theory of organizational creativity and innovation (Amabile,

1997), which highlights expertise as one of the most important factors influencing creativity. Employees have the most experience in their own fields, thus their ideas are mostly related to areas they know. Furthermore, this makes sense in light of motivational theories. For an action to take place, it must have a valence to the person (Vroom, 1964). Thus, it is comprehensible that extra-role ideas are mostly related to the employee's work context. Implementing an idea can directly improve the employee's work situation; hence, the idea has a value for the person. Another benefit could arise when leaders see the dedication of an employee who thinks about improvements, and recognize this in their performance review (Potočnik & Anderson, 2016). In addition, extra-role ideas can be rewarded through organizational systems that are installed to capture these ideas. There is no guarantee of a reward, but, if an extra-role idea is implemented, employees get a bonus (Fairbank & Williams, 2001).

Another characteristic of extra-role behavior is it being discretionary (van Dyne et al., 1995). The ideas we examined were discretionary as they were developed by the employee without any requirement to do so. Additionally, we found spontaneity as a further central characteristic of extra-role ideas. Extra-role creativity does not seem to be planned but arises when there is a given environmental stimulus. This spontaneity might be one of the most prominent differences between extra-role creativity and in-role creativity. The latter describes the generation of ideas which are part of the job, required (Montag et al., 2012), and, consequently, actively searched for. Accordingly, there is probably external pressure for them to be developed. Another difference between extra-role and in-role creativity could be the time restrictions under which they are developed. For in-role creativity, the end-point of idea development is fixed (e.g., when there is a project deadline). Thus, the given time to develop the idea is definite. For extra-role ideas, however, it is likely that there is no time deadline as they are developed beyond job tasks.

Regarding the process from extra-role creativity to innovation, our data revealed that after development ideas were either forgotten, implemented right away, or expressed to others. The last option was mentioned most frequently. Accordingly, what seems to be of crucial importance for extra-role ideas to get implemented is voice. Potočnik and Anderson (2016, p. 486) explain that "whereas creativity refers to generation of novel and useful ideas, the concept of voice refers to aspects such as keeping informed and speaking up along with introducing ideas and changes". Voice helps organizations to innovate because employees talk about their concerns and their ideas (van Dyne, Ang, & Botero, 2003). When ideas are voiced, it is possible to learn and improve as a team or as an organization (Edmondson, 1999). Employees' voice is related to improved work processes and learning (Morrison, 2011).

For ideas to be voiced, the support from colleagues is of crucial importance. They were described as the first ones who are consulted after an idea is generated. Their support seems to decide whether an idea is voiced to the leader or dismissed. If colleagues say the idea is not good, the employee with the idea is likely to reject it. If they support the idea, the employee with the idea is more likely to pursue it further. This highlights the importance of colleagues during the innovation process. When talking about the function of colleagues, they were described as helping to refine and improve the idea, which is a process much needed for ideas to become ready for implementation (Boeddrich, 2004).

Our study further revealed that after refining and voicing an idea, the leader decides whether the idea is pursued and implemented. Accordingly, leader support seems to be crucial for voiced ideas to become an innovation. Ideas "have to be brought to a stage in which success and risks can be calculated" (Boeddrich, 2004, p. 278). The leader can help estimate the success rate and based on that decide whether it makes sense to try to implement the idea, especially as employees seem to have difficulties with that. This finding underlines the importance of the leader during the innovation process (Rosing, Frese, & Bausch, 2011). Our results highlight that "to harness creativity, managers must be able to (…) convert it to

innovations of value" (Fairbank & Williams, 2001, p. 68). They seem to play an important role in making innovations happen.

Our data further suggests that few ideas are ultimately passed on to a suggestion system, and only after being extensively thought-out. This may explain why only 30% of employees participate in organizational suggestion systems (Jeberien et al., 2013). Other ideas are either solely discussed with the leader and then implemented, or implemented by the employee herself or himself without further discussion. Accordingly, a suggestion system is only one route ideas can take. Hence, organizations which rely only on that will overlook a lot of ideas. It is important to establish more possibilities for sharing ideas. Getz and Robinson (2003) mentioned an example of the detrimental effects if ideas are not shared. Technicians had already found a solution to a problem facing engineers. As the solution was not shared, the engineers searched for several months for a solution, prolonging their work unnecessarily. Accordingly, to capture more ideas, it is important to establish opportunities for sharing good ideas. Best practice forums, where employees can share and discuss their solutions to problems, are one possibility.

The model we created is the first approach towards capturing extra-role creativity and its relation to innovation. After the 10 interviews we conducted, saturation was reached regarding our research questions. However, some adjacent areas remained less understood as, for example, interviewees could not specify a time nor place at which ideas were developed. To create an even more in-depth analysis, other data collection methods could be used, such as event sampling of ideas. Then it would be possible to estimate when exactly and under which circumstances extra-role ideas are developed. A refined model could be created, similar to the process model of creative resourcing (Sonenshein, 2014). Contrary to that, our analysis does not claim to be all-encompassing, but to build a solid basis for further quantitative testing. More research should build on our model in order to test it.

Study 2: Cross-Sectional Study

Study 1 concentrated on getting in depth information on extra-role creativity and its connection to innovation. It was highlighted that the process from extra-role ideas to innovation is usually threefold: ideas are first generated, then voiced, and then implemented. However, not all ideas complete this process as there are boundary conditions fostering or impeding it. Two influences were highlighted: (a) the role of the colleagues as the first gate keeper between having an idea and voicing it to the leader, and (b) the leader as the second gate keeper between voicing an idea and implementing it. Our subsequent study was done to explore the connections between extra-role creativity, innovation, and social influences in detail with a quantitative approach. Thereby we examined part of our previously developed research model in greater depth. The research model for Study 2 is depicted in Figure 2.

Insert Figure 2 about here

The mediatory process between extra-role creativity and innovation highlighted in our qualitative study was voice. It was also previously suggested that "creativity and making suggestions can be seen as a process" (Ohly, Sonnentag, & Pluntke, 2006, p. 272). Accordingly, voice has been proposed as the second stage in the innovation process (Janssen, 2000). This is also in line with previous models, e.g., by Rank et al. (2004). It was proposed that voice serves as a mediator between creativity, the generation of new and useful ideas, and innovation, the implementation of these. Rank et al. (2004) reasoned that new ideas need to be expressed in order for them to be implemented. Managers need to hear the ideas and suggestions from their employees. Then they are able to make appropriate decisions and induce changes (Morrison, 2011). During this process there are, however, environmental influences which can foster or prevent extra-role ideas being voiced and implemented. Our assumptions regarding this are depicted in our research model (Figure 2), which is based on the insights we gained in Study 1. In the following section we explain the reasoning behind

our model. We do so stepwise: first from extra-role creativity to voice, then from voice to innovation, highlighting at each stage which boundary conditions we consider to be operative.

From Extra-Role Creativity to Voice: Support for Innovation as a Boundary Condition

Research has highlighted that many employees do not voice their ideas (Milliken, Morrison, & Hewlin, 2003). The question is, why is this so? Do these employees have no ideas, or do environmental influences prevent them from expressing them? Our interview study would suggest the latter. It showed that employees have many ideas. They might not express them, however, because they fear rejection (Staw, 1995). The open expression of ideas could lead to employees being rejected because the person deviates from the group or shows weaknesses (Gebert, Boerner, & Kearney, 2006). Voice can further damage interpersonal relationships (van Dyne & LePine, 1998), reduce a person's credibility, or make others view her or him as someone who complains a lot (Milliken et al., 2003). For extra-role creativity this fear is probably even more prominent, as it is not part of the person's job to generate these ideas.

Using the model of employee voice, Morrison (2011) emphasizes that, for employees who want to help their organization or work unit, there are contextual factors acting as moderators. These can influence whether employees feel it is safe and effective to speak up. The contextual factors may stem, for example, from the workgroup or the leader. Our interview study revealed that, for extra-role creativity to be voiced, support from colleagues is most important. Most employees said that colleagues were the first people they would contact before handing an idea to the leader. Tangirala & Ramanujam (2008) also argued that whether or not individuals speak up depends on the social team context. The influence of the climate in a work group can serve as a moderator between individual level factors and voice (Morrison, Wheeler-Smith, & Kamdar, 2011).

A particular climate has already been specified by West (1990) in his development of the team climate for innovation. It consists of dimensions such as vision, participative safety,

task orientation, and support for innovation. Various studies have highlighted that team climate for innovation, and its individual dimensions, are important in the innovation process (Bain et al., 2001; Eisenbeiss et al., 2008; Hülsheger, Anderson, & Salgado, 2009), with support for innovation being especially relevant (Pirola-Merlo, Härtel, Mann, & Hirst, 2002).

Support for innovation is defined as "(...) the expectation, approval and practical support of attempts to introduce new and improved ways of doing things in the work environment" (West, 1990, p. 318). An encouraging team climate, as described by support for innovation (West, 1990), could help employees feel that they are not rejected for speaking up. Previous studies showed that a climate supportive of creativity is related to greater involvement in the creative process (Shalley & Gilson, 2004) as well as to greater efforts to be innovative (Paulsen, Callan, Ayoko, & Saunders, 2013). Both factors Morrison (2011) highlighted as being relevant boundary conditions for voice to take place—safety and efficacy—could be induced through support for innovation. When new ideas are valued, it is likely that one feels safe proposing them. Additionally, colleagues who are willing to help refine an idea, make it efficient to express it. Based on this, we assume that when support for innovation is given, it is more likely that extra-role ideas are voiced.

When support for innovation is not given, employees might be less likely to speak up. Then they cannot be sure that their team would support their creative attempts. They might fear rejection, leading to a weaker relationship between extra-role creativity and voice. Taking these reasonings together, we assumed:

H1. The positive relationship between extra-role creativity and voice is moderated by support for innovation, in that the relationship is stronger when support for innovation is high.

From Voice to Innovation: Leader Support as a Boundary Condition

In addition to the influence of colleagues, the results of Study 1 accentuate the fact that leaders have an essential influence as well. Whereas previous studies have mainly focused on the leader as a predictor of creativity (Amabile et al., 1996; Shin & Zhou, 2003), our interview study revealed that leaders play a further important role as a boundary condition during the innovation process, facilitating or hindering the implementation of voiced ideas.

While there are many leadership behaviors that can be considered, Frese, Teng, and Wijnen (1999) highlighted leader support as a relevant moderator between voicing a suggestion and implementing it. Leader support is defined as a leader who encourages making suggestions (Frese et al., 1999). Thus, leader support is likely to be of pivotal importance for ideas to get implemented. Leaders create social contexts that can support or inhibit innovation (Mumford, Scott, Gaddis, & Strange, 2002). They further provide their employees with conditions in which their work takes place. Leaders are responsible for the structure of the environment and apply human resource practices such as rewards or performance evaluations which may or may not allow room for innovation to take place (Mumford et al., 2002; Shalley & Gilson, 2004).

Leaders who are perceived as supportive of innovation make employees feel encouraged to pursue their ideas (Janssen, 2005). Thus, when employees pursue their ideas, they are more likely to be implemented. Furthermore, for innovation to take place, sufficient resources must be used which could otherwise be used elsewhere, e.g., time, money, or utensils (Shalley & Gilson, 2004). As leaders control resources, their support is important because they need to allow their use (Mumford et al., 2002). It was shown that employees who were creative and had a supportive leader produced more innovative outcomes (Oldham & Cummings, 1996). Accordingly, the leader can provide a signal that an employee is welcome to implement an idea. When leaders do not approve of employees being innovative, they may simply not give them room and resources to do so. Then, even though employees

have voiced their suggestions, they will be less likely to be implemented. In sum, we assumed that leader support plays a fundamental role as a moderator between voice and innovation:

H2. Leader support moderates the positive relationship between voice and innovation, in that the relationship is stronger when leader support is high.

The Whole Process Perspective

When we studied the process from extra-role creativity to innovation, we found that social influences come into play at different steps of the innovation process. The two steps are depicted in our previous hypotheses. After testing them separately, we further aimed to test the combined effect of social influences on the whole process from extra-role creativity to innovation.

Anderson et al. (2014) have stated that one major omission in previous frameworks is the combination of idea generation and idea implementation. Our interview study showed that voice can be an important link between these two. When ideas are voiced they are more likely to be implemented (Rank et al., 2004). However, for this process to come into play, there are different boundary conditions. In particular, social influences play a huge role in enabling innovation (Janssen, 2003). We hypothesized that only when both the team and the leader are supportive of the innovative attempt is it likely that extra-role ideas evolve and become an innovation. Otherwise their implementation might stop during the process.

Team support can help create a climate where new ideas are welcomed and supported (West, 1990). This may help employees to speak up as they have lesser fear of being rejected. If employees speak up, it is then the support of the leader which helps drive ideas towards implementation. Leaders can actively support implementation by giving employees the freedom, time, and resources to do it (Shalley & Gilson, 2004). This led us to the conclusion

that both social influences are relevant at different stages for extra-role creativity leading to innovation. Thus our third hypothesis was:

> H3. The mediation from extra-role creativity via voice to innovation is dually moderated, first by support for innovation and second by leader support. We propose that the indirect effect is stronger when both support for innovation and leader support are high.

Method

Sample and Procedure

We conducted a cross-sectional online-questionnaire study; again, data were collected in the large transport and logistics organization in Germany, which provides services and maintenance work regarding transportation. We conducted the study with the agreement of the organization's work council. Prior to data assessment, employees were informed about the background of our research. We further assured participants of anonymity and explained that their organization would get a short data report based on averages in order to improve their idea management. Participation was voluntary and no compensations were offered. However, the organization allowed participants to take part in the study during work time.

In all, we collected data from 160 employees. Most worked as drivers, technical officers, administrators, or workshop employees. As they were not used to filling out questionnaires, many employees seemed only slightly curious about it, as they clicked through most or all items without answering them. We included only participants in our analysis who had answered at least 50% of the scales' items in order to calculate reliable scores. Thus, a further 39 individuals had to be excluded. The final sample consisted of 121 employees; 89.3% were male, 9.9% were female and one person did not make a specification

regarding gender. On average the participants were 47.59 years old (*SD* = 8.87) and they had worked with their team for about 6.42 years (*SD* = 5.00).

Measures

Extra-role creativity. We based the extra-role creativity scale on our findings from Study 1. To create a scale which captures extra-role creativity, we combined knowledge from operationalisations of creativity (e.g., Janssen, 2000; Tierney et al., 1999) and extra-role behavior (Morrison & Phelps, 1999) and constructed new items based on them. An example item is "I come up with ideas regarding new work methods that are more effective for the company". In all, our scale consisted of eight items (see Table 1) which were rated on a five-point Likert scale ranging from 1 (*never*) to 5 (*always*); Cronbach's alpha was .96.

To assess model fit, we conducted a CFA resulting in $X^2 = 86.50$, $df = 20$, $p < .001$, RMSEA = .17, CFI = .94, NFI = .92; for factor loadings see Table 1. Both the CFI and the NFI were above .90, thus ensuring that misspecified models are not accepted (Bentler, 1990; Bentler & Bonnet, 1980). The fit was also similar to that of other scales in the extra-role behavior context (Morrison & Phelps, 1999). Only the RMSEA was higher than expected, however, it was argued that for smaller samples (e.g., a sample of 200) the cut-off of 0.05 is too conservative (Chen, Curran, Bollen, Kirby, & Paxton, 2008). Accordingly, it is important to integrate also other goodness-of-fit measures to inform global model fit (Chen et al., 2008). Additionally, we looked at it theoretically. It is possible that the RMSEA is higher than expected because extra-role creativity consists of a broad range of ideas which are directed towards various aspects. Thus, it makes sense that the scale is more diverse, resulting in a higher error of approximation. When, for example, we excluded all the items regarding the correction of procedures, as well as the one which is not directed towards the organizational but the unit level, the model fit was excellent: $X^2 = 1.61$, $df = 2$, $p = .45$, RMSEA = .00, CFI = 1.00, NFI = .99. The model then only included item 2, 4, 7, and 8. However, as the underlying

theory is paramount (Eid, Gollwitzer, Schmitt, 2013), we decided to keep the scale in its diversity as only then can it capture the various aspects of extra-role creativity.

Voice. Voice was measured with five items by Liang, Farh, and Farh (2012) which we rephrased to capture self-assessment. A sample item is "I make constructive suggestions to improve the unit's operation." All items were rated on a five-point Likert scale ranging from 1 (*disagree*) to 5 (*agree*). Cronbach's alpha was .94.

Innovation. Innovation was measured with three items that refer to idea implementation which we adapted for self-assessment from the Innovative Work Behavior Scale (Janssen, 2000). An example item is "I transform innovative ideas into useful applications." All items were rated on a five-point Likert scale ranging from 1 (*never*) to 5 (*always*) with a Cronbach's alpha of .88.

Support for innovation. We assessed support for innovation with the shortened version of the Team Climate Inventory (TCI) by Kivimäki and Elovainio (1999) which is based on the TCI by Anderson and West (1996). All items were rated on a five-point Likert scale, ranging from 1 (*to a very small extent*) to 5 (*to a very large extent*). A sample item is "People in this work unit are always searching for fresh, new ways of looking at problems." Cronbach's alpha was .87.

Leader support. Leader support was measured with the two items developed by Frese et al. (1999). A sample item is "My leader encourages me to give suggestions." The items were answered on a five-point Likert scale ranging from 1 (*disagree*) to 5 (*agree*). The correlation between both items was high (r = .87).

Data Analysis

All hypotheses were tested with linear regression analyses one-tailed with a 95% confidence interval using the SPSS macro PROCESS (Hayes, 2013), which is based on bootstrapping. The advantage of bootstrapping is that it incorporates the skew of the distribution. In addition, confidence intervals were bias-corrected to improve the accuracy of

our models (MacKinnon, Lockwood, & Williams, 2004). First we conducted moderation analyses to examine hypotheses 1 and 2 and then computed a dual moderated mediation model which integrates both moderators simultaneously to test hypothesis 3. Prior to analysis, variables included in the moderation were centered on the mean.

Insert Table 1 and Table 2 about here

Results

Means, standard deviations, and correlations are presented in Table 2.

Test of Hypotheses

The results of the moderation analyses for testing hypothesis 1 and hypothesis 2 are presented in Table 3. Model 1 presents the results for hypothesis 1 while model 2 depicts the results for hypothesis 2.

Hypothesis 1 posits that the positive relationship between extra-role creativity and innovation is moderated by support for innovation, in that the relationship is stronger when support for innovation is high. As shown in Table 3 (Model 1), the interaction effect between support for innovation and extra-role creativity on voice was positively significant. Figure 3a shows that the relation between extra-role creativity and voice is stronger under conditions of high support for innovation ($b = .76$, $p < .05$) than under conditions of low support for innovation ($b = .55$, $p < .05$), thus supporting hypothesis 1.

Hypothesis 2 posits that the positive relationship between voice and innovation is moderated by leader support, in that the relationship is stronger when leader support is high. As voice and innovation can only take place when employees have ideas, we controlled for extra-role creativity. The results are presented in Table 3 (Model 2). The interaction effect between voice and leader support was significantly positive. The interaction effect is depicted in Figure 3b: under conditions of low leader support, the relation between voice and

innovation is non-significant (b = .00, *ns*); under conditions of high leader support it is (b = .35, $p < .05$). These findings support hypothesis 2.

Insert Table 3 and Figure 3 about here

To make sure that the two moderators operate on our assumed positions in the model, we also tested the moderations with swapped moderators. However, both interactions were non-significant. Leader support did not moderate the positive relationship between extra-role creativity and voice (b = .01, *ns*), nor did support for innovation moderate the positive relationship between voice and innovation (b = .03, *ns*).

Hypothesis 3 states that the mediation from extra-role creativity via voice to innovation is dually moderated, first by support for innovation and second by leader support. We proposed that the indirect effect is stronger when both support for innovation and leader support are high. The conditional indirect effects for testing hypothesis 3 are presented in Table 4. It is noticeable that the indirect effect of extra-role creativity on innovation via voice was only significant when leader support was high (one standard deviation above the mean), not when it was low (one standard deviation below the mean). This underlines that leader support is relevant for the indirect effect to take place. The indirect effect when leader support was high increased further with higher values of support for innovation. To estimate whether this increase was statistically significant, we calculated a z-score for the differences of the beta weights, comparing low, medium, and high support for innovation under the condition of high leader support. The comparison between low and medium support for innovation was statistically non-significant (z = 0.25, *ns*) and the comparison between medium and high support for innovation was also non-significant (z = 0.25, *ns*). The comparison between low and high support for innovation was further non-significant (z = 0.50, *ns*). This shows that the increase in support for innovation under conditions of high leader support did not make a significant difference on the innovation output. Accordingly, when examining support for

innovation and leader support in a dual moderated mediation model, leader support had the strongest impact on the indirect effect, while support for innovation became non-significant. Thus, hypothesis 3 was partly empirically supported: the indirect effect is the highest when leader support is high. Under this condition, the effect of support for innovation was not statistically significant.

Insert Table 4 about here

Discussion

Our results revealed that, as hypothesized, support for innovation moderates the positive relation of extra-role creativity to voice; leader support moderates the effect of voice in relation to innovation. Simple slope analysis revealed that the more a team supports creative attempts, the more employees voice their ideas. Simple slope analysis further showed that the relation between voice and innovation is only significant under a high amount of leader support. Additionally, we tested both moderators together in a dual moderated mediation model. Our analysis revealed that leader support had an impact on the indirect effect of extra-role creativity via voice on innovation, but support for innovation was not significant anymore.

Our findings highlight the importance of social support as a boundary condition in the innovation process. It seems to be important for employees to work in an environment where colleagues support each other to voice ideas. Support for innovation might make employees feel valued for their ideas by colleagues, and therefore more motivated to voice them. This is in line with the intrinsic motivation perspective by Amabile (1988). She suggests that the context influences an employee's intrinsic motivation which then affects creative achievement. Also, it has been shown empirically that support for innovation influences motivation which in turn leads to more innovative performance (Chen, Farh, Campbell-Bush, Wu, & Wu, 2013). The anticipated help and support from colleagues due to a supportive

climate may further give employees the confidence needed that their ideas will be supported (Zhou & George, 2001). Similarly, perceived recognition and rewards for creativity were positively related to creative performance (George & Zhou, 2002). However, when tested simultaneously with leader support in a dual moderated mediation model, the effect of support for innovation as a boundary condition became non-significant. A reason could be that, in direct comparison, leader support overshadows support from colleagues. Leader support and support for innovation were correlated, thus multicollinearity might be a problem. When integrating both variables in a cross-sectional model, leader support may take away the variance from support for innovation, making the effect less strong. This relationship between leader support and support for innovation has also been shown in other studies. The leader seems to be an influence on the team climate (Eisenbeiss et al., 2008; Pirola-Merlo et al., 2002). Thus the leader may influence the first step of the innovation process indirectly through inducing support for innovation, and accordingly sharing variance with the team climate. More information could be provided with structural equation modeling with a larger sample that additionally integrates the leader in the first step as the initiator of the team climate. Furthermore, a longitudinal examination which takes the time perspective into consideration could help understand both variables as the process from extra-role creativity to innovation unfolds.

Our results underline the prominent role of leaders in the implementation of ideas. This is stressed by the fact that high leader support was a precondition for the indirect effect. Accordingly, the leader seems to function almost inevitably as a gate keeper in the innovation process. The importance of the leader for the implementation of ideas underlines that "creativity and innovation (…) require skilful leadership to maximize the benefits of new and improved ways of working" (Anderson et al., 2014, p. 1298). While previous literature mainly focused on the impact of leadership on creativity, we further emphasize the importance of the leader throughout the innovation process (Basadur, 2004). During this process, leader support

seems to be specifically required in order for ideas to get implemented. The importance of the leader at this stage of the innovation process was also found in previous studies (Shalley & Gilson, 2004).

A limiting factor of Study 2 is our cross-sectional approach. Therefore, it is not possible to deduce conclusions about the causality of the found relationships. Regarding our third hypothesis in particular, which includes a mediation, longitudinal data would be best to examine it further (Cole & Maxwell, 2003). Future research should take time into consideration to realistically depict how the innovation process unfolds. However, Rank et al. state that "if new ideas are not articulated, they can hardly be implemented" (2004, p. 523). Thus, given the nature of how ideas evolve, it is likely that ideas must be generated first before they can be expressed and implemented. The successful implementation of an idea might further lead to increased motivation to be creative and thus again to more extra-role creativity. We recommend testing this hypothesis of a positive upward spiral in a longitudinal study in which the different variables are assessed repeatedly.

Regarding the measurement fit of the extra-role creativity scale, we decided to keep the complexity of the scale. We believe that extra-role creativity is complex as it includes various aspects of idea generation. This has been shown in our interview data; no idea was like the other, each relating to a different problem. Also in the literature it has been argued that creativity is a complex construct including, for example, both radical and incremental ideas (Anderson et al., 2014). Future studies could further refine extra-role creativity by differentiating between different aspects of the construct. For example, to differentiate small ideas from bigger ones, consideration might be given to how many employees potentially profit from an idea, or how long it takes to develop the idea. Our analysis is a first step towards analyzing extra-role creativity in its complexity and we hope for more research that looks more at the details of the construct.

General Discussion

The aim of our study was to illuminate in detail extra-role creativity and its relation to innovation. We did this by conducting two complementary studies. First, we explored the innovation process with a qualitative analysis and deduced a surrounding framework (Study 1); then, in a second step, we validated parts of the model with a quantitative analysis (Study 2). As the innovation process is primarily a social process (Rank et al., 2004), we concentrated on social influences in both approaches.

Our results reveal that, although many employees are not required to come up with ideas, most generate them nonetheless. These ideas are developed spontaneously and are related to the direct work environment, demonstrating that extra-role creativity is present. Regarding the implementation of ideas, two social influences could be established: first colleagues, who mainly serve as discussion partners for the employee. They are helpful for initial feedback and further elaboration before ideas are voiced to the leader. Second, the leader serves as a gate keeper for idea implementation. Those explorative results were mostly supported with quantitative testing. Support for innovation served as a moderator between extra-role creativity and voice, and leader support served as a moderator between voice and innovation. When examining both moderations simultaneously in a dual moderated mediation approach, leader support proved to be significant for influencing the indirect effect of extra-role creativity via voice on innovation, however, support for innovation did not make a significant impact anymore.

Theoretical Implications

Our results lead to several implications for research and practice. First, the concept of extra-role creativity is supported. To the best of our knowledge, the two studies presented here are the first that empirically examine extra-role creativity. Our results support former theoretical assumptions (Montag et al., 2012; Potočnik & Anderson, 2016; Unsworth, 2001) in that extra-role creativity is discretionary and goes beyond role expectations. It further

encourages the view that “creative work can be generated by employees in any job and at any level of the organization, not just in jobs that are traditionally viewed as necessitating creativity” (Madjar et al., 2002, p. 757).

Second, the found interplay between the innovative process of a person and her or his work environment highlights that a creative process does not occur in a vacuum but is influenced through the environment. The interaction between the person and her or his environment supports the interactionist perspective on organizational creativity (Woodman et al., 1993). This perspective highlights the importance of interplay between a person and a situation for creative output to occur.

Third, our study gives in-depth information about the kind and the role of social influences in the innovation process. Various assumptions have already been made about the work context promoting or hindering creative achievement (Amabile et al., 1996; Anderson et al., 2014) and previous studies highlighted that leader’s or colleagues’ support are important for creative performance (Madjar et al., 2002; Oldham & Cummings, 1996). Our study allows us to refine these statements. First, the team’s support and then the leader’s support is important in the innovation process.

Paying attention to these social influences may be especially relevant when considering the other options that would come into play when employees’ ideas are not pursued. If ideas are repeatedly left unvoiced and unimplemented, employees might become dissatisfied, which could make them withdraw from their work or even exit the organization (Farrell, 1983). Allowing employees to channel problems via generating ideas is a constructive approach to handle job dissatisfaction (Zhou & George, 2001). Thus, helping ideas to be voiced and implemented might not only be positive insofar as the employee and the organization can thrive on the ideas, but also in that the process itself prevents negative results such as the employee becoming frustrated or terminating her or his employment.

Future studies could examine these influences in more detail. For example, how is a supportive climate and leader support created? Other climates such as justice climate are supposed to emerge from experiences, information sharing, and interaction with team colleagues (Rupp, Bashshur, & Liao, 2007). The emergence of support for innovation might be similar. In their meta-analysis, Hülsheger et al. (2009) examined team process variables in the innovation context. They proposed that leaders and management representatives influence the team climate. In contrast, team composition and structure variables were of less importance for innovation (Hülsheger et al., 2009). Thus, management styles could be assessed in order to explain how a climate supportive of innovation develops.

The examination of different leadership styles could be interesting regarding how leader support emerges. Future studies could explore how the leader can signal that she or he is open to suggestions. For example, transformational leadership could be considered conducive as it is a leadership style targeted at change (Bass, 1985), or ambidextrous leadership could be tested as it was developed specifically for the innovation process (Rosing et al., 2011).

Furthermore, both leaders and teams do not affect individuals alone, but teams as a whole. For example, the importance of support for innovation is even greater in relation to team innovation than to individual innovation (Hülsheger et al., 2009). Anderson and West (1996) speak of team climate as a collective-level phenomenon, and leadership is oftentimes considered to influence teams as a whole (Eisenbeiss et al., 2008). Thus, it would be interesting to test our results again in a multilevel approach that also includes the team level.

Limitations

Besides the several strengths of this work, there are limitations which need to be addressed. First, we relied on self-ratings. The resulting common method variance may have led to biases in our effects (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). To get a more complete picture of the innovation process it would be beneficial to combine different data

sources. More objective data could be used as an additional indicator for innovation, e.g., the number of patents. To limit a possible bias in our study, we based our results on different methodological approaches. Both approaches led to similar findings, supporting our results.

Another limiting but also beneficial factor is that we conducted both studies within one organization. In consequence, it is difficult to generalize the results to other organizational settings. However, by doing so, we could keep influences of the organizational context—such as human resource practices, organizational culture, size, and strategy (for an overview of organizational influences on innovation see Anderson et al., 2014)—constant. To capture extra-role creativity, we asked about ideas regarding processes, procedures, and methods to improve organizational efficiency. This matches what interviewees had described as extra-role creativity in the interview study. Thus we believe that generating these ideas is not part of the job of most employees. However, there could still be employees which would say otherwise, employees from the R&D department, for example, whose job it is to develop new products or improve processes (Unsworth, 2001). In their jobs, it is probably more difficult to distinguish creativity as in-role and as extra-role behavior. As we did not assess any employees from R&D in our study, we cannot make any assumptions about this. Future studies could consider this aspect and specifically look at extra-role creativity in employees whose job it is to be highly creative.

Another limitation is that our samples consisted mainly of men. Although this is representative of the organization, it limits the generalizability of our results to female employees. When looking at other studies with a majority of females, similar results were reported. Madjar et al. (2002) also found moderating effects from social support on creative performance with a sample of 97% females. Madjar et al. (2002) reasoned in their study that their results may have an evolutionary explanation because women may be more nurturing than men. However, our study showed that, against this gender-stereotype, men also benefit

from social support. Thus it is likely that the positive effect of social support is consistent, regardless of gender.

Practical Implications

The results of our studies bear great potential to improve idea management. Many managers make the assumption that creativity can only be shown in certain contexts (Amabile, 1998). Our studies show that this view is too restricted, and may even be dangerous for organizational survival. Through acknowledging and fostering extra-role creativity it is possible to utilize the full creative potential of an organization. This can help tackle problems which the organization faces. If organizations struggle, extra-role creativity could be one solution. As employees know the organization very well, their ideas can be a valuable resource to help it stay sustainable and competitive even when organizational problems arise.

If organizations wish to foster the implementation of ideas, they should make that aim transparent to their employees. New employees should be informed that extra-role creativity and innovation are valued. Then they know that they are welcome to voice their ideas and that they are appreciated. Additionally, it cannot be assumed that ideas get implemented without any effort from the organization. Both colleagues and leaders are crucial during an innovation process.

Organizations should further sensitize their leaders and their employees to the fact that everyone can have good ideas, even though it may not be part of her or his job to come up with them. A first step towards using the organizational idea potential is colleagues carefully listening to ideas without judging them. They should be open to discussing ideas with each other and helping refine them. This could be instilled through specific creativity training, whereby employees learn how to support each other in creative attempts and to refine ideas so that they can be used by the organization. Especially important may be educating employees about how to calculate the costs and savings of an idea in these trainings, as many have

problems with that. This may help them to judge ideas more easily and decide which ones are worth implementing.

Leaders could learn in specific training programs how to support their employees during the innovation process. Their training should cover aspects such as creating an environment where errors are seen as opportunities. This focus transmits the principle that improvements are welcome and thinking outside the box is appreciated (Garvin, 1993). This may take away the fear of failing when implementing an idea. Leader training could further cover aspects of empowering employees—within specific, preassigned borders. For example, small incremental improvements may not be needed to be discussed with the leader. This could save time for the leader and accelerate the implementation process. For bigger ideas where the exchange between parties is important, leaders could implement weekly meetings to discuss ideas or foster informal idea discussions by allowing extended coffee breaks or so called brownbag-sessions. Then employees could easily engage with their team to talk about ideas, refine them and then voice them to their leader.

To share good ideas throughout the organization, organizational suggestion systems are one possibility. However, it has been shown that only very fully thought-out ideas are passed onto them. Other ideas might get implemented without the organization even noticing. However, the whole organization might profit from them. Thus, there should be more organizational initiatives that promote the exchange of ideas, e.g., best practice forums. This could be an online forum for employees where they can share ideas with each other.

Conclusion

In conclusion, the current work adds knowledge to the understanding of extra-role creativity and its relation to innovation. Our results help understand how companies can cope with the major competition for innovation. Within the innovation process, a high degree of support for innovation and leader support are needed as boundary conditions. Our studies follow the call of Anderson et al. (2014) and Ohly and Stelzer (2007) to examine the

innovation process and its boundary conditions more specifically. While the social context has already been highlighted to be important (Rank et al., 2004), we can make more refined statements: first team support and then leader support seem to be important for extra-role creativity to become an innovation. Thus our study gives answers to the question of how ideas can be managed well, setting the foundation for organizational success.

References

Amabile T. M. (1988). A model of creativity and innovation in organizations. In B. M. Staw & L. L. Cummings (Eds.), *Research in Organizational Behavior* (Vol. 10, pp. 123–167). Greenwich, CT: JAI Press.

Amabile, T. M. (1996). *Creativity in context: Update to the "social psychology of creativity"*. Boulder, CO: Westview Press.

Amabile, T. M. (1997). Motivating creativity in organizations: On doing what you love and loving what you do. *California Management Review, 40*, 39–58. doi:10.2307/41165921

Amabile, T. M. (1998). How to kill creativity. In J. Henry (Ed.), *Creative management and development* (pp. 76–87). Thousand Oaks, CA: Sage.

Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal, 39*, 1154–1184. doi:10.2307/256995

Anderson, N., Potočnik, K., & Zhou, J. (2014). Innovation and creativity in organizations: A state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management, 40*, 1297–1333. doi:10.1177/0149206314527128

Anderson, N., & West, M. A. (1996). The team climate inventory: Development of the TCI and its applications in teambuilding for innovativeness. *European Journal of Work and Organizational Psychology, 5*, 53–66. doi:10.1080/13594329608414840

Axtell, C. M., Holman, D. J., Unsworth, K. L., Wall, T. D., Waterson, P. E., & Harrington, E. (2000). Shopfloor innovation: Facilitating the suggestion and implementation of ideas. *Journal of Occupational and Organizational Psychology, 73*, 265–285. doi:10.1348/096317900167029

Bain, P. G., Mann, L., & Pirola-Merlo, A. (2001). The innovation imperative: The relationships between team climate, innovation, and performance in research and development teams. *Small Group Research, 32*, 55–73. doi:10.1177/104649640103200103

Balkin, D. B., Roussel, P., & Werner, S. (2015). Performance contingent pay and autonomy: Implications for facilitating extra-role creativity. *Human Resource Management Review, 25*, 384–395. doi:10.1016/j.hrmr.2015.07.001

Basadur, M. (2004). Leading others to think innovatively together: Creative leadership. *The Leadership Quarterly, 15*, 103–121. doi:10.1016/j.leaqua.2003.12.007

Bass, B. M. (1985). *Leadership and performance beyond expectations.* New York: Free Press.

Bentler, P.M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*, 238–246. doi: 10.1037/0033-2909.107.2.238

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*, 588–606. doi:10.1037/0033-2909.88.3.588

Boeddrich, H.-J. (2004). Ideas in the workplace: A new approach towards organizing the fuzzy front end of the innovation process. *Creativity and Innovation Management, 13*, 274–285. doi:10.1111/j.0963-1690.2004.00316.x

Chen, F., Curran, P. J., Bollen, K. A., Kirby, J., & Paxton, P. (2008). An empirical evaluation of the use of fixed cutoff points in RMSEA test statistic in structural equation models. *Sociological Methods & Research, 36*, 462–494. doi:10.1177/0049124108314720

Chen, G., Farh, J.-L., Campbell-Bush, E. M., Wu, Z., & Wu, X. (2013). Teams as innovative systems: Multilevel motivational antecedents of innovation in R&D teams. *Journal of Applied Psychology, 98*, 1018–1027. doi:10.1037/a0032663

Cole, D. A., & Maxwell, S. E. (2003). Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology, 112*, 558–577. doi:10.1037/0021-843X.112.4.558

Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly, 44*, 350–383. doi:10.2307/2666999

Eid, M., Gollwitzer, M., & Schmitt, M. (2013). *Statistik und Forschungsmethoden* [Statistics and research methods]. Weinheim, Germany: Beltz.

Eisenbeiss, S. A., van Knippenberg, D., & Boerner, S. (2008). Transformational leadership and team innovation: Integrating team climate principles. *Journal of Applied Psychology, 93*, 1438–1446. doi:10.1037/a0012716

Ekvall, G. (1996). Organizational climate for creativity and innovation. *European Journal of Work and Organizational Psychology, 5*, 105–123. doi:10.1080/13594329608414845

Fairbank, J. F., & Williams, S. D. (2001). Motivating creativity and enhancing innovation through employee suggestion system technology. *Creativity and Innovation Management, 10*, 68–74. doi:10.1111/1467-8691.00204

Farrell, D. (1983). Exit, voice, loyalty, and neglect as responses to job dissatisfaction: A multidimensional scaling study. *Academy of Management Journal, 26*, 596–607. doi:10.2307/255909

Ford, C. M. (1996). A theory of individual creative action in multiple social domains. *Academy of Management Review, 21*, 1112–1142. doi:10.5465/AMR.1996.9704071865

Frese, M., Teng, E., & Wijnen, C. J. (1999). Helping to improve suggestion systems: Predictors of making suggestions in companies. *Journal of Organizational Behavior, 20*, 1139–1155. doi:10.1002/(SICI)1099-1379(199912)20:7<1139

Garvin, D. A. (1993). Building a learning organization. *Harvard Business Review, 71(4)*, 78–91. Retrieved from https://hbr.org/1993/07/building-a-learning-organization

Gebert, D., Boerner, S., & Kearney, E. (2006). Cross-functionality and innovation in new product development teams: A dilemmatic structure and its consequences for the management of diversity. *European Journal of Work and Organizational Psychology, 15*, 431–458. doi:10.1080/13594320600826314

George, J. M., & Zhou, J. (2002). Understanding when bad moods foster creativity and good ones don't: The role of context and clarity of feelings. *Journal of Applied Psychology, 87*, 687–697. doi:10.1037/0021-9010.87.4.687

Getz, I., & Robinson, A. G. (2003). Innovate or die: Is that a fact? *Creativity and Innovation Management, 12*, 130–136. doi:10.1111/1467-8691.00276

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the gioia methodology. *Organizational Research Methods, 16*, 15–31. doi:10.1177/1094428112452151

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach.* New York, NY: Guilford Press.

Hueske, A.-K., Endrikat, J., & Guenther, E. (2015). External environment, the innovating organization, and its individuals: A multilevel model for identifying innovation barriers accounting for social uncertainties. *Journal of Engineering and Technology Management, 35*, 45–70. doi:10.1016/j.jengtecman.2014.10.001

Hueske, A.-K., & Guenther, E. (2015). What hampers innovation? External stakeholders, the organization, groups and individuals: A systematic review of empirical barrier research. *Management Review Quarterly, 65*, 113–148. doi:10.1007/s11301-014-0109-5

Hülsheger, U. R., Anderson, N., & Salgado, J. F. (2009). Team-level predictors of innovation at work: A comprehensive meta-analysis spanning three decades of research. *Journal of Applied Psychology, 94*, 1128–1145. doi:10.1037/a0015978

Janssen, O. (2000). Job demands, perceptions of effort-reward fairness and innovative work behaviour. *Journal of Occupational and Organizational Psychology, 73*, 287–302. doi:10.1348/096317900167038

Janssen, O. (2003). Innovative behaviour and job involvement at the price of conflict and less satisfactory relations with co-workers. *Journal of Occupational and Organizational Psychology, 76*, 347–364. doi:10.1348/096317903769647210

Janssen, O. (2005). The joint impact of perceived influence and supervisor supportiveness on employee innovative behaviour. *Journal of Occupational and Organizational Psychology, 78*, 573–579. doi:10.1348/096317905X25823

Jeberien, B., Stephan, M., & Schneider, M. J. (2013). *Management von Ideen: Stand in der Praxis* [Idea management: State-of-the-art in current practice] (Report No. 13-01). Marburg, Germany: Philipps-University Marburg.

Kinkel, S., Lay, G., & Wengel, J. (2004). *Innovation: Mehr als Forschung und Entwicklung. Wachstumschancen auf anderen Innovationspfaden* [Innovation: More than Research and Development: Growth opportunities on different innovation paths] (Report No. 33). Karlsruhe, Germany: Fraunhofer, ISI.

Kivimäki, M., & Elovainio, M. (1999). A short version of the team climate inventory: Development and psychometric properties. *Journal of Occupational and Organizational Psychology, 72*, 241–246. doi:10.1348/096317999166644

Liang, J., Farh, C. I. C., & Farh, J.-L. (2012). Psychological antecedents of promotive and prohibitive voice: A two-wave examination. *Academy of Management Journal, 55*, 71–92. doi:10.5465/amj.2010.0176

MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research, 39*, 99–128. doi:10.1207/s15327906mbr3901_4

Madjar, N., Oldham, G. R., & Pratt, M. G. (2002). There's no place like home? The contributions of work and nonwork creativity support to employees' creative performance. *Academy of Management Journal, 45*, 757–767. doi:10.2307/3069309

MAXQDA (Version 12) [Computer software]. Berlin, Germany: VERBI Software.

Milliken, F. J., Morrison, E. W., & Hewlin, P. F. (2003). An exploratory study of employee silence: Issues that employees don't communicate upward and why. *Journal of Management Studies, 40*, 1453–1476. doi:10.1111/1467-6486.00387

Mirow, C., Hölzle, K., & Gemünden, H. G. (2007). Systematisierung, Erklärungsbeiträge und Effekte von Innovationsbarrieren [Systematization, explanatory contributions, and effects of innovation barriers]. *Management Review Quarterly, 57*, 101–134. doi:10.1007/s11301-007-0023-1

Montag, T., Maertz, C. P., & Baer, M. (2012). A critical analysis of the workplace creativity criterion space. *Journal of Management*, *38,* 1362–1386. doi:10.1177/0149206312441835

Morrison, E. W. (2011). Employee voice behavior: Integration and directions for future research. *The Academy of Management Annals*, *5,* 373–412. doi:10.1080/19416520.2011.574506

Morrison, E. W., & Milliken, F. J. (2000). Organizational silence: A barrier to change and development in a pluralistic world. *Academy of Management Review, 25*, 706–725. doi:10.5465/AMR.2000.3707697

Morrison, E. W., & Phelps, C. C. (1999). Taking charge at work: Extrarole efforts to initiate workplace change. *Academy of Management Journal, 42*, 403–419. doi:10.2307/257011

Morrison, E. W., Wheeler-Smith, S. L., & Kamdar, D. (2011). Speaking up in groups: A cross-level study of group voice climate and voice. *Journal of Applied Psychology*, *96*, 183–191. doi:10.1037/a0020744

Mumford, M. D., Scott, G. M., Gaddis, B., & Strange, J. M. (2002). Leading creative people: Orchestrating expertise and relationships. *The Leadership Quarterly, 13*, 705–750. doi:10.1016/S1048-9843(02)00158-3

Paulsen, N., Callan, V. J., Ayoko, O., & Saunders, D. (2013). Transformational leadership and innovation in an R&D organization experiencing major change. *Journal of Organizational Change Management, 26*, 595–610. doi:10.1108/09534811311328597

Ohly, S., Sonnentag, S., & Pluntke, F. (2006). Routinization, work characteristics and their relationships with creative and proactive behaviors. *Journal of Organizational Behavior, 27*, 257–279. doi:10.1002/job.376

Ohly, S., & Stelzer, F. (2007). Über die Motivation zur Teilnahme am Ideenmanagement [About the motivation to participate in the idea management]. *Wirtschaftspsychologie, 9(2),* 25–33. Retrieved from http://www.psychologie-aktuell.com/index.php?id=wirtschaftspsychologie

Oldham, G. R., & Cummings, A. (1996). Employee creativity: Personal and contextual factors at work. *Academy of Management Journal, 39*, 607–634. doi:10.2307/256657

Pirola-Merlo, A., Härtel, C., Mann, L., & Hirst, G. (2002). How leaders influence the impact of affective events on team climate and performance in R&D teams. *The Leadership Quarterly, 13*, 561–581. doi:10.1016/S1048-9843(02)00144-3

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*, 879–903. doi:10.1037/0021-9010.88.5.879

Potočnik, K., & Anderson, N. (2016). A constructively critical review of change and innovation-related concepts: Towards conceptual and operational clarity. *European Journal of Work and Organizational Psychology, 25*, 481–494. doi:10.1080/1359432X.2016.1176022

Rank, J., Pace, V. L., & Frese, M. (2004). Three avenues for future research on creativity, innovation, and initiative. *Journal of Applied Psychology, 53*, 518–528. doi:10.1111/j.1464-0597.2004.00185.

Rosing, K., Frese, M., & Bausch, A. (2011). Explaining the heterogeneity of the leadership-innovation relationship: Ambidextrous leadership. *The Leadership Quarterly, 22*, 956–974. doi:10.1016/j.leaqua.2011.07.014

Rupp, D. E., Bashshur, M., & Liao, H. (2007). Justice climate past, present, and future: Models of structure and emergence. In F. Yammarino & F. Dansereau (Eds.), *Multi-level issues in organizations and time* (Vol. 6, pp. 357–396). Bingley, UK: Emerald Group Publishing Limited. doi:10.1016/S1475-9144(07)06017-1

Schultz, H. (1999). *Pour your heart into it: How starbucks built a company one cup at a time.* New York, NY: Hachette Books.

Shalley, C. E., & Gilson, L. L. (2004). What leaders need to know: A review of social and contextual factors that can foster or hinder creativity. *The Leadership Quarterly, 15*, 33–53. doi:10.1016/j.leaqua.2003.12.004

Shalley, C. E., Gilson, L. L., & Blum, T. C. (2009). Interactive effects of growth need strength, work context, and job complexity on self-reported creative performance. *Academy of Management Journal, 52*, 489–505. doi:10.5465/AMJ.2009.41330806

Shin, S. J., & Zhou, J. (2003). Transformational leadership, conservation, and creativity: Evidence from Korea. *Academy of Management Journal, 46*, 703–714. doi:10.2307/30040662

Sonenshein, S. (2014). How organizations foster the creative use of resources. *Academy of Management Journal, 57*, 814–848. doi:10.5465/amj.2012.0048

Staw, B. M. (1995). Why no one really wants creativity. In C.M. Ford & D.A. Gioia (Eds.), *Creative action in organizations: Ivory tower visions and real world voices (*pp. 161–166). Thousand Oaks, CA: Sage.

Tangirala, S., & Ramanujam, R. (2008). Employee silence on critical work issues: The cross level effects of procedural justice climate. *Personnel Psychology, 61*, 37–68. doi:10.1111/j.1744-6570.2008.00105.x

Tierney, P., Farmer, S. M., & Graen, G. B. (1999). An examination of leadership and employee creativity: The relevance of traits and relationships. *Personnel Psychology, 52*, 591–620. doi:10.1111/j.1744-6570.1999.tb00173.x

Unsworth, K. (2001). Unpacking creativity. *Academy of Management Review, 26*, 289–297. doi:10.5465/AMR.2001.4378025

van Dyne, L., Ang, S., & Botero, I. C. (2003). Conceptualizing employee silence and employee voice as multidimensional constructs. *Journal of Management Studies, 40*, 1359–1392. doi:10.1111/1467-6486.00384

van Dyne, L., Cummings, L. L., & Parks, M. J. (1995). Extra- role behaviors: In pursuit of construct and definitional clarity. In L. L. Cummings & B. M. Shaw (Eds.), *Research in organizational behavior* (Vol. 17, pp. 215–285). Greenwich, CT: JAI Press.

van Dyne, L., & LePine, J. A. (1998). Helping and voice extra-role behaviors: Evidence of construct and predictive validity. *Academy of Management Journal, 41*, 108–119. doi:10.2307/256902

Vroom, V. H. (1964). *Work and motivation*. New York, NY: Wiley.

West, M. A. (1990). The social psychology of innovation in groups. In M. A. West, & J. L. Farr (Eds.), *Innovation and creativity at work: Psychological and organizational strate*gies (pp. 309–333). Chichester, United Kingdom: John Wiley & Sons, Ltd.

West, M. A. (2002). Sparkling fountains or stagnant ponds: An integrative model of creativity and innovation implementation in work groups. *Journal of Applied Psychology, 51*, 355–387. doi:10.1111/1464-0597.00951

West, M. A., & Farr, J. L. (1990). Innovation at work. In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work: Psychological and organizational strategies* (pp. 3–15). Oxford, United Kingdom: Wiley.

Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *Academy of Management Review, 18*, 293–321. doi:10.5465/AMR.1993.3997517

Zhou, J., & George, J. M. (2001). When job dissatisfaction leads to creativity: Encouraging the expression of voice. *Academy of Management Journal, 44*, 682–696. doi:10.2307/3069410

Table 1

Factor Analysis Results for Extra-Role Creativity

Item	Factor Loading
1. I develop ideas to bring about improved procedures for the work unit or department.	.84
2. I develop ideas to institute new work methods that are more effective for the company.	.86
3. I develop ideas to change organizational rules or policies that are nonproductive or counterproductive.	.87
4. I develop ideas for constructive suggestions to improve how things operate within the organization.	.91
5. I develop ideas to correct a faulty procedure or practice.	.85
6. I develop ideas to eliminate redundant or unnecessary procedures.	.86
7. I develop ideas to implement solutions to pressing organizational problems.	.90
8. I develop ideas to introduce new structures, technologies, or approaches to improve efficiency.	.90

Note. $N = 121$.

Table 2

Means, Standard Deviations, and Intercorrelations between Study Variables

Variable	*M*	*SD*	1	2	3	4	5
1. Extra-role creativity	3.25	.89	-				
2. Voice	3.56	.90	.66**	-			
3. Support for innovation	3.19	1.02	.30**	.27**	-		
4. Leader support	3.81	1.10	.10	.08	.46**	-	
5. Innovation	2.46	1.07	.32**	.31**	.28**	.10	-

Note. $N = 121$. *$p < .05$. **$p < .01$.

Table 3

Estimated Linear Regressions with Moderation Effects

	Outcome: Voice				
		b	*SE*	*t*	R^2
Model 1					.46
	Constant	3.52	0.06	56.40**	
	Extra-role creativity	0.65	0.07	9.17**	
	Support for innovation	0.05	0.20	-.47	
	Interaction: Extra-role creativity x support for innovation	0.11	0.06	1.94*	
	Outcome: Innovation				
		b	*SE*	*t*	R^2
Model 2					.15
	Constant	1.63	0.43	3.75**	
	Voice	0.17	0.14	1.27	
	Extra-role creativity	0.25	0.13	1.95*	
	Leader support	0.05	0.09	.62	
	Interaction: Voice x leader support	0.16	0.09	1.83*	

Note. $N = 121$. 5000 bootstrap resamples for bias corrected bootstrap confidence intervals, one-tailed. *$p < .05$. **$p < .01$.

Table 4

Conditional Indirect Effects of Dual Moderated Mediation

Support for innovation	Leader support	Indirect effect	Boot *SE*	Boot LLCI	Boot ULCI
-1 *SD*	-1 *SD*	.00	.12	-.15	.24
-1 *SD*	*M*	.10	.09	-.01	.32
-1 *SD*	+1 *SD*	.19	.11	.06	.41
M	-1 *SD*	.00	.14	-.20	.25
M	*M*	.11	.10	-.02	.31
M	+1 *SD*	.23	.11	.06	.42
+1 *SD*	-1 *SD*	.00	.16	-.25	.27
+1 *SD*	*M*	.13	.11	-.03	.33
+1 *SD*	+1 *SD*	.27	.12	.08	.47

Note. $N = 121$. Boot = bootstrapped. 5000 bootstrap resamples for bias corrected bootstrap confidence intervals, one-tailed.

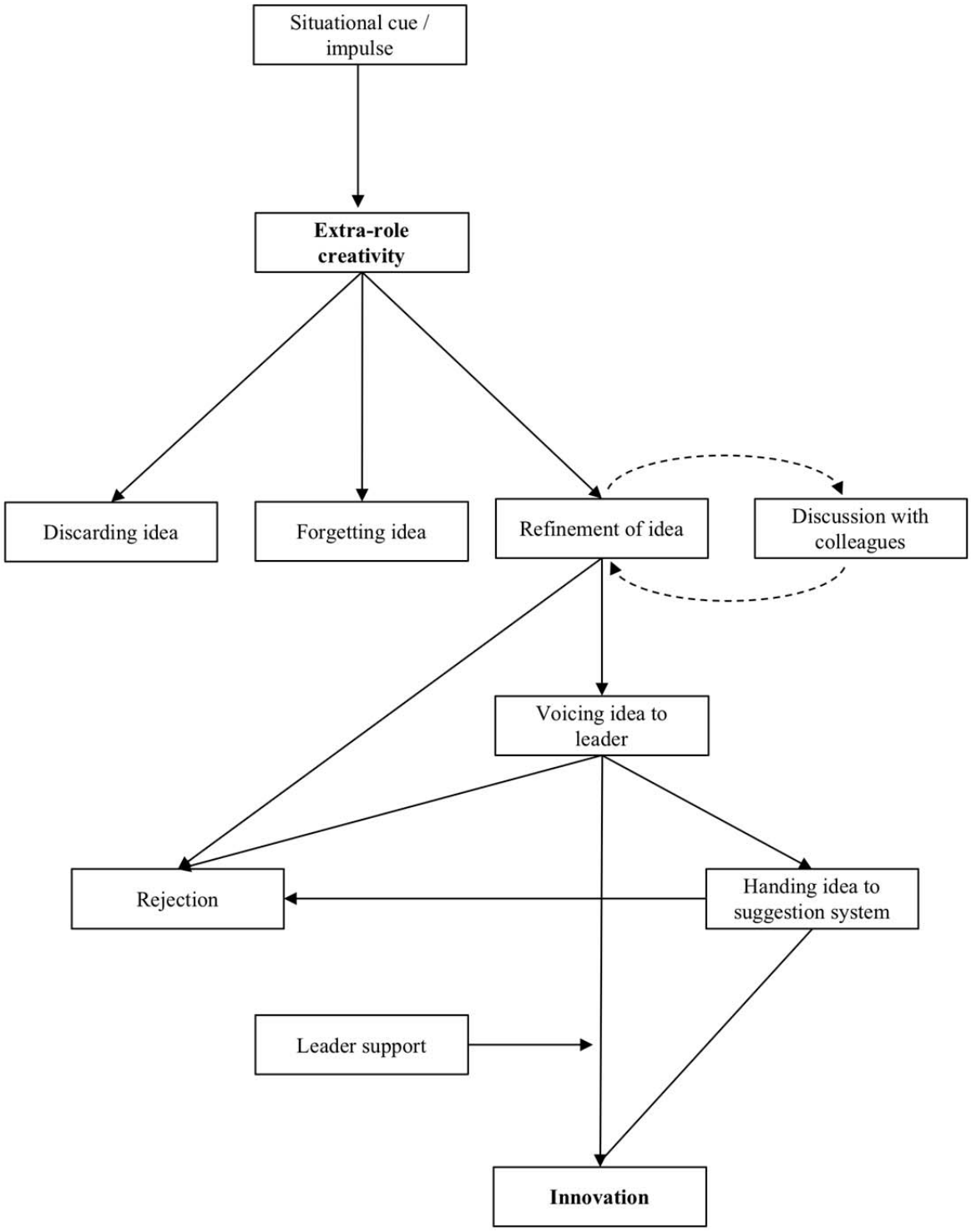


Figure 1. Extra-role creativity process model (Study 1).

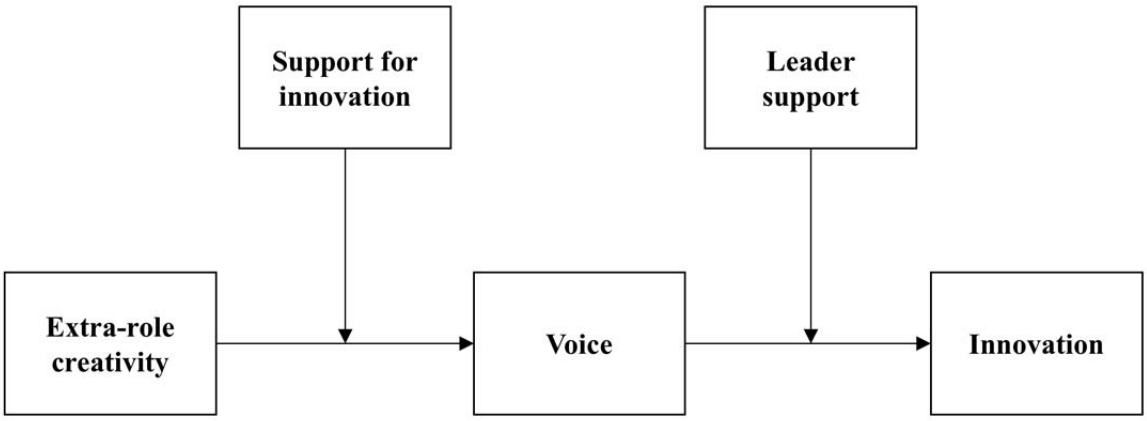
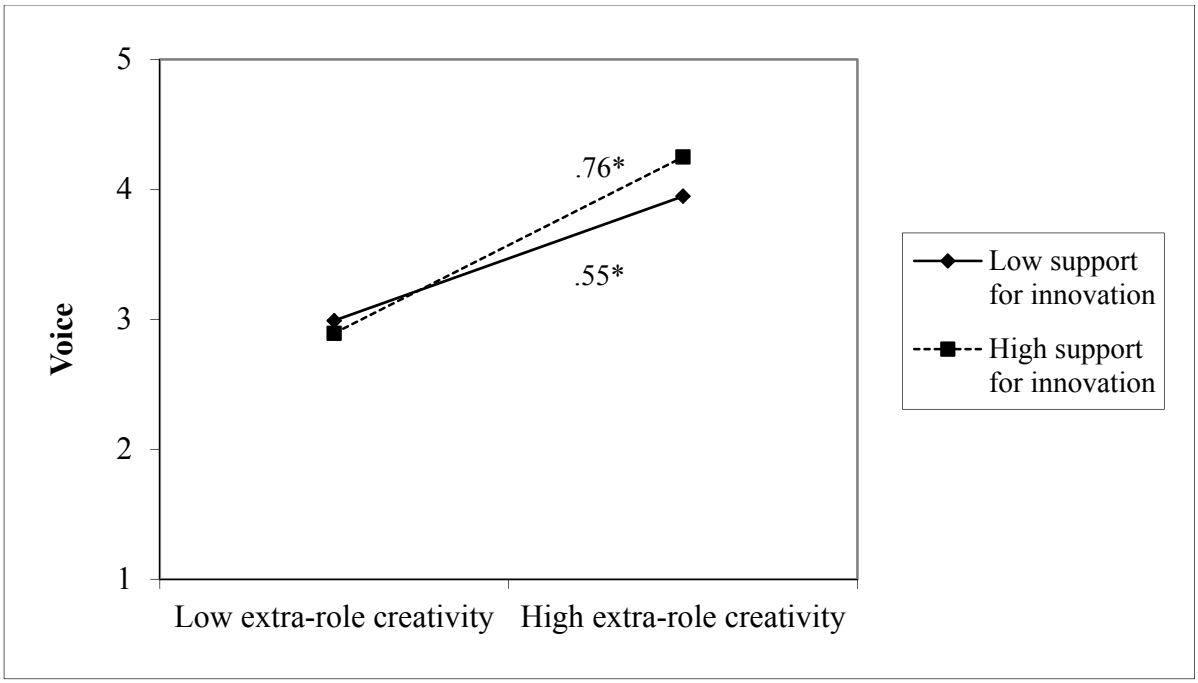
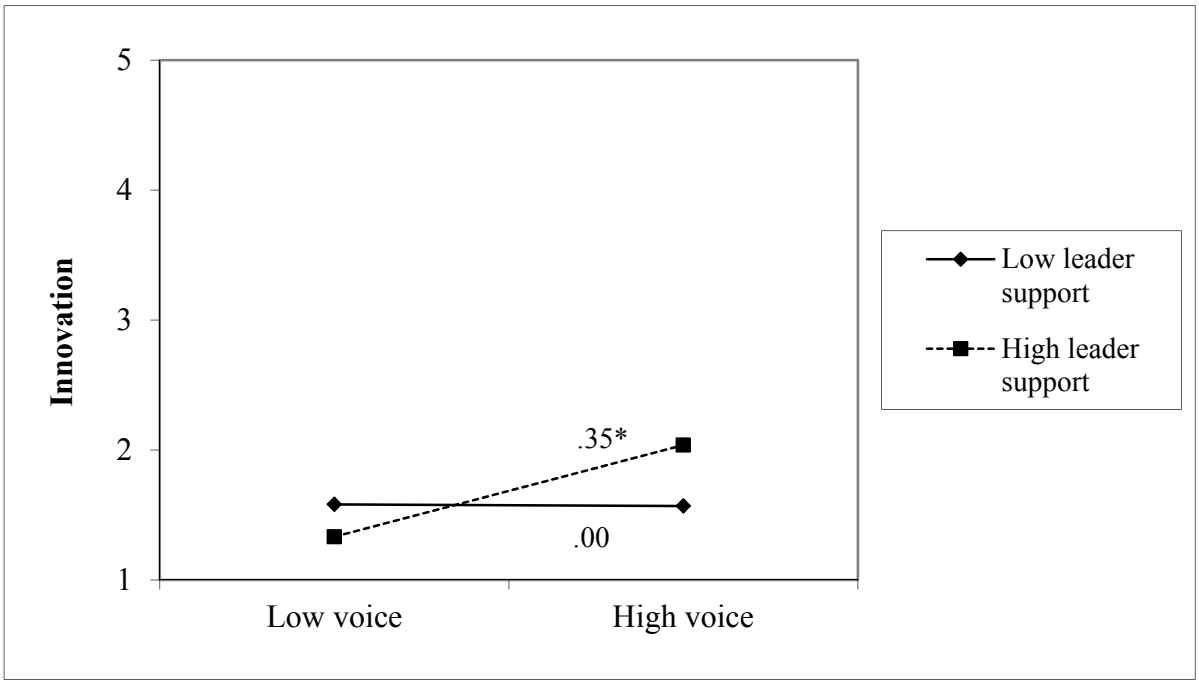


Figure 2. Research model (Study 2).



a)



b)

Figure 3. Interaction effects between (a) extra-role creativity and support for innovation on voice and (b) voice and leader support on innovation.
Low = -1 *SD*, High = +1 *SD*. $N = 121$. *$p < .05$.

Appendix

Interview Guideline

1. Creativity

a) Is it part of your job to develop new ideas? If so, in what way?
b) What is an idea for you? (e.g., characteristics)?
c) Are there any ideas that you develop voluntarily beyond your work and which are potentially useful to your company?
d) Which word would you use to describe such ideas?
e) Do you develop these ideas primarily for your own work or for other areas, too?

2. Specific questions about extra-role creativity

a) What kind of extra-role ideas do you develop? Can you give me an example?
b) If you had to sort the extra-role ideas that you develop into categories – which categories would be appropriate for the ideas you have?
c) Why do you develop these ideas? What motivates you?
d) Can you assess the usefulness of your extra-role ideas for your company?
e) How often do you have extra-role ideas on average...?
f) How long do you approximately need to develop these ideas?
g) When and under which circumstances do you mostly develop extra-role ideas?

3. Innovation process

a) When you have an extra-role idea, what do you do with it?
b) Do you share extra-role ideas? If so: to whom?
c) Why do you share your ideas? What motivates you?
d) Do your extra-role ideas get implemented? If so, how?
e) Who implements the ideas?
f) Is there a difference between the ideas you implement yourself and the ones you pass on to others?
g) Are extra-role ideas implemented differently compared to in-role ideas?
h) How long does it take on average until an idea is implemented?
i) Are there ideas that are not implemented? If so, why not?
j) Are there any rules in your company about what happens to extra-role ideas?
k) Does your leader contribute, develop, or implement new ideas? If so: how?
l) What would help you to develop more extra-role ideas?
m) What would cause you to stop developing extra-role ideas?

4. Leader perspective on extra-role ideas (only if applicable)

a) How often does an employee come up with an extra-role idea?
b) What are the most common ideas?
c) How do you react to them?
d) Do you implement these ideas or do you pass them on to other persons in the company?
e) Are there any ideas of your employees that you do not receive because your employees implement them directly or pass them on to other persons in the company?
f) How do you as a leader help your employees to develop extra-role ideas?

Manuscript 2

Leading Ideas: A Diary Study on the Effect of Ambidextrous Leadership on In-Role and Extra-Role Creativity

Jana S. Keil, Maria U. Kottwitz, & Kathleen Otto

University of Marburg, Germany

Abstract

There are inconsistent findings regarding leadership and creativity. To explain these inconsistencies, we examined whether new approaches to leadership and creativity could help solve this issue. We investigated ambidextrous leadership—the interplay of opening and closing leadership behavior—with creativity split along theoretical considerations into in-role and extra-role creativity. Our results are based on a multilevel analysis with 205 daily responses from 73 employees. Daily opening leadership behavior was positively related to both types of creativity. There was no moderation effect with daily closing leadership behavior on daily in-role creativity, but there was a detrimental effect on daily extra-role creativity. Additionally, we found a positive main effect of daily closing leadership behavior on daily in-role creativity. Our findings underline that, in order to understand the leadership–creativity relationship, both leadership behaviors and creativity constructs should be considered in depth. Then the underlying relationships can be revealed.

Keywords: ambidextrous leadership, creativity, in-role, extra-role, diary study

Leadership is one of the main influences on *creativity* (Shalley & Gilson, 2004)—the generation of new and useful ideas (Amabile, Conti, Coon, Lazenby, & Herron, 1996; West,

2002). However, a recent meta-analysis underlines that there are inconsistent findings regarding different leadership styles and creativity (Rosing, Frese, & Bausch, 2011). To solve this issue, it is important to look at both leadership and creativity in detail.

Rosing et al. (2011) proposed a new leadership style that integrates the diverse findings: *ambidextrous leadership*. It highlights that there are two complementary leadership behaviors needed to address the changing requirements for generating and implementing ideas: *opening* and *closing leadership behaviors*. While opening leadership behavior gives freedom to experiment and thus leads to exploration, closing leadership behavior reduces the variability in behavior and sets the focus on goal attainment (Rosing et al., 2011). For creativity to occur it is most important that opening leadership is shown. Closing leadership can be additionally helpful to direct attention to the problem so that generated solutions are useful and applicable (Rosing et al., 2011). Another approach to solve the inconsistent findings regarding leadership and creativity is to look not only at leadership behaviors in detail but also at creativity. Montag, Maertz, and Baer (2012) and Potočnik and Anderson (2016) have posited that creativity can take place either as *in-role* behavior or as *extra-role* behavior. These differ in whether creativity is shown within the job (in-role) or as discretionary behavior beyond that (extra-role). Montag et al. (2012) argue that the lack of distinguishing between them "may have hidden differential predictors" (p. 1368).

It is our aim to combine these theories to leadership and creativity. While we believe that the interplay of closing and opening leadership behaviors is beneficial to in-role creativity, we hypothesize that it is, at the same time, detrimental to extra-role creativity. This detailed examination helps understand the complex leadership-creativity relationship. To capture the volatility of creativity, we approach this question with a daily diary study. This allows us to examine the daily fluctuations of the relationship between ambidextrous leadership and both kinds of creativity.

Theoretical Background

Ambidextrous Leadership

Different leadership behaviors have been assessed with regard to creativity. Transformational leadership (Gumusluoglu & Ilsev, 2009; Shin & Zhou, 2003), supervisor support (Amabile, Schatzel, Moneta, & Kramer, 2004; Oldham & Cummings, 1996), and leader-member exchange (Tierney, Farmer, & Graen, 1999) are a few. However, there are inconsistent findings. A recent meta-analysis (Rosing et al., 2011) studying different leadership behaviors and their relation to creativity showed that there are a few tendencies, e.g., transformational leadership across all studies being rather positive, but there is no overall conclusion, since there is a wide range of correlations also with contrary findings (Rosing et al., 2011). Accordingly, it is not possible to make a statement about which one of the previously mentioned leadership behaviors is the most effective.

Rosing et al. (2011) suggested a new approach: ambidextrous leadership, which integrates the different findings. It relinquishes the idea of only one leadership style and instead argues that interplay of two opposing leadership behaviors—opening and closing—is needed for generating and implementing ideas. Opening leadership behavior is assumed to lead to employees' exploration and thus to a variance in employees' behavior. It encompasses motivation to take risks, allowing errors, different ways of accomplishing a task, and encouraging experimentation. Closing leadership behavior by contrast is supposed to initiate exploitation and hence a constraint in employees' behavioral variance. Related behaviors are: monitoring employees, controlling goal attainment and adherence to rules, or taking corrective action.

Recent empirical evidence with cross sectional (Zacher, Robinson, & Rosing, 2014; Zacher & Rosing, 2015) as well as diary data (Zacher & Wilden, 2014) supports the ambidextrous' assumption. Thereby the ambidexterity theory has been proposed and tested with regard to the generation and implementation of ideas. Both were assessed together under the term innovative performance (Welbourne, Johnson, & Erez, 1998, p. 30). The interplay of

opening and closing leadership behaviors was positively related to innovative performance, such that innovative performance was highest when both opening and closing leadership behaviors were present (e.g., Zacher & Rosing, 2015; Zacher & Wilden, 2014). The leaders' influence was described as a process in which leaders first support creative ideas which are then turned into innovative products (Zacher & Wilden, 2014). However, how ambidextrous leadership relates to idea generation and idea implementation individually has not been tested. Idea generation and implementation are supposed to have unique predictors, amongst others different relationships with leadership (for an overview see Rank, Pace, & Frese, 2004). We explore the relationship of ambidextrous leadership with creativity—the generation of new and useful ideas—as it is the basis of all innovative attempts (Amabile et al., 1996).

In-Role and Extra-Role Creativity

Less detailed perspectives have been considered in regard to creativity (Anderson, Potočnik, & Zhou, 2014). The construct has been assessed as part of in-role job activities (e.g., Hirst, Knippenberg, & Zhou, 2009; Shin & Zhou, 2003) as well as part of extra-role behavior (Frese, Teng, & Wijnen, 1999; Jeberien, Stephan, & Schneider, 2013). For example, in the field of Research and Development, creativity is critical for effective work. Therefore, these studies consider creativity as an in-role behavior that serves to fulfill job requirements (Gupta & Singh, 2015; Hirst et al., 2009; Tierney et al., 1999). However, creativity can also be shown as an extra-role behavior (Montag et al., 2012; Unsworth, 2001). Creativity as an extra-role behavior has been examined, for example, in the manufacturing area, by studying voluntarily generated ideas (Axtell et al., 2000; Baer, Oldham, & Cummings, 2003; Frese et al., 1999).

These different assessments represent the two-dimensional nature of the creativity construct, for which theoretical attempts have called (e.g., Montag et al., 2012; Unsworth, 2001). Creativity can be considered analogues to the broader performance literature that divides performance into in-role behavior and extra-role behavior (van Dyne, Cummings, &

Parks, 1995). In-role behavior refers to required or expected behavior. It is the basis of job performance. Extra-role behavior "benefits the organization and/or is intended to benefit the organization, which is discretionary and which goes beyond existing role expectations" (van Dyne et al., 1995, p. 218). An employee in marketing working on a new design for a website shows in-role creativity, as it is her or his job task. Creativity in this example is generated to fulfill job requirements. While working on the website, the employee might notice problems within the internal IT-structure. If she or he then develops an idea to improve the IT-structure, this would be regarded as extra-role creativity, because it is beneficial for the organization but not part of her or his job.

Montag et al. (2012) assume that each creativity dimension has unique predictors. They highlight, for instance, ability as one main predictor of in-role creativity and motivation as one main influence on extra-role creativity. However, studies so far have not examined predictors and creativity as in-role or extra-role behaviors. This impreciseness in not capturing the dimensions of creativity might be another reason why there are contradicting results between leadership and creativity. While one leadership behavior may be beneficial to in-role creativity, it may, at the same time, be detrimental to extra-role creativity, and vice versa.

Hypotheses

Rosing et al. (2011, p. 967) state that "in situations that require employees to explore (and these situations are mainly those when the innovation task requires creativity…), leaders need to show opening leader behaviors." Accordingly, opening leadership behavior is assumed closely linked to creativity. Several studies have also underlined that behavior considered as opening leadership behavior is positively related to creativity. Recognition for creative attempts by the leader and support to be creative and to share ideas lead to more employee creativity (Tierney & Farmer, 2004). Similarly, a learning goal orientation that focuses on the development of competence and mastery is positively related to creativity

(Dragoni, 2005). A leader who provides motivation to experiment and learn from errors can possibly induce such learning goal orientation and, hence, foster creativity. In these studies, creativity was expected from the examined employees and can thus be considered as mainly in-role creativity. Even if creativity is shown as extra-role behavior, opening leadership behavior can likely foster it. Leaders who are perceived to be open to discretionary contributions enhance the willingness of their employees to exceed formal job requirements (Bettencourt, 2004). By being open to ideas and supporting their employees, leaders can give cues that creativity is wanted and support the belief in the employees' creative capability, which is especially needed when routine work is exceeded (Ford, 1996).

The ambidexterity theory further proposes that one has to use the synergies of both leadership behaviors. "Therefore, exploration and exploitation are important for both creativity and implementation, even if creativity is linked more closely to exploration (…)" (Rosing et al., 2011, p. 965). The additionally needed exploitation is induced through closing leadership behavior. Closing leadership behavior includes monitoring goal attainment or controlling behavior. Also Amabile et al. (1996) highlighted that besides encouragement for experimenting with ideas, it is important to have goal clarity and a defined problem when it comes to being creative. Thus, guidance through the leader is needed because a lot of problems are at first unclear and thus need to be structured (Bain, Mann, & Pirola-Merlo, 2001). The directive function of closing leadership behavior could be beneficial to help understand what there is to do when creative tasks are ill-defined. Closing leadership behavior could further be useful to make sure that the generated ideas match the existing problems.

A study already showed that, for employees with a project where creativity was desirable, leaders should be open to ideas but also provide guidance and monitor progress and goal attainment (Amabile et al., 2004). Taking goal theory into consideration, setting a goal has a directive function. It leads the attention and effort to the goal (Locke & Latham, 1990). Under the right circumstances, having a goal can be helpful and beneficial for creativity. A

study that looked closer into this found out that goals can be effective when they are used for the desired outcomes (Shalley, 1995). Therefore, when employees have a specific work task they are supposed to do and have a leader who not only gives them freedom by applying opening leadership behaviors but also sets goals, they are more engaged to develop ideas to fulfill their work goals. In a similar way, it showed that, for employees with job projects that needed creativity and thus creativity was expected, providing direction in how to do work and communicating task objectives is positively related to creativity (Amabile et al., 2004). By making the work tasks a salient and rewarded behavior, employees model their responses correspondingly, according to social learning theory (Bandura, 1986). Consequently, they focus on their work tasks. This could direct the emerging creative attempts, due to the positive effects of the opening leadership behavior, to fulfill the work tasks more efficiently. Accordingly, more in-role creativity is generated.

On the downside, this salient and rewarded task focus might take away the attention from extra-role attempts. This might lead to less daily extra-role creativity. This kind of creativity is not perceived as required (Potočnik & Anderson, 2016). Employees need to feel in control and confident in performing activities outside their work tasks to engage in extra-role creativity (Axtell et al., 2000). They further have to be supervised in a non-controlling manner (Oldham & Cummings, 1996). Closing leadership behavior, however, controls employees and constrains the focus to work tasks (Rosing et al., 2011). This may limit ideas that exceed work tasks and thus mitigate extra-role creativity. Concluding, we hypothesized:

Hypothesis 1a: Daily closing leadership behavior moderates the positive relationship between daily opening leadership behavior and daily in-role creativity. The relationship is stronger for employees with a leader who exerts a high amount of daily closing leadership behavior.

Hypothesis 1b: Daily closing leadership behavior moderates the positive relationship between daily opening leadership behavior and daily extra-role creativity. The relationship is weaker for employees with a leader who exerts a high amount of daily closing leadership behavior.

Method

Participants and Procedure

To recruit participants, we contacted organizations and individual working employees in Germany via e-mail. We asked them to participate and to further distribute the study to colleagues and acquaintances. All relevant information was obtained by daily questionnaires on five consecutive work days, Monday through Friday. Participants enrolled in the study by providing an email address that we used to send them the daily questionnaire. Participants received daily email invitations to complete the questionnaire. They also stated the time when they completed work, and we offered to send them text messages each day after work to remind them of the study. Additionally, we designed an idea sheet and sent it to them before the beginning of the study. It was created for the participants' personal use to collect their ideas. They were asked to refer to it when completing the questionnaire to facilitate the daily recall of their ideas.

We collected a total of 339 daily responses from 89 employees. In order to achieve correct information, we excluded daily data of participants who did not interact with their leader that day as well as participants that did not go to work (e.g., due to being sick). We also deleted data from participants that did not fill out the questionnaire at the correct time point. Our final sample consisted of 205 daily responses from 73 working participants ($M_{\text{response rate}}$ = 2.81 days). A total of 25 men and 48 women participated. Most of the employees were middle management (47.95%), senior executives (21.92%), and skilled workers (13.70%). Their average age was 32.18 years (SD = 11.99). They were employed in different sectors, e.g., in the field of education, insurance, finance, and consulting. The mean tenure was 8.49 years

(*SD* = 11.33), and they had worked with their leader 2.41 years on average (*SD* = 3.30). Their weekly work time was on average 36.92 hours (*SD* = 9.10).

Measures

Daily ambidextrous leadership. All participants rated their leaders' opening and closing behaviors daily on two sets of four items each. The items were taken from the diary study of Zacher and Wilden (2014). They took the highest loading items from the study by Zacher and Rosing (2015), based on Rosing et al.'s (2011) suggestions. Each response was indicated on a five-point Likert scale ranging from 1 (*not at all*) to 5 (*frequently, if not always*). An example item from the opening leadership behavior is "Today, my supervisor allowed different ways of accomplishing a task," with a Cronbach's alpha ranging from .83 to .90 across the five days. An example of the closing leadership behavior items is "Today, my supervisor took corrective action," with a Cronbach's alpha ranging from .83 to .91 across the five days.

Daily in-role and extra-role creativity. We based our creativity assessment on the definition of creativity as new and useful ideas (Amabile et al., 1996). Hence, we assessed daily in-role and extra-role creativity via the amount of new and useful ideas each participant generated each day. By doing so, we did not have to rely on self-evaluations, but we were able to capture the exact number participants indicated. To assess creativity in accordance with the definition, we collected not only the daily number of ideas but also their average usefulness. Then, we multiplied the number of ideas with the average usefulness so that we were given an exact amount of daily in-role and extra-role creativity. We did this because ideas can range from incremental to radical improvements (Anderson et al., 2014). With this twofold assessment, we represent this aspect. To make sure that participants recalled their ideas, we assisted them by giving them an idea sheet. They were asked to use it for collecting their ideas throughout the day. Hence, our approach leaned on event-based investigations, but

without disturbing the daily workflow, as we assessed the amount of ideas and usefulness only in the evening.

To distinguish between in-role and extra-role ideas, we used different wordings. For in-role creativity, we asked: "Please note the exact number of ideas you had today *within the scope of your work tasks.*" For extra-role creativity, the instruction text was similar, but we highlighted that the participants should now refer to ideas they developed without needing to do so beyond their job tasks. We asked, "How many ideas have you developed today *voluntarily beyond your job tasks*?" Following both statements, we made clear: "Just the incident is important, regardless of whether your ideas have been implemented. Your ideas do not have to be huge improvements; please also include small ideas. How many ideas have you developed today within (respectively voluntarily beyond) the scope of your work tasks? Please write down the number. How useful were your ideas on average on a scale from 1 (*not useful at all*) to 7 (*very useful*)?"

The indicated number of in-role ideas ranged from zero to 10 ideas per person per day, with 65% of all employees indicating at least one in-role idea. Their average usefulness was 5.28 (SD = 1.36). Afterward, we asked our participants to write down one of their ideas if they wanted. Examples for in-role ideas are "a change in programming", "an introduction of a compliance management system", "loss settlement", or "a redesign of flyers and emails". The indicated number of extra-role ideas ranged from zero to seven ideas per person per day, with 27% of all participants indicating at least one extra-role idea. Their average usefulness was 4.78 (SD = 1.67). We again asked our participants to write down one of their ideas if they wanted. Examples of extra-role ideas are "repositioning of files", "advancements for personnel management", "improvements of the internal IT-structure", or "helping a colleague with a presentation".

Validation of the creativity measures. In-role creativity and extra-role creativity are constructed along the lines of the broader performance literature. In-role behavior refers to

required or expected behavior and is considered as the basis of job performance Accordingly in-role creativity should be directly related to job performance, whereas extra-role creativity should not or should be to a lesser extent. To validate our measures, we therefore looked at the relationship between daily in-role and daily extra-role creativity and daily job performance.

Daily job performance was assessed with the item "Today I have fulfilled the performance requirements for my position" by Williams and Anderson (1991). Responses were possible on a seven-point Likert scale ranging from 1 (*not at all to*) to 7 (*completely right*). Results showed that daily in-role creativity was significantly related to daily job performance ($b = 0.03$, $SE = 0.01$, $t = 2.74$, $p < .01$), whereas daily extra-role creativity was only marginally related to daily job performance ($b = 0.02$, $SE = 0.01$, $t = 1.70$, $p < .10$). The findings support the construction of our creativity scales. They underline that in-role creativity is more strongly related to job performance; extra-role creativity is marginally related to it.

Control variables. We controlled for the amount of creativity required in each job as well as for daily time pressure. It was relevant to control for the amount of creativity required in the job, because this amount can affect daily creativity. Other studies already showed that the requirement to be creative is relevant to this issue (Scott & Bruce, 1994). As we have included participants with a lot of different jobs, this may lead to differences between the participants. It was assessed with a measure by Shalley, Gilson, and Blum (2000) with the wording "My job requires me to be creative." Response was indicated on a five-point Likert scale ranging from 1 (*not at all*) to 5 (*very true*).

Time pressure is a daily job stressor that has already been shown to influence creativity (e.g., Binnewies & Wörnlein, 2011). Time pressure might be especially important in regard to extra-role creativity, as it can influence how much time can be spent on ideas that are not directly relevant to task accomplishment. This assumption was also supported by

Unsworth (2011) who reasoned that time pressure is a hindrance for creativity that is shown beyond the job. Time pressure was assessed via one item from the Instrument for Stress-Related Work Analysis. The item was "How often did you have a high work pace today" (Semmer, Zapf, & Dunckel, 1999). The response was indicated on a five-point Likert scale anchored by 1 (*very little*) and 5 (*very much*).

Data Analysis

Our data possessed a two-level structure with the day-level being nested in the person-level. This structure was found for in-role creativity (*ICC* = 0.46) as well as for extra-role creativity (*ICC* = 0.40). To account for this structure, we used hierarchical linear modeling to analyze our data using the HLM software (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2011). We assessed the amount of creativity required in the job as a level 2 control variable. Daily opening and closing leadership behaviors, daily in-role and extra-role creativity, as well as daily time pressure were assessed on level 1. We centered all level 1 variables around the person mean, allowing us to examine daily intra-individual differences. This means that we assessed deviations of the person's individual mean. The level 2 variable was centered on the grand mean. Our outcome variables—daily in-role and extra-role creativity—remained uncentered.

Results

Descriptive Statistics

Table 1 shows the means, standard deviations, and intercorrelations of the study variables on the daily level and averaged over five days.

Insert Table 1 about here

Hypotheses Testing

The models were constructed step-wise for both kinds of creativity. In the Null Model, we accounted only for the effect of the intercept. In Model 1, we tested for the effects of our control variables: amount of creativity required in the job and daily time pressure. In Model 2 we additionally tested the main effects of daily opening and closing leadership behaviors. In Model 3 we included the interaction of daily opening and closing leadership behaviors to test our moderator hypotheses.

Insert Table 2 about here

Results from hierarchical linear models are depicted in Table 2 for in-role creativity. Regarding in-role creativity, Model 1 showed a significant improvement over the Null Model (Δ-2 x log = 7.43, $\Delta df = 2$, $p < .05$). However, there was no significant relationship between the control variables and daily in-role creativity. In the next step, we entered daily opening and closing leadership behaviors as additional predictors. This is illustrated in Model 2. It showed a significant improvement over Model 1 (Δ-2 x log = 15.81, $\Delta df = 7$, $p < .05$). Daily opening leadership behavior was positively related to daily in-role creativity ($b = 1.81$, $p < .05$). Surprisingly, we found an additional positive main effect of daily closing leadership behavior on daily in-role creativity ($b = 3.03$, $p < .01$). Then, in Model 3, we integrated the interactions to address Hypothesis 1a. We proposed that daily closing leadership behavior moderates the positive relationship between daily opening leadership behavior and daily in-role creativity. The relationship is assumed to be stronger for employees with a leader who exerts a high amount of daily closing leadership behavior. Model 3 showed a marginally significant improvement over Model 2 (Δ-2 x log = 10.26, $\Delta df = 5$, $p < .10$), but no interaction effect of daily closing and opening leadership behavior on daily in-role creativity was found ($b = .06$, *ns*). Hypothesis 1a had to be declined. Daily closing leadership behavior does not

moderate the positive relationship between daily opening leadership behavior and daily in-role creativity.

Insert Table 3 about here

Regarding extra-role creativity, results from hierarchical linear modelling are depicted in Table 3. Model 1 showed a significant improvement over the Null Model (Δ-2 x log = 21.09, Δ*df* = 2, $p < .001$); however, the control variables did not prove to be significant predictors of extra-role creativity. Next, in Model 2, we tested the main effects of daily opening and closing leadership behaviors on daily extra-role creativity. Model 2 showed a significant improvement over Model 1 (Δ-2 x log = 43.53, Δ*df* = 7, $p < .001$). Daily opening leadership behavior was positively related to daily extra-role creativity ($b = 1.96$, $p < .01$). No main effect could be detected between daily closing leadership behavior and daily extra-role creativity ($b = 0.04$, *ns*). According to Hypothesis 1b, daily closing leadership behavior moderates the positive relationship between daily opening leadership behavior and daily extra-role creativity. The relationship is assumed to be weaker for employees with a leader who exerts a high amount of daily closing leadership behavior. Model 3 for extra-role creativity showed no significant improvement over Model 2 (Δ-2 x log = 5.03, Δ*df* = 5, *ns*). However, there was a significant negative interaction effect between daily opening and closing leadership behavior on daily extra-role creativity ($b = -.79$, $p < .05$). In order to have a closer look at this relationship, we plotted it graphically and conducted simple slopes tests. As can be seen in Figure 1, the relationship between daily opening leadership behavior and daily extra-role creativity is lessened when there is a high amount (one standard deviation above the mean) of daily closing leadership behavior ($b = 1.64$, $SE = 0.68$, $t = 2.40$, $p < .05$). For employees with a low amount of closing leadership behavior (one standard deviation below the mean), the relationship between daily opening leadership behavior and daily extra-role

creativity is stronger ($b = 2.41$, $SE = 0.74$, $t = 3.24$, $p < .01$). Accordingly, Hypothesis 1b was supported. Daily closing leadership behavior seems to moderate the positive relationship between daily opening leadership behavior and daily extra-role creativity. The relationship is weaker for employees with a leader who exerts a high amount of daily closing leadership behavior.

Insert Figure 1 about here

Discussion

Our study is the first one that explicitly tested the relationship between daily ambidextrous leadership and daily in-role and extra-role creativity. Our findings highlight that this more nuanced conceptualization of leadership behavior and creativity allows us to identify unique relationships. Daily opening leadership behavior was positively related to daily in-role as well as to daily extra-role creativity. Additionally, we found a positive main effect of daily closing leadership behavior on daily in-role creativity. No additional main effect of daily closing leadership behavior on daily extra-role creativity was found. Against our prediction, no interaction effect between daily opening and closing leadership behavior was found on daily in-role creativity. Regarding daily extra-role creativity, our results revealed the hypothesized moderation effect: Daily closing leadership behavior weakened the positive effect of daily opening leadership behavior on daily extra-role creativity.

Our findings support the assumptions of the ambidextrous leadership theory that opening leadership behavior is especially beneficial for creativity (Rosing et al., 2011). As expected, this positive relationship was found for both kinds of creativity. It seems that although the subdimensions of creativity are unique, they still have similarities, as both refer to generating ideas. Opening leadership behavior creates motivation to take risks, encourages experimentation, and gives room for ideas (Rosing et al., 2011). As these characteristics target coming up with ideas—the main characteristic of creativity (Amabile et al., 1996)—it would

have been surprising if this was not the case. These findings are also congruent with previous studies. It has been shown that creativity arises when employees are supervised in a creativity-encouraging and helpful way (Oldham & Cummings, 1996) or when employees are empowered through their leaders to engage in creative activities (Zhang & Bartol, 2010).

Regarding daily closing leadership behavior, our findings are more complex. The ambidextrous leadership theory assumes that leadership is most effective when both daily closing leadership behavior and daily opening leadership behavior are shown (Rosing et al., 2011). As closing leadership behavior leads the employees' focus mainly to task fulfillment, we expected accordingly that daily closing leadership behavior enhances the positive effect of daily opening leadership behavior on daily in-role creativity. However, we detected no moderation effect between daily opening and closing leadership behavior on daily in-role creativity. It does not seem to matter for the positive effect of daily opening leadership behavior on daily in-role creativity whether closing leadership behavior occurs simultaneously.

Surprisingly, we found a positive main effect of daily closing leadership behavior on daily in-role creativity. It seems that not only opening leadership behavior but also closing leadership behavior can foster in-role creativity. As closing leadership behavior focuses on goal attainment and controls task accomplishment (Rosing et al., 2011), employees may more easily detect problems that prevent them from goal attainment. As an example: A marketing employee who strives to fulfill a design task has a supervisor who controls this goal attainment. As the employee's focus is thus even more on accomplishing this task, she or he might more easily detect problems that prevent her or him from designing the website so that she or he needs new HTML commands. Accordingly, in-role creativity is needed to realize the website. This could be the reason for the main effect. Employees show in-role creativity to solve issues that prevent them from reaching their goals.

Previous studies (Zacher et al., 2014; Zacher & Wilden, 2014) that looked at ambidextrous leadership have found a positive interaction effect of daily closing and opening leadership. The effect was found on innovative performance as the outcome. The difference our study makes from previous studies is that it examines only creativity, not creativity and innovation simultaneously, via the construct innovative performance. Additionally, we looked at creativity as in-role and as extra-role behaviors. Our findings highlight the importance of looking at the unique effects. These effects are another explanation for the so far inconsistent findings between leadership and creativity (Rosing et al., 2011). When closing leadership behavior is related to in-role but not to extra-role creativity, the overall effect on the general creativity construct might be a null effect. This could, for example, resolve results from previous studies. No relationship was found between contingent reward and employee creativity (Moss & Ritossa, 2007). As contingent reward is not the same as closing leadership behavior but also highlights task-related behavior, the null effect might be due to not distinguishing between in-role and extra-role creativity. Assessing creativity twofold might be a future approach for explaining so far inconsistent and null findings.

It could further be possible that the interaction of the two leadership behaviors were non-significant on in-role creativity, because it additionally needs leaders that know in which situation they must show which behavior. The ambidexterity theory proposes that leaders need to know when to switch between these behaviors (Rosing et al., 2011). Thus, future studies should further examine whether leaders are capable of recognizing a situation in which closing or opening leadership behaviors should be shown. Then, there may also be the anticipated interaction effects.

Regarding extra-role creativity, the hypothesized interaction effect could be detected. Daily closing leadership behavior mitigated the positive relationship between daily opening leadership behavior and daily extra-role creativity. This finding underlines our assumption that closing leadership behavior sets a focus on task fulfillment, whereby fewer ideas are

pursued that do not relate to the work task. Closing leadership behavior might induce pressure to fulfill work tasks, and therefore, there are fewer cognitive capacities to pursue other—not directly related—ideas. If, for example, the marketing employee is so preoccupied with her or his website design, she or he might notice other problems beyond that task but might not have the resources to actually think about them and come up with solutions.

Furthermore, applying both opening as well as closing leadership behaviors might send an ambiguous signal to employees regarding extra-role creativity. Shalley and Gilson (2004) conclude in their review about leadership and creativity that leaders should align their behaviors and not convey mixed messages. If leaders give possibilities for independent thinking and motivation to take risks via opening leadership behavior but, at the same time, restrict the attention to routines and task accomplishment, this might induce insecurity in the employees whether they are desired to be creative beyond their work tasks or not. This might lead to less extra-role creativity. Additionally, closing leadership behavior might undermine the motivating nature of opening leadership behavior, as it shifts the attention to evaluation and control. According to Montag et al. (2012), motivation is especially important for creativity that is shown voluntarily and not expected. This could be another explanation why closing leadership behavior weakens the positive effect of opening leadership behavior on extra-role creativity.

Study Strengths and Limitations

By assessing creativity and the other measures via self-reports, the problem of common method variance arises, which can lead to overestimated effects (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). However, Conway and Lance (2010) state that self-reports may be reasonable when authors can give arguments for applying them. Shalley, Gilson, and Blum (2009) argue that “employees are best suited to self-report creativity because they are the ones who are aware of the subtle things they do in their jobs that make them creative” (p. 495). Furthermore, research has shown that there are no firm job roles but a

constant refinement that shapes one's role (Spector & Fox, 2010). To accord for this, we assessed creativity as self-reports, because employees know best what they classify as in-role and extra-role creativity. The voluntary description of their ideas gives some hints to what the participants rank as in-role and as extra-role ideas. Nonetheless, we cannot make any statements if these ideas would also be rated by the leader as extra-role creativity. It would be interesting to compare ratings from different persons regarding the same ideas in future studies.

One problem of self-reports is that they can be influenced through social desirability. Some participants may have a tendency to come up with lots of ideas and rate each one of them as very useful, even though none of those ideas may be good. However, looking at intra-individual differences counteracts this problem. Every person is compared daily to her or his own baseline. Thus, the total difference between participants does not play a role, only the deviation of the person's own mean. Hence, it does not matter whether participants tend to report a lot of ideas that they rate as very useful and others are more modest about it. Every time it is the comparison to the person herself or himself and not to the overall participants' mean.

A strength of our study is that we increased the objectivity in the creativity assessment by asking the participants to indicate the number of ideas they had during a day. This restricts the problem of self-reports so that employees do not indicate a potentially biased value of how creative they see themselves. To further account for differences between the impacts of the ideas, we asked how useful the ideas were on average. This is also in line with the definition of creativity as new and useful ideas (Amabile et al., 1996). Therefore, a person with many but rather small ideas could get a similar score as a person with only a few but very useful ideas, allowing us to account for the diverse magnitude of ideas. However, assessing the average usefulness has the downfall of a potentially restricted range of variance. Our data analysis revealed that there is some variance. To capture the variance even better, it

would be an optimization for future studies to evaluate each idea and its usefulness individually.

Moreover, the use of diary data has strength as well as limitations. It does not allow us to draw any causal inferences (Bortz & Döring, 2006). It would be possible that it is not the leader that influences the employees but the other way around. Their creative attempts might induce a specific response, such as opening or closing leadership behaviors. To detect causal relationships, experimental studies would be needed. Although our study does not allow us to draw any causal inferences, we refined previous cross-sectional studies by applying a daily assessment. Consequently, we get a view of the everyday experiences of employees. Diary studies capture more realistic, short-term fluctuations of creativity (Ohly, Sonnentag, Niessen, & Zapf, 2010).

Theoretical Implications

Our findings underline that it is important to distinguish not only between different leadership behaviors but also between different creativity dimensions to fully understand the effects of leadership on creativity. Just as Rosing et al. (2011) emphasized that leadership is not as simple as only one behavior, the same applies to creativity and its subdimensions of in-role and extra-role creativity.

For ideas to be implemented, innovation is needed. It is referred to as the second stage that follows creativity (West, 2002). Whereas creativity refers to the generation of new and useful ideas, innovation focuses on the successful implementation of ideas within an organization (Amabile et al., 1996). Thus, for ideas to have an impact, innovation is needed.

Regarding innovation, closing leadership behavior is supposed to be most beneficial (Rosing et al., 2011). Closing leadership behavior centers on exploitation and thus on reaching goals and on the efficient execution of tasks. Hence, it helps in efficiently implementing ideas. However, also with regard to innovation, Rosing et al. (2011) proposed that the interplay of closing and opening leadership behavior is also most beneficial for the

implementation of ideas. Experimenting and error learning induced through opening leadership behavior could be helpful to find new and useful ways of implementing ideas. This moderation might be especially important with regard to the implementation of extra-role ideas. As they are not expected, there might be no standard routine for implementing them. Opening leadership behavior could help in finding new ways to do so and in overcoming obstacles. These considerations could be assessed by an approach similar to ours but with a focus on the relationship between ambidextrous leadership and innovation. To further combine creativity and innovation in one study, it would be possible to follow ideas from their development till their implementation and relate both to ambidextrous leadership.

Practical Implications

Besides theoretical assumptions, our study allows direct managerial implications as well. They should just be considered with caution, as our results do not allow drawing any causal deductions. Our results suggest that two distinct leadership behaviors are useful when correctly applied. In general, leaders should show opening leadership behavior when they want to foster creativity. If it is mainly extra-role creativity in which they would like their employees to engage, they should avoid closing leadership behavior. If it is in-role creativity they want to encourage, closing leadership behavior can be beneficial as well. Leaders now get the tools to play an active part in fostering their employees' creativity. Hence, leaders can utilize the potential of all companies' personnel for reaching creative progress. Consequently, organizations will be better equipped to face the demands of today's hypercompetitive dynamic work environment and can actively help to sustain the companies' competitive edge.

The awareness for this topic could be reached by specific trainings. Leaders should be informed about the effects of leadership as well as trained on how to apply an opening or a closing leadership style. This information could be beneficial for leaders of employees that have to be very creative. The same applies to leaders with employees that do not have to be creative in their everyday work but want to enhance extra-role creativity. They might have

tried to reach creative progress by applying closing leadership behaviors, such as establishing routines or correcting errors to reach creative progress. Our study showed that it would be better to be less controlling and more open to experimenting as a leader that wants to support extra-role creativity. Opening leadership behavior could help facilitate that all employees are creatively engaged.

Conclusion

In summary, our study contributes to the understanding of how leadership is linked to creativity by studying both constructs in detail. We refined previous analyses by examining the unique effects daily opening and closing leadership behaviors have on daily in-role and extra-role creativity. Our study shows how leaders can actively promote in-role and extra-role creativity. Future attempts could complete our study by looking more closely at the unique effects ambidextrous leadership has on innovation—the subsequent implementation ideas.

References

Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal, 39*, 1154–1184. doi:10.2307/256995

Amabile, T. M., Schatzel, E. A., Moneta, G. B., & Kramer, S. J. (2004). Leader behaviors and the work environment for creativity: Perceived leader support. *The Leadership Quarterly, 15*, 5–32. doi:10.1016/j.leaqua.2003.12.003

Anderson, N., Potočnik, K., & Zhou, J. (2014). Innovation and creativity in organizations a state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management, 40*, 1297–1333. doi:10.1177/0149206314527128

Axtell, C. M., Holman, D. J., Unsworth, K. L., Wall, T. D., Waterson, P. E., & Harrington, E. (2000). Shopfloor innovation: Facilitating the suggestion and implementation of ideas. *Journal of Occupational and Organizational Psychology, 73*, 265–285. doi:10.1348/096317900167029

Baer, M., Oldham, G. R., & Cummings, A. (2003). Rewarding creativity: When does it really matter? *The Leadership Quarterly, 14*, 569–586. doi:10.1016/S1048-9843(03)00052-3

Bain, P. G., Mann, L., & Pirola-Merlo, A. (2001). The innovation imperative the relationships between team climate, innovation, and performance in research and development teams. *Small Group Research, 32*, 55–73. doi:10.1177/104649640103200103

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Upper Saddle River, NJ: Prentice-Hall.

Bettencourt, L. A. (2004). Change-oriented organizational citizenship behaviors: The direct and moderating influence of goal orientation. *Journal of Retailing, 80*, 165–180. doi:10.1016/j.jretai.2003.12.001

Binnewies, C., & Wörnlein, S. C. (2011). What makes a creative day? A diary study on the interplay between affect, job stressors, and job control. *Journal of Organizational Behavior, 32*, 589–607. doi:10.1002/job.731

Bortz, J., & Döring, N. (2006). *Forschungsmethoden und Evaluation für Human- und Sozialwissenschaftler* [Research methods and evaluation for human and social sciences]. Heidelberg: Springer.

Conway, J. M., & Lance, C. E. (2010). What reviewers should expect from authors regarding common method bias in organizational research. *Journal of Business and Psychology, 25*, 325–334. doi:10.1007/s10869-010-9181-6

Dragoni, L. (2005). Understanding the emergence of state goal orientation in organizational work groups: The role of leadership and multilevel climate perceptions. *Journal of Applied Psychology, 90*, 1084–1095. doi:10.1037/0021-9010.90.6.1084

Ford, C. M. (1996). A theory of individual creative action in multiple social domains. *Academy of Management Review, 21*, 1112–1142. doi:10.5465/AMR.1996.9704071865

Frese, M., Teng, E., & Wijnen, C. J. (1999). Helping to improve suggestion systems: Predictors of making suggestions in companies. *Journal of Organizational Behavior, 20*, 1139–1155. doi:10.1002/(SICI)1099-1379(199912)20:73.0.CO;2-I

Gumusluoglu, L., & Ilsev, A. (2009). Transformational leadership, creativity, and organizational innovation. *Journal of Business Research, 62*, 461–473. doi:10.1016/j.jbusres.2007.07.032

Gupta, V., & Singh, S. (2015). Leadership and creative performance behaviors in R&D laboratories examining the mediating role of justice perceptions. *Journal of Leadership & Organizational Studies, 22*, 21–36. doi:10.1177/1548051813517002

Hirst, G., Knippenberg, D. V., & Zhou, J. (2009). A cross-level perspective on employee creativity: Goal orientation, team learning behavior, and individual creativity. *Academy of Management Journal, 52*, 280–293. doi:10.5465/AMJ.2009.37308035

Jeberien, B., Stephan, M., & Schneider, M. J. (2013). *Management von Ideen: Stand in der Praxis* [Management of ideas: State of the industry]. Marburg, Germany: Department of Technology and Innovation Management.

Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting & task performance*. Englewood Cliffs, NJ: Prentice-Hall.

Montag, T., Maertz, C. P., & Baer, M. (2012). A critical analysis of the workplace creativity criterion space. *Journal of Management, 38*, 1362–1386. doi:10.1177/0149206312441835

Moss, S. A., & Ritossa, D. A. (2007). The impact of goal orientation on the association between leadership style and follower performance, creativity and work attitudes. *Leadership, 3*, 433–456. doi:10.1177/1742715007082966

Ohly, S., Sonnentag, S., Niessen, C., & Zapf, D. (2010). Diary studies in organizational research: An introduction and some practical recommendations. *Personnel Psychology, 9*, 79–93. doi:10.1027/1866-5888/a000009

Oldham, G. R., & Cummings, A. (1996). Employee creativity: Personal and contextual factors at work. *Academy of Management Journal, 39*, 607–634. doi:10.2307/256657

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*, 879–903. doi:10.1037/0021-9010.88.5.879

Potočnik, K., & Anderson, N. (2016). A constructively critical review of change and innovation-related concepts: Towards conceptual and operational clarity. *European Journal of Work and Organizational Psychology, 25*, 481–494. doi:10.1080/1359432X.2016.1176022

Rank, J., Pace, V. L., & Frese, M. (2004). Three avenues for future research on creativity, innovation, and initiative. *Journal of Applied Psychology, 53*, 518–528. doi:10.1111/j.1464-0597.2004.00185.

Raudenbush, S. W., Bryk, A. S., Cheong, Y. F., Congdon, R. T., & du Toit, M. (2011). *HLM 7: Hierarchical linear and nonlinear modeling*. Chicago, IL: Scientific Software International.

Rosing, K., Frese, M., & Bausch, A. (2011). Explaining the heterogeneity of the leadership-innovation relationship: Ambidextrous leadership. *The Leadership Quarterly, 22*, 956–974. doi:10.1016/j.leaqua.2011.07.014

Scott, S. G., & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal, 37*, 580–607. doi:10.2307/256701

Semmer, N., Zapf, D., & Dunckel, H. (1999). Instrument zur stressbezogenen Tätigkeitsanalyse [Instrument for stress-related job analysis] (ISTA). In H. Dunckel (Ed.), *Handbuch psychologischer Arbeitsanalyseverfahren* (pp.179–204). Zürich, Switzerland: VdF Hochschulverlag.

Shalley, C. E. (1995). Effects of coaction, expected evaluation, and goal setting on creativity and productivity. *Academy of Management Journal, 38*, 483–503. doi:10.2307/256689

Shalley, C. E., & Gilson, L. L. (2004). What leaders need to know: A review of social and contextual factors that can foster or hinder creativity. *The Leadership Quarterly, 15*, 33–53. doi:10.1016/j.leaqua.2003.12.004

Shalley, C. E., Gilson, L. L., & Blum, T. C. (2000). Matching creativity requirements and the work environment: Effects on satisfaction and intentions to leave. *Academy of Management Journal, 43*, 215–223. doi:10.2307/1556378

Shalley, C. E., Gilson, L. L., & Blum, T. C. (2009). Interactive effects of growth need strength, work context, and job complexity on self-reported creative performance. *Academy of Management Journal, 52*, 489–505. doi:10.5465/AMJ.2009.41330806

Shin, S. J., & Zhou, J. (2003). Transformational leadership, conservation, and creativity: Evidence from Korea. *Academy of Management Journal, 46*, 703–714. doi:10.2307/30040662

Spector, P. E., & Fox, S. (2010). Counterproductive work behavior and organisational citizenship behavior: Are they opposite forms of active behavior? *Journal of Applied Psychology, 59*, 21–39. doi:10.1111/j.1464-0597.2009.00414.x

Tierney, P., & Farmer, S. M. (2004). The pygmalion process and employee creativity. *Journal of Management, 30*, 413–432. doi:10.1016/j.jm.2002.12.001

Tierney, P., Farmer, S. M., & Graen, G. B. (1999). An examination of leadership and employee creativity: The relevance of traits and relationships. *Personnel Psychology, 52*, 591–620. doi:10.1111/j.1744-6570.1999.tb00173.x

Unsworth, K. (2001). Unpacking creativity. *Academy of Management Review, 26*, 289–297. doi:10.5465/AMR.2001.4378025

van Dyne, L., Cummings, L. L., & Parks, J. M. (1995). Extra-role behaviors: In pursuit of construct and definitional clarity. In L. L. Cummings & B. M. Staw (Eds.), *Research in organizational behavior* (Vol. 17, pp. 215–285). Greenwich, CT: JAI Press.

Welbourne, T. M., Johnson, D. E., & Erez, A. (1998). The role-based performance scale: Validity analysis of a theory-based measure. *Academy of Management Journal, 41*, 540–555. doi:10.2307/256941

West, M. A. (2002). Sparkling fountains or stagnant ponds: An integrative model of creativity and innovation implementation in work groups. *Applied Psychology, 51*, 355–387. doi:10.1111/1464-0597.00951

Williams, L. J., & Anderson, S.E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behavior. *Journal of Management, 17*, 601-617. doi:10.1177/014920639101700305

Zacher, H., Robinson, A. J., & Rosing, K. (2014). Ambidextrous leadership and employees' self-reported innovative performance: The role of exploration and exploitation behaviors. *The Journal of Creative Behavior, 50*, 24–46. doi:10.1002/jocb.66

Zacher, H., & Rosing, K. (2015). Ambidextrous leadership and team innovation. *Leadership & Organization Development Journal, 36*, 54–68. doi:10.1108/LODJ-11-2012-0141

Zacher, H., & Wilden, R. G. (2014). A daily diary study on ambidextrous leadership and self-reported employee innovation. *Journal of Occupational and Organizational Psychology, 87*, 813–820. doi:10.1111/joop.12070

Zhang, X., & Bartol, K. M. (2010). Linking empowering leadership and employee creativity: The influence of psychological empowerment, intrinsic motivation, and creative process engagement. *Academy of Management Journal, 53*, 107–128. doi:10.5465/AMJ.2010.48037118

Table 1

Means, Standard Deviations, and Intercorrelations between Study Variables

Variable	*M*	*SD*	1	2	3	4	5	6
1. Creativity required in job	3.53	1.02	-	-	-	-	-	-
2. Daily time pressure	3.07	0.98	.17	-	.09	.24**	.09	-.03
3. Daily opening leadership behavior	3.23	1.12	.32**	.13	-	.01	.26**	.15*
4. Daily closing leadership behavior	2.40	1.05	-.19	.18	.01	-	.01	-.02
5. Daily in-role creativity	8.90	12.39	.06	.10	.29*	.04	-	.25**
6. Daily extra-role creativity	2.66	6.10	-.11	-.06	.16	-.04	.35**	-

Note. Intercorrelations regarding the daily level are presented above the diagonal ($n = 205$); intercorrelations regarding the person level are presented below the diagonal ($N = 73$).
*$p < .05$. **$p < .01$.

Table 2

Multilevel Estimates of Models Predicting Daily In-Role Creativity

	Null Model			Model 1			Model 2			Model 3		
Variable	*b*	*SE*	*t*	*b*	*SE*	*t*	*b*	*SE*	*t*	*b*	*SE*	*t*
Intercept	8.93	1.18	7.56***	8.95	1.17	7.66***	9.00	1.18	7.65***	9.06	1.19	7.58***
Creativity required in job				1.07	1.01	1.06	0.84	1.00	0.84	1.11	0.98	1.13
Daily time pressure				0.90	1.03	0.87	0.42	1.14	0.37	0.91	1.27	0.72
Daily opening leadership behavior							1.81	0.83	2.17*	1.70	0.80	2.12*
Daily closing leadership behavior							3.03	1.05	2.88**	3.11	1.00	3.12**
Daily opening x closing leadership behavior										0.06	2.28	0.03
-2 x log (lh)			1565.78			1558.35			1542.54			1532.28
Δ -2 x log						7.43*			15.81*			10.26†
Δ *df*						2			7			5

Note. *N* on the person level = 73; *n* on the daily level = 205. All level 1 variables are group-mean centered; all level 2 variables are grand-mean centered. *b* = unstandardized regression coefficients; *SE* = standard error; *t* = t-value.
†$p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 3

Multilevel Estimates of Models Predicting Daily Extra-Role Creativity

	Null Model			Model 1			Model 2			Model 3		
Variable	*b*	*SE*	*t*	*b*	*SE*	*t*	*b*	*SE*	*t*	*b*	*SE*	*t*
Intercept	2.74	0.57	4.83***	2.72	0.54	5.04***	2.83	0.58	4.85***	2.87	0.60	4.80***
Creativity required in job				0.30	0.41	0.74	0.36	0.37	0.96	0.21	0.40	0.51
Daily time pressure				-0.69	0.70	-1.03	-0.71	0.59	-1.19	-0.55	0.52	-1.05
Daily opening leadership behavior							1.96	0.66	2.97**	2.02	0.70	2.91**
Daily closing leadership behavior							0.04	0.52	0.08	-0.18	0.58	-0.31
Daily opening x closing leadership behavior										-0.79	0.33	-2.41*
-2 x log (lh)			1287.23			1266.14			1222.61			1217.59
Δ -2 x log						21.09***			43.53***			5.03
Δ *df*						2			7			5

Note. *N* on the person level = 73; *n* on the daily level = 205. All level 1 variables are group-mean centered; all level 2 variables are grand-mean centered. *b* = unstandardized regression coefficients; *SE* = standard error; *t* = t-value.
$^{\dagger}p < .10$. $*p < .05$. $**p < .01$. $***p < .001$.

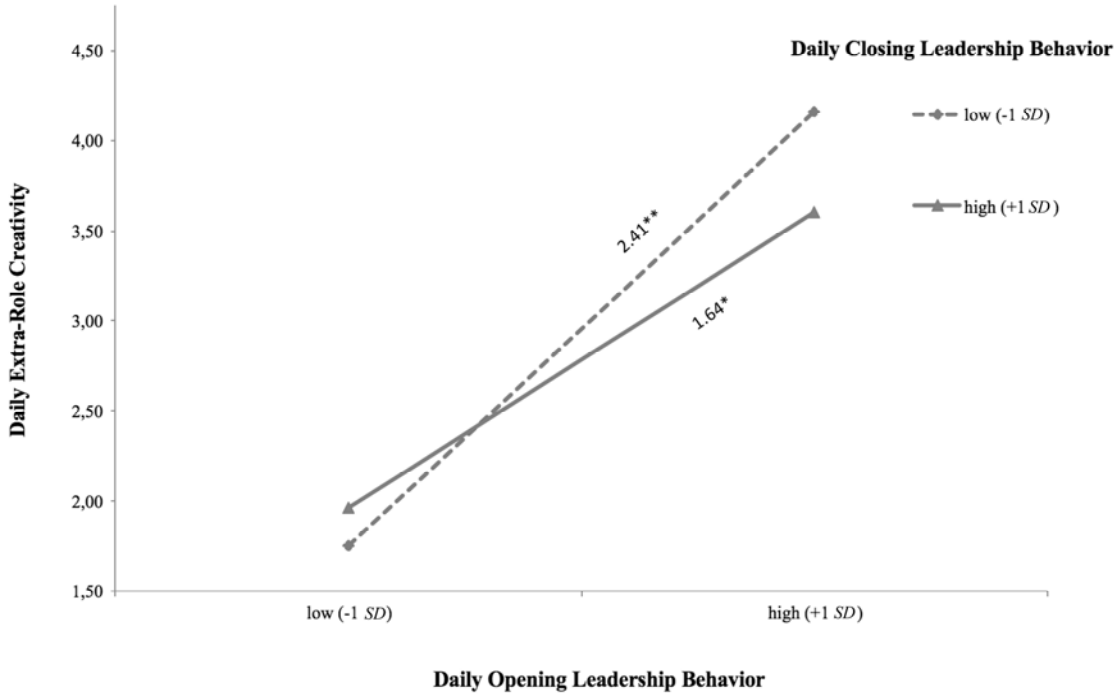


Figure 1. Interplay of daily opening and closing leadership behaviors on daily extra-role creativity.

Manuscript 3

Transformational Leadership and Team Performance: Illuminating Team Climate for Innovation as a Mediator

Jana S. Keil[a], Thomas Rigotti[b], & Kathleen Otto[a]

[a]University of Marburg, Marburg, Germany

[b]Johannes Gutenberg University, Mainz, Germany

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Abstract

Transformational leadership has an important influence on team performance. The processes underlying this influence are not, however, well understood. We integrated insights from innovation research to address this issue. To test our model we conducted a multisource, two-

wave-study in several German organizations and departments. Our sample comprised a total of 609 team members from 84 teams and the associated 84 team leaders. Regression analyses revealed that the relationship between transformational leadership and team performance is mediated by two dimensions of team climate for innovation, (1) vision and (2) task orientation. This effect was stronger in teams with low job autonomy. (3) Participative safety was only a mediator of this relationship in teams with low job autonomy. (4) Support for innovation, one of the strongest predictors of innovation, did not have a mediating effect on the transformational leadership–team performance relationship that was independent of job autonomy. We discuss ways to enhance transformational leadership and the team climate for innovation, especially in low-job autonomy contexts.

Keywords: Team performance, transformational leadership, team climate for innovation, job autonomy, moderated mediation

Organizational success depends on the proper functioning of teams (Guzzo & Dickson, 1996). That is because today's teams are expected to cope well with the challenges arising from rapid changes in the competitive environment facing companies (Kozlowski & Bell, 2008). *Transformational leadership* should be considered in analyses of the qualities teams need to handle these challenges. Transformational leaders motivate followers to act proactively, question routines, create a compelling vision, and support team members (Bass, 1985). They are one of the key factors in team performance (Wang, Oh, Courtright, & Colbert, 2011), the extent to which a team accomplishes a goal or mission (Devine & Philips, 2001). The relationship between transformational leadership and team performance has already been studied in different settings, e.g., transformational leadership and platoon performance (Bass, Avolio, Jung, & Berson, 2003), transformational leadership and team performance in German research teams (Braun, Peus, Weisweiler, & Frey, 2013), or transformational leadership and business unit performance in a Canadian financial institution (Howell & Avolio, 1993).

Dionne, Yammarino, Atwater, and Spangler (2004) directed attention to the fact that the processes by which transformational leadership affects team performance were largely unknown. To address this they developed a *general transformational leadership and team performance mediated model* that highlights teamwork processes as mediators of the relationship between transformational leadership and team performance. Various empirical studies have identified mediators e.g., followers' empowerment and group cohesiveness (Jung & Sosik, 2002), trust in the leader (Schaubroeck, Lam, & Cha, 2007), or team communication and trust in teammates (Boies, Fiset, & Gill, 2015). However, it seems that the full range of mediators has not yet been identified. "The processes explaining how and under which conditions leaders affect team performance need further examination" (Ceri-Booms, Curşeu, & Oerlemans, 2017, p. 189). We aimed to extend knowledge in this field in two ways.

First, we hypothesized that integrating insights from innovation research can help understand how transformational leadership influences team performance. To ensure good team performance managers are urged to create team environments where errors are seen as opportunities for learning (Unger-Aviram & Erez, 2016). The *team climate for innovation* is such an environment. It consists of four dimensions: *vision*, *participative safety*, *task orientation*, and *support for innovation*. We examined these four dimensions of team climate for innovation as mediators of the transformational leadership–team performance relationship.

Second, to counter the need to examine more closely the conditions under which these processes take place, we looked at boundary conditions. We hypothesized that *job autonomy* is a boundary condition under which transformational leadership is connected to team performance. Team member's job autonomy potentially enhances the degree to which they can thrive on the team climate for innovation, resulting in higher team performance. Our research model is summarized in Figure 1.

Insert Figure 1 about here

Team Climate for Innovation as a Mediator

Team climate for innovation is a collective-level phenomenon describing a team environment in which the emphasis is on flexibility and adaptability to environmental change (West, 1990). It consists of four dimensions (West, 1990). The vision dimension of team climate for innovation is defined as the extent to which team members focus on a common and valued vision and have clearly defined goals. Participative safety captures the extent to which team members feel safe in proposing new ways of doing things and affording each other the opportunity to participate in decision making procedures. Task orientation describes whether team members are committed to high standards of performance and hence are prepared to ask basic questions and appraise weaknesses. The support for innovation

dimension reflects the extent to which team members are actively searching for new ways of looking at problems and developing new ideas as well as cooperating to apply them (Anderson & West, 1996).

The concept of team climate for innovation was originally developed to explain the processes leading to innovation (West, 1990). It has mainly been studied in the context of innovation, e.g., in Research and Development (R&D) teams (Eisenbeiss, van Knippenberg, & Boerner, 2008; Pirola-Merlo, Härtel, Mann, & Hirst, 2002) or in product development teams (Sun, Xu, & Shang, 2012). The activity of these teams is "focused on producing specific innovations" (Bain, Mann, & Pirola-Merlo, 2001, p. 58)—the intentional introduction and application of new ideas, processes, products or procedures within a job, team, or organization (West & Farr, 1990). Accordingly, the performance of R&D teams is considered largely a reflection of their capacity for innovation (Bain et al., 2001).

Teams that do not have innovation as their central performance outcome can nevertheless benefit from a team climate for innovation. Anderson and West (1998, p. 254) highlight that team climate for innovation can be beneficial for "other types of group output, but further research is called for to examine this issue." We assume that the team climate for innovation is one of the so far overlooked reasons why transformational leaders are beneficial for team performance.

Transformational leaders are known to be especially effective in times of constant change (Bass, 1985; Eisenbach, Watson, & Pillai, 1999). They support their employees to enable them to approach problems in new ways and question beliefs and assumptions (Bass, 1985). Transformational leadership is an adaptive leadership style that is suited to today's challenges as it generates "creative solutions to complex problems" (Bass et al. 2003, p. 207). Accordingly, transformational leaders stimulate their team to address problems in new ways and always strive to do things better. Accordingly, transformational leadership has been connected to the team climate for innovation (Eisenbeiss et al., 2008; Shin, 2015).

When employees are working in a team climate for innovation they are more likely to be involved in discussions and confronted with opposing views. Kivimäki et al. (2000) suggested that understanding other people's ideas would improve a team's problem-solving ability and thus improve performance. It has already been shown that team climate for innovation is related to team effectiveness (Gil, Rico, Alcover, & Barrasa, 2005). A team climate for innovation might further increase learning within teams and thereby enhance team performance. A study of medical teams showed that only when errors were openly discussed, could they be prevented (Edmondson, 1996). A team climate for innovation may signal that discussion and exchange of new ideas in order to help solve problems are considered desirable and thus lead to higher team performance. Accordingly, we assume that team climate for innovation is a mediator of the relationship between transformational leadership and team performance.

Team climate for innovation has often been studied as a unitary construct (e.g., Gil et al., 2005; Pirola-Merlo et al., 2002; Sun et al., 2012) but it was described in terms of a four-dimensional model (West, 1990). The four dimensions vision, task orientation, participative safety, and support for innovation, were again found when validating the theory (e.g., Agrell & Gustafson, 1994; Anderson & West, 1998; Kivimäki et al., 2000). It is important to consider the four dimensions separately because—although correlated—they have independent influences on team outcomes (Bain et al., 2001; Burningham & West, 1995). To get a detailed picture of their unique effects, we examined the four dimensions of team climate for innovation separately as mediators of the transformational leadership–team performance relationship.

H1: The positive relationship between transformational leadership and team performance is mediated by a) vision, b) participative safety, c) task orientation, and d) support for innovation.

Job Autonomy as a Boundary Condition

A prerequisite for high performance is having the opportunity to perform (Blumberg & Pringle, 1982). Leach, Wall, Rogelberg, and Jackson (2005) interpreted this in terms of need for job autonomy, which is one of the most important workplace factors in motivation, performance and work satisfaction (Spector, 1986; Wegman, Hoffman, Carter, Twenge, & Guenole, 2016).

Hackman and Oldham (1975) defined autonomy as freedom in scheduling work and determining how it is carried out. When people are autonomous they feel responsible for the outcomes of their work (Hackman & Oldham, 1975), so autonomy may enhance the impact of the team climate for innovation dimensions on team performance, because autonomous team members feel more responsible for ensuring that the goals they have been set are attained. Autonomous employees are further more intrinsically motivated and thus feel excited about work activities and show interest in them (Shalley, Zhou, & Oldham, 2004). This motivation may increase the wish to fulfill their work goals and transmit this enthusiasm to other team members, resulting in higher team performance. Perceived ownership of processes and performance as a result of autonomy might also lead to team members feeling that their suggestions can have an impact. Thereby, team members can improve not-functioning procedures, processes, or team outcomes and thus foster team performance.

When team members lack job autonomy the benefits of a team climate for innovation may be reduced. Without job autonomy team members do not have the freedom to change how they work, even if they want to discuss ideas and improve weaknesses (Hackman & Oldham, 1975). “In jobs with low levels of autonomy (…) an individual’s actions are likely to be constrained” (Fuller, Hester, & Cox, 2010, p. 39). Constraints could emerge from work rules, a predetermined pace of work or guidelines for machinery. Accordingly, team members are restricted in their behavior due to their lack of job autonomy. Then, even if support for innovation leads to ideas about improvements, or task orientation makes team members

critically question how they do their work, it is more difficult to transmit ideas about improvements into action as it is not the team members' field of responsibility to make any changes. Thus the team climate dimensions are less likely to have an impact on team performance. On this basis we hypothesized that:

> H2: Job autonomy moderates the mediation of the relationship between transformational leadership and team performance by (a) vision, (b) participative safety, (c) task orientation, and (d) support for innovation. The indirect effects are stronger in the case of teams with more job autonomy.

Method

Procedure and Participants

Our study was part of a larger research project on rewarding and sustainable health promoting leadership (anonymized source to ensure author anonymity). Data were collected on teams from multiple organizations in the fields of banking, auditing, social services, education, and facility management. To make sure that teams and their leaders could assess each other, team members were required to interact with their team on a regular basis. Before the assessment teams were given information about the objectives of the study. The teams were guaranteed anonymity with respect to the processing and evaluation of data. Teams that decided to participate were given a randomly generated code that was distributed to the team by its leader. This code was used to match teams' responses with the leaders' responses. The code was entered on the first page of the questionnaire. Individuals could provide data by completing an online or paper-and-pencil version of the questionnaires. Data were collected at two time points, one year apart.

At the first time point (T1), team members were asked about their team leader's transformational leadership as well as the team's vision, task orientation, participative safety, support for innovation, and their job autonomy. At the second time point (T2), one year later, the team leaders were asked to report on their team's performance of the last year. We decided for this time-lag as Geyer and Steyrer (1998) found out that the relationship between transformational leadership and long-term performance was stronger than the relationship with short-term performance. They speculated that this is because transformational leadership needs time to exert its influence through procedures and processes on performance. Thus, to detect the relationship between transformational leadership and team performance we also applied a time-lag of one year.

In total 1,203 team members of 180 teams participated at T1 and 212 leaders responded at T2. During initial data screening we excluded teams whose leader had changed between T1 and T2 and responses that did not include a team code. Then we matched team members' responses at T1 with leaders' responses at T2; we were able to match 95 leaders to team responses. However, 11 leaders had missing data for the performance construct, leading to a reduced sample of 84 team leaders and 612 team members. We then screened out data for team members who had responded to 50% or fewer of the items of a scale (n = 3), which resulted in a final sample of 609 team members distributed across 84 teams. The teams were mainly employed in sales and distribution, as specialists in banking, in auditing, or as educators.

The teams had, on average, 7.25 (SD = 4.12) members. Most team members were women (77%). The most common highest level of education was first stage of tertiary education (42%), followed by upper secondary level (14%) and then post-secondary level (10%). The mean age of team members was 40.40 years old (SD = 10.46) and the mean number of hours worked per week was 39.33 (SD = 5.25). At T1 team members had, on average, worked in their current unit for 7.14 years (SD = 6.70). There were roughly equal

proportions of male (43%) and female (57%) team leaders. The highest level of education attained by the majority of team leaders was the first stage of tertiary education (64%), followed by post-secondary (7%), upper secondary (6%), and second stage of tertiary education (5%). When they replied at T2, they were on average 46.24 years old (*SD* = 7.97), worked 44.46 hours a week (*SD* = 5.63), and had been with their team for 6.41 (*SD* = 4.99) years.

Measures

Transformational leadership. We assessed transformational leadership with the shortened seven-item transformational leadership scale developed by Carless, Wearing, and Mann (2000). Items were rated on a five-point Likert scale ranging from 1 (*to a very small extent*) to 5 (*to a very large extent*). An example item is "My immediate superior gives encouragement and recognition to staff", which had a Cronbach's alpha of .97 at team level.

Team climate for innovation. We assessed all team climate for innovation dimensions using the shortened version of the Team Climate Inventory by Kivimäki and Elovainio (1999), which is based on the Team Climate Inventory (TCI) by Anderson and West (1996). All items were rated using a five-point Likert scale ranging from 1 (*to a very small extent*) to 5 (*to a very large extent*).

Participative safety was measured with four items (Kivimäki & Elovainio, 1999). A sample item is "People keep each other informed about work related issues in the work unit." Cronbach's alpha was .90 at team level.

Task orientation was measured with three items (Kivimäki & Elovainio, 1999). A sample item is "Are members of your work unit prepared to question the basis of what the work unit is doing?" Cronbach's alpha was .86 at team level.

Support for innovation was measured with four items (Kivimäki & Elovainio, 1999). A sample item is "People in this work unit are always searching for fresh, new ways of looking at problems." Cronbach's alpha was .85 at team level.

Vision was measured with four items (Kivimäki & Elovainio, 1999). An example item is "To what extent are you in agreement with the objectives of your work unit?" Cronbach's alpha was .54 at team level. Because of the low Cronbach's alpha we looked more closely at this dimension. Our model showed one vision item had a negative loading of -.17 on the vision factor, this item read as follows: "How worthwhile do you think these objectives are to the organization?" It is the only item that refers not to the team, but to the organization. Vision describes team activities "focusing on clear and realistic objectives in which the team members are committed" (Kivimäki & Elovainio, 1999, p. 241). Accordingly, the team and not the organization is the focus. This change of focus may be the cause for the low loading. The exclusion of this item led to a better model fit than the model fit when this item had been included ($\Delta X^2 = 85.160$, $\Delta df = 12$, $p < .001$). Cronbach's alpha for vision at team level improved—despite the loss of one item—from .54 for the four-item version to .62 for the three-item version. This is still not high; however because the shortened vision subscale was heterogeneous we consider it adequate. Due to the statistical issues and doubts about its content validity we excluded this item from our analyses.

We conducted confirmatory factor analysis to examine whether the four team climate dimensions were represented better by a four-factor model than a one-factor model. The results matched our assumptions: the four-factor model fit the data better than the one factor model ($\Delta X^2 = 102.869$, $\Delta df = 6$, $p < .001$).

Job autonomy. We assessed job autonomy with four items developed by Guest, Isaksson, and De Witte (2010). The items were rated on a five-point Likert scale ranging from 1 (*very seldom or never*) to 5 (*very often or always*). A sample item is "I can choose my job assignments", which had a Cronbach's alpha of .82 at team level.

Team performance. The team variables and leadership variables were based on team members' ratings, whereas team performance was rated by the leader one year later using the

item "How would you rate the performance of your team during the previous year on a scale from 1 (*very bad*) to 10 (*extraordinary*)?"

Aggregation

Prior to aggregation, we calculated the agreement of the team members using the formula developed by James, Demaree, and Wolf (1984). The mean values were $r_{WG} = .76$ for transformational leadership, $r_{WG} = .83$ for vision, $r_{WG} = .72$ for participative safety, $r_{WG} = .78$ for task orientation, $r_{WG} = .72$ for support for innovation, and $r_{WG} = .81$ for team members' job autonomy. All r_{WG} values were above the cut-off value of .70 (James et al., 1984) and thus allowed aggregation of the individual team members' responses at team level.

Data Analysis

Table 1 shows means, standard deviations, and the correlation matrix for all variables at the team level. Some team climate for innovation dimensions were highly correlated; the highest correlations were between task orientation and participative safety ($r = .85$) and between support for innovation and task orientation ($r = .78$). These results are in line with other research e.g., reports of high correlations between task orientation and participative safety ($r = .77$) and between innovation and task orientation ($r = .77$) (Burningham & West, 1995). However, the same study also showed that the dimensions had independent effects (Burningham & West, 1995). Our confirmatory factor analysis also showed that the four dimensions of team climate for innovation were best represented by a four-factor model. Because of the high correlations between task orientation and participative safety and between task orientation and support for innovation we also tested a two-factor model with vision as one factor and task orientation, participative safety, and support for innovation as a second factor. However, the four-factor model proved to be a better fit to the data than the two-factor model ($\Delta X^2 = 42.007$, $\Delta df = 5$, $p < .001$). We also tested a three-factor model in which the most highly correlated pair of dimensions, task orientation and participative safety, were combined into a single factor; however, once again the analysis indicated that the four-factor

model offered a better fit ($\Delta X^2 = 19.505$, $\Delta df = 3$, $p < .001$). Accordingly, we concluded that a four-factor model is better than alternative models merging some or all the dimensions of the team climate for innovation and continued our analysis on this basis. All the hypotheses derived from our theoretical model (Figure 1) were tested using one-tailed tests with a 95% confidence interval.

Insert Table 1 about here

We first analyzed the relationship between transformational leadership climate and team performance. Next we used a bootstrapping procedure (Preacher, Rucker, & Hayes, 2007) to analyze the different team climate for innovation dimensions as potential mediators of this relationship. We assessed each mediator individually as the high correlations between them could lead to multicollinearity issues and hence unreliable results. We used bootstrapping for our analyses as Preacher et al. (2007, p. 185) "advocate that researchers use bootstrapping whenever possible." The advantage of this method is that it incorporates the skew of the distribution. We also applied bias corrections to the confidence intervals to improve the accuracy of our models (MacKinnon, Lockwood, & Williams, 2004). Third, we conducted moderated mediation tests to assess how indirect effects changed when job autonomy was included in the model as a moderator. We followed the procedure described by Preacher et al. (2007) and Hayes (2015). In the first step, the mediator is regressed on the predictor. Then the outcome is regressed on the predictor, the mediator, the moderator, and the interaction between mediator and moderator. We plotted the results of step 2 to illustrate graphically how the moderator influences the relationship between each mediator and outcome. In the third step indices of moderated mediation are estimated (Hayes, 2015). These indices are "an interval estimate of the parameter of a function linking the indirect effect to values of a moderator" (Hayes, 2015, p.1). To illustrate how indirect effects changed when job autonomy was included in the model we computed conditional indirect effects for

different values (*M*, -1 *SD*, and +1 *SD*) of the moderator. Once again we applied bootstrapping procedures and centered the variables prior to the moderation analysis. All bootstrapping analyses were performed with the SPSS macro PROCESS (Hayes, 2013).

Results

Before we tested our hypotheses, we looked at the relationship between transformational leadership and team performance. Transformational leadership was positively related to team performance ($r = .26$, $p < .05$).

Our mediation hypotheses stated that the positive relationship between transformational leadership and team performance is mediated by multiple dimensions of team climate for innovation: vision (H1a), participative safety (H1b), task orientation (H1c), and support for innovation (H1d). There were positive indirect effects of vision ($b = .20$, $SE = .14$, 95% CI [0.01, 0.45]) and task orientation ($b = .09$, $SE = .07$, 95% CI [0.01, 0.23]), providing support for hypotheses 1a and 1c. The positive relationship between transformational leadership and team performance seems to be mediated by vision and task orientation. Neither participative safety ($b = .08$, $SE = .08$, 95% CI [-0.03, 0.24]) nor support for innovation ($b = .00$, $SE = .05$, 95% CI [-0.07, 0.10]) had an indirect effect on team performance. In other words, neither participative safety nor support for innovation seem to mediate the transformational leadership–team performance relationship in our sample. Hence, hypotheses 1b and 1d had to be rejected.

Two of our mediations were non-significant. However, “a significant unconditional indirect effect does not constitute a prerequisite for examining conditional indirect effects” (Preacher et al., 2007, p. 211). An indirect effect might occur only for specific values of the moderator, with the result that there is no overall indirect effect. Including a moderator in the analysis allows to investigate how the indirect effect varies with variation in the level of the moderator.

After testing the mediation relationships we estimated moderated mediation models to examine hypothesis 2a–2d. We hypothesized that job autonomy moderates indirect effects of transformational leadership on team performance via vision (H2a), participative safety (H2b), task orientation (H2c), and support for innovation (H2d). We hypothesized that the indirect effect is stronger in the case of teams that have more job autonomy.

The results of regression steps 1 and 2 are displayed in Table 2. The results of step 1 demonstrate that transformational leadership was positively related to all the dimensions of team climate for innovation. In step 2 we detected significant interactions between vision and job autonomy, participative safety and job autonomy, and task orientation and job autonomy on team performance. To illustrate how the moderator works at this position in the model we plotted the interaction effects. As can be seen in Figure 2, the effects of vision (Figure 2a), participative safety (Figure 2b), and task orientation (Figure 2c) on team performance were always significant and positive for low (-1 *SD*) values of job autonomy. When job autonomy was high (+1 *SD*) the interaction effect lost its significance. The interaction between support for innovation and job autonomy did not significantly affect team performance.

Insert Table 2 and Figure 2 about here

To test whether the indirect effects were moderated by job autonomy we estimated indices of moderated mediation in a third step. The indices supported our hypothesis that job autonomy would moderate the indirect effects of transformational leadership on team performance via vision (*Index* = -.67, *SE*(Boot) = .43, 95% CI [-1.58, -.10]), participative safety (*Index* = -.34, *SE*(Boot) = .22, 95% CI [-.78, -.06]), and task orientation (*Index* = -.*26*, *SE*(Boot) = .18, 95% CI [-.66, -.05]). We examined how the moderator influenced the indirect effects by analyzing the conditional indirect effects for specific values of the moderator: the mean and one standard deviation above and below the mean (Table 3).

Insert Table 3 about here

The indirect effects were always larger for teams with low job autonomy (-1 *SD*). There were no indirect effects for teams with high job autonomy (+1 *SD*). It appears that the effects of vision, participative safety, and task orientation on team performance are stronger in the context of low job autonomy. Hypotheses 2a–2c were not supported because although significant, the conditional indirect effects were contrary to what we had expected. The index of moderated mediation was not significant with support for innovation as the mediator (*Index* = -.19, *SE*(Boot) = .17, 95% CI [-.54, .01]), hence hypothesis 2d was rejected. There seems to be no job autonomy-moderated, indirect effect of transformational leadership on team performance through support for innovation.

Discussion

Our study addresses the call for research into how and under which conditions transformational leaders influence team performance (Ceri-Booms et al., 2017). We found that the relationship between transformational leadership and team performance was mediated by two dimensions of team climate for innovation, namely vision and task orientation. There was no evidence that it was mediated by participative safety nor support for innovation. We also investigated these mediation relationships by including job autonomy in our analyses as a moderator. We found conditional indirect effects in the cases of vision, participative safety, and task orientation, but the direction of the relationships was contrary to expectations. In all cases the relationship was stronger in the context of low job autonomy. The conditional indirect effect with support for innovation as the mediator was not significant.

The fact that both vision and task orientation were mediators of the leadership–performance relationship may be due to their functional similarity: both are “task or product oriented” (West, 1990, p. 316). High team vision encourages team members to engage in work tasks because it provides focus and direction (West, 1990). Task orientation implies that

team members will put effort into work tasks because it represents a commitment to high standards of performance and is characterized by evaluation and modification of established routines to maximize task performance (West, 1990). Taken together, both vision and task orientation serve to encourage teams to focus on work tasks. As performance is measured by how well teams execute their work tasks to reach a goal or mission (Devine & Philips, 2001) this could explain why both dimensions mediate the impact of transformational leadership on team performance.

When the analyses included job autonomy as a moderator, vision and task orientation were stronger mediators in the context of low job autonomy. In the context of low job autonomy participative safety was also a mediator. In other words vision, task orientation and participative safety seem to be especially beneficial to teams with low job autonomy. We expected that job autonomy would enhance the effect of the team climate for innovation dimensions on team performance, whereas in fact it weakened it. There are several reasons to explain these findings.

When team members have a lot of job autonomy they are in control (Hackman & Oldham, 1975). Accordingly, they do not necessarily interact much with their team, nor do they require their support. In such cases team members can make their own decisions and so having a shared vision, striving together for excellence in work tasks or feeling safe when proposing ideas may be less important. Then team members are not dependent on each other. It has been shown that transformational leadership is less effective in environments with little interdependence and cooperation (Keller, 2006). This is also consistent with the argument that the relationship between team processes and team outcomes is weaker when there is little interaction between team members (LePine, Piccolo, Jackson, Mathieu, & Saul, 2008). Another explanation could be that team members with high job autonomy are not influenced by other factors such as a good team climate because autonomy itself already leads to high motivation and performance (Hackman & Oldham, 1975). For team members with little job

autonomy the team climate for innovation may compensate for the unfulfilling job characteristics, such as being unable to change how work is carried out. Consequently, in the absence of job autonomy vision, participative safety, and task orientation may give teams' work meaning and relevance and thereby increase their performance.

Support for innovation did not mediate the transformational leadership–team performance relationship, even when job autonomy was included as a moderator. One possible explanation for this is that in conventional teams the discussion of new and potentially useful ideas competes with the efficient execution of existing work tasks. This is consistent with the theory that there are two competing actions: creative and habitual actions (Ford, 1996). Creative action requires more effort and its outcome is unclear (Ford, 1996). Whilst this effort pays off in R&D teams, because innovation is the central performance outcome (Bain et al., 2001), this is not the case for conventional teams. It may be better to take a traditional approach to some tasks and concentrate on rapid execution, rather than discussing how to improve the task process. In these cases support for innovation could actually impede performance as it distracts attention from tried and tested methods.

Study Limitations

Some limitations of our study must be addressed. Potential mediation relationships are best analyzed using longitudinal data (Cole & Maxwell, 2003). Even though we implemented a time-lag before the assessment of the outcome, we collected data regarding transformational leadership and the team climate dimensions simultaneously and did not control for team performance at T1. This means that we cannot make causal inferences and our results are subject to the risk of spuriously inflated effects (Cole & Maxwell, 2003). Whilst we cannot rule out the possibility that our results are affected by these problems, we did take several steps to counteract them. First, we worded our questions on performance carefully, indicating that we were interested in performance over the previous year. This measurement method ensured that the measured performance data—the outcome variable—occurred after the

predictor variables had been assessed. Other experimental studies support our assumption about the direction of the effects, e.g., it has been shown that transformational leadership has an impact on team performance (Boies et al., 2015). Second, we used a multi-source approach reducing systematic measurement error in our data (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Third, our data speaks against highly inflated effects, because some of our hypotheses were rejected. This supports our assumption that our model can reveal differences. However, future studies could examine whether opposite relationships also exist between team performance, dimensions of team climate for innovation and transformational leadership. Ideally such research would assess predictors, mediators and outcomes at three different time points and control for the potential confounding effects of prior outcomes.

A limitation of our performance data is that we used only one item to measure it. We applied it because teams worked in different areas. This very broad performance measure allowed leaders from different departments to answer it. It further minimized the time it took leaders to respond, but we do not have any insight into how leaders arrived at their responses. In future studies it may be helpful to ask participating leaders what performance criteria would be relevant to their teams and develop a more detailed measure of team performance based on their responses. This should produce a more transparent, more refined performance measure.

Future Research

Our study highlights that integrating insights from innovation research with team performance and leadership theories advances our understanding. It seems that the constructs originally from innovation research match what teams need nowadays in general: to be adaptive, flexible, and react fast to changes (Kozlowski & Bell, 2008). As we have shown that several team climate dimensions of the innovation context influence team performance, it would be interesting to investigate further constructs of the innovation context regarding team performance, e.g., the impact of a leadership style that is usually used in the innovation

context: ambidextrous leadership. This kind of leadership is composed of two complementary sets of behaviors: opening and closing leadership behavior (Rosing, Frese, & Bausch, 2011). As ambidextrous leadership emphasizes adaptability (Rosing et al., 2011) it might be beneficial for teams in general which are operating in a turbulent environment.

Our study further addressed the importance of boundary conditions. Our findings provide support for the assumption that there is always interplay between the person or team and its environment and that they should fit with each other (Caplan, 1987). Integrating work factors as boundary conditions is important as they determine the environment under which work is executed (Bamberg, Mohr, & Busch, 2012), thus broadening or limiting the behavior employees can show at work. Thus, future research should consider further boundary conditions. One of these conditions could be availability of resources. When teams have material and time resources to improve how they do their work, they can likely thrive more on the team climate for innovation dimensions than when they are limited in their resources.

Practical Implications

In addition to theoretical implications our study also has practical implications. One characteristic of high-performance organizations is that they make teamwork a priority (de Waal, 2007). When used correctly, team-based structures can help companies in their struggle for survival, because they are more adaptive and flexible (West & Markiewicz, 2008). Our study provides organizations with knowledge about how to create an environment in which teams can work effectively.

Leaders should see their responsibilities as extending beyond the distribution of work tasks to empowering their team through adopting a transformational leadership style. Kozlowski and Bell (2008) emphasized that it is not enough to create groups that are teams in name only; to be successful they must function as teams. Our research highlights the relevant team processes. Transformational leaders can initiate a shared vision or task orientation which leads to higher team performance.

These team processes are especially important in teams where members have little job autonomy. This may be counter-intuitive, as leaders of these teams may consider it their duty to monitor performance closely. However, they should allow their team members to act proactively, question routines and create a compelling vision as this may counteract the negative effects of limited freedom. Vision, task orientation, and participative safety can thus provide a basis for teams to thrive and perform well. Organizations that wish to foster transformational leadership could use specially designed programs that teach relevant, job-related transformational leadership behaviors (Avolio, 1999).

Conclusion

In summary, our study demonstrates that integrating findings from innovation research with team performance theories can provide insights into the processes underlying the transformational leadership–team performance relationship. It emphasizes that vision, task orientation, and participative safety are crucial to team performance, especially when team members have low job autonomy. Support for innovation, which is highly beneficial for innovation, does not seem to be as important to performance outside the innovation context.

References

Agrell, A., & Gustafson, R. (1994). The Team Climate Inventory (TCI) and group innovation: A psychometric test on a Swedish sample of work groups. *Journal of Occupational and Organizational Psychology, 67*, 143–151. doi: 10.1111/j.2044-8325.1994.tb00557.x

Anderson, N., & West, M. A. (1996). The team climate inventory: Development of the TCI and its applications in teambuilding for innovativeness. *European Journal of Work and Organizational Psychology, 5*, 53–66. doi:10.1080/13594329608414840

Anderson, N., & West, M. A. (1998). Measuring climate for work group innovation: Development and validation of the team climate inventory. *Journal of Organizational Behavior, 19*, 235–258. doi:10.1002/(SICI)1099-1379(199805)19:3<235::AID-JOB837>3.0.CO;2-C

Avolio, B. J. (1999). *Full leadership development: Building the vital forces in organizations*. Thousand Oaks, CA: Sage Publications.

Bain, P. G., Mann, L., & Pirola-Merlo, A. (2001). The innovation imperative: The relationships between team climate, innovation, and performance in research and development teams. *Small Group Research, 32*, 55–73. doi:10.1177/104649640103200103

Bamberg, E., Mohr, G., & Busch, C. (2012). *Arbeitspsychologie [Work psychology]*. Göttingen, Germany: Hogrefe Verlag.

Bass, B. M. (1985). *Leadership and performance beyond expectations*. New York, NY: Free Press.

Bass, B. M., Avolio, B. J., Jung, D. I., & Berson, Y. (2003). Predicting unit performance by assessing transformational and transactional leadership. *Journal of Applied Psychology, 88*, 207–218. doi:10.1037/0021-9010.88.2.207

Blumberg, M., & Pringle, C. D. (1982). The missing opportunity in organizational research: some implications for a theory of work performance. *Academy of Management Review, 7*, 560–569. doi:10.5465/AMR.1982.4285240

Boies, K., Fiset, J., & Gill, H. (2015). Communication and trust are key: Unlocking the relationship between leadership and team performance and creativity. *The Leadership Quarterly, 26*, 1080–1094. doi:10.1016/j.leaqua.2015.07.007

Braun, S., Peus, C., Weisweiler, S., & Frey, D. (2013). Transformational leadership, job satisfaction, and team performance: A multilevel mediation model of trust. *The Leadership Quarterly, 24*, 270–283. doi:10.1016/j.leaqua.2012.11.006

Burningham, C., & West, M. A. (1995). Individual, climate, and group interaction processes as predictors of work team innovation. *Small Group Research, 26*, 106–117. doi:10.1177/1046496495261006

Caplan, R. D. (1987). Person-environment fit theory and organizations: Commensurate dimensions, time perspectives, and mechanisms. *Journal of Vocational Behavior, 31*, 248–267. doi:10.1016/0001-8791(87)90042-X

Carless, S. A., Wearing, A. J., & Mann, L. (2000). A short measure of transformational leadership. *Journal of Business and Psychology, 14*, 389–405. doi:10.1023/A:1022991115523

Ceri-Booms, M., Curşeu, P. L., & Oerlemans, L. A. G. (2017). Task and person-focused leadership behaviors and team performance: A meta-analysis. *Human Resource Management Review, 27*, 178–192. doi: 10.1016/j.hrmr.2016.09.010

Cole, D. A., & Maxwell, S. E. (2003). Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology, 112*, 558–577. doi:10.1037/0021-843X.112.4.558

de Waal, A. A. (2007). The characteristics of a high performance organization. *Business Strategy Series, 8*, 179–185. doi:10.1108/17515630710684178

Devine, D. J., & Philips, J. L. (2001). Do smarter teams do better: A meta-analysis of cognitive ability and team performance. *Small Group Research, 32*, 507–532. doi:10.1177/104649640103200501

Dionne, S. D., Yammarino F. J., Atwater, L. E. & Spangler, W. D. (2004). Transformational leadership and team performance. *Journal of Organizational Change Management, 17*, 177–193. doi:10.1108/09534810410530601

Edmondson, A. C. (1996). Learning from mistakes is easier said than done: Group and organizational influences on the detection and correction of human error. *The Journal of Applied Behavioral Science, 40*, 66–90. doi:10.1177/0021886304263849

Eisenbach, R., Watson, K., & Pillai, R. (1999). Transformational leadership in the context of organizational change. *Journal of Organizational Change Management, 12*, 80–89. doi:10.1108/09534819910263631

Eisenbeiss, S. A., van Knippenberg, D., & Boerner, S. (2008). Transformational leadership and team innovation: Integrating team climate principles. *Journal of Applied Psychology, 93*, 1438–1446. doi:10.1037/a0012716

Ford, C. M. (1996). A theory of individual creative action in multiple social domains. *Academy of Management Review, 21*, 1112–1142. doi:10.5465/AMR.1996.9704071865

Fuller, J. B., Hester, K., & Cox, S. S. (2010). Proactive personality and job performance: Exploring job autonomy as a moderator. *Journal of Managerial Issues, 22*, 35–51. Retrieved from http://www.jstor.org/stable/25822514

Geyer, A., & Steyrer, J. (1998). Messung und Erfolgswirksamkeit transformationaler Führung [Measurement and effectiveness of transformational leadership]. *German Journal of Human Resource Management: Zeitschrift für Personalforschung, 12*, 377–401.

Gil, F., Rico, R., Alcover, C. M., & Barrasa, A. (2005). Change-oriented leadership, satisfaction and performance in work groups: Effects of team climate and group potency. *Journal of Managerial Psychology, 20*, 312–328. doi:10.1108/02683940510589073

Guest, D. E., Isaksson, K., & De Witte, H. (2010). *Employment contracts, psychological contracts, and worker well-being: An international study*. New York, NY: Oxford University Press.

Guzzo, R. A., & Dickson, M. W. (1996). Teams in organizations: Recent research on performance and effectiveness. *Annual Review of Psychology, 47*, 307–338. doi: 10.1146/annurev.psych.47.1.307

Hackman, J. R., & Oldham, G. R. (1975). Development of the job diagnostic survey. *Journal of Applied Psychology, 60*, 159–170. doi:10.1037/h0076546

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford Press.

Hayes, A. F. (2015). An index and test of linear moderated mediation. *Multivariate Behavioral Research, 50*, 1–22. doi:10.1080/00273171.2014.962683

Howell, J. M., & Avolio, B. J. (1993). Transformational leadership, transactional leadership, locus of control, and support for innovation: Key predictors of consolidated-business-unit performance. *Journal of Applied Psychology, 78*, 891–902. doi:10.1037/0021-9010.78.6.891

James, L. R., Demaree, R. G., & Wolf, G. (1984). Estimating within-group interrater reliability with and without response bias. *Journal of Applied Psychology*, *69,* 85–98. doi:10.1037//0021-9010.69.1.85

Jung, D. I., & Sosik, J. J. (2002). Transformational leadership in work groups: The role of empowerment, cohesiveness, and collective-efficacy on perceived group performance. *Small Group Research, 33*, 313–336. doi:10.1177/10496402033003002

Keller, R. T. (2006). Transformational leadership, initiating structure, and substitutes for leadership: A longitudinal study of research and development project team performance. *Journal of Applied Psychology, 91*, 202–210. doi:10.1037/0021-9010.91.1.202

Kivimäki, M., & Elovainio, M. (1999). A short version of the team climate inventory: Development and psychometric properties. *Journal of Occupational and Organizational Psychology, 72*, 241–246. doi:10.1348/096317999166644

Kivimäki, M., Länsisalmi, H., Elovainio, M., Heikkilä, A., Lindström, K., Harisalo, R., … & Puolimatka, L. (2000). Communication as a determinant of organizational innovation. *R&D Management, 30*, 33–42. doi: 10.1111/1467-9310.00155

Kozlowski, S. W. J., & Bell, B. S. (2008). Team learning, development, and adaptation. In V. I. Sessa & M. London (Eds.), *Work group learning: Understanding, improving & assessing how groups learn in organizations* (pp. 15–44). New York, NY: Lawrence Erlbaum Associates.

Leach, D. J., Wall, T. D., Rogelberg, S. G., & Jackson, P. R. (2005). Team autonomy, performance, and member job strain: Uncovering the teamwork KSA link. *Applied Psychology, 54*, 1–24. doi:10.1111/j.1464-0597.2005.00193.x

LePine, J. A., Piccolo, R. F., Jackson, C. L., Mathieu, J. E., & Saul, J. R. (2008). A meta-analysis of teamwork processes: Tests of a multidimensional model and relationships with team effectiveness criteria. *Personnel Psychology, 61*, 273–307. doi:10.1111/j.1744-6570.2008.00114.x

MacKinnon, D. P., Lockwood, C. M., & Williams, J. (2004). Confidence limits for the indirect effect: Distribution of the product and resampling methods. *Multivariate Behavioral Research, 39*, 99–128. doi: 10.1207/s15327906mbr3901_4

Pirola-Merlo, A., Härtel, C., Mann, L., & Hirst, G. (2002). How leaders influence the impact of affective events on team climate and performance in R&D teams. *The Leadership Quarterly, 13*, 561–581. doi:10.1016/S1048-9843(02)00144-3

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*, 879–903. doi:10.1037/0021-9010.88.5.879

Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behavioral Research, 42*, 185–227. doi:10.1080/00273170701341316

Rosing, K., Frese, M., & Bausch, A. (2011). Explaining the heterogeneity of the leadership-innovation relationship: Ambidextrous leadership. *The Leadership Quarterly, 22*, 956–974. doi:10.1016/j.leaqua.2011.07.014

Schaubroeck, J., Lam, S. S. K., & Cha, S. E. (2007). Embracing transformational leadership: Team values and the impact of leader behavior on team performance. *Journal of Applied Psychology, 92*, 1020–1030. doi:10.1037/0021-9010.92.4.1020

Shalley, C. E., Zhou, J., & Oldham, G. R. (2004). The effects of personal and contextual characteristics on creativity: Where should we go from here? *Journal of Management, 30*, 933–958. doi:10.1016/j.jm.2004.06.007

Shin, J. S. (2015). Leadership and creativity: The mechanism perspective. In C. E. Shalley, M. A. Hitt, & J. Zhou (Eds.), *The Oxford Handbook of Creativity, Innovation, and Entrepreneurship* (pp. 17–30). New York, NY: Oxford University Press.

Spector, P. E. (1986). Perceived control by employees: A meta-analysis of studies concerning autonomy and participation at work. *Human Relations, 39*, 1005–1016. doi:10.1177/001872678603901104

Sun, W., Xu, A., & Shang, Y. (2012). Transformational leadership, team climate, and team performance within the NPD team: Evidence from China. *Asia Pacific Journal of Management, 31*, 127–147. doi:10.1007/s10490-012-9327-3

Unger-Aviram, E., & Erez, M. (2016). The effects of situational goal orientation and cultural learning values on team performance and adaptation to change. *European Journal of Work and Organizational Psychology, 25,* 239–253. doi:10.1080/1359432X.2015.1044515

Wang, G., Oh, I.-S., Courtright, S. H., & Colbert, A. E. (2011). Transformational leadership and performance across criteria and levels: A meta-analytic review of 25 years of research. *Group & Organization Management, 36*, 223–270. doi:10.1177/1059601111401017

Wegman, L. A., Hoffman, B. J., Carter, N. T., Twenge, J. M., & Guenole, N. (2016). Placing job characteristics in context: Cross-temporal meta-analysis of changes in job characteristics since 1975. *Journal of Management,* Online First. doi:10.1177/0149206316654545

West, M. A. (1990). The social psychology of innovation in groups. In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work: Psychological and organizational strategies* (pp. 309–333). Oxford, United Kingdom: Wiley.

West, M. A., & Farr, J. L. (1990). Innovation at work. In M. A. West & J. L. Farr (Eds.), *Innovation and creativity at work: Psychological and organizational strategies* (pp. 3–15). Oxford, United Kingdom: Wiley.

West, M. A., & Markiewicz, L. (2008). *Building team-based working: A practical guide to organizational transformation*. Chichester, United Kingdom: Wiley.

Table 1

Means, Standard Deviations, and Intercorrelations between Study Variables

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. Transformational leadership	3.29	0.64	-						
2. Vision	3.93	0.37	.50**	-					
3. Participative safety	3.77	0.46	.36**	.58**	-				
4. Task orientation	3.43	0.39	.28**	.57**	.85**	-			
5. Support for innovation	3.19	0.41	.25*	.40**	.67**	.78**	-		
6. Job autonomy	3.16	0.43	.15	-.15	-.13	-.03	.06	-	
7. Team performance[a]	8.17	1.26	.26*	.28**	.19	.21	.07	-.01	-

Note. $N = 84$. [a]Assessed at T2, one year after the other variables. $^{\dagger}p < .10$. $*p < .05$. $**p < .01$.

Table 2

Mediator and Dependent Variable Models

	Mediator variable model (Step1)															
	Vision				Participative Safety				Task orientation				Support for innovation			
	b	*SE*	*t*	R^2	*b*	*SE*	*t*	R^2	*b*	*SE*	*t*	R^2	*b*	*SE*	*t*	R^2
Constant	-.96	.19	-5.11**	.25	-.85	.25	-3.41**	.13	-.56	.22	-2.60*	.08	-.51	.23	-2.26*	.06
Transformational leadership	.29	.06	5.21**		.26	.07	3.47**		.17	.06	2.64**		.16	.07	2.30*	
	Dependent variable model (Step 2): Team performance[a]															
Constant	6.96	.82	8.46**	.15	6.41	.78	8.19**	.11	6.38	.76	8.40**	.12	6.06	.78	7.76**	.10
Transformational leadership	.35	.25	1.43†		.52	.23	2.24*		.54	.23	2.38**		.64	.23	2.74**	
Mediator	.79	.42	1.87*		.09	.34	.26		.34	.37	.93		.04	.34	.11	
Job autonomy	.13	.32	.42		.03	.33	.09		.03	.32	.08		-.19	.31	-.62	
Mediator x job autonomy	-2.28	1.07	-2.12*		-1.30	.74	-1.76*		-1.52	.87	-1.75*		-1.19	.80	-1.49	

Note. $N = 84$. [a]Assessed at T2, one year after the other variables. †$p < .10$. *$p < .05$. **$p < .01$.

Table 3

Conditional Indirect Effects of Transformational Leadership on Team Performance at Different Values of the Moderator

Mediator	Job Autonomy	Indirect Effect	Boot *SE*	Boot LLCI	Boot ULCI
Vision	-1 *SD*	.52	.30	.14	1.21
	M	.23	.16	.03	.55
	+1 *SD*	-.06	.16	-.35	.18
Participative Safety	-1 *SD*	.17	.11	.03	.40
	M	.02	.08	-.10	.17
	+1 *SD*	-.12	.14	-.41	.05
Task Orientation	-1 *SD*	.17	.12	.03	.41
	M	.06	.07	-.01	.21
	+1 *SD*	-.05	.09	-.26	.05
Support for Innovation	-1 *SD*	.09	.10	-.01	.33
	M	.01	.06	-.06	.12
	+1 *SD*	-.07	.08	-.27	.00

Note. $N = 84$. Boot = bootstrapped. 5000 bootstrap resamples for bias corrected bootstrap confidence intervals, one-tailed.

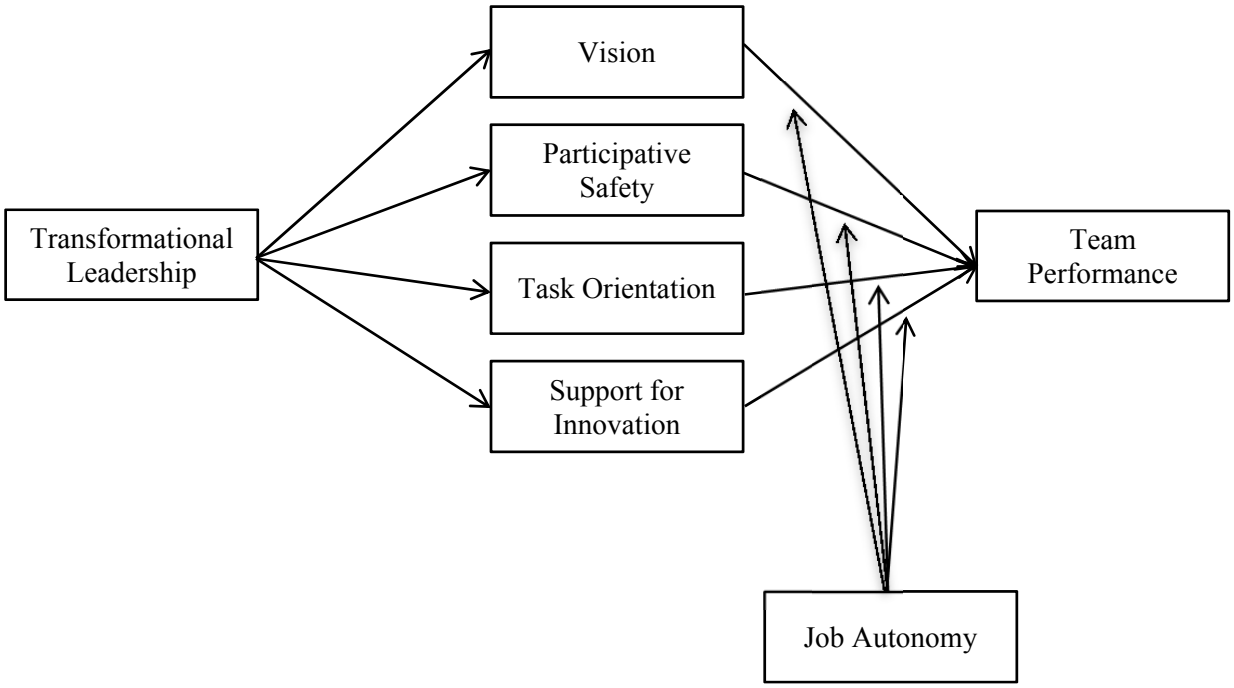
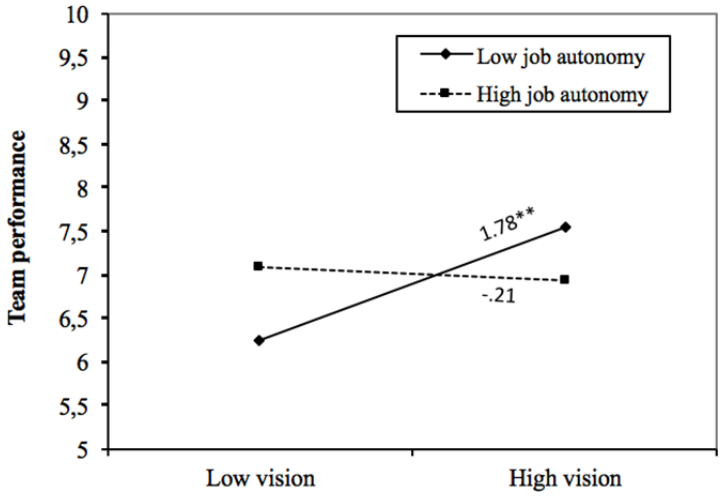
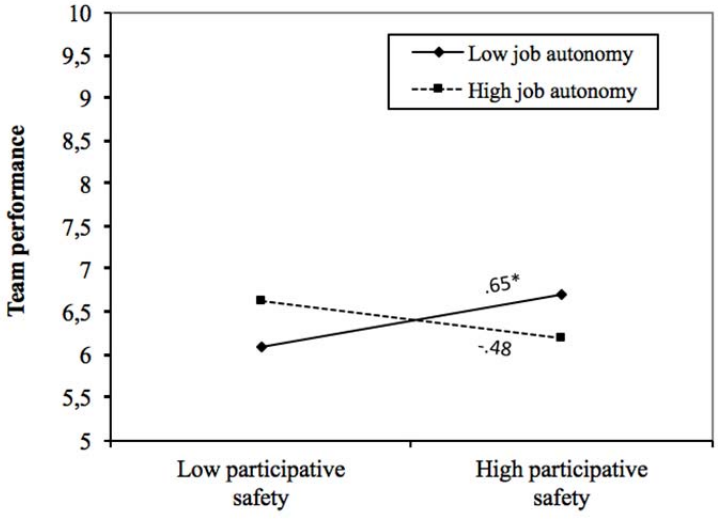


Figure 1. Research model.

a)



b)



c)

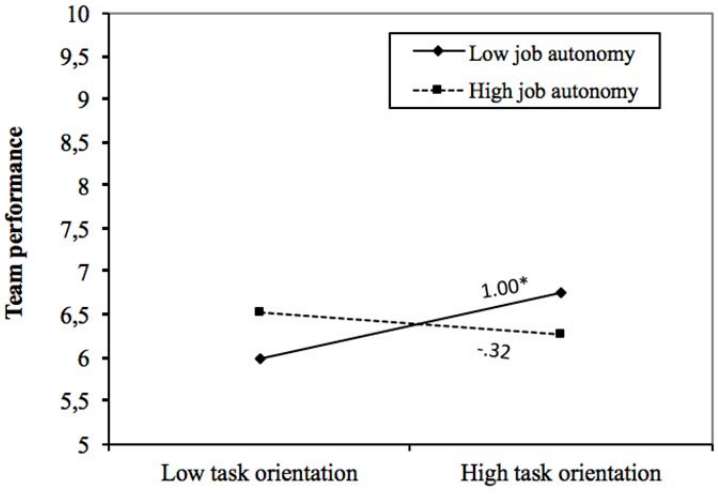


Figure 2. Interaction effects between a) vision, b) participative safety, c) task orientation, and job autonomy on team performance.
N = 84. Low = -1 *SD*, High = +1 *SD*. *$p < .05$. **$p < .01$.

Angaben zur Person

Wissenschaftlicher Werdegang

04/2016 – 09/2017	**Wissenschaftliche Mitarbeiterin** der Arbeits- und Organisationspsychologie der Philipps-Universität Marburg unter Leitung von Frau Prof. Dr. Otto
06/2015 – 03/2016	**Stipendiatin** des Fachbereichs Psychologie, Philipps-Universität Marburg
06/2014 – 05/2015	**Wissenschaftliche Mitarbeiterin** der Arbeits- und Organisationspsychologie der Philipps-Universität Marburg unter Leitung von Frau Prof. Dr. Otto
10/2011 – 11/2013	**Master of Science Psychologie** mit dem Schwerpunkt Personal- und Wirtschaftspsychologie, Westfälische Wilhelms-Universität Münster
09/2008 – 07/2011	**Bachelor of Science Psychologie**, Universität Mannheim,
09/1999 – 06/2008	**Abitur**, Clara-Fey-Gymnasium in Bonn-Bad Godesberg

Konferenzen und Tagungen

08/2017	**77th Annual Meeting of the Academy of Management** Präsentation des Artikels Transformational Leadership and Team Performance: Illuminating Team Climate for Innovation as a Mediator von J. S. Keil, T. Rigotti und K. Otto in Atlanta, Georgia, USA
09/2016	**50. Kongress der Deutschen Gesellschaft für Psychologie** Die dunkle Seite erwacht: Schädliche Kreativität in Organisationen**.** Posterpräsentation von B. P. Frank und J. S. Keil in Leipzig, Deutschland
06/2016	**Summer School Wissenschaft kommunizieren** bei der Marburg University Research Academy in Marburg, Deutschland
09/2015	**9. Fachgruppentagung Arbeits-, Organisations- und Wirtschaftspsychologie** Präsentation zu Leadership Styles and Unexpected Creativity von J. S. Keil, M. U. Kottwitz und K. Otto in Mainz, Deutschland
07/2015	**Nachwuchsworkshop der Fachgruppe Arbeits-, Organisations- und Wirtschaftspsychologie der Deutschen Gesellschaft für Psychologie** Präsentation des Promotionsvorhabens in Paderborn, Deutschland

05/2015	**17th Congress of the European Association of Work and Organizational Psychology** The benefit of transformational leadership and team climate for innovation on team performance: A moderated mediation analysis at the team level. Interaktive Posterpräsentation von J. S. Keil, T. Rigotti und K. Otto in Oslo, Norwegen
05/2015	**pHResh Pre-Conference Doctoral Consortium** Leadership in your PhD project – Präsentation des Promotionsvorhabens in Oslo, Norwegen

Zertifikate & Qualifikationen

06/2016 – 09/2017	Zertifikatserwerb **Kompetenz für professionelle Hochschullehre** für eine wissenschaftlich fundierte, praxisnahe Qualifizierung für die Hochschullehre
08/2015 – 10/2017	Mentee bei **Mentoring Hessen** (vormals SciMento) Förderung von Frauen auf ihren Karrierewegen in Wissenschaft und Wirtschaft durch Mentoring, Training und Networking
11/2013	**DIN 33430** Zertifizierung zur berufsbezogenen Eignungsbeurteilung

Erklärung der Verfasserin

Ich versichere, dass ich meine Dissertation „Unleashing the Organizational Potential: Extra-Role Creativity, Innovation, and Performance in the Context of Social Influences“ selbstständig, ohne unerlaubte Hilfe angefertigt, und mich keiner anderen als der von mir ausdrücklich bezeichneten Quellen und Hilfen bedient habe.
Die Dissertation wurde in der jetzigen oder ähnlichen Form noch bei keiner anderen Hochschule eingereicht und hat noch keinen sonstigen Prüfungszwecken gedient.

Ort, Datum

Jana Keil