

**A Multi-Perspective Investigation of the Innovation Process:
Dynamics, Regulation, and Integration of Concepts**

Dissertation

zur Erlangung des akademischen Grades
Doktorin der Philosophie (Dr. phil.)

vorgelegt am Fachbereich Humanwissenschaften (FB 01)
der Universität Kassel von

Maike Hundeling

Kassel, November 2020

Disputation am 30. April 2021

Betreuung: Prof. Dr. Kathrin Rosing

Gutachter: Prof. Dr. Kathrin Rosing (Universität Kassel)

Prof. Dr. Sandra Ohly (Universität Kassel)

Prof. Dr. Hannes Zacher (Universität Leipzig)

Acknowledgements

I am grateful to all people who have contributed to this dissertation in many ways over the past years.

First of all, I thank my supervisor Kathrin Rosing for her support in all stages of my dissertation project. Thank you for all fruitful discussions and for your insightful suggestions, comments, and ideas on my research.

I am also grateful to Sandra Ohly and Hannes Zacher for reviewing this dissertation, and to Heidi Möller and Martin Hänze for serving as members of the dissertation committee.

Moreover, I would like to thank my colleagues and friends at the University of Kassel, especially Friederike Gerlach, Max Auerswald, Katrin Oellerich, Martina Vogelsang, and my mentoring group. Thank you for many discussions, ideas, feedback, and suggestions, and for the many hours we spent talking about other things.

I would also like to express my gratitude to my research assistants, Hanna Wettlaufer, Lisa Nebel, and Ann-Kathrin Meise, and to all research interns who were involved in my research. Further, the data collection would not have been possible without many students writing their bachelor or master thesis within my dissertation project. Special thanks to Isabel Ohlendorf and Gesa Aden, who assisted in the demanding phase of data collection during the team-based field study. Thank you for your great commitment and your tireless efforts.

Finally, I thank my family and my friends for being caring, understanding, and supportive through all these years. I am especially grateful to my parents for their help and support during the last years, and to you, Christian, Marlene, and Klara, for your patience and for our cheerful family life.

Abstract

This dissertation provides insight into how individuals and teams address the complex and dynamic nature of innovation processes. Focusing on affect and self-regulation, I investigate how and why regulation efforts of individuals and teams may be beneficial for both innovative activities (i.e., idea generation and implementation) and innovative strategies (i.e., exploration and exploitation). Further, I address the issue of conceptual variety in innovation research and I examine to what extent innovative activities and innovative strategies as different concepts used in innovation research may be interwoven. The dissertation is based on a literature review on the relationship between individual-level affect and innovation, and on three empirical studies. Two of these studies, a longitudinal field study with work teams and a laboratory study with student teams, examine the association between team regulatory focus and innovation. The third study, a qualitative interview study with founders and facilitators of innovation processes (i.e., coaches, trainers, consultants), explores how far innovative activities and innovative strategies are interdependent concepts. Most importantly, the empirical findings provide insight about the associations between team regulatory focus and both innovative activities and strategies. For example, the field study results suggest a dynamic interplay of cognitive and affective constructs that explains the relationship between team regulatory focus and innovative strategies. Considering the conceptual level, the findings of this dissertation emphasize that innovative activities and innovative strategies are interwoven, and that the relative importance of innovative strategies also shifts in the course of an innovation project. Overall, the findings underline both the complexity and dynamics that individuals and teams are faced with in innovation processes. In sum, the dissertation mainly addresses the fields of innovation dynamics, individual-level and team-level regulation of affect and behavior, and the construct clarity of innovation and related facets.

Contents

| | |
|---|------------|
| 1. General Introduction | 1 |
| 2. Theoretical Background | 5 |
| 2.1 The Innovation Process in Psychological Research: A State-of-the-Art Overview | 5 |
| 2.2 Complexity and Dynamic Approaches in Innovation Research | 8 |
| 2.3 Addressing the Complexity and Dynamics of Innovation: The Role of Individual- Level and Team-Level Regulation of Behavior and Affect..... | 11 |
| 2.4 Dissertation Outline | 15 |
| 3. Literature Review | 18 |
| <i>The Role of Affect and Its Regulation for Creativity and Innovation</i> | |
| 4. Study 1 | 39 |
| <i>A Multilevel Moderated Mediation Study on Regulatory Focus and Exploration and Exploitation in Teams: The Role of Future-Related Cognitions and Affective Tone</i> | |
| 5. Study 2 | 78 |
| <i>Team Regulatory Focus and its Role for Idea Generation, Idea Implementation, and Innovative Performance: A Dynamic Perspective</i> | |
| 6. Study 3 | 109 |
| <i>A Qualitative Analysis on the Conceptual Integration of Exploration and Exploitation with Idea Generation and Implementation</i> | |
| 7. General Discussion | 137 |
| 7.1 Summary of Findings | 137 |
| 7.2 Overall Theoretical Contributions | 140 |
| 7.3 Limitations and Future Research Directions | 145 |
| 7.4 Conclusion | 148 |
| References | 150 |

| | |
|---|------------|
| Conference Contributions and Scope of Responsibility | 177 |
| Appendix | 178 |
| Appendix A: Study 1 | 178 |
| Appendix B: Study 2..... | 181 |
| Appendix C: Study 3 | 192 |

List of Tables

| | |
|---|-----|
| Table 1: Indices of Within-Group Agreement for all Scales (Study 1)..... | 59 |
| Table 2: Means, Standard Deviations, and Intercorrelations (Study 1) | 62 |
| Table 3: Results of Multilevel Moderated Mediation Analysis (H1c, Study 1)..... | 65 |
| Table 4: Moderated Mediation Results Across Levels of Team Affective Tone (Study 1)..... | 67 |
| Table 5: Results of Multilevel Moderated Mediation Analysis (H2c, Study 1)..... | 69 |
| Table 6: Means, Standard Deviations, and Intercorrelations (Study 2) | 99 |
| Table 7: Exploration and Exploitation and Their Frequencies within Idea Generation (Study 3) | 121 |
| Table 8: Exploration and Exploitation within Idea Generation and Idea Implementation (Study 3)..... | 123 |
| Table 9: Exploration and Exploitation and Their Frequencies within Idea Implementation (Study 3) | 124 |

List of Figures

| | |
|---|-----|
| Figure 1: Theoretical Model (Study 1)..... | 42 |
| Figure 2: Moderated Mediation Models (Study 1)..... | 66 |
| Figure 3: Theoretical Model (Study 2)..... | 81 |
| Figure 4: Results of H1a-d (Study 2) | 101 |

List of Abbreviations

| | |
|-------|---|
| ANOVA | Analysis of Variance |
| CFI | Comparative Fit Index |
| CIT | Critical Incident Technique |
| ICC | Intraclass Correlation |
| LGC | Latent Growth Curve |
| PSI | Personality Systems Interactions |
| QCA | Qualitative Content Analysis |
| RFQ | Regulatory Focus Questionnaire |
| RMSEA | Root Mean Square Error of Approximation |
| SEM | Structural Equation Modelling |
| SRMR | Standardized Root Mean Square Residual |

1. General Introduction

To remain competitive in challenging and fast-changing environments, organizations increasingly rely on innovation (Anderson et al., 2014; Bledow et al., 2009; Rosenbusch et al., 2011). In general, innovation refers to both the development and introduction of ideas. More specifically, it is defined as “the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, the organization or wider society” (West & Farr, 1990, p. 9). Innovation enables organizations, as well as teams and individuals, to adapt and respond to changes in their environment, for example, in terms of changing competition or changing customer needs (van Knippenberg, 2017). Thus, the relevance of innovations has been widely recognized by researchers, practitioners, and society (Bledow et al., 2009).

Despite the relevance of innovations, the processes that finally lead to innovative outcomes are difficult to describe, plan, or predict. In general, innovation processes are assumed to be highly complex (Anderson et al., 2004). The complexity results from the variety of factors that have an impact on innovation at the individual level, the team level, and the organizational level, which in turn lead to a variety of models, concepts, and constructs aiming at describing the innovation process. In particular, the variety of dependent variables used in innovation research (e.g., generation, creativity, implementation, exploration, exploitation) makes it rather complex to transfer results from one research line to another. Likewise, the complexity results from unpredictable requirements resulting from unpredictable developments (e.g., Bledow et al., 2009; Schroeder et al., 1989), also involving a variety of tensions, paradoxes, contradictions, and dilemmas (Bledow et al., 2009). This is reflected in, for example, the interplay of ideation and implementation (e.g., Kimberly & Evanisko, 1981), the interplay of exploration and exploitation (e.g., Rosing & Zacher, 2017),

or the interplay of cognitive–affective processes on the part of the actors (e.g., Bledow et al., 2013). Innovation literature further suggests that the innovation process does not follow a simple pattern of steps or activities, but rather is based on an interplay of activities unfolding over time (Rosing et al., 2018). This implies that innovation processes are not only complex, but also highly dynamic phenomena (e.g., Anderson et al., 2004; Bledow et al., 2009; Miron-Spektor, Gino, & Argote, 2011).

To address both the complexity and the dynamics of the innovation process, specific regulation efforts, especially at the level of individuals and teams, may be required. Previous research has shown that the regulation of behavior (i.e., self-regulation) and affect may have a high potential to address the challenges and demands inherent to innovation and related constructs such as creativity (e.g., Baas et al., 2011b; Bledow et al., 2013; Herman & Reiter-Palmon, 2011). Current research on affect regulation and self-regulation has mainly focused on the individual level of analysis and, thus, investigated how the individual regulation efforts of single persons, for example, in terms of their self-regulation mode, are related to specific activities within the innovation process (e.g., idea generation). However, in fact, innovation processes are carried out by teams rather than by individuals (van Knippenberg, 2017), such that regulation efforts also need to be considered at the team level of analysis. In general, a team can be defined as “a distinguishable set of two or more people who interact, dynamically, interdependently, and adaptively toward a common and valued goal/objective/mission, who have each been assigned specific roles or functions to perform, and who have a limited life-span of membership” (Salas et al., 1992, p. 4). By stressing the dynamic, interdependent, and adaptive interaction of team members, this definition reflects well that team-level innovation is accompanied by various requirements, which go far beyond the generation and implementation of new ideas. Likewise, members of innovation teams are assumed to be

highly involved in team processes aiming at, for example, regulating their shared efforts toward their common goals (Kozlowski et al., 1996) within the innovation process.

Overall, taking into account the complex and dynamic nature of innovation processes, as well as the related regulation requirements at the individual and team levels, this dissertation particularly aims at advancing the understanding of how the complexity and dynamics of innovation may be addressed by individual-level affect and its regulation, and by team-level self-regulation. To better understand and integrate these and further research results, this work also addresses the issue of conceptual variety and aims at gaining insights into how different concepts used in innovation research may be interwoven.

This dissertation adds to innovation literature in the following ways. First, it contributes to research regarding innovation as a highly dynamic phenomenon. Taking into account the temporal dynamics inherent to innovation processes, the findings of the dissertation help to better understand how actors of innovation processes (i.e., individuals and teams) may ideally face unpredictable changes in their environments. To this end, this work emphasizes the role of individual affect and dynamic forms of its regulation within innovation processes. Further, it refers to team-level dynamics and adds to our understanding of how the self-regulatory efforts of teams are beneficial for innovative projects over the course of time. Finally, it considers shifts in the relative importance of innovative strategies and investigates to what extent innovative actors engage in specific patterns of exploration and exploitation, depending on whether they generate or implement an idea.

Second, this dissertation contributes to research on self-regulation at the team level by extending the existing line of research on team regulatory focus and innovation and by considering the impact of team regulatory focus on both growth trajectories of innovative activities and innovative performance ratings. On the one hand, including the temporal development of innovative activities, it contributes to a more dynamic perspective on the

relationship of team regulatory focus and innovation that, up to now, has been basically studied from a static perspective. On the other hand, by studying innovative performance ratings separate from innovative activities, it offers a differentiated perspective on innovation and potential outcomes. Further, it provides an insight into *why* team regulatory focus is related to innovative strategies by examining the role of cognitive–affective processes underlying this relationship. It contributes to a more comprehensive understanding of this relationship by integrating research on regulatory focus, future-related cognitions, and affect.

Finally, this work offers an integrated and more complete view of the innovation process by contributing to research on the concept clarity of innovation-related constructs (e.g., Potočnik & Anderson, 2016). This is highly relevant with regard to the variety of concepts referring to how individuals, teams, and organizations survive in competitive and fast-changing environments increases (Anderson et al., 2014). By conceptually examining and integrating two specific sets of constructs (i.e., idea generation/idea implementation and exploration/exploitation) and by studying how they are interwoven, the dissertation adds relevant insights into the interdependence of two important theoretical lines in innovation research. This will also help to explain how specific research results may be integrated or to what extent they can be transferred from one of the research streams to the other.

In the next chapter (Chapter 2), I present the theoretical background of the dissertation by providing a state-of-the-art overview of the innovation process in psychological research, by giving details of complex and dynamic perspectives on innovation, and by referring to the role of individual-level and team-level regulation as a means of addressing the complex and dynamic nature of innovation processes. Further, I will briefly introduce the four main parts of this work, that is, first, a literature review on affect and its regulation in the context of creativity and innovation, and second, a multilevel study that integrates research on self-regulation, future-related cognitions, and affect in the context of team innovation. The third

part presents a laboratory study examining the relationship between team regulatory focus and both innovative activities and performance, while the fourth part presents a qualitative interview study that conceptually integrates different constructs from innovation literature.

2. Theoretical Background

2.1 The Innovation Process in Psychological Research: A State-of-the-Art Overview

Innovations in organizations are considered to be important determinants of performance, success, and long-term survival, such that over the last 30 to 40 years, a considerable amount of research has examined the innovation process referring to the individual, team, organizational, or multilevel perspective (Anderson et al., 2014). Thus, a multitude of antecedents, mechanisms, or consequences of innovation processes have been investigated. In line with the variety of research, a variety of definitions, concepts, and constructs has emerged. Regarding a central definition of innovation, in this dissertation, I refer to the abovementioned definition provided by West and Farr (1990) which states that the innovation process comprises both the generation and implementation of new ideas, processes, and products. Researchers also refer to the term creativity when describing idea generation, such that, in their more recent and integrative definition, Anderson et al. (2014) highlighted that the creativity stage of innovation processes refers to idea generation.

Basically, two groups of theoretical models have been proposed to describe the innovation process: linear phase models and complexity models. On the one hand, linear phase models (e.g., Amabile, 1988; Basadur & Gelade, 2006; Farr et al., 2003; Zaltman et al., 1973) reflect a step-by-step perspective with distinct phases that actors of innovation processes undergo in a given order. For example, Farr et al.'s (2003) model on team innovation reflects the abovementioned division into idea generation or creativity and implementation. Specifically, it assumes that the innovation process consists of two main stages: creativity and innovation

implementation. Each of the two stages consists of a transition and an action phase, such that, in sum, the authors proposed four phases that teams need to go through when aiming at developing an innovative outcome. The phases are problem identification, idea generation, idea evaluation, and implementation. On the other hand, complexity models assume innovation processes to be rather nonlinear and chaotic. Researchers arguing for this approach have described innovation processes as complex phenomena that cannot be divided into clearly defined stages (e.g., Anderson et al., 2004; Bledow et al., 2009; Schroeder et al., 1989). Rather, these researchers assume that going through distinct phases in a given order is impossible due to unpredictable requirements. As a result, actors of innovation processes need to engage parallelly in innovative activities or move back and forth between them. Rosing et al. (2018) have underlined that each of the theoretical perspectives contains some validity inasmuch as innovation processes can be assumed to be both linear and chaotic. The authors have further stressed that the two groups of models have one important aspect in common: they assume that there are at least two different kinds of activities that teams carry out during the innovation process, that is, generation and implementation of ideas. Rosing and Zacher (2017) have emphasized that this “duality of innovation” (p. 694) becomes apparent in most definitions of innovation.

This duality also becomes apparent in another line of research that describes two main facets of innovation. This research line uses the concept of exploration and exploitation to describe strategies and antecedents relevant for innovation (e.g., Gibson & Birkinshaw, 2004; He & Wong, 2004; Junni et al., 2013). The concepts of exploration and exploitation were originally rooted in the literature on organizational learning (March, 1991) and then transferred by several researchers to innovation research (e.g., Benner & Tushman, 2003; Gibson & Birkinshaw, 2004). Exploration is commonly described in terms of, for example, search, variation, and risk-taking, while exploitation is associated with features such as

refinement, choice, and production (March, 1991). Researchers often refer to ambidexterity when describing the interplay of exploration and exploitation (e.g., Gupta et al., 2006). Literally, ambidexterity describes one's ability to use the left and the right hand equally well (Rosing & Zacher, 2017). In management and innovation literature, ambidexterity refers to the organizational ability to simultaneously explore new possibilities or directions and exploit existing knowledge (Benner & Tushman, 2003; Gibson & Birkinshaw, 2004).

Although the two lines of research (i.e., idea generation/implementation and exploration/exploitation) are distinct, the underlying constructs can be assumed to be interwoven, as both idea generation/idea implementation and exploration/exploitation are used by researchers to refer to activities, behaviors, or strategies being used to yield an innovative outcome. The abovementioned duality becomes apparent in many fields of innovation research. For example, team-based self-regulation has been examined in relation to two distinct sets of dependent variables. One research line examined the role and function of self-regulation for idea generation, idea implementation, and further activities (e.g., Rietzschel, 2011), while another research line assessed it in relation to exploration and exploitation (e.g., Tuncdogan et al., 2017). As it remains unclear how idea generation/implementation and exploration/exploitation are interrelated, the interpretation and comparison of findings is challenging.

Although innovation processes are often assumed to be cyclical, longitudinal, recursive, and iterative, a large majority of studies have investigated innovations in organizations as a very static phenomenon (Anderson et al., 2004). In more recent research, the focus has been starting to shift toward a consideration of the complex and dynamic elements of innovation processes (e.g., Bledow et al., 2009; Rosing et al., 2018) to represent innovation processes in a more realistic and appropriate way. In the next section, I will provide an overview of the

research efforts that have stressed a complexity and dynamic perspective on innovation by also referring to the benefits of such approaches for innovation research.

2.2 Complexity and Dynamic Approaches in Innovation Research

As described above, models referring to the innovation process as a rather nonlinear and chaotic phenomenon (i.e., complexity models) assume that the innovation process is based on an unpredictable pattern of activities. In other words, complexity perspectives on innovation refer to the different requirements of innovation that result from fast-changing and unpredictable innovative environments. Specifically, innovative actors are required to integrate contradictory and conflicting demands to perform effectively (Miron-Spektor, Gino, & Argote, 2011). For example, on the one hand, they need to generate creative ideas, while on the other hand, they need to calculate potential costs or make implementation plans. These different requirements also result from a variety of tensions, paradoxes, contradictions, and dilemmas inherent to complex and uncertain innovative environments (e.g., Bledow et al., 2009; Miron-Spektor et al., 2018). Recent research efforts have revealed that studying the innovation process with respect to an integration of possible tensions, paradoxes, and dilemmas sheds light on how actors of innovation processes address the different demands and requirements they are faced with. For example, Gebert et al. (2010) highlighted that innovation processes require both the generation and integration of knowledge. They argued that the two processes may be fostered through combining open and closed action strategies such as delegative versus directive leadership. While they assumed open action strategies to foster knowledge generation, they assumed closed action strategies to foster knowledge integration. In general, the authors argued that such opposing action strategies mutually reinforce each other such that positive synergies occur, which in turn foster innovation. The assumption that opposing action strategies may be complementary in their effects on

innovation has also been reflected in research on ambidexterity (e.g., Andriopoulos & Lewis, 2009; Gibson & Birkinshaw, 2004; He & Wong, 2004; Junni et al., 2013). Specifically, engaging equally in exploration and exploitation has been discussed as useful for addressing the contradictory requirements of innovation in a balanced manner (O'Reilly & Tushman, 2013). Research on further constructs, such as team composition, also shows that the integration of contradictory aspects can be beneficial. For example, results provided by Miron-Spektor, Erez, and Naveh (2011) showed that including both creative and conformist members in one team fostered radical team innovation.

The integration of contradictory requirements is one central element within the dialectic perspective on innovation (Bledow et al., 2009). The dialectic perspective addresses the complexity of innovation processes by focusing on the integration of opposing constructs. These constructs are referred to as dualities, emphasizing that they are contrary, but likewise interdependent (Bledow, 2013). As a result, interactions of such constructs may yield to synergy effects that are beneficial for innovation. Hence, studying the integration of alleged opposite constructs within the framework of the dialectic perspective offers the potential to refer to the specific characteristics of the innovation process in an appropriate way.

Apart from idea generation and implementation (West, 2002a, 2002b) or exploration and exploitation (March, 1991), researchers highlighted further dualities intrinsic to the innovation process, for example, positive and negative affect (e.g., George & Zhou, 2007). Specifically, not only positive and negative affect were individually shown to be beneficial for creativity and innovation (e.g., Amabile et al., 2005; George & Zhou, 2002, 2007), but also their interaction (Bledow et al., 2013). As the innovation process relies on a variety of affective and cognitive processes (Choi et al., 2011), it can be assumed that aside from positive and negative affect, further processes referring to the cognitive and affective level may reflect the assumption of the dialectic perspective on innovation and rely on specific

interaction patterns to address the complex, and sometimes paradoxical requirements of innovation. However, in this regard, research is still in its infancy. Overall, considering opposing constructs as interdependent instead of incompatible and identifying possibilities of integration appears to be advantageous in order to understand innovation and its underlying complex processes in a more detailed manner.

Recent approaches to innovation further aim at addressing the specific dynamics of innovation processes. Generally, those dynamics refer to potential developments and changes in the course of innovation projects. For example, Amabile and Pratt (2016) have revised the frequently cited componential model of creativity and innovation in organizations (Amabile, 1988) and have proposed a dynamic version of this model by building on other theories and empirical findings from more recent research. Thus, they included dynamic elements in the form of feedback loops and new linkages between creativity and innovation. Further, they introduced new components such as affect and highlighted how these psychological factors may influence creativity with respect to varying degrees and in different stages of the creative process and how they are interconnected with other components of the model. Bledow et al. (2009) have also referred to the dynamic nature of innovation and emphasized that the two main innovative activities, that is, idea generation and implementation, alternate within the innovation process with only limited predictability. Further, they postulated that the relative weight or importance of these activities may shift over time. Idea generation or creativity are often assumed to be especially relevant at the beginning of an innovation project, while idea implementation is often supposed to be more relevant at the end of it (e.g., West, 2002a, 2002b). However, it is also realistic that unforeseen obstacles require idea generation activities at the end of a project (Bledow et al., 2009; Mumford et al., 2002), for example, to find creative solutions to problems that arise during the actual application of an idea. Consequently, over time, it can be assumed that innovation processes follow a dynamic

pattern with both orderly and chaotic elements (e.g., Bledow et al., 2009; Cheng & Van de Ven, 1996; Rosing et al., 2018). For example, this may imply that an episode of planning co-occurs with the flexibility to modify a specific course of action (Bledow et al., 2009). Recently, Rosing et al. (2018) have explicitly addressed the issue of temporal dynamics in innovation projects and have provided support for the assumption described above. Their team-level results showed that teams engage in unconstrained creativity throughout the entire innovation process while they increase their implementation efforts over time.

In sum, addressing complexity aspects in innovation research and treating innovation as a dynamic rather than a static phenomenon, appears to be beneficial for obtaining the most realistic picture of innovation processes and, consequently, for considering the challenging requirements for actors of innovation processes. The next section refers to the question of how actors of innovation processes may address those challenges through regulation of behavior and affect.

2.3 Addressing the Complexity and Dynamics of Innovation: The Role of Individual-Level and Team-Level Regulation of Behavior and Affect

As indicated before, to address both the complexity and dynamics of the innovation process, effective regulation efforts may be required for individuals (Van de Ven, 1986), but also for teams. For example, integrating idea generation and implementation or exploration and exploitation toward successful innovation requires self-regulation (Bledow et al., 2013). Previous research has revealed that not only the regulation of behavior (i.e., self-regulation) but also the regulation of affect may be beneficial to address the challenges and demands inherent to innovation and further related constructs such as creativity (e.g., Baas et al., 2011b; Bledow et al., 2013; Herman & Reiter-Palmon, 2011). Research efforts have mainly focused on the individual level of analysis (for exceptions, see, for example, Li et al., 2019; Rietzschel,

2011; Shin et al., 2016). However, as innovation processes are often carried out by teams rather than by individuals (Hülshager et al., 2009; van Knippenberg, 2017), regulation efforts need likewise to be considered at the team level of analysis.

In general, self-regulation refers to cognitive processes that individuals apply to reach a specific goal (Carver & Scheier, 1981, 2011). In recent years, researchers have emphasized that, in order to reach their goals, not only individuals but also teams need to regulate their shared activities (e.g., Kozlowski et al., 1996; Levine et al., 2000; Rietzschel, 2011). Accordingly, self-regulation in teams refers to strategies that teams apply while balancing workloads and moving toward common goals (Kozlowski et al., 1996). Specifically, Kozlowski et al. (1996) proposed that “team self-regulation involves an understanding of how to coordinate member actions, engage in error detection, and monitor each other’s performance, so the team can balance workloads and stay on track toward stated objectives” (p. 276). Consequently, teams improve their self-regulation competence by developing and deepening a common understanding of the team as a whole, including aspects such as the team’s environment or teamwork skills (Kozlowski et al., 1996). With respect to self-regulation, particularly the concept of regulatory focus (Higgins, 1997, 1998) has been used to describe how regulatory focus and its inherent motivational orientations may foster or hinder individual-level and team-level innovation. In general, regulatory focus theory distinguishes two regulatory systems of behavioral choice (Johnson et al., 2015; Lanaj et al., 2012), promotion focus and prevention focus. Following Higgins (1997), promotion-focused persons strive for goals through self-growth and through pursuit of their ideal selves. Thus, these individuals do not consider potential losses, but focus on hopes and aspirations when regulating behavior, resulting in a motivation by accomplishments (Johnson et al., 2015). Consequently, promotion-focused self-regulation results in pleasure when rewarded for accomplishments, while it results in pain when not rewarded for accomplishments (Brockner

& Higgins, 2001). On the other hand, prevention-focused persons are guided by the fulfillment of duty or responsibility when they strive for goals (Higgins, 1997). These individuals focus on obligation and accountability when regulating behavior, resulting in motivation to prevent mistakes (Johnson et al., 2015). Hence, prevention-focused self-regulation results in pleasure when negative consequences are absent, while it results in pain when negative consequences are present (Brockner & Higgins, 2001). Overall, individual-level regulatory focus is typically considered a chronic disposition dependent on, for example, personal needs or values, but situational influences and changes may alter a person's regulatory focus state (Johnson et al., 2015). Regulatory focus has also been described and examined as a team-level construct (e.g., Johnson & Wallace, 2011; Levine et al., 2000; Rietzschel, 2011; Sassenberg & Wolfin, 2008). Team regulatory focus can be considered a functional equivalent of individual-level regulatory focus and develops from the shared needs and values of interacting individuals. Thus, teams with promotion focus strive for the realization of gains, while teams with prevention focus strive for avoiding losses (Johnson & Wallace, 2011). The regulatory focus of a team can be regarded as an "emergent state" (Marks et al., 2001, p. 357), which depends on the team members' characteristics as well as on situational influences (Johnson et al., 2015).

Research has revealed different functions of promotion and prevention focus within the context of creativity and innovation. In other words, promotion and prevention focus address different requirements in the innovation context. For example, research highlighted differential effects of promotion and prevention focus concerning the different activities in the innovative process (e.g., Brockner et al., 2004; Friedman & Förster, 2001; Johnson et al., 2015; Lam & Chiu, 2002; Rietzschel, 2011). For example, Brockner et al. (2004) maintained that being promotion-focused is advantageous for creating a successful idea, whereas being prevention-focused is advantageous for screening ideas.

The regulation of behavior (i.e., self-regulation) is closely related to affect (Brockner & Higgins, 2001). Thus, in addition to regulatory focus, affect has been shown to have an important function within the innovation process (Baas et al., 2008). Specifically, individual-level research has revealed that both positive and negative affective states have the potential to address the different requirements that result from the complexity of the innovation process (e.g., Amabile et al., 2005; George & Zhou, 2002, 2007). Different from research on regulatory focus that, up to now, has solely concentrated on the differential effects of promotion and prevention focus for innovation, several research efforts have been made to assess interactions of positive and negative affect and their effects on innovation. These approaches reflect that the interplay of positive and negative affect can be assumed to be highly beneficial within the innovation process. One central approach was proposed by George and Zhou (2007). In their dual tuning perspective, they suggest joint interactions between positive and negative affect to be beneficial for creativity. Within this perspective, positive affect is assumed to foster aspects such as confidence and divergent thinking, while negative affect is assumed, for example, to encourage people to work on solutions to change the status quo. The authors provided support for the different tuning effects of positive and negative affect and argued that positive and negative affect complement each other in contributing to creativity. Bledow et al. (2013) went beyond an interactive perspective on positive and negative affect and proposed an approach that also takes into account the temporal dynamics of positive and negative affect. In their affective shift model of creativity, they addressed regulatory aspects of affect and assumed a dynamic interplay of positive and negative affect in fostering creativity. They found that creativity was higher when negative affect was followed by a down-regulation of negative affect and an increase in positive affect, and they claimed that the down-regulation of negative affect facilitates new associations, which may be needed for idea development.

Overall, self-regulation as well as affect and its regulation can be assumed to be highly relevant for addressing the challenging requirements of innovation processes. Specifically, at the individual level, initial research efforts have been made to integrate research on regulatory focus and affect (e.g., Baas et al., 2011b) to better understand how the two constructs jointly contribute to innovation. However, at the team level, research exploring regulatory focus and innovation (e.g., Li et al., 2019; Rietzschel, 2011) or regulatory focus, affect, and innovation (e.g., Shin, 2014) has not taken into account the complex and dynamic nature of innovation processes so far. This research gap will be addressed in two of the four main parts of this dissertation. In the next section, I will provide an outline of this dissertation by giving an overview of its main parts.

2.4 Dissertation Outline

This dissertation is composed of four main parts, that is, a literature review and three empirical studies (Chapters 3 to 6). The review and Studies 1 and 2 investigate the role of individual-level affect and team-level self-regulation within innovation processes. Study 3, however, has a different research focus as it addresses the issue of concept clarity in innovation research.

The literature review (see Chapter 3) examines the role of affect and its regulation for creativity and innovation. This review focuses on individual-level research on both positive and negative affect and their impact on creativity and innovation. Further, the review considers several interactive and dynamic perspectives integrating the effects of positive and negative affect in the context of innovation. Not only affect itself, but also affect regulation impacts creativity and innovation. Thus, this theoretical examination also provides a review of the role of affect regulation for creativity and innovation. Finally, research gaps and directions for future research are presented, specifically considering the integration of

research on affect and its relationship with creativity and innovation with research on regulatory focus theory (Higgins, 1997, 1998).

Study 1 (Chapter 4) refers to the team level and integrates research on self-regulation, future-related cognitions, and affect within the context of innovation. The study investigated the associations between team regulatory focus and innovative strategies. By building on the dialectic perspective on innovation (Bledow et al., 2009) as well as on the feelings-as-information-perspective (Schwarz, 1990, 2001) and the mood-as-input model (e.g., Martin et al., 1993), the study examined the underlying regulatory mechanisms of the relationships between team regulatory focus and innovative strategies, and investigated how far team future-related cognitions (Oettingen & Mayer, 2002) and team affective tone interact and complement each other. Hypotheses were tested within a longitudinal design. In the study, $N = 58$ work teams provided data once a week over a period of four weeks.

Study 2 (Chapter 5) also addresses the team level. The laboratory study presented in this chapter sheds light on the relationships between team regulatory focus and innovation and differentiates between innovative activities and performance. The study's aim was to provide a comprehensive understanding of how team regulatory focus and the temporal trajectories of innovative activities are linked to innovative performance. Regulatory focus was manipulated in $N = 44$ student teams ($N = 132$ individuals). Innovative activities were assessed over time based on video data, while external raters assessed innovative performance.

Study 3 (Chapter 6) refers to the individual level and presents a qualitative study aimed at the conceptual integration of innovative strategies (i.e., exploration/exploitation) with innovative activities (i.e., idea generation/implementation). The study addresses the issue of construct clarity in innovation research (Potočnik & Anderson, 2016) and investigated to what extent exploration and exploitation are used within idea generation and implementation. $N =$

40 actors of innovation processes ($n = 23$ founders and $n = 17$ facilitators) provided interview data by describing innovation processes.

In the final chapter (Chapter 7), I will summarize the results from the literature review and the three empirical studies and then discuss the overall theoretical contributions of this dissertation as well as the limitations and possible future research directions resulting from my findings.

3. Literature Review:

The Role of Affect and Its Regulation for Creativity and Innovation¹

Creativity and innovation play an important role in today's work life as they are key to enhancing organizations' competitiveness (e.g., Amabile, 1988; Anderson et al., 2014; Bledow et al., 2009). Creativity may be defined as a facet of innovation that refers to the generation and development of new and useful ideas (Amabile, 1983, 1996). Innovation, in contrast, is "the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, the organization or wider society" (West & Farr, 1990, p. 9). In other words, whereas creativity refers to the generation of ideas, innovation additionally includes the implementation of those ideas.

In creativity and innovation literatures, researchers agree that creativity and innovation often are accompanied by affect and affect-related constructs. Amabile et al. (2005) claim that "[c]reative activity appears to be an affectively charged event, one in which complex cognitive processes are shaped by, co-occur with, and shape emotional experience" (p. 367). For example, the generation and implementation of a new product may cause feelings that are associated with failure or success (e.g., Ivcevic & Brackett, 2015).

There is some variability regarding the terminology used in creativity research to study those feelings. Like many other researchers (e.g., Brief & Weiss, 2002; Gross, 2015; Weiss

¹ A version of this chapter is published as:

Hundeling, M., & Rosing, K. (2020). The role of affect and its regulation for creativity and innovation. In L.-Q. Yang, R. Cropanzano, C. S. Daus, & V. Martínez-Tur (Eds.), *The Cambridge Handbook of Workplace Affect* (pp. 131-145). Cambridge University Press. <https://doi.org/10.1017/9781108573887.011>

& Cropanzano, 1996), we summarize them in the generic term “affect”, which also comprises frequently used affect-related variables such as emotion (e.g., sadness) and mood (e.g., feeling down). As most of the research reviewed in this chapter is concerned with affective states, we will explicitly mention when we refer to affect as a dispositional trait.

The purpose of this chapter is to review and integrate the research on affect and affect-related variables in relation to creativity and innovation in organizations. The relationship between affect and creativity has been studied in psychology for decades (e.g., Baas et al., 2008; Mumford, 2003): A large body of research has demonstrated that positive affect enhances creativity (for an overview see Baas et al., 2008). In contrast, the relationship between negative affect and creativity is commonly assumed to be negative, even though some researchers have demonstrated that negative affect may also increase creativity (e.g., Kaufmann, 2003; Kaufmann & Vosburg, 1997). Thus, as the findings are divergent, the affect–creativity relationship appears to be more complex than one might assume. We will address this issue and examine which further affect-related aspects, beyond the valence of affect, may be crucial for creativity.

Compared to the long tradition of research on the affect–creativity relationship, significantly less research exists about the link between affect and innovation. For that reason we will also review findings from entrepreneurship literature, which is substantially connected with the innovation literature and also provides evidence regarding the affect–innovation relationship.

In this chapter, we will first review research on positive affect and its influence on creativity and innovation. Second, we will move on to negative affect and summarize what is known about negative affect and its impact on creativity and innovation. Third, taking into account that the effects of positive affect and negative affect on creativity and innovation are not independent, we then present several interactive and dynamic perspectives on affect that

have been linked to creativity. For example, Fong (2006) argued for an ambivalent perspective: that is, the assumption that the simultaneous experience of positive and negative affect leads to creativity. Another recent line of research has argued for a dynamic perspective, describing an interplay between positive and negative affect over time that fosters creativity (Bledow et al., 2013).

While affect itself is relevant for creativity and innovation, its regulation may also have an impact. Thus, fourth, we will examine the role of affect regulation in the context of organizational creativity and innovation. Building on Gross (2015), “affect regulation” refers to the individual’s ability to influence affective states when those affective states prevent the realization of specific goals, and comprises coping, emotion regulation, and mood regulation. Research on the role of regulation efforts and creativity and innovation indicates that regulatory behaviors are resources for successfully completing creative tasks (De Stobbeleir et al., 2011).

Finally, we will discuss several research gaps and offer suggestions for future research directions.

Positive Affect and Its Impact on Creativity and Innovation

In creativity research, there is substantive evidence for the assumption that positive affective states are related to enhanced creativity (e.g., Amabile et al., 2005; Baas et al., 2008; Davis, 2009). The overall pattern of findings implies that positive affect leads to broadened attention and cognitive flexibility: that is, an adjustable way of processing and generating information in order to switch between different approaches or perspectives (Nijstad et al., 2010). Generally, this is in line with the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2001), which maintains that positive affect broadens the individual’s

scopes of attention and cognition and, therefore, helps them to put forth novel paths of thought and actions.

In their extensive overview on empirical research regarding the relationship between affect and creativity and innovation, Rank and Frese (2008) pointed out that experimental research by Isen and colleagues (e.g., Ashby et al., 1999; Isen, 1993; Isen et al., 1987) provides comprehensive empirical support for the link between positive affect and creativity. Research based on field studies further substantiates these findings. For example, Amabile et al. (2005) analyzed within-person fluctuations in creativity with respect to long-time work tasks and found a linear positive relationship between positive affect and creativity. They proposed an organizational affect–creativity cycle drawing on Isen’s work and on broaden-and-build theory (Fredrickson, 1998, 2001). This cycle implies that positive affect facilitates cognitive variation, thereby initiating an incubation process that yields new associations. As a result, creativity evokes and may in turn provoke (further) affect or reaction from others.

In general, meta-analytic results supported the impact of positive affect on creativity. Baas et al. (2008) meta-analytically examined creativity as a function of specific affective states. Based on 66 reports with a total of 102 independent samples and about 7,000 research participants, their results imply that positive affect relates to higher levels of creativity than shown in affect-neutral controls ($r = .15$). This effect was more pronounced for experimental than for correlational studies. Interestingly, no significant differences between positive and negative affect were found. This result is in line with Davis (2009), whose meta-analysis also revealed that the effect of positive affect appears to be contingent on the referent affective state (neutral affective states, negative affective states). The results are based on 62 experimental and 10 nonexperimental studies and showed that the creativity-enhancing effects of positive affect are noticeably robust in relation to neutral affect ($d = .52$). Compared to negative affective states, however, creativity-enhancing effects of positive affect are

smaller ($d = .18$). Additionally, Davis's (2009) results revealed that other factors such as affect intensity or affect attributions appear to moderate the affect–creativity relationship. For example, regarding affect attributions, the effect of positive affect on creativity depends on whether individuals are aware of the source of their affect. The effect is stronger when they are not aware of the affect's source.

Overall, the effect sizes are not as large as could have been expected. One possible explanation might be Baas et al.'s (2008) important observation that in order to predict creativity the activation of affect is at least as important as the valence of affect. Baas et al. (2008) highlighted that affective states can be distinguished with respect to hedonic tone, the level of activation, and their association with regulatory focus². According to the authors, activation of affect refers to the individual's level of arousal. Specifically, moderate levels of arousal help individuals to search and integrate information and take into account various alternatives. The authors indicate that creativity is enhanced most by activating positive affective states that are associated with an approach motivation and promotion focus (e.g., happiness).

On the basis of those findings, within the last ten years, research concentrating on the role of affect activation has expanded tremendously, and new theoretical approaches have been developed. In particular, the dual pathway to creativity model (De Dreu et al., 2008)

² Regulatory focus theory (Higgins, 1997) considers the motivational aspects of self-regulation and builds on the assumption that there are “different ways of approaching different types of desired end-states” (p. 1281). Those end-states involve aspects such as advancements and growth on the one hand, and aspects such as obligations and protection on the other hand. Referring to these convergent states, regulatory focus theory distinguishes two perspectives of individual self-regulation, namely promotion focus and prevention focus. According to Higgins (1997), individuals with a chronic promotion focus have a strong need for growth or change, and are strongly guided by their ideals. In contrast, individuals with a chronic prevention focus have a strong need for security and are guided by their obligations. Taken together, each regulatory focus influences distinct processing strategies (Friedman & Förster, 2001).

appears to be seminal within the abovementioned research trend on affect activation. According to this model, creativity can be facilitated in qualitatively different ways: through a cognitive flexibility route, through a persistence route, or through both. The cognitive flexibility route involves surveying *many* conceptual categories, whereas the persistence route involves surveying *fewer* categories in greater depth (Nijstad et al., 2010). In a nutshell, the dual pathway model assumes that the activation of affect determines whether creativity occurs or not, whereas the valence of affect determines the relevant pathway (flexibility vs. persistence) for creativity to occur. For example, positive affect such as happiness increases flexibility while negative affect, such as anger, increases persistence. Thus, affect activation and valence interact to promote creativity. Specifically, the authors argue that activating affective states (e.g., being angry, being happy) foster creative fluency and originality, in contrast with deactivating affective states (e.g., being sad, being relaxed).

Empirical evidence for the dual pathway model's assumptions was found in several studies. For example, De Dreu and colleagues (2008) found that activating affect with a positive tone fosters creative fluency and originality because of greater cognitive flexibility. They conducted a meta-analysis based on twenty studies of their research group and confirmed the assumption that positive activating affect (happiness, elation) enhances creativity via the flexibility pathway.

To et al. (2012) also built on De Dreu et al.'s (2008) suggestion that affect activation and affect valence interact to promote creativity and found that individuals' creative process engagement was higher during activating positive (e.g., being excited) and activating negative (e.g., being angry) affect in comparison to positive as well as negative deactivating affect (e.g., being relaxed, being discouraged).

Hirt et al. (2008) also referred to the dual pathway framework to identify mechanisms behind the relationship between positive affect and cognitive flexibility. They conducted three

experimental studies in order to examine the possibility that hedonic contingency theory (Hirt et al., 1997) may be an important mechanism underlying the relationship between positive affect and cognitive flexibility. This theory assumes that positive affect is more prone to be reduced by specific tasks than negative affect and, therefore, happy individuals consider possible (hedonic) consequences of their actions. Thus, the enhanced cognitive flexibility of happy individuals may be due to their strong efforts to maintain or even enhance their happiness. Hirt et al.'s (1997, 2008) research provides support for the assumptions of hedonic contingency theory. One principal finding was that happy study participants being confronted with an affect-threatening task were able to protect their positive affect and transformed the task in a creative way. As a result, they maintained their positive affect as well as their interest in the task.

In sum, creativity research has concentrated on the valence of affect for decades, whereas recent research additionally sheds light on the relevance of affect activation. In general, researchers agree that positive affect fosters creativity (e.g., Baas et al., 2008; Davis, 2009). However, research efforts that have been made especially in the last ten years suggest that particularly activating positive affect leads to increased cognitive flexibility in working on a creative task. This flexibility “represents the possibility of achieving creative insights, problem solutions, or ideas through the use of broad and inclusive cognitive categories, through flexible switching among categories, approaches, and sets, and through the use of remote (rather than close) associations” (Nijstad et al., 2010, p. 43). Thus, when positive affect is activating, specific cognitive processes can unfold, which in turn lead to a high level of creativity.

Considerably less research effort has been made with regard to the relationship between affect and innovation. However, there is no reason why affect should matter only with regard to idea generation, given that idea implementation is also accompanied by

affective states. In general, in their review, Rank and Frese (2008) suggest that the implementation of an idea often involves the need to overcome barriers such as change resistance, which gives rise to such affects as anger or anxiety. Moreover, a successful product launch is likely to evoke positive affect such as joy, pride, or relief, whereas a failed product realization may yield frustration. Thus, Rank and Frese (2008) argue that positive affect fosters innovation as well as creativity. According to the authors, variables such as control, self-efficacy, and organizational commitment can also be regarded as affect-related predictors of innovation. For example, the affective component of organizational commitment “refers to employees’ emotional attachment to, identification with, and involvement in, the organization” (Allen & Meyer, 1990, p. 1). Consequently, organizational commitment includes the positive feeling that it is a pleasure to be part of a specific organization and thus enhances the individual’s motivation to be involved and to initiate changes within this organization. Rank and Frese (2008) also reviewed studies with dependent variables related to innovation. For example, they referred to George and Brief (1992), who assumed organizational spontaneity to be fostered by positive affect. Accordingly, organizational spontaneity may be important for innovation, as it includes relevant behaviors such as making constructive suggestions. Moreover, Rank and Frese (2008) highlight the role of positive affect for innovation negotiations: “Individuals in a positive mood are more likely to formulate optimistic expectations, to use more cooperative bargaining strategies and to actually produce more successful negotiation outcomes” (p. 107). Thus, positive affect and affect-related constructs can be assumed to foster specific behaviors relevant to innovation.

As innovation is assumed to be crucial for success in new ventures, the entrepreneurship literature may also provide further evidence regarding the benefits of affect for innovation. Baron and Tang (2011), for example, proposed that entrepreneurs’ dispositional positive affect is related to their creativity, which in turn relates to firm-level

innovation. These relationships are stronger in dynamic than in stable environments. The researchers' assumptions were supported by the results of a field study among entrepreneurs.

Results provided by Foo et al. (2009) can also be applied to innovation. They assumed and found that positive affect fosters efforts on venture tasks that go beyond what is immediately required. They argued that positive affect influences future-oriented thinking that may lead to extra efforts as it induces proactive behaviors. Such proactive behaviors may play an important role for innovation, as they require anticipating future events or outcomes.

To conclude, previous research reveals that positive affect is beneficial for creativity as well as for innovation or innovation-related behavior. However, compared with creativity, substantially fewer efforts have been made to precisely examine the relationship between positive affect and innovation.

Negative Affect and Its Impact on Creativity and Innovation

As pointed out above, a large body of research supports the view that positive affect facilitates creativity and innovation. However, effects regarding the relationship between negative affect and creativity are less conclusive. Lindebaum and Jordan (2014) have stated that generally, many organizational researchers assume that negative feelings bring on negative results. In line with that, several creativity researchers have postulated that negative affect inhibits creative outcomes (e.g., Isen et al., 1987; Lyubomirsky et al., 2005). One of the most common explanations for this argument is that negative affect reduces cognitive flexibility (e.g., Isen, 1999; Isen et al., 1987). Drawing on Beal et al. (2005), another reason could be that negative affect “redirect[s] the attentional focus from the task to the circumstances” (p. 1059) and thus depletes cognitive resources, which are needed for creative performance. Within this perspective, negative affect is seen as a distraction from the task and, thus, as discouraging and interfering with creativity (To et al., 2015). Meta-analytic

results by Baas et al. (2008) tentatively imply that (in correlational studies) negative affect tends to relate to less creativity than affect-neutral controls ($r = -.08$).

Nevertheless, some researchers found exceptions to the proposed general pattern that positive affect enhances creativity and negative affect impedes it, providing evidence that negative affect facilitates creativity under certain circumstances (e.g., George & Zhou, 2002, 2007; Kaufmann & Vosburg, 1997, 2002). Within these studies, negative affect is not seen as a distraction from creativity, but as an important signal that something has gone wrong and must be corrected immediately. This is in line with the feelings-as-information perspective (Schwarz, 1990, 2001) and the mood-as-input model (e.g., Martin et al., 1993), both assuming that affective states provide informational cues: positive affect signals good progress, whereas negative affect signals that more efforts are necessary. Thus, according to this theoretical perspective, individuals use affect to evaluate their level of goal attainment and work harder when they experience negative affect. This may also involve an increased search for creative solutions.

The assumptions of the mood-as-input model are also reflected in the dual pathway model (De Dreu et al., 2008). As highlighted earlier, the model assumes that negative affect results in increased persistence, which in turn leads to creative solutions (persistence pathway). However, De Dreu and colleagues (2008) specify that this is the case only for activating affect. Thus, unlike the flexibility pathway, the persistence pathway describes how creativity is achieved through hard work as well as through systematic and in-depth exploration of only a few categories or possibilities (Nijstad et al., 2010).

Laboratory studies by De Dreu et al. (2008) and Nijstad et al. (2010) supported the notion that creativity is fostered by negative activating affect. De Dreu and colleagues (2008) found that activating affect with a negative tone fosters creative fluency and originality because it evokes greater persistence. Similarly, Nijstad and colleagues (2010) presented

evidence that negative activating affect (e.g., anger, fear) enhances creativity via the persistence route, based on a meta-analysis of 20 studies conducted in their research group.

In line with affect activation research, Baas et al. (2011a) examined experimentally whether anger (negative, activating affect with promotion focus) fosters creativity. Their results implied that compared to sadness (negative, deactivating affect with promotion focus) and affect-neutral states, anger results in more creativity. However, angry individuals experienced a greater decline in creative productivity over time than individuals who are in a sad or affect-neutral state. The authors suggested that this decline is caused by resources depletion, inasmuch as angry individuals use their energy for creative production early on, but they tire faster than sad or affect-neutral individuals, which in turn results in reduced creativity.

Despite the important insight that negative activating affect has the potential to foster creativity, until recently little was known about the conditions under which this relationship occurs. To et al. (2015) addressed this gap and examined possible moderators of the relationship between negative affect and creative process engagement. Their field data show that activating negative affect is positively related to creative process engagement when resources such as trait learning goal orientation and perceived psychological empowerment are both high. To et al. (2015) argue that under these conditions, individuals stay focused, persist, and are encouraged to try out new alternatives.

To conclude, there is still ongoing debate regarding the role of negative affect in creativity and innovation. The question remains whether negative affect fosters or hinders creativity. Generally, there is consensus that the impact of negative affect on creativity is more complex and difficult to predict than the impact of positive affect (Baas et al., 2011a). Research efforts that have been made in the last ten years suggest that in particular, activating

negative affect can lead to increased cognitive energy and persistence in working on a task, and to increased creativity as a consequence.

There is only limited research focusing on the relationship between negative affect and innovation. As Rank and Frese (2008) pointed out, study results are inconclusive. On the one hand, there is research indicating that low levels of negative affect are conducive for innovation. For example, Rank and Frese (2008) referred to Howell and Shea (2001), who studied the behavior of innovation champions. Innovation champions are persons who informally promote innovation in organizations. Howell and Shea (2001) found that champion behavior was lower when innovation was framed as response to a threat. As threats are often linked to negative outcomes, a threat may also reflect negative affect.

On the other hand, there is also research indicating that higher levels of negative affect are conducive for innovation. As mentioned earlier, entrepreneurship research conducted by Foo et al. (2009) can also be applied to innovation and gives important insights. Drawing on Carver (2003) and the feelings-as-information perspective (Schwarz, 1990, 2001), Foo et al. argued that negative affect signals an inadequate progress toward goals or a current task, so that increased working efforts are necessary for goal attainment. Foo et al. (2009) assumed and found that negative affect was positively related to effort on venture tasks requiring immediate attention. Unexpectedly, negative affect was also positively related to venture efforts beyond what is immediately required. Hence, the authors suggested that negative affect signals that things are not going well in the venture and entrepreneurs may engage in future-oriented behaviors. Those behaviors may also be relevant for innovation.

In sum, extant research suggests that negative affect may be beneficial for creativity when it is activating. However, with respect to innovation as the outcome variable, there is little research examining whether the results of creativity research are transferrable to innovation outcomes.

Interactive and Dynamic Perspectives on Affect and Creativity

The research discussed in the preceding sections has shown that both positive and negative affect have the potential to enhance creativity and innovation. However, most of the research presented so far has focused on *either* positive *or* negative affect, independently. In contrast, in their comprehensive review on workplace affect and workplace creativity, James et al. (2004) assumed that creativity may be fostered when positive and negative affective states occur together. Similarly, Amabile and colleagues (2005) underscored that the effects of positive affect and negative affect on creativity should not be regarded separately. In fact, the authors suggest that “simultaneously experiencing positive and negative emotions may serve to activate a greater number of memory nodes, thereby increasing both cognitive variability and creativity” (p. 372). They refer to this simultaneity of positive and negative affect as “affective ambivalence”. However, Amabile et al. (2005) did not find empirical evidence for a relationship between affective ambivalence and creativity.

The effects of affective ambivalence on creativity were further studied by Fong (2006). She found that individuals who felt affectively ambivalent were better at recognizing unusual relationships between concepts, a skill that is considered to be relevant for bringing forth creative ideas. Further, individuals may interpret affective ambivalence as an unusual experience, which in turn enhances their sensitivity to unusual associations between apparently unrelated concepts as well as their creativity.

A concept similar to affective ambivalence is the positivity ratio: that is, the ratio of positive to negative affective states. Rego et al. (2012) argued that high positivity ratios “broaden the individual’s momentary thought–action repertoire” (p. 262) and foster creative problem solving, but only up to a point. According to the authors, being too happy increases the risk of becoming complacent and overconfident in approaching problems, which may impede individuals’ creative potential. Using field data, they found support for their

assumptions: the results revealed an inverted U-shaped pattern for the relationship between positivity ratio and creativity.

In a similar vein, George and Zhou (2007) suggested that workers might experience high levels of both positive and negative affect at the same time. Therefore, they argued for taking positive as well as negative affect into account when studying behavior at work, and they drew on the feelings-as-information framework (Schwarz, 1990, 2001). For example, a negative affective state may signal that further efforts are needed to complete a creative task satisfactorily. George and Zhou (2007) assumed joint interactions between positive and negative affect in the context of creativity and developed a dual tuning perspective. According to this perspective, negative affect may promote opportunity identification and prompt people to work on solutions to change the status quo. Positive affect, on the other hand, fosters such aspects as confidence and divergent thinking. Thus, negative as well as positive affect may contribute to creative output “through their differential tuning effects” (George & Zhou, 2007, p. 607). The field study results provided by George and Zhou (2007) confirm the dual tuning perspective. They found that in a supportive context (e.g., developmental feedback provided by supervisors), positive and negative affect complement each other in contributing to creativity. Specifically, negative affect had the strongest positive relation to creativity when the context was supportive and when positive affect was high.

While the abovementioned studies suggest an interactive perspective on positive and negative affect and creativity, other researchers proposed dynamic approaches. For example, Akbari Chermahini and Hommel (2012) experimentally examined whether different types of cognitive processes (divergent vs. convergent thinking) might influence people’s affect. They found that divergent thinking (i.e., generating many target-related responses) is related to a more positive affective state, while convergent thinking (i.e., focusing on one possible response) is related to a more negative affective state. According to the authors, this result

underlines that convergent and divergent thinking support two different types of cognitive control: an exclusive control state tends to induce negative affect, whereas a distributed control state tends to induce positive affect. This research suggests that the relationship between affect and creativity is not unidirectional but rather reciprocal. However, we agree with Akbari Chermahini and Hommel (2012) that more research is necessary to understand the reciprocal and thus dynamic relationship between affect and cognition in greater detail.

A combination of interactions as well as temporal dynamics of positive affect, negative affect, and creativity was proposed by Bledow et al. (2013). They addressed the limitations of the dual tuning model, arguing that it does not take into account the specific dynamics of positive and negative affect, especially the benefits of decreasing negative affect for creativity. They referred to personality systems interactions (PSI) theory (Kuhl, 2000, 2001) and its focus on affect changes, and they assumed a dynamic interplay of positive and negative affect in fostering creativity. They also built on the affective shift model of work engagement (Bledow et al., 2011), which suggests that negative affect is positively related to work engagement, on the condition that negative affect is followed by positive affect. Accordingly, Bledow et al. (2013) proposed an affective shift model of creativity and argued that creativity is higher when negative affect is followed by a down-regulation of negative affect and an increase in positive affect. For example, an author quarreling with his editor about a creative ending to his latest book would do well to take a walk and try to shift attention to more positive things before sitting back down to continue writing. Bledow et al.'s (2013) assumption was supported in an experience-sampling study and in an experimental study. In line with PSI theory, the authors argued that the down-regulation of negative affect is assumed to facilitate new associations needed for idea development.

The conducive integration of positive and negative affect can be located within the dialectic perspective on innovation (Bledow et al., 2009), which assumes duality as a key

psychological determinant of creativity and innovation. To date, creativity and innovation researchers concerned with affect interactions and dynamics have primarily focused on creativity as the outcome variable. The benefits of affect interactions and dynamics for innovation remain largely unexplored.

To sum up, a static perspective on affect appears to be insufficient to explain its impact on creativity and innovation. However, despite initial efforts to examine interactive and dynamic effects of positive and negative affect, this issue is a rather new development in the literature and requires further research.

Regulation of Affect and Its Impact on Creativity and Innovation

In addition to positive and negative affect, the regulation of affect is also relevant for creativity and innovation. Regulation strategies are of great relevance for goal attainment because affective states frequently result in a redirection of the attentional focus away from the task, which in most cases lowers performance (Beal et al., 2005). Accordingly, regulating (i.e., monitoring and influencing) affective states, which are related to creativity, “can make the difference between persisting or giving up on a project” (Ivcevic & Brackett, 2015, p. 480). Further, with respect to the dynamic perspective, regulation of affect is also relevant to maintaining balance between positive and negative affect (Bledow et al., 2013). This balance is of great importance in dealing with the complexity of creativity and innovation. However, despite the relevance of affect regulation, little is known so far about how the strategies that individuals use to actively monitor and influence their affective states are linked to creativity and innovation.

Some researchers have begun to examine possible conditions and mechanisms in the link between affect regulation ability and creativity. For example, Ivcevic and Brackett (2015) assessed the connection between openness to experience and the ability to regulate affect.

They highlighted that openness to experience is the personality trait that is linked most consistently to creativity. Following McCrae (1994, 1996), they underlined that openness to experience includes such traits as seeking new experiences, imaginative thinking, or tolerance for ambiguity and is thus seen as a critical personality disposition for creativity. Ivcevic and Brackett (2015) assumed that the relationship between affect regulation ability and creativity is moderated by openness to experience, such that the relationship is stronger for individuals with a relatively high level of openness to experience. They argued that for individuals who do not like working on ideas and who prefer routine tasks (indicators of low openness to experience), creativity will be unlikely regardless of affect regulation ability. Further, they assumed that affect regulation ability helps individuals to maintain their passion for creative achievement and persistence in the task, as those forms of engagement with creative activity are vulnerable to being influenced by social forces such as evaluation and rewards. Thus, the authors hypothesized that passion and persistence mediate the relationship between affect regulation ability and creativity for individuals with high openness to experience. Their hypotheses were largely supported within a field study among high school students.

Another approach to explaining how individuals actively monitor and influence their affective states is self-regulation theory, which emphasizes that change in affect may be needed to stay on the right track to reach a goal (Carver & Scheier, 1990; Kuhl, 2000). Thus, insights about how affect regulation may be linked to creativity and innovation can be drawn from the line of work that has linked self-regulation to creativity and innovation. According to Carver and Scheier (2011), the term “self-regulation” refers to cognitive processes applied by individuals to reach a certain purpose. These processes comprise “self-corrective adjustments” (p. 3), which emerge within a single person and which are needed to stay on the right track to reach a goal. This viewpoint builds on the assumption “that behavior is a continual process of moving toward (and sometimes away from) goal representations” (p. 3).

Individual self-regulation can also be described as ongoing comparison between an existing state and a target state while a specific problem is being solved (see also the TOTE [test–operate–test–exit] unit; G. A. Miller et al., 1960). For example, negative affect may be seen as an indicator for moving away from a specific goal representation, and thus self-regulatory efforts are needed to return to the right track (Carver, 2003).

Carver and Scheier (1981, 2011) argued that one central concept of self-regulation is feedback control. In line with this argument, De Stobbeleir et al. (2011) have examined the role of feedback seeking as a key self-regulation tactic of individuals to enhance their creative performance. The authors define “feedback seeking” as “individuals’ proactive search for evaluative information about their performance” (p. 812). They argue that due to the chaotic nature of creative processes it is necessary for individuals to acquire feedback proactively, as managers do not always provide feedback at exactly the time when it is needed. Further, because creativity is seen as a social process, it is important for individuals to interact with others who may stimulate and support their creativity. Studying 456 supervisor–employee dyads from different organizations, De Stobbeleir et al. (2011) essentially found that feedback inquiry about job performance partially mediates the way cognitive style relates to perceived organizational support for creativity and supervisors’ ratings of creative performance.

Although researchers have generally highlighted that affect regulation is of great relevance for creative performance, the relationship between affect regulation and creativity has not been studied in detail. Moreover, future research is necessary to examine innovation as the dependent variable. Specific insights about how affect regulation may be linked to creativity and innovation may be drawn from self-regulation research. Further, Gross’s (1998) classic work on affect regulation may be a meaningful starting point for studying the influences of distinct types of affect regulation (e.g., modification of the situation, deployment of attention, change of cognitions) on creativity and innovation.

Conclusion and Research Directions

The research presented in this chapter has highlighted that creativity “appears to be an affectively charged event” (Amabile et al., 2005, p. 367). In particular during the last decade, considerable progress has been made in enhancing our understanding of how affect and affect-related variables positively or negatively impact organizational creativity.

Research on the role of positive affect suggests that activating positive affect fosters creativity as it leads to increased cognitive flexibility when working on creative tasks. Likewise, research on the role of negative affect reveals that activating negative affect is also beneficial for creativity as it leads to increased persistence when working on creative tasks. A few researchers have postulated that a focus on either positive or negative affect alone is not sufficient. For example, the “dynamic perspective on affect and creativity” (Bledow et al., 2013, p. 432) integrated both views and proposed a dynamic interplay of positive and negative affect in fostering creativity. Consequently, a static perspective on either positive or negative affect appears to be insufficient to explain the impact of affect on creativity within rapidly changing work environments as it does not take into account possible increases, decreases, and interactions of affect over time. However, such an integrative and interactive perspective offers vast potential for future research, especially because it addresses many limitations of preceding research. For example, it highlights the beneficial role of down-regulation of negative affect for creativity and, thus, the dynamic perspective also provides important insights concerning the role of affect regulation for creativity and innovation.

Another regulatory construct relevant for research on the relationship of affect to creativity and innovation is regulatory focus (Higgins, 1997). As mentioned before, regulatory focus theory distinguishes two self-regulatory foci: a promotion focus (e.g., need for growth and change) and a prevention focus (e.g., need for security). Although a vast body of research has linked regulatory focus theory to creativity and innovation, this line of research hardly

receives any attention in affect research (for an exception see Baas et al., 2008). In general, study results indicate that both promotion focus and prevention focus have an effect on creative and innovative activities (e.g., Friedman & Förster, 2001; Herman & Reiter-Palmon, 2011; Lam & Chiu, 2002). A promotion focus is associated with activities linked to creativity (e.g., idea generation), while a prevention focus is associated with activities linked to innovation (e.g., idea evaluation or implementation). Compared with prevention-focused individuals, promotion-focused individuals are assumed to have a greater tendency to show for example a risk-taking behavior or think divergently, which are both important strategies for creativity, but not for innovation. Contrarily, prevention-focused individuals are often assumed to have a greater tendency to show a rather careful and thorough behavior, which is essential for idea implementation activities, but not for idea generation activities.

A promising example for linking regulatory focus, affect, and creativity is the study provided by Baas et al. (2011b). The authors integrated research on the interplay of regulatory focus, affect, and activation with research on cognitive functions underlying creativity. They proposed and found that regulatory closure (whether or not a promotion or prevention goal is fulfilled) is a primary condition for the relationship between regulatory focus and creative performance and that affect activation has a mediating function. Specifically, the authors argue that unfulfilled goals result in enhanced activation as the motivation to fulfill a specific goal is maintained. This is the case for both promotion and prevention focus. However, the closure (i.e., fulfillment) of these goals has different effects for promotion and prevention focus. While promotion success activates and motivates the individual to engage in further goals or tasks, prevention success leads to deactivation, relief, and disengagement. In other words, when prevention goals are successfully regulated, the individual gets deactivated and less creative. By contrast, when prevention goals are unfulfilled, activation and alertness is maintained. Thus, contrary to what is often assumed, prevention focus states and promotion

focus states can produce similar creativity levels. Taken together, future research on affect regulation and creativity and innovation may give more weight to insights from research on regulation of behavior (e.g., regulatory focus) because affect and behavior are closely interwoven constructs.

Compared with creativity, substantially fewer efforts have been made to precisely examine the affect–innovation relationship. Interestingly, this research gap mirrors a more general shortcoming within innovation research: there is a lack of knowledge about processes underlying idea implementation, while idea generation has been studied much more extensively. As it remains unclear whether the research results for creativity can be transferred to innovation, further research is needed, even though several studies presented in this chapter suggest that positive as well as negative affect influence innovation or at least innovation-related behavior. We hope that this chapter will assist future researchers to further develop this important field.

4. Study 1:

A Multilevel Moderated Mediation Study on Regulatory Focus and Exploration and Exploitation in Teams: The Role of Future-Related Cognitions and Affective Tone

Abstract

Innovation processes require self-regulatory competencies not only from individuals, but also from teams. Existing research has revealed that team regulatory focus is related to activities or strategies that are relevant for innovation. Within a longitudinal field study, we analyzed the associations between team promotion and prevention focus with team exploration and exploitation in detail. Specifically, we were interested in the underlying regulatory mechanisms and focused on the role of team future-related cognitions and team affective tone. Data were collected once a week over a period of four weeks from a sample of $N = 58$ work teams. Multilevel moderated mediation analyses revealed a mediating function of team positive fantasies within the relationship between team promotion focus and team exploration. Negative team affective tone moderated the relationship between team positive fantasies and team exploration, such that the indirect effect was weakest when negative team affective tone was low. A further interaction pattern was found for team barrier cognitions and positive team affective tone within the association between team prevention focus and team exploitation. Underpinning a dialectic perspective on innovation, the authors discuss how far team innovation can be fostered through the interaction of opposite constructs.

Introduction

In order to gain competitive advantage, organizations rely on innovation (e.g., (Anderson et al., 2014; Bledow et al., 2009; Rosenbusch et al., 2011)). Innovation refers to both the development and the implementation of new ideas, processes, and products (West & Farr, 1990). To meet the requirements of ideation and implementation, two innovative strategies are relevant: first, the exploration of new possibilities and directions and second, the exploitation of existing expertise and knowledge (Bledow et al., 2009; Taylor & Greve, 2006). High levels of exploration and exploitation ensure that organizations are competitive in the short as well as the long run (Rosing & Zacher, 2017).

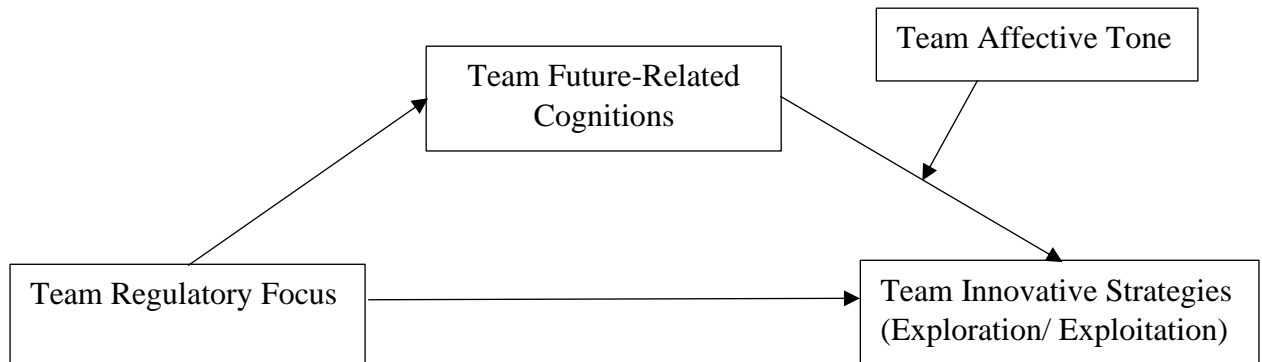
In this article, we explicitly focus on innovative strategies of teams. Teams are assumed to have a high potential for innovation (Hülshager et al., 2009; van Knippenberg, 2017), which can be attributed to the variety of knowledge, expertise, and perspectives within a team (van Knippenberg, 2017). However, as the innovation process is highly complex and dynamic (Anderson et al., 2004; Bledow et al., 2009), innovation teams are faced with particularly challenging and competitive environments. To perform effectively in these environments, members of innovation teams need to coordinate diverse tasks, decide on different solutions or approaches, or discuss competing viewpoints. In other words, they need to effectively make use of their wide range of knowledge, opinions, and expertise and need to regulate their shared activities to perform effectively (Rietzschel, 2011). Thus, self-regulation can be assumed to have a central function in innovation teams.

Although exploration and exploitation as well as self-regulation are central requirements of team innovation, comparatively little is known about their association. Thus, in our longitudinal study, we attempt to explain how and why self-regulation in teams relates to team exploration and exploitation. We argue that studying this relationship in detail is important for at least three reasons. First, not all teams are able to perform effectively and

deliver innovative results (Rosing et al., 2018). Thus, insufficient engagement in exploration or exploitation may be due to the manner of the team's self-regulation. Second, not only investigating *how* self-regulation and innovative strategies are related at the team level, but also understanding *why* these associations exist, will deepen our understanding about team-level innovation and its underlying dynamics and interactions. Third, we assume that these underlying dynamics need to be addressed from a within-team perspective as they unfold over time (Kozlowski, 2015).

Our theoretical model is represented in Figure 1. Building on regulatory focus theory (Higgins, 1997, 1998), we study team promotion and team prevention focus and their relationship with team exploration and exploitation. Further, we are interested in the underlying regulatory mechanisms of those relationships. To this end, we focus on team future-related cognitions (Oettingen & Mayer, 2002) as well as team affective tone. Both constructs have been associated with innovation (e.g., Rosing, 2011; Shin, 2014), and they appear to be closely related to self-regulation and may also have a regulatory function. Specifically, we build on the dialectic perspective on innovation (Bledow et al., 2009), the feelings-as-information-perspective (Schwarz, 1990, 2001), and the mood-as-input model (e.g., Martin et al., 1993), and we study the degree to which team future-related cognitions and team affective tone interact and complement each other. The dialectic perspective assumes that the innovation process is characterized by various contradictions, tensions, dualities, and paradoxes. Integrating those contradictory and paradoxical elements is considered to be beneficial for innovative performance (Rosing & Zacher, 2017). Thus, we focus on how supposed opposites (i.e., team positive fantasies and negative team affective tone) may complement each other within the association between team regulatory focus and team innovative strategies, and how these opposites may foster team innovation. By further

building on the feelings-as-information-framework and the mood-as-input model, we also focus on the role of affect in information processing within the context of innovation.

Figure 1*Theoretical Model (Study 1)*

In sum, our paper makes four important contributions. First, our results provide comprehensive theoretical insights into how and why self-regulation may be related to innovative strategies (i.e., exploration and exploitation) at the team level. Second, by studying team future-related cognitions and team affective tone as potential regulatory mechanisms underlying this association, we integrate research on self-regulation, future-related cognitions, and affect within the context of innovation. Existing innovation research has either focused on the role and function of one of these constructs or, at best, on a combination of two of these constructs. By going beyond these studies and considering the dynamic interplay of more than two constructs, our study stresses the relevance of regarding innovation as phenomenon characterized by a high level of complexity. Third, by studying the relationships over time and from a within-team perspective, we provide a comprehensive understanding about the dynamics of the innovation process in teams and enrich literature on team-level self-regulation and innovation with longitudinal results. Finally, as we consider the possible benefits of opposite constructs, we contribute to dialectic or paradox perspectives on the

innovation process. Specifically, our study advances the understanding of how teams can profit from possible tensions between cognitions and affect and stay innovative in the long term.

Theoretical Background and Hypotheses

One influential individual-level self-regulation approach that has been applied to creativity and innovation is Higgins's (1997, 1998) regulatory focus theory. This theory refers to the motivational aspects of goal attainment and distinguishes two different foci of individual self-regulation (i.e., promotion and prevention focus). Individuals with a chronic promotion focus aim at seeking pleasure, and thus, they have a strong need for growth or change and are strongly guided by their ideals (Crowe & Higgins, 1997; Higgins, 1997, 1998). Individuals with a chronic prevention focus aim at avoiding pain, are motivated by a strong need for security, and are guided by their obligations (Crowe & Higgins, 1997; Higgins, 1997, 1998).

In recent years, regulatory focus theory was extended to the team level (e.g., Faddegon et al., 2008; Sassenberg & Woltin, 2008; Shin et al., 2016). Team regulatory focus describes how teams regulate their actions in order to reach their common goals (e.g., Johnson et al., 2015; Johnson & Wallace, 2011). Thus, teams with promotion focus are guided by the realization of gains and aim at yielding the best possible outcome (Johnson & Wallace, 2011). In contrast, teams with prevention focus are guided by an overall attention on security and aim at avoiding losses (Johnson & Wallace, 2011). The regulation of shared activities and efforts appears to be highly relevant for innovation due to the comparatively competitive and demanding nature of the innovation process (Rietzschel, 2011). Therefore, we expect team regulatory focus to impact teams' engagement in innovative strategies, that is, team exploration and exploitation. Based on organizational learning theory (March, 1991), team

exploration refers to the creation of new knowledge through searching for, experimenting with, and developing new ideas and capabilities, while team exploitation refers to the utilization of existing knowledge through refining, recombining, and implementing existing knowledge and skills (Jansen et al., 2016; Kostopoulos & Bozionelos, 2011). Although the two innovative strategies are clearly relevant to the team level, up to now, team exploration and exploitation remain poorly understood (for exceptions see, for example, Jansen et al., 2016; Kostopoulos & Bozionelos, 2011). Previous research has focused mainly on exploration and exploitation at the individual level (e.g., Mom et al., 2007; Rogan & Mors, 2014; Rosing et al., 2011; Rosing & Zacher, 2017) or at the organizational level (e.g., Gibson & Birkinshaw, 2004; He & Wong, 2004; Junni et al., 2013).

In this study, we focus on the relationships between team promotion focus and team exploration and between team prevention focus and team exploitation as well as on the underlying mechanisms of these relationships. While some researchers have focused on the relationship between team regulatory focus and exploration and exploitation (e.g., Tuncdogan et al., 2017) or between team regulatory focus and other innovation-related constructs (e.g., Rietzschel, 2011; Shin et al., 2016), we still do not know much about the underlying cognitive and regulatory mechanisms of these relationships. Therefore, we suggest two specific theoretical concepts to have an important function in this context: team future-related cognitions and team affective tone.

First, building on Rosing (2011), we argue that future-related cognitions (Oettingen & Mayer, 2002) are a central mechanism underlying the relationship between team regulatory focus and team exploration and exploitation. Future-related cognitions are defined as mental constructions of future goal attainment (Oettingen, 1996) and can be regarded as means of self-regulation that may be of particular relevance in innovative contexts, where predictions concerning the future or future developments play a central role (Rosing, 2011). In line with

Rosing (2011), we differentiate between positive fantasies and barrier cognitions as two ways of imagining the future. Positive fantasies describe a way of optimistic thinking and can be defined as mental imaginations of successfully achieving a goal (Oettingen, 1996; Oettingen et al., 2005; Oettingen & Mayer, 2002). Barrier cognitions, however, describe thoughts about difficulties and potential hindrances that might occur during a project (Rosing, 2011). At the team level, positive fantasies refer to a shared tendency of optimistic imaginations, whereas barrier cognitions refer to a shared tendency of imagining potential barriers and hindrances of a common project. We argue that future-related cognitions appear to be a crucial cognitive construct to explain the relationship between team regulatory focus and team exploration and exploitation. On the one hand, fantasies about the future can be assumed to be a “cognitive expression” (Rosing, 2011, p. 93) of regulatory focus. At the team level, a shared regulatory focus may be reflected in shared or common future-related cognitions. On the other hand, as innovations are mainly concerned with viable solutions, most innovation projects are inherently oriented toward the future. Thus, future-related cognitions likely have consequences for how teams engage in innovative strategies. In sum, we expect indirect effects of team promotion and prevention focus on team exploration and exploitation via team future-related cognitions.

Second, we propose that team affective tone plays a central role within the relationship between team regulatory focus and team exploration and exploitation. In line with George (1990), we define team affective tone as “consistent or homogenous affective reactions” (p. 108) within a team. Specifically, we suggest that the second part of the indirect effects described above (i.e., the relationships between future-related cognitions and team exploration and exploitation, see Figure 1) may be conditional on team affective tone. There is consensus in the literature that affect and related constructs are central especially to

creativity (e.g., Amabile et al., 2005; Baas et al., 2008; Mumford, 2003) but also to innovation (e.g., Baron & Tang, 2011; Foo et al., 2009; Rank & Frese, 2008).

Specifically, both individual-level and team-level research has indicated that affect may play an important role within the relationship between regulatory focus and creativity or innovation (e.g., Baas et al., 2008; Shin, 2014). Going beyond these studies, we suggest that team affective tone is a boundary condition of the relationship between team regulatory focus and team exploration/exploitation. We propose that negative affective tone will moderate the relationship between team promotion focus and team exploration and positive affective tone will moderate the relationship between team prevention focus and team exploitation. More specifically, we assert that future-related cognitions interact with team affective tone in their effect on team exploration and exploitation.

To develop assumptions about these specific interactions, we integrated several theoretical perspectives. On the one hand, by assuming interactions of alleged opposites (i.e., negative team affective tone and team positive fantasies), we explicitly refer to the dialectic perspective on innovation (Bledow et al., 2009). This perspective assumes that the innovation process is characterized by contradictions, tensions, dualities, and paradoxes and that an integration of inconsistencies may help to explain creative performance. Accordingly, we argue that analyzing and integrating alleged contradictory elements such as negative affective tone and positive fantasies will provide key insights into the innovation process. On the other hand, we build on the feelings-as-information-perspective (Schwarz, 1990, 2001) and the mood-as-input model (e.g., Martin et al., 1993) and take into account the signaling effect of positive affect for information processing within the context of innovation. Thus, for the interaction of barrier cognitions and positive affective tone, we suggest a pattern that differs from dialectic assumptions. In the next sections, we will develop hypotheses about how team promotion and prevention focus may be related to team exploration and exploitation and about

the function of team future-related cognitions and team affective tone within these relationships.

Hypotheses Development

Team Regulatory Focus and Its Relationship with Exploration and Exploitation

In order to engage in exploration, teams need to search for opportunities, experiment with new ideas and concepts, and have a positive attitude toward risk (e.g., Jansen et al., 2016; March, 1991; Tuncdogan et al., 2017). We expect team exploration to be positively related to team promotion focus. According to Baas et al. (2008), promotion states are assumed to broaden the attentional scope and facilitate the access to mental representations such that they may foster creative insight and divergent thinking. Further, promotion focus can be regarded as the eagerness component of regulatory focus (Crowe & Higgins, 1997; Faddegon et al., 2009; Tuncdogan et al., 2017). Thus, team promotion focus will increase a team's willingness to take risks and foster exploration efforts as exploration can be considered an activity involving high risks (Tuncdogan et al., 2017). Studies at the individual and the organizational level have provided support for the association between promotion focus and exploration (e.g., Ahmadi et al., 2017; Kammerlander et al., 2015). Some researchers have studied regulatory focus and its relationship with other innovation-related constructs. Individual-level results reveal an association between promotion focus and a risky processing style fostering idea generation and related constructs such as creativity or originality (e.g., Crowe & Higgins, 1997; Friedman & Förster, 2001; Herman & Reiter-Palmon, 2011; Lam & Chiu, 2002).

Taken together, we argue that a team focus on attainment, growth, and accomplishment (i.e., team promotion focus) increases team exploration as it fosters the team's risk-taking tendency (Levine et al., 2000; Tuncdogan et al., 2017), its creative potential (Faddegon et al., 2009), and the level of idea generation (Rietzschel, 2011). It can be assumed

that these aspects are crucial for team exploration as they are explicitly oriented toward the creation of new knowledge. Therefore, we predict:

Hypothesis 1a: Team promotion focus will be positively related to team exploration.

In order to engage in exploitation, teams need to refine and recombine existing knowledge, select ideas, and implement solutions (e.g., Jansen et al., 2016; Kostopoulos & Bozionelos, 2011; March, 1991). We expect team exploitation to be positively related to team prevention focus. In contrast to promotion states, prevention states narrow the attentional scope, rather engendering a focus on local perceptual details (Baas et al., 2008). Moreover, prevention focus reveals the vigilance or avoidance component of regulatory focus (Crowe & Higgins, 1997; Faddegon et al., 2009; Shin et al., 2016; Tuncdogan et al., 2017).

To date, empirical results are rather diverse. For example, Kammerlander et al. (2015) found that the CEO's level of prevention focus is negatively related to the firm's engagement in exploration and not related to the firm's engagement in exploitation. Individual-level studies on regulatory focus and its relationship with other innovation-related constructs have shown that prevention focus relates to a rather conservative and risk averse processing style being relevant for idea implementation or related constructs such as maintaining persistence (e.g., Crowe & Higgins, 1997; Friedman & Förster, 2001; Herman & Reiter-Palmon, 2011; Lam & Chiu, 2002).

In sum, we expect a team focus on security, safety, and responsibility (i.e., a team prevention focus) to be positively related to team exploitation as it fosters the team's risk-avoiding and conservative tendency (Levine et al., 2000), its accuracy (Faddegon et al., 2009) and task-performance instead of creative performance (Shin et al., 2016). We suggest that these aspects are highly relevant for team exploitation as they are explicitly oriented toward

relying on existing knowledge and referring to prior experience. Our assumptions are reflected in the following hypothesis:

Hypothesis 2a: Team prevention focus will be positively related to team exploitation.

The Mediating Role of Future-Related Cognitions

We assume that team positive fantasies may underlie the positive relationship between team promotion focus and team exploration. Teams with promotion focus have their attention on attainment, growth, and accomplishment. We argue that such a form of regulation closely connected with collective eagerness, aspiration, and ambition will evoke positive fantasies about goal attainment in the team. Thus, according to Rosing (2011), positive fantasies about finishing a project successfully can be assumed to be a direct expression of team promotion focus. At the individual level, the positive relationship between promotion focus and positive fantasies was supported in Rosing's (2011) study.

We further propose that the team's way of thinking about the future directs the team to adopt their specific innovative strategy. Specifically, we assume team positive fantasies to be related to team exploration. We argue that optimistic imaginations enable team members to search for unusual solutions, to take risks, and to play and experiment with new ideas. This is in line with the individual-level results provided by Neill et al. (2018), who found that a positive view toward gains fosters exploratory learning. The authors pointed out that optimistic individuals are more likely to address possible challenges. Regarding the team level, we argue that positive fantasies will have an energizing function for all team members such that they will collectively engage in exploring problems in depth and developing new ideas.

Overall, as team promotion focus is supposed to be related to team positive fantasies, and as team positive fantasies likewise are assumed to be related to team exploration, we

expect that team promotion focus is indirectly related to team exploration as it evokes positive fantasies in the team. Thus, we assume team positive fantasies to mediate the team promotion focus-team exploration relationship:

Hypothesis 1b: Team positive fantasies will mediate the relationship between team promotion focus and team exploration.

We further propose that team barrier cognitions may explain the positive relationship between team prevention focus and team exploitation. Teams with prevention focus are guided by their obligations and aim at avoiding losses, failure, and pain. We argue that such a form of regulation that appears to be closely connected with collectively striving for security and preventing negative project outcomes will evoke barrier cognitions concerning goal attainment in the team. Consequently, team members will rather be concerned with potential future problems, and they may reflect on potential barriers or project failure instead of imagining how they may finish their project with success. Thus, team cognitions concerning barriers, obstacles, and failure can be assumed to be a direct expression of team prevention focus. In fact, the positive relationship between prevention focus and barrier cognitions was supported in Rosing's (2011) individual-level study.

Moreover, we assume team barrier cognitions to be related with team exploitation. We argue that rather pessimistic imaginations of the future will motivate team members to rely on well-known pathways and proven concepts in order to ensure project results. Accordingly, they will strive to apply current knowledge and expertise, and they will be less likely to directly address challenges or to take risks. Thus, we argue that team members with high levels of barrier cognitions will prefer to collectively engage in exploitation strategies, such as executing well-known tasks, and to this end, they will make use of their existing knowledge and prior experience.

Taken together, as a team prevention focus is assumed to be related with team barrier cognitions, and as team barrier cognitions likewise may be related to team exploitation, we expect that team prevention focus is indirectly related to team exploitation by evoking barrier cognitions in the team. Thus, we anticipate team barrier cognitions to mediate the team prevention focus-team exploitation relationship:

Hypothesis 2b: Team barrier cognitions will mediate the relationship between team prevention focus and team exploitation.

The Moderating Role of Affective Tone

In addition, we expect the link between future-related cognitions and exploration/exploitation to be dependent on the teams' affective tone. First, we assume the relationship between team positive fantasies and team exploration to be stronger when the team's negative affective tone is high. Specifically, we refer to fantasy realization theory (Oettingen, 1996, 1999). The theory assumes that individuals who contrast fantasies about a positive future with reality-based aspects that may impede the realization of these fantasies experience a strong necessity to act, which then fosters a behavior commitment toward fantasy realization. Oettingen (2000) showed that individuals who did not contrast positive fantasies with impeding reality, but only fantasized about a positive future, did not experience a necessity to act.

Accordingly, we claim that negative team affective tone functions as impeding reality. Fantasy realization theory suggests that positive fantasies enhance both motivation and behavioral tendencies when positive fantasies are contrasted with impeding or negative reality. Thus, we expect the link between team positive fantasies and team exploration to be strengthened by negative team affective tone. This is also in line with the dialectic perspective on innovation (Bledow et al., 2009), underlining the potential benefits of the interplay of

opposing constructs (i.e., team positive fantasies and negative team affective tone) for innovation. We argue that negative affective tone can be assumed to have an absorbing function within the relationship between team positive fantasies and team exploration. As positive fantasies may be accompanied by high levels of enthusiasm and eagerness, negative affective tone may dampen potential adverse consequences (e.g., superficiality or oversimplifications) such that team members remain focused and reflect properly about potential ideas. For example, when promotion-focused team members with positive fantasies concerning an important project experience an event, which is charged by negative affect for the whole team (e.g., frustration triggered by a team conflict), the team may experience a strong necessity to engage in exploration strategies in order to maintain their alignment toward their common project tasks. Our assumptions are reflected in the following hypothesis:

Hypothesis 1c: Negative team affective tone will moderate the mediated relationship between team promotion focus and team exploration via team positive fantasies, such that the mediated relationship will be weaker under low negative team affective tone than under high negative team affective tone.

Second, we assume the relationship between team barrier cognitions and team exploitation to be weaker when the team's positive affective tone is high. Specifically, we argue that too high levels of positive team affective tone have the potential to dampen team barrier cognitions. We draw on the feelings-as-information-perspective (Schwarz, 1990, 2001) and the mood-as-input model (e.g., Martin et al., 1993), which both assume that affective states contribute to information processing. According to these perspectives, affect is used to evaluate goal attainment, such that positive affect signals good progress toward goals and fosters aspects such as confidence. Thus, when team members jointly experience positive affect, they may be inclined to interpret this affective state as a signal indicating

successful goal achievement. This may, in turn, result in high levels of, for example, satisfaction or enthusiasm.

As barrier cognitions may be accompanied by high levels of caution and reflection on risks, overly high levels of positive affective tone may dampen potential favorable consequences (e.g., focusing on details, accuracy) such that team members cannot stay focused on their goal. In other words, when positive affective tone is too high, there may be a risk of overlooking important details when engaging in exploitative strategies such as implementing ideas. For example, when prevention-focused team members with barrier cognitions concerning an important project experience an event which is strongly charged by positive affect for the whole team (e.g., pride or joy triggered by a successful product launch), team members may experience a less strong necessity to focus on details, identify potential hindrances, or work efficiently, resulting in lower levels of exploitation. Therefore, we assume:

Hypothesis 2c: Positive team affective tone will moderate the mediated relationship between team prevention focus and team exploitation via team barrier cognitions, such that the mediated relationship will be weaker under high positive team affective tone than under low positive team affective tone.

Method

Participants and Procedure

We recruited a sample of teams working in fields that demand both exploration and exploitation behaviors. Based on an internet search, we created a list of firms operating in the fields of architecture, construction engineering, media management, marketing and event management, graphic and web design, product and software development, Information Technology (IT) service providers, film production, artistry, and fashion design. We defined

two inclusion criteria: First, the firm's main areas of work actually contained exploration and exploitation behaviors, and second, the firm size ranged from a minimum of three and a maximum of 200 employees. The second precondition was necessary to avoid long decision processes within the firm.

Our contacting procedure was as follows: In a first next step, we contacted each firm by means of a postal letter, in which we invited the firm to be part of a scientific team study. Next, during a phone call, we informed a firm's contact person more specifically about our study's goals and research design and checked if the firm's activities required both exploration and exploitation strategies. As an incentive, we offered a team-related executive summary containing the general results of our study and a team-based analysis. Finally, in case of the firm's agreement to commit, we arranged the start time for the first survey and asked for the email addresses of all participating team members.

In total, we contacted 529 German firms of which 60 teams with 267 team members agreed to participate in our study (response rate: 11.34%). Two teams were dropped after the second survey because they did not answer any of the questionnaires. Thus, ultimately, 58 teams with 261 team members took part in our study (final response rate: 10.96%). The final sample included 35 teams from the field of advertising, marketing, and public relations, 11 teams from IT and electrical engineering, and 11 teams from the field of architecture/construction engineering. One team came from the field of health and social services.

In our final sample, team size ranged from 2 to 11 members, with a mean of 4.50 ($SD = 2.13$) and a median of 4 members. Team members as well as team leaders responded to the four surveys. The sample included 107 females (41%) and 147 males (56%), seven participants (3%) did not provide their gender information. The average age was $M = 35.85$ years ($SD = 11.42$) with a range from 16 to 65 years. A total of 128 participants (49%) held a

university degree, and 109 participants had professional experience of more than 10 years (42%). Organizational tenure was diverse: more than 10 years (26.4%), more than 5 and up to 10 years (15.7%), more than 2 and up to 5 years (20.7%), from half a year to 2 years (22.2%), and less than half a year (8.0%).

We conducted an online survey with weekly questionnaires over a 4-week period. As the weekly questionnaires (completion time: approximately 15 min per questionnaire) required the team members to reflect on team-related aspects in the past week, we asked the team members to fill out the questionnaires on Fridays. Thus, on the starting date and on the three following Fridays, each team member received an email link to the online questionnaire and was asked to respond to it in the course of the day. Each team member answered each questionnaire individually and individual data were aggregated to team data when the data collection was finished. On average, teams provided data at 3.96 measurement points, leading to a total sample of $N = 230$ weekly observations.

Measures

All independent variables, moderators, and dependent variables were assessed on a weekly basis for four weeks (T1–T4). Demographic control variables were measured at T1. Using a referent shift model (Chan, 1998), for each scale, we asked team members to indicate to what degree the statements applied to their team in the past week (1 = does not apply, 5 = does apply). Individual-level scales were adopted accordingly to refer to the team level. All scales are provided in the supplemental materials (see Appendix A).

Team regulatory focus. The team regulatory focus measure was based on of Lockwood et al.'s (2002) individual-level regulatory focus scale (German version by Keller & Bless, 2006). We selected those eight items from this scale that were also appropriate for a team-level measure and the work context. We supplemented our team measure with two items

based on Sassenberg et al.'s (2007) regulatory strategies scales, which added new aspects that were not captured by Lockwood et al.'s (2002) items. The final scale consisted of five items measuring promotion focus and five items measuring prevention focus. Sample items included "In the past week, we were more oriented toward achieving success than preventing failure" for the team promotion focus scale, or "In the past week, we concentrated on fulfilling our duties and responsibilities" for the team prevention focus scale. Cronbach's alphas were $\alpha = .68$ (T1), $.75$ (T2), $.79$ (T3), and $.74$ (T4) for the team promotion focus scale, and $\alpha = .66$ (T1), $.71$ (T2), $.75$ (T3), and $.68$ (T4) for the team prevention focus scale.

Team future-related cognitions. Team positive fantasies and team barrier cognitions were measured with three items per subscale. The individual-level items were developed by Rosing (2011) and are based on the literature on future-related cognitions (Oettingen & Mayer, 2002). Sample items included "In the past week, we envisioned the future success of our current projects" for team positive fantasies, and "In the past week, we concerned ourselves with difficulties that might occur in the course of our projects" Cronbach's alphas were $\alpha = .80$ (T1), $.88$ (T2), $.87$ (T3), and $.89$ (T4) for the team positive fantasies scale, and $\alpha = .84$ (T1), $.89$ (T2), $.88$ (T3), and $.85$ (T4) for the team barrier cognitions scale.

Team affective tone. Team affective tone was measured with a 10-item scale adapted from Sevastos et al. (1992) with five adjectives representing positive team affective tone (e.g., enthusiastic) and five adjectives representing negative team affective tone (e.g., angry). We asked team members to indicate to what degree each adjective described the way in which their team worked in the past week. Cronbach's alphas were $\alpha = .72$ (T1), $.78$ (T2), $.80$ (T3), and $.77$ (T4) for positive team affective, tone and $\alpha = .78$ (T1), $.84$ (T2), $.86$ (T3), and $.87$ (T4) for negative team affective tone.

Team exploration and exploitation. Team exploration and exploitation were measured with a scale adapted from Mom et al. (2007) that we extended with five items capturing further

aspects of exploration and exploitation. The final scale consisted of 16 items with seven items measuring team exploration (e.g., “In the past week, we searched for new possibilities with respect to our work.”) and nine items measuring team exploitation (e.g., “In the past week, we engaged in activities which we clearly knew how to conduct.”). Again, using the back-and-forth translation procedure recommended by Brislin (1970), all items were translated into German. Cronbach’s alphas were $\alpha = .83$ (T1), $.84$ (T2), $.86$ (T3), and $.85$ (T4) for team exploration, and $\alpha = .83$ (T1), $.87$ (T2), $.92$ (T3), and $.90$ (T4) for team exploitation.

Control variables. We included team age, team gender, and team size in our analyses. In line with other team-related studies (e.g., Rietzschel, 2011), team age was operationalized as the mean age of team members, while team gender was operationalized as the proportion of female team members. Further, similar to previous studies on team performance (e.g., Farh et al., 2010), we controlled for team size because internal resources and workload requirements possibly vary with respect to the number of team members (Chiu et al., 2016). We assessed team size by asking team members to indicate the size of the team they were referring to when answering the questionnaires.

Data Aggregation

In order to capture the team level, we needed to aggregate our individual-level data to the team level by using mean scores. To confirm the reliability and validity of the aggregated values (Chan, 1998; Klein & Kozlowski, 2000), we calculated the value of within-group agreement index r_{wg} (James et al., 1993) and intraclass correlation coefficients ICC[1] and ICC[2] (Bliese, 2000) by using the Excel-based statistic tool provided by Biemann et al. (2012). There is no consensus on absolute standard values for the three aggregation indices. However, according to Bliese (2000), an r_{wg} value greater than $.70$ is sufficient to justify an aggregation, whereas the recommended cutoff value for ICC[1] is $.12$ (e.g., James, 1982) and

.60 for ICC[2] (Glick, 1985). Table 1 shows the indices of agreement for all scales and each observation. Except for team positive fantasies and team barrier cognitions, the mean r_{wg} values were greater than .70. For team positive fantasies and team barrier cognitions, the mean r_{wg} values ranged from .49 to .72 within the four observations. Inspection of the team-based r_{wg} values instead of the mean r_{wg} values revealed some outliers for these two variables. Therefore, we also considered the median r_{wg} values, which ranged from .57 to .81 within the four observations, and thus, they appeared to be more meaningful for these cases. Further, ICC[2]s were rather low for nearly all variables within the four observations. ICC[2] depends on the number of raters in each group, such that the low ICC[2] values for team may have resulted from the rather small team size in this study (Chiu et al., 2016; Gong et al., 2009). Chiu et al. (2016) have pointed out that several studies (e.g., Dietz et al., 2015) have suggested that cutoff values of .25 for ICC[2] are still acceptable when the other aggregation indices display high values. As this was the case in our study, aggregation to the team level was justified.

Table 1*Indices of Within-Group Agreement for all scales (Study 1)*

| | T1 | | | | T2 | | | | T3 | | | | T4 | | | |
|------------------------------|---------------|--------|--------|-------------------|---------------|--------|--------|-------------------|---------------|--------|--------|---------|---------------|--------|--------|-------------------|
| | $r_{wg(j)}^a$ | ICC(1) | ICC(2) | F | $r_{wg(j)}^a$ | ICC(1) | ICC(2) | F | $r_{wg(j)}^a$ | ICC(1) | ICC(2) | F | $r_{wg(j)}^a$ | ICC(1) | ICC(2) | F |
| Team Promotion Focus | .83 | .29 | .63 | 2.69*** | .80 | .15 | .42 | 1.71** | .77 | .19 | .46 | 1.83** | .78 | .13 | .35 | 1.54* |
| Team Prevention Focus | .77 | .09 | .29 | 1.40* | .81 | .08 | .26 | 1.35 [†] | .78 | .11 | .30 | 1.43* | .82 | .13 | .36 | 1.56* |
| Team Positive Fantasies | .59 | .23 | .56 | 2.30*** | .49 | .05 | .16 | 1.19 | .63 | .14 | .37 | 1.58* | .59 | .09 | .26 | 1.36 [†] |
| Team Barrier Cognitions | .59 | .08 | .28 | 1.39 [†] | .67 | .09 | .29 | 1.40 [†] | .72 | .23 | .53 | 2.11*** | .67 | .12 | .32 | 1.47* |
| Team Positive Affective Tone | .84 | .21 | .53 | 2.13*** | .82 | .15 | .40 | 1.67** | .78 | .10 | .30 | 1.43* | .85 | .08 | .23 | 1.29 |
| Team Negative Affective Tone | .86 | .17 | .47 | 1.90*** | .82 | .15 | .41 | 1.70** | .86 | .19 | .46 | 1.86** | .81 | .19 | .45 | 1.82** |
| Team Exploration | .79 | .22 | .55 | 2.21*** | .81 | .08 | .26 | 1.36 [†] | .77 | .15 | .39 | 1.63* | .76 | .07 | .21 | 1.27 |
| Team Exploitation | .91 | .17 | .47 | 1.89*** | .90 | .17 | .44 | 1.78** | .89 | .13 | .35 | 1.54* | .90 | .12 | .32 | 1.48* |

Note. ^a Mean $r_{wg(j)}$. F ratio refers to the results of a one-way ANOVA based on the individuals' scale means.

*** $p < .001$, ** $p < .01$, * $p < .05$, [†] $p < .10$

Results

Statistical Analysis

In this study, weekly observations (level 1/within-team level) were nested within teams (level 2/between-team level). We conducted multilevel random intercept regression analysis using the statistical software Mplus (Version 8, Muthén & Muthén, 1998-2017). 58 teams with 230 weekly observations were included in the analysis. At the between-team level, we entered team age, team gender, and team size as control variables. All other variables were entered at the within-team level.

We centered the predictors prior to the analyses. Control variables as between-level predictors were grand-mean centered, whereas within-level predictors were group-mean centered (Enders & Tofighi, 2007). We tested our six hypotheses in separate models, resulting in three models with team exploration as the dependent variable and three models with team exploitation as the dependent variable. We computed ICCs (Bliese, 2000) for the dependent variables team exploration and team exploitation. The ICC[1] values were .42 for team exploration and .52 for team exploitation, indicating a cluster dependency of our observations. Consequently, the multilevel data structure needed to be reflected in the analyses (Bliese, 2000) and a within-team perspective was justified.

Hypotheses Tests

Means, standard deviations, and intercorrelations of all variables are displayed in Table 2. As expected, inspection of the within-level correlations revealed significant relationships among the main variables. These findings provided preliminary evidence for the hypothesized relationships. Furthermore, and different from what we expected, team promotion focus was also positively correlated with team exploitation ($r = .18, p < .01$), while team prevention focus was also positively correlated with team exploration ($r = .43, p < .001$).

In addition, team promotion focus was not only positively correlated with team positive fantasies ($r = .71, p < .001$), but also with team barrier cognitions ($r = .46, p < .001$). Likewise, team prevention focus was not only correlated with team barrier cognitions ($r = .47, p < .001$), but also with team positive fantasies ($r = .25, p < .001$).

In the next section, we will describe the results referring to the main effects and the tests of mediation. After that, we will present the results referring to the moderated mediation hypotheses.

Table 2*Means, Standard Deviations, and Intercorrelations (Study 1)*

| Variable | Mean | SD | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. |
|---------------------------------|------|-----|--------|------------------|--------|--------|---------|---------|------------------|--------|-------|------|
| 1. Team Promotion Focus | 3.17 | .49 | - | .23*** | .71*** | .46*** | .39*** | -.20** | .59*** | .18** | | |
| 2. Team Prevention Focus | 2.64 | .42 | .18 | - | .25*** | .47*** | -.09 | .36*** | .43*** | .23*** | | |
| 3. Team Positive Fantasies | 3.00 | .71 | .76*** | .23 [†] | - | .42*** | .35*** | -.20** | .60*** | .11 | | |
| 4. Team Barrier Cognitions | 2.98 | .69 | .43*** | .52*** | .42*** | - | .05 | .11 | .56*** | .05 | | |
| 5. Positive Team Affective Tone | 3.39 | .45 | .43*** | -.27* | .40** | -.03 | - | -.59*** | .20** | .20** | | |
| 6. Negative Team Affective Tone | 1.70 | .48 | -.27* | .44*** | -.27* | .11 | -.72*** | - | .05 | -.13* | | |
| 7. Team Exploration | 2.92 | .53 | .68*** | .41** | .72*** | .67*** | .21 | -.04 | - | .05 | | |
| 8. Team Exploitation | 3.78 | .44 | .15 | .22 [†] | .05 | -.08 | .12 | -.09 | -.03 | - | | |
| 9. Team Age | | | -.18 | -.12 | -.40** | .03 | -.02 | -.11 | -.17 | .11 | - | |
| 10. Team Gender | | | .04 | .11 | .04 | .14 | -.11 | .07 | -.14 | .37** | -.18 | - |
| 11. Team Size | | | .12 | .23 [†] | .19 | .17 | -.11 | .04 | .24 [†] | -.17 | -.001 | -.08 |

Note. Correlations above the diagonal represent the within-team level ($N = 230$). Correlations below the diagonal represent the between-team level ($N = 58$). To calculate between-team correlations, variables were aggregated across occasions.

*** $p < .001$, ** $p < .01$, * $p < .05$, [†] $p < .10$

Main Effects and Tests of Mediation

To test Hypothesis 1a, we regressed team exploration on team promotion focus at the within-team level, including control variables at the between-team level. Team promotion focus was positively associated with team exploration ($b = 0.58$, $SE = 0.11$, $p < .001$), supporting Hypothesis 1a.

To test Hypothesis 1b, we included team positive fantasies as a mediator in the analysis. At the within-team level, team promotion focus was positively related to team positive fantasies ($b = 0.88$, $SE = 0.10$, $p < .001$), and team positive fantasies were positively related to team exploration ($b = 0.22$, $SE = 0.07$, $p < .01$). The indirect effect of team promotion focus on team exploration was also positive and significant ($b = 0.19$, $SE = 0.07$, $p < .01$). However, the direct effect of team promotion focus on team exploration remained significant ($b = 0.39$, $SE = 0.13$, $p < .01$), such that team positive fantasies only partially mediated this relationship. Consequently, Hypothesis 1b was partially supported.

To test Hypothesis 2a, we regressed team exploitation on team prevention focus at the within-team level, again including control variables at the between-team level. Team prevention focus was positively related to team exploitation ($b = 0.24$, $SE = 0.11$, $p < .05$), supporting Hypothesis 2a.

To test Hypothesis 2b, we included team barrier cognitions as a mediator in the analysis. At the within-team level, team prevention focus was positively related to team barrier cognitions ($b = 0.72$, $SE = 0.16$, $p < .001$), but team barrier cognitions were not related to team exploitation ($b = 0.08$, $SE = 0.05$, $p = .14$). Accordingly, the indirect effect of team prevention focus on team exploitation was not significant ($b = 0.05$, $SE = 0.04$, $p = .14$). Further, the effect of team prevention focus on team exploitation was not significant ($b = 0.18$, $SE = 0.11$, $p = .11$) in this model. Overall, Hypothesis 2b was not supported.

Tests of Moderated Mediation

In Hypothesis 1c, we predicted that negative team affective tone moderates the strength of the mediated relationship between team promotion focus and team exploration via team positive fantasies, such that the mediated relationship will be stronger under high negative team affective tone than under low negative team affective tone. Thus, at the within-team level, we entered negative team affective tone as well as the interaction term between team positive fantasies and negative team affective tone into the mediation model of Hypothesis 1b, again including control variables at the between-team level (see Table 3). The full moderated mediation model is depicted in Panel A of Figure 2. Results indicated a significant positive relationship between negative team affective tone and team exploration ($b = 0.28$, $SE = 0.08$, $p < .001$) and between the interaction term and team exploration ($b = 0.49$, $SE = 0.21$, $p < .05$). The direct effect of team promotion focus on team exploration remained significant ($b = 0.41$, $SE = 0.10$, $p < .001$).

We further analyzed if the form of this interaction corresponded to the hypothesized pattern. Therefore, we operationalized high, medium, and low levels of negative team affective tone as one standard deviation above the mean, the mean, and one standard deviation below the mean of negative team affective tone, respectively, and calculated the conditional indirect effects (Preacher et al., 2007) at low, medium, and high levels of negative team affective tone. Estimates, standard errors, and p -values are depicted in the upper part of Table 4. As predicted, the results showed that the conditional indirect effect was strongest and significant in the high negative affective tone condition ($b = 0.30$, $SE = 0.08$, $p < .001$), while it was weakest and not significant in the low negative affective tone condition ($b = 0.06$, $SE = 0.09$, $p = .48$). However, Hypothesis 1c was only partially supported as the direct effect stayed significant in this model.

Table 3*Results of Multilevel Moderated Mediation Analysis (H1c, Study 1)*

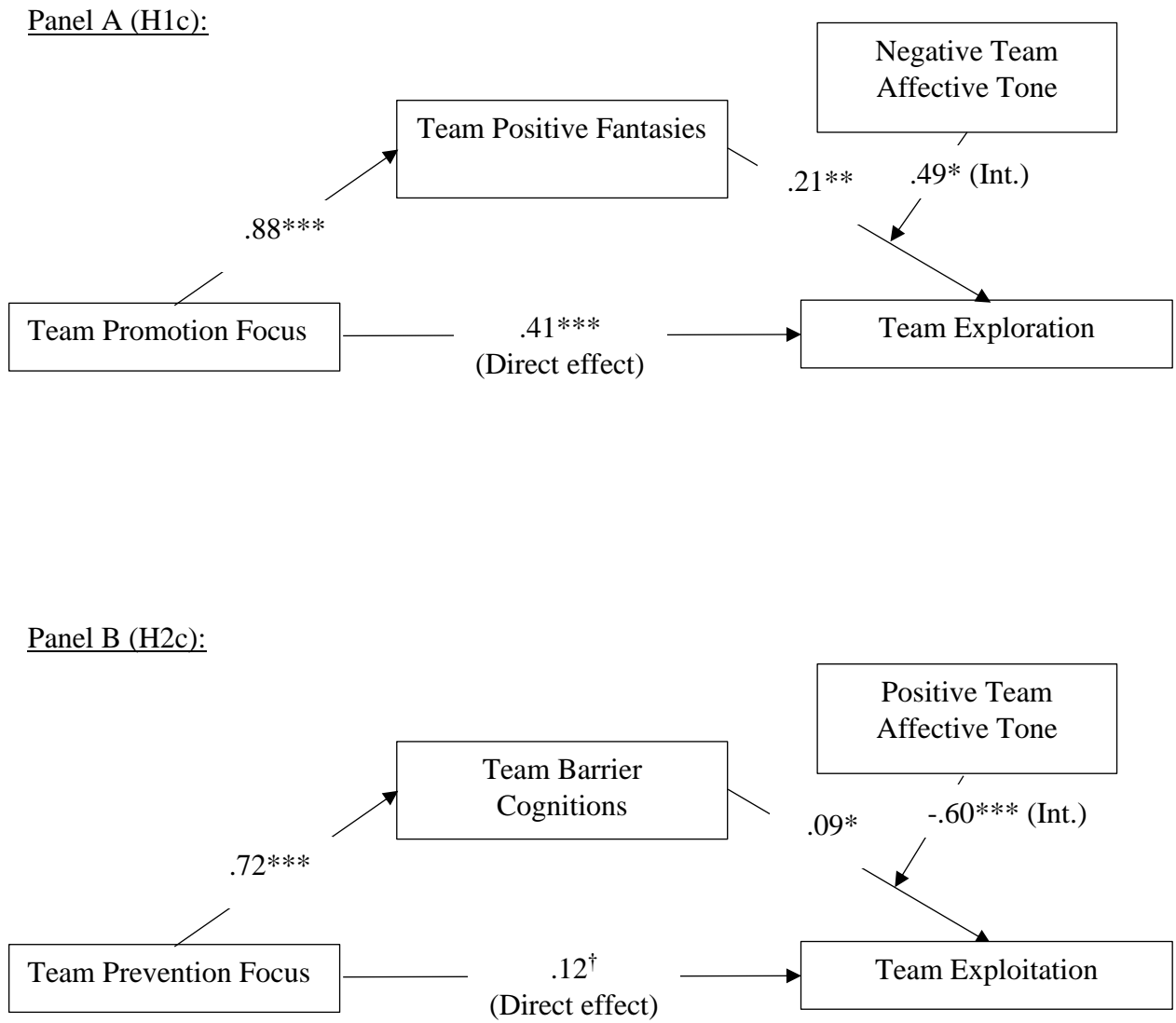
| | Dependent Variable: Team Positive Fantasies | | Dependent Variable: Team Exploration | |
|---|---|-----------|---|-----------|
| | <i>b</i> | <i>SE</i> | <i>b</i> | <i>SE</i> |
| Within-Team Level | | | | |
| <i>Fixed Effects:</i> | | | | |
| Intercept | .00 | (.02) | | |
| Team Promotion Focus | .88*** | (.08) | .41*** | (.10) |
| Team Positive Fantasies | | | .21** | (.07) |
| Negative Team Affective Tone | | | .28*** | (.08) |
| Team Positive Fantasies × Negative Team Affective Tone | | | .49* | (.21) |
| <i>Random Parameters:</i> | | | | |
| Residual Variance | .11*** | (.01) | .11*** | (.01) |
| Between-Team Level | | | | |
| <i>Fixed Effects:</i> | | | | |
| Intercept | 3.00*** | (.07) | 2.92*** | (.05) |
| Team Age | -.03*** | (.01) | -.01* | (.01) |
| Team Gender | -.04 | (.24) | -.23 | (.17) |
| Team Size | .03* | (.01) | .02* | (.01) |
| <i>Random Parameters:</i> | | | | |
| Residual Variance | .26*** | (.05) | .11*** | (.03) |

Note. N= 230 weekly observations nested in N = 58 teams.

*** $p < .001$, ** $p < .01$, * $p < .05$

Figure 2

Moderated Mediation Models (Study 1)



Note. For reasons of simplicity, only Estimates (b) are depicted.
Int. = Interaction

*** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$

Table 4*Moderated Mediation Results Across Levels of Team Affective Tone (Study 1)*

| Hypothesis 1c (Mediator: Team Positive Fantasies) | | | | | | | |
|---|--------|-----------------------------|-----------|----------|--------------------------|-----------|----------|
| Moderator | Level | Conditional indirect effect | <i>SE</i> | <i>p</i> | Conditional total effect | <i>SE</i> | <i>p</i> |
| | Low | .06 | .09 | .475 | .47 | .10 | .000 |
| Team Negative Affective Tone | Medium | .18 | .06 | .004 | .59 | .08 | .000 |
| | High | .30 | .08 | .000 | .71 | .10 | .000 |
| Hypothesis 2c (Mediator: Team Barrier Cognitions) | | | | | | | |
| Moderator | Level | Conditional indirect effect | <i>SE</i> | <i>p</i> | Conditional total effect | <i>SE</i> | <i>p</i> |
| | Low | .18 | .05 | .001 | .30 | .08 | .000 |
| Team Positive Affective Tone | Medium | .06 | .03 | .039 | .19 | .07 | .005 |
| | High | -.05 | .04 | .183 | .07 | .07 | .327 |

Note. $N = 230$ weekly observations nested in $N = 58$ teams.

Finally, Hypothesis 2c predicted that positive team affective tone moderates the strength of the mediated relationship between team prevention focus and team exploitation via team barrier fantasies, such that the mediated relationship will be weaker under high positive team affective tone than under low positive team affective tone. The analysis procedure was similar to that of Hypothesis 1c. Hence, at the within-team level, we entered positive team affective tone as well as the interaction term between team barrier cognitions and positive team affective tone to the mediation model of Hypothesis 2b, again including control variables at the between-team level (see Table 5). The full moderated mediation model is depicted in Panel B of Figure 2. Team barrier cognitions were related to team exploitation ($b = 0.09$, $SE = 0.04$, $p < .05$) in this model. The results further revealed a positive and significant relationship between positive team affective tone and team exploitation ($b = 0.30$, $SE = 0.07$, $p < .001$), and a negative and significant association between the interaction term and team exploitation ($B = -0.60$, $SE = 0.15$, $p < .001$).

Again, we analyzed if the form of this interaction was in line with the hypothesized pattern. Thus, we followed Preacher et al. (2007) and operationalized high, medium, and low levels of positive team affective tone as one standard deviation above the mean, the mean, and one standard deviation below the mean of positive team affective tone, respectively, and calculated the conditional indirect effects. Estimates, standard errors, and p -values are depicted in the lower part of Table 4. As predicted, the results showed that the conditional indirect effect was strongest and significant in the low positive affective tone condition ($b = 0.18$, $SE = 0.05$, $p < .001$), while it was negative and not significant in the high positive affective tone condition ($b = -0.05$, $SE = 0.04$, $p = .18$). Thus, Hypothesis 2c was supported.

Table 5*Results of Multilevel Moderated Mediation Analysis (H2c, Study 1)*

| | Dependent Variable: Team Barrier Cognitions | | Dependent Variable: Team Exploitation | |
|---|---|-----------|--|-----------|
| | <i>b</i> | <i>SE</i> | <i>b</i> | <i>SE</i> |
| Within-Team Level | | | | |
| <i>Fixed Effects:</i> | | | | |
| Intercept | .00 | (.03) | | |
| Team Prevention Focus | .72*** | (.11) | .12 [†] | (.07) |
| Team Barrier Cognitions | | | .09* | (.04) |
| Positive Team Affective Tone | | | .30*** | (.07) |
| Team Positive Fantasies × Negative Team Affective Tone | | | -.60*** | (.15) |
| <i>Random Parameters:</i> | | | | |
| Residual Variance | .20*** | (.02) | .08*** | (.01) |
| Between-Team Level | | | | |
| <i>Fixed Effects:</i> | | | | |
| Intercept | 2.98*** | (.06) | 3.80*** | (.04) |
| Team Age | -.001 | (.01) | .01 | (.01) |
| Team Gender | -.21 | (.22) | .42** | (.14) |
| Team Size | .02 | (.01) | -.01 | (.01) |
| <i>Random Parameters:</i> | | | | |
| Residual Variance | .23*** | (.04) | .06*** | (.02) |

Note. N= 230 weekly observations nested in N = 58 teams.

*** $p < .001$, ** $p < .01$, * $p < .05$, [†] $p < .10$

Discussion

This study aimed at investigating how and why self-regulation in teams relates to teams' innovative strategies. Specifically, we were interested in the potential underlying regulatory mechanisms within the relationship between team regulatory focus and team exploration and exploitation. To this end, we focused on the role and function of team future-related cognitions and team affective tone. We conducted a longitudinal field study with teams from different firms and sectors and analyzed our data by means of multilevel regression models.

As expected, our findings revealed a positive relationship between team promotion focus and team exploration. We further demonstrated that team positive fantasies partially mediated this relationship. In addition, moderated mediation analysis indicated that negative team affective tone moderated the relationship between team positive fantasies and team exploration. The indirect effect of team promotion focus on team exploration was weakest when negative team affective tone was low. In sum, the moderated mediation effect was partially supported, as the direct effect of team promotion focus on team exploration stayed significant.

Further, our data showed a positive relationship between team prevention focus and team exploitation. Contrary to our expectations, the association between team prevention focus and team exploitation was not mediated by team barrier cognitions. However, the mediation effect occurred under specific conditions. Moderated mediation analysis displayed that positive team affective tone moderated the association between team barrier cognitions and team exploitation. Thus, we demonstrated an indirect effect of team prevention on team exploitation via team barrier cognitions, only when positive team affective tone was not too high.

Theoretical Contributions

Our study contributes to literature in several ways. To begin with, our results provide further insight into how and why team regulatory focus is related to innovative strategies at the team level. To date, research exploring the association between regulatory focus and exploration and exploitation at the team level is limited. As an exception, Tuncdogan et al. (2017) studied this relationship at the team and the organizational level. However, different from our sampling strategy, they referred to responses from teams' top managers to assess team regulatory focus. Their results indicated that a promotion focus of a unit's management team is positively related with the unit's exploratory innovation. This in line with the general tendency that promotion focus and exploration are related, which was also shown at the individual and the organizational level (e.g., Kammerlander et al., 2015). Our finding that team prevention focus was associated with team exploitation is especially relevant as, up to now, research on the effects of prevention focus on innovative strategies has been rather inconclusive. For example, Kammerlander et al. (2015) did not find a relationship between prevention focus and exploitation, but a negative relationship with exploration. In Tuncdogan et al.'s (2017) study, prevention focus also had a marginal negative effect on exploration, while the effect on exploitation was not analyzed. A second research stream with studies on team regulatory focus and further innovation-related constructs showed a similar pattern: While team promotion focus was considerably related to constructs such as idea generation or creative performance (e.g., Rietzschel, 2011; Shin et al., 2016), the effects of team prevention focus remain unclear. For example, Rietzschel's (2011) study revealed a negative relationship between team prevention focus and idea promotion but no relationship between team prevention focus and either idea generation or implementation.

These rather inconclusive results, especially concerning the association between prevention focus and innovative strategies, highlight a second contribution of our study, that

is, studying potential mechanisms and boundary conditions of the relationships between team regulatory focus and innovative strategies. More specifically, we add to the literature by identifying moderated mediation effects that may help to explain why and under what conditions team promotion and prevention focus are related to team exploration and exploitation. Up to now, the role of cognitive-affective processes underlying the relationship between regulatory focus and innovative strategies or further innovation-related constructs remains an under-researched field. Our results point in a similar direction as the individual-level results of Rosing's (2011) study as we demonstrated the same cognitive consequences of regulatory focus at the team-level. Hence, promotion-focused teams can be assumed to engage in positive fantasies about their project realization, while prevention-focused can be assumed to engage instead in barrier cognitions concerning their project. Moreover, we have gone beyond existing research by studying the boundary condition of team affective tone of the association between team regulatory focus, future-related cognitions, and team exploration and exploitation. Doing so, we integrated research on self-regulation, future-related cognitions, and affect within the context of innovation. Thus, we have stressed the relevance of regarding innovation as a complex and dynamic phenomenon (e.g., Anderson et al., 2004; Bledow et al., 2009; Miron-Spektor, Gino, & Argote, 2011) that requires a corresponding complex form of self-regulation and affect regulation among the actors. Existing individual-level and team-level research has mainly focused on the association between regulatory focus and innovation or related constructs (e.g., Friedman & Förster, 2001; Rietzschel, 2011; Shin et al., 2016) or on the relationship between affect and innovation or related constructs (e.g., Amabile et al., 2005; Baas et al., 2008; Baas et al., 2011a; George & Zhou, 2007). A few exceptions focused on a combination of at least two of these constructs: Rosing (2011) studied the relationship among regulatory focus, future-related cognitions, and explorative and exploitative momentum, while Baas et al. (2011b) integrated regulatory focus,

affect, and creativity in their study (Baas et al., 2011b). Thus, by integrating self-regulatory, cognitive, and affective facets, we attempted to investigate their interplay within innovation processes and offer a starting point for further studies.

Additionally, by considering the possible benefits of opposite constructs, such as team positive fantasies and negative team affective tone, we supported the assumption of some researchers arguing for the benefits of opposing and conflicting strategies within the framework of innovation (e.g., Bledow et al., 2009; Gebert et al., 2010; Miron-Spektor, Gino, & Argote, 2011). Our finding that the interaction of team positive fantasies and negative team affective tone fostered exploration highlights the relevance of a dialectic perspective on innovation. Specifically, this result advances the understanding of how teams can profit from tensions or paradoxes to stay adaptive in the long term. In other words, this study strengthens the assumption that opposing constructs may have a complementary effect on team innovation as they have the strong potential to yield positive synergies (Gebert et al., 2010). However, while we expected and found a dialectical effect for team positive fantasies and negative team affective tone, our data revealed another pattern for the interaction of team barrier cognitions and positive team affective tone. As predicted, barrier cognitions were positively related to exploitation only when positive team affective tone was low. On the one hand, this result emphasizes that team exploitation strongly differs from team exploration in terms of underlying requirements and supports our approach to study exploration and exploitation separately. On the other hand, this finding questions the general argument that the effect of positive affect on information processing is always beneficial in the context of innovation (e.g., Amabile et al., 2005; Baas et al., 2008). Rather, these findings strengthen the relevance of also considering the interplay of affect with further constructs as well as the benefits of low positive affect when studying innovation.

Finally, our study enriches research in the field of team-level self-regulation and innovation with longitudinal data. To date, most studies in this research area have referred to cross-sectional data (e.g., Kammerlander et al., 2015; Rietzschel, 2011; Tuncdogan et al., 2017). However, by studying the relationships from a within-team perspective, we took into account the dynamics of both team processes (Kozlowski, 2015) and innovation processes (Bledow et al., 2009) and were able to consider the variables' weekly fluctuations due to shifting demands or requirements.

Limitations and Future Research

Our study has several limitations, which also indicate potential areas for future research. First, due to the correlational design of our study, causal interpretations of the relationships are not possible. Thus, for example, we cannot be sure that team promotion focus affects team positive fantasies and team exploration. It might also be possible that team positive fantasies constitute a team promotion focus or that team exploration positively affects team promotion focus. In line with that, referring to the dynamic and complex nature of innovation processes, Rosing (2011) suggested that the association between future-related cognitions and exploration and exploitation could also be expected to be reciprocal. Thus, experimental studies with manipulations of team regulatory focus, team future-related cognitions, and team affective tone are necessary to draw causal conclusions. In particular, the moderated mediation effects need to be studied intensively and replicated in experimental settings. Although our data revealed the assumed interaction effects, additional experimental data would underpin our findings, as potential confounding effects could be eliminated.

Second, with the short time spans of one week between the four measures and a total study period of four weeks, our data only represented small parts of the teams' projects and did not cover whole projects. However, we decided to capture a period of four weeks, as we were

interested in potential weekly fluctuations. For example, as we consider team regulatory focus as a state depending on the team members' characteristics as well as on situational influences (Johnson et al., 2015), short-term fluctuations in team regulatory focus appear to be quite realistic and need to be considered. Future research should also examine if there is still variance in the data when studying the assumed effects within longer periods or within entire innovation processes. This would shed further light on the dynamics of the innovation processes, especially with respect to the team level. Studying further timelines would contribute to a more comprehensive understanding of innovative strategies and possible reasons for temporal fluctuations of these strategies within the whole innovation process. Such sequence effects may also have the potential to be beneficial for innovative performance (Rosing & Zacher, 2017). Moreover, according to Johnson et al. (2015), studying dynamic models of team regulatory focus offers an avenue for future research. Identifying temporal shifts of promotion and prevention focus and the possible effects of these shifts would be tremendously important as existing research on regulatory focus is basically static. However, examining such effects would require longer time periods than those utilized in our study.

Finally, we separately studied team exploration and exploitation to analyze the specific regulatory antecedents of each strategy. However, most studies on innovative strategies have referred to ambidexterity, that is, the combination of high levels of exploration and exploitation (e.g., Mom et al., 2007; Rosing et al., 2011). Those researchers argued that innovation requires both a balance of exploration and exploitation and a high level of this balance (Rosing & Zacher, 2017). We decided to separately analyze the relationship between team regulatory focus and team exploration and exploitation to understand each association in detail. Similar to some other researchers (e.g., Tuncdogan et al., 2015) we argue that this is a necessary step before studying the concept of team ambidexterity as a whole. Hence, we propose that the insights of this study might also be relevant for ambidexterity research at the

team level, such that future research should explicitly apply the study's findings in the context of ambidexterity.

Practical Implications

The relationship between regulatory focus and innovative strategies as well as the underlying regulatory mechanisms of this relationship are also of practical interest. First of all, it is important for both team members and supervisors of innovation teams to be aware of the differential effects of team promotion and prevention focus on innovative strategies. Particularly, supervisors can try to either foster promotion or prevention focus among their team members (Kark & van Dijk, 2007), depending on whether a specific project requires an explorative or an exploitative team strategy. Further, imagining the future success of an innovation project will help promotion-focused teams to push forward their explorative strategy. This imagination process can also be initiated by the team's supervisor through discussions, but also by team members actively reflecting on their future-related cognitions. Therefore, they must be aware of the concept of future-related cognitions and its specific effects. This might be fostered by regular team reflecting practices supported and guided by experts such as team trainers. Finally, with respect to the dynamics and tensions of the innovation process (Bledow et al., 2009), both supervisors and team members should be made aware of the beneficial effects of alleged opposites. For example, promotion-focused teams who simultaneously experience positive fantasies and negative affect should not immediately try to down-regulate the negative affect. Likewise, supervisors should not immediately encourage teams to do so. Rather, team members and supervisors should become aware of the regulatory function of team affective tone and the interactive effects with fantasies or cognitions about the future. This would also involve an understanding about the interaction of barrier cognitions and positive affect. In such a case, contrasting appears to be less useful

while down-regulation of positive affect may be beneficial. Therefore, both team members and supervisors should become aware of the effect of positive affect on information processing, and they will need to internalize the idea that high positive affect is not always beneficial in the context of innovation.

5. Study 2:

Team Regulatory Focus and its Role for Idea Generation, Idea Implementation, and Innovative Performance: A Dynamic Perspective³

Abstract

In an experimental study, we explored the relationships between team regulatory focus and temporal patterns of innovative activities as well as innovative performance. We manipulated regulatory focus in 44 student teams and assessed idea generation and implementation activities over time based on video data. External raters assessed innovative performance. Structural equation models revealed that higher team promotion focus increased idea generation at the beginning of an innovative project but decreased this activity over time. High levels of idea generation at the beginning of a project were related to lower levels of originality, whereas a decline in idea generation over time was related to higher levels of originality. Unexpectedly, relationships between team prevention focus, idea implementation, and quality were not significant. Our findings contribute to a comprehensive perspective on team regulatory focus and innovation, emphasizing the importance of differentiating between activities and performance.

³ A version of this chapter will be published as:

Hundeling, M., Auerswald, M. & Rosing, K. (in press). Team regulatory focus and its role for idea generation, idea implementation, and innovative performance: A dynamic perspective. *The Journal of Creative Behavior*. <https://doi.org/10.1002/jocb.503>

Introduction

In today's work life, innovation is crucial for organizations' competitiveness (Anderson et al., 2014; Bledow et al., 2009; van Knippenberg, 2017). Innovative tasks are often performed in teams because they are supposed to have higher potential for innovation than individuals (Hülshager et al., 2009; Rietzschel, 2011). Interactive and social processes are central elements of the innovation process because innovation requires intensive exchange and dialogue within a team in order to successfully develop ideas and put them into action (Drach-Zahavy & Somech, 2001). By definition, team innovation refers to both the development and implementation of something novel (van Knippenberg, 2017). The demands on innovative teams are particularly challenging compared to teams in other contexts (e.g., administration), as they are faced with rapidly changing requirements in highly complex environments. Members of innovative teams must coordinate different tasks, decide on different working approaches, and discuss diverse and competing viewpoints on procedures and problems. Thus, they must regulate their shared activities in order to attain their goals in an extremely dynamic context. Our study aims at providing a comprehensive understanding of how team regulation strategies are linked to both innovative activities (e.g., idea generation) over time and innovative performance (e.g., originality).

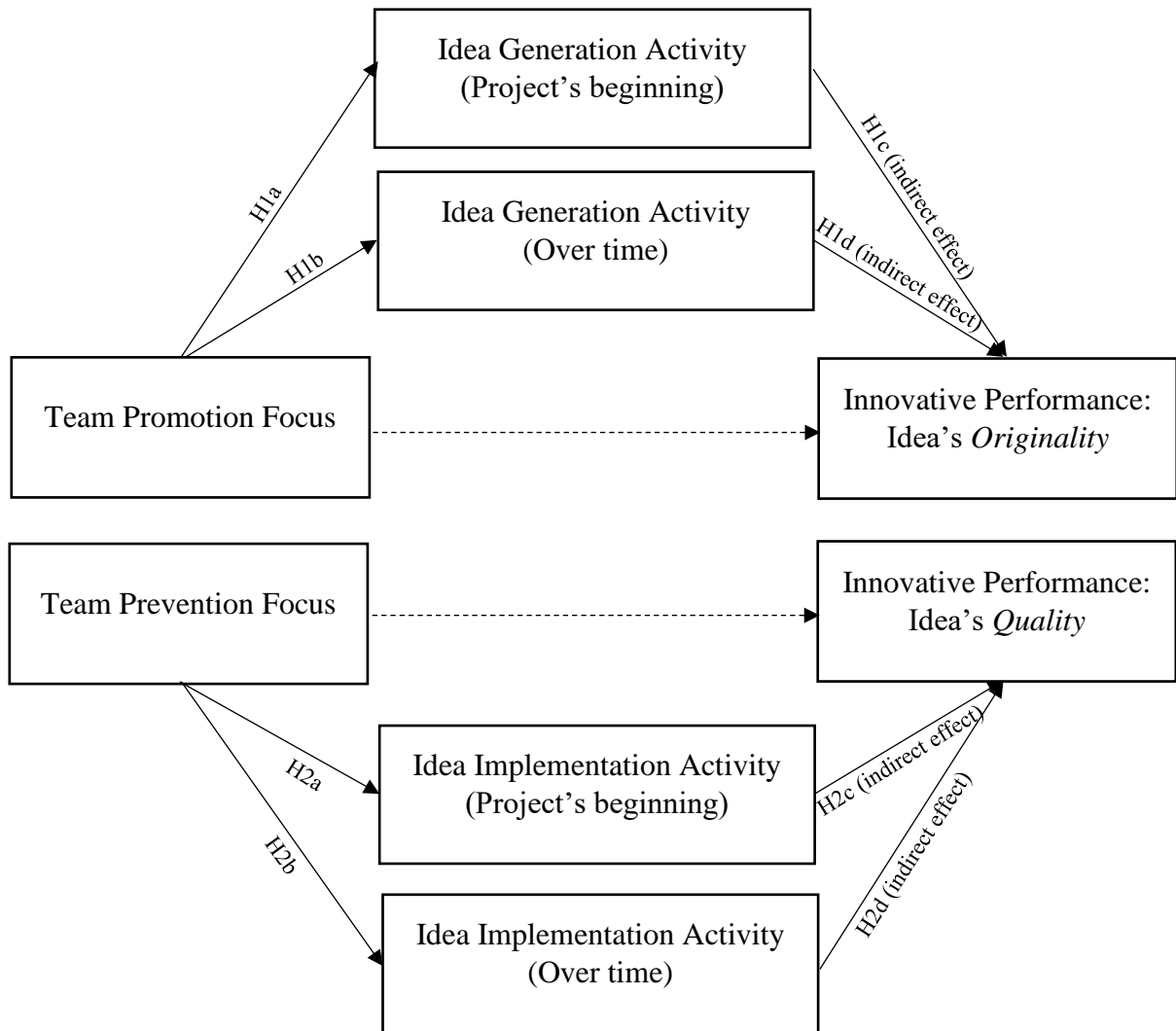
To study team regulation, we build on Higgins's (1997) influential regulatory focus theory. This theory has recently been applied at the team level and is concerned with the motivational strategies preferred by people or teams in order to accomplish their objectives (Johnson et al., 2015). It distinguishes two foci of self-regulation, promotion focus and prevention focus. Up to now, the relationship between team regulatory focus and innovative activities has only been partially investigated. Existing research has focused on a static perspective, specifically analyzing the relationships between team regulatory focus and various innovative activities on a general level (e.g., Rietzschel, 2011). As innovative

environments are highly dynamic (West, 2002b) and rapidly changing, innovative activities will not be carried out on a constant level over time. Thus, we argue that a temporal perspective on team regulatory focus and innovative activities is necessary to develop a comprehensive understanding of how team regulatory focus impacts innovation in teams. In this study, we go beyond the static perspective and examine the dynamic role of innovative activities as they fluctuate as a function of time. Moreover, we also link team regulatory focus and the temporal trajectories of innovative activities to innovative performance (see Figure 3 for an overview of our theoretical model).

Our paper contributes to existing research on team regulatory focus and innovation in the following ways. On the one hand, we extend this line of research by incorporating a temporal perspective based on growth trajectories of innovative activities. On the other hand, we examine how team regulatory focus and the dynamics of innovative activities are linked to innovative performance. As previous research has been limited to studying the link between team regulatory focus and innovative activities, we suggest that it is necessary to go one step further and examine how team regulatory focus is related to the outcomes of these activities, that is, innovative performance.

Figure 3

Theoretical Model (Study 2)



Theoretical Background and Hypotheses

Higgins's (1997) regulatory focus theory is the most influential individual-level self-regulation approach for examining the self-regulatory underpinnings of creativity and innovation. Considering the motivational aspects of self-regulation, regulatory focus theory builds on the assumption that there are "different ways of approaching different types of desired end-states" (p. 1281). Those end-states involve aspects like advancements and growth on the one hand, and aspects like obligations and protection on the other hand. Accordingly, regulatory focus theory is concerned with two different foci of individual self-regulation: promotion and prevention focus. Although the theory was originally aimed at explaining individual self-regulation, scholars have recently begun to examine regulatory focus at the team level (e.g., Levine et al., 2000; Rietzschel, 2011; Sassenberg & Woltin, 2008; Shin et al., 2016). By definition, team regulatory focus involves distinct team processes in order to regulate their actions to reach collective goals (e.g., Johnson et al., 2015; Johnson & Wallace, 2011).

Following Higgins (1997), individuals with chronic promotion focus have a strong need for growth or change and are driven by their ideals. Similarly, teams with promotion focus are guided by development and realization of gains, prioritizing success and working to reach the best possible outcome (Johnson & Wallace, 2011). In contrast, individuals with chronic prevention focus have a strong need for security and are guided by their obligations. Correspondingly, teams with prevention focus will have their overall attention on security, avoiding losses and regarding team members' errors as obstructive for development (Johnson & Wallace, 2011). Thus, as teams with prevention focus have their priority on preventing negative outcomes, they may rather concentrate on joint decision making and details.

We suggest that team regulatory focus is highly relevant for innovation processes as aspects like growth, change, success, security, and errors appear to play a central role in

innovation processes (e.g., Bledow et al., 2009; Brockner et al., 2004; Frese & Gielnik, 2014; Rank et al., 2004). A team's attitude towards those aspects appears to be particularly relevant to their specific activities within innovation processes, and team regulatory focus is thus expected to directly affect the activities of teams in innovation processes. Typically, researchers differentiate between creativity and implementation as different kinds of activities within innovation processes (Rosing et al., 2018). Creativity comprises the development or generation of original and useful ideas (Amabile, 1983). Implementation, in contrast, refers to the application or realization of these ideas (West, 2002a).

Several individual-level studies have documented that both promotion focus and prevention focus impact these activities. The results of this research reveal that promotion focus is associated with a comparatively risky processing style that fosters idea generation and related constructs like creativity, originality, or fluency (e.g., Crowe & Higgins, 1997; Friedman & Förster, 2001; Herman & Reiter-Palmon, 2011; Lam & Chiu, 2002). Promotion states may foster creative insight and divergent thinking as they broaden the attentional scope and facilitate access to mental representations (Baas et al., 2008). Prevention focus, however, appears to be related to a conservative and risk-averse processing style, which may be relevant for idea implementation or related constructs, such as maintaining persistence or evaluation of the outcome's quality (e.g., Crowe & Higgins, 1997; Friedman & Förster, 2001; Herman & Reiter-Palmon, 2011; Lam & Chiu, 2002). Prevention states are assumed to narrow the attentional scope, engendering a focus on local perceptual details (Baas et al., 2008).

Some researchers have also explored the effects of team-level regulatory focus on innovative activities. In line with individual-level results, these studies revealed that team promotion focus is associated with idea generation (Rietzschel, 2011), or related constructs like creative performance (Shin et al., 2016) or risky decisions (Levine et al., 2000), whereas team prevention focus was associated with risk aversion (Florack & Hartmann, 2007) and

task performance (Shin et al., 2016) but not with creative performance (Shin et al., 2016) or idea realization (Rietzschel, 2011).

Development of Hypotheses

Promotion focus and idea generation

Building on research showing a general relationship between team promotion focus and idea generation, we more specifically suggest that team promotion focus affects the frequency of idea generation activities especially at the initial stages of innovation processes. Shin (2014) pointed out that promotion-focused teams display an optimistic and proactive motivation, which enables them to try new ways of working and to challenge the status quo. We add that their focus on success and their striving for goal attainment energize them particularly at the initial stage of a project. Thus, as team promotion focus impedes thinking about potential barriers or problems, team members may enthusiastically generate as many different ideas as possible and may not reflect on potential future obstacles. Furthermore, Rietzschel (2011) and Levine et al. (2000) have stated that team promotion focus fosters a collective bias toward risk. Thus, teams with a promotion focus will not think about dismissing an idea at the beginning of a project due to prospective problems or risks. Consequently, especially at the beginning of a project, teams with a promotion focus will try to generate as many diverse ideas as possible.

Hypothesis 1a: Team promotion focus will be positively related to idea generation activities at the beginning of an innovation project.

While we expect promotion-focused teams to highly engage in idea generation when beginning innovation projects, we expect a decrease in idea generation over time. In other words, the more that teams are in a promotion focus, the less they engage in the activity of

idea generation over time. We argue that being motivated and activated (i.e., being in a promotion focus) over a longer period of time will deplete resources, and the idea generation curve will decrease as a result. This is in line with Baas et al. (2011a), who assumed that activating states (e.g., anger) drive creative performance but likewise tax energy and cause resource depletion. Building on research on resource depletion (e.g., Boksem & Tops, 2008; Kaplan & Berman, 2010), they argued that the depletion of energetic resources will result in a loss of performance. We add that teams will tire especially fast because compared to individuals, they have to manage diverse social processes in addition to content-related interaction.

We further argue that the higher a team promotion focus is, the more team members will be oriented towards success. Thus, as project completion approaches, they will simultaneously focus on further tasks (e.g., evaluation or selling of ideas) crucial for the project's success. As a result, the idea generation curve will decrease over time. In general, researchers have emphasized time pressure as an influential factor for creativity at the individual level (e.g., Baer & Oldham, 2006; Ohly et al., 2006). For example, Ohly et al. (2006) showed an inverted U-shaped relationship between time pressure and creativity and innovation, indicating that when time pressure is too high, activation is also too high to be productive. This may also apply at the team level. As promotion-focused teams display a high collective orientation towards success, time pressure may result in even higher levels of activation than at the individual level, and in turn, it may also result in resource depletion. Accordingly, the levels of activation will be too high to be productive and will result in a decreasing idea generation curve over time.

Taken together, time progress can be considered another important reason why team promotion focus may not ensure high levels of idea generation activities. Thus, time pressure

due to deadlines or further project tasks may dampen the positive effects of team promotion focus on idea generation activities. Therefore, we predict:

Hypothesis 1b: Team promotion focus will be negatively related to idea generation activities in innovation projects over time.

Promotion focus, idea generation, and originality

We further expect that the level of idea generation at initial project stages will be positively related to the originality of the outcome. Originality refers to the extent that ideas are not only new but also unusual or unconventional (Guilford, 1957). In line with Rosing et al. (2018), we argue that, especially in early time frames, teams lay the foundation for innovative outcomes if they explore opportunities in depth and engage in developing a variety of creative solutions. This is also in accordance with West (2002b), who proposed that the generation of creative ideas is required more strongly at early stages of an innovation project when a specific need for innovation is identified and solutions and ideas need to be developed. Consequently, a high level of idea generation is needed to develop promising solutions that are unique and original. Thus, we assume that the level of idea generation at initial stages will be positively related to originality.

In sum, we expect a positive indirect effect (Mathieu & Taylor, 2006) of promotion focus on originality via idea generation activities at early project stages. As a team focus on attainment and success that results from promotion focus is supposed to foster idea generation, especially at early stages, and as high levels of idea generation should result in high originality, we expect the indirect effect of team promotion focus on originality to be positive. In other words, promotion-focused teams will focus on generating many ideas at a project's beginning, which helps them to reach highly original project outcomes.

Hypothesis 1c: There will be a positive indirect effect of team promotion focus on originality via a high level of idea generation activities at initial project stages.

Moreover, we expect that a decrease of idea generation activities during the further course of an innovation project will lower the level of originality. Building on Rosing et al. (2018), who found that high levels of creativity throughout an innovation project are positively related to team innovation, we assume that teams need to maintain high levels of creativity throughout projects in order to ensure original outcomes. In line with Paulus (2002), these authors argue that an idea is never complete and needs to be developed and modified throughout the whole innovation process in order to reach a level of elaboration that makes realistic implementation possible. Specifically, they add that creativity is needed for the realization of highly original ideas, as those ideas do not have known implementation strategies. Without proven concepts or strategies for team members to draw on, existing knowledge must be recombined and integrated in a new and creative manner, and for that reason, the level of idea generation needs to be maintained (Rosing et al., 2018). Thus, we assume that a decrease in idea generation activities over time will negatively affect the originality of ideas.

In sum, we expect a negative indirect effect (Mathieu & Taylor, 2006) of promotion focus on originality via idea generation activities over time. As a team focus on attainment and success that results from promotion focus is supposed to lower idea generation over time, and likewise, decreasing levels of idea generation result in lower originality, we expect the indirect effect of team promotion focus on originality to be negative.

Hypothesis 1d: There will be a negative indirect effect of team promotion focus on originality via a decrease of idea generation activities over time.

Prevention focus and idea implementation

We propose that team prevention focus fosters idea implementation activities at the beginning of an innovative project. As teams with a prevention focus are averse to risk (Levine et al., 2000), they may strive to implement an idea as quickly as possible in order to ensure results, even if only minimal requirements are met. This strong tendency to avoid failure was also mentioned by Brockner et al. (2004) who underlined that failure has an energizing function within a prevention focus such that failure has a greater motivational intensity than success. We add that this motivational intensity will result in high implementation efforts at the beginning of an innovation project.

Previous individual-level research has linked prevention focus particularly to constructs related to idea implementation (e.g., Crowe & Higgins, 1997; Friedman & Förster, 2001; Herman & Reiter-Palmon, 2011; Lam & Chiu, 2002). However, empirical evidence on the relationship between team prevention focus and idea implementation or related constructs is rather weak (for exceptions see Rietzschel, 2011 and Shin et al., 2016) and inconclusive. Building on Shin et al. (2016), who have shown that task performance refers to goal accomplishment, we argue that task performance may also be close to idea implementation activities, as goal specifications are assumed to be particularly relevant for idea implementation (Farr et al., 2003).

Taken together, at early stages of an innovation project, prevention-focused teams will start out in engaging in implementation activities at a relatively high level. Therefore, we predict:

Hypothesis 2a: Team prevention focus will be positively related to idea implementation activities in the team at the beginning of an innovation project.

Over time, we expect a further increase of idea implementation for prevention-focused teams. Thus, we propose a positive relationship between team prevention focus and idea implementation activities during the course of an innovation project. We assume typical strategies of prevention-focused teams (e.g., avoiding mistakes, working precisely, preventing failure) to be particularly relevant for realization tasks over time. We argue that, especially in the course of time, ideas will become more concrete and tangible such that team members will be able to anticipate how the final product and its implementation will appear. In such a case, prevention-focused teams that focus on details and accuracy will critically question and check the practical feasibility of ideas. At the same time, when ideas are getting more specific and detailed, more potential risks and barriers to their implementation, as well as problems with the ideas themselves, become obvious. A focus on avoiding losses will energize prevention-focused teams even more in the course of an innovation project, when its deadline is approaching and things need to get done with a high level of accuracy. As a result, the implementation curve will further increase.

Lam and Chiu (2002) argued that prevention focus fosters sustained effort in a project, especially in the case of unforeseen obstacles. We add that this argument becomes even more relevant in the course of the project, as unforeseen obstacles may have a greater impact on the project's success when the deadline approaches. This is in line with the "goal looms larger" effect (e.g., Lewin, 1935; N. M. Miller, 1944) assuming that motivational strength increases, and effort accordingly, as people draw closer to certain goals. In line with that, Förster et al. (1998) found that vigilance resulting from a prevention focus increased as people moved close to a task's accomplishment. Thus, we assume that prevention-focused teams will further increase their attention to implementation over time and when the deadline approaches.

Time progress (Marks et al., 2001) in general and, thus, time awareness may also intensify the prevention-focused team's effort to implement the idea and finalize the project.

Hence, during the course of the project, team prevention focus seems to be a beneficial regulation strategy for implementation activities to “gain momentum” (Rosing et al., 2018, p. 804) such that an approaching project’s deadline will further intensify the prevention-focused team’s implementation efforts. In sum, we expect team prevention focus also to be beneficial for the activity of idea implementation over time.

Hypothesis 2b: Team prevention focus will be positively related to idea implementation activities over time.

Prevention focus, idea implementation, and quality

We expect that the level of idea implementation at initial project stages will be negatively related to the quality of the outcome. According to Miron et al. (2004), a high-quality product is reliable, stable, and in keeping with all standards and specifications. Past research has revealed that quality, similar to originality, appears to be an important facet of innovation performance (e.g., Amabile, 1983; Mumford & Hunter, 2005; Rosing et al., 2018).

We argue that a high initial level of idea implementation is obstructive for the quality of the outcome. We assume that episodes of implementation activities (e.g. early pre-tests) will occur in early time frames (Rosing et al., 2018), but, however, the ideas resulting from these initial implementation episodes will not be as elaborated, and their quality is consequently expected to be rather low at this point. Further, Rosing et al., 2018 point out that teams concentrating on “getting things done” (p. 799) early on may have a rather closed focus on execution. However, this appears to be obstructive, as ideas will not be precisely thought out, which lowers their quality. Thus, we assume that a high level of idea implementation at initial stages will be negatively related to quality.

In sum, we expect a negative indirect effect (Mathieu & Taylor, 2006) of prevention focus on quality via idea implementation activities at early project stages. As a team focus on

security and losses that results from prevention focus is supposed to foster idea implementation at early stages of an innovation project, and as high levels of idea implementation result in low quality in turn, we expect the indirect effect of team prevention focus on quality to be negative. In other words, members of prevention-focused teams will focus too much on implementation early on and, as a result, will not be able to provide high-quality outcomes.

Hypothesis 2c: There will be a negative indirect effect of team prevention focus on quality via a high level of idea implementation activities at initial project stages.

Finally, we expect that an increase of idea implementation activities during the further course of an innovation project will enhance the level of quality. Referring to Baer (2012) and West (2002a), Rosing et al. (2018) have argued that at some point during the project, implementation activities need to be intensified in order to present more than an original idea. We add that this counts not only for originality but also for quality that results from a high level of elaboration. In their team-level study, Rosing et al. (2018) provided support for the general assumption that an increase in implementation is positively related to team innovation. They assume implementation to have the function of a reality check, which becomes more and more important over time because the time frame for possible adjustments steadily gets smaller.

In sum, we expect a positive indirect effect (Mathieu & Taylor, 2006) of team prevention focus on the quality of the outcome over time. As a team focus on security and losses that results from prevention focus is supposed to foster idea implementation over time, and as increasing levels of idea implementation likewise result in higher quality, we expect the indirect effect of team prevention focus on quality to be positive. In other words, as prevention-focused teams are assumed to be attentive to detail and work precisely, over time,

team prevention focus particularly directs teams to aspects of quality when implementing ideas.

Hypothesis 2d: There will be a positive indirect effect of team prevention focus on quality via an increase of idea implementation activities over time.

Methods

Participants and Design

132 German undergraduate students of psychology (79.5% women; mean age 21.94 years, standard deviation (SD) = 5.25) took part in our experimental study and received credit points for participation. They were divided into 44 three-person teams (mixed-gender) and randomly assigned to one of the two conditions (team promotion focus vs. team prevention focus) of the single-factor between-subjects experimental design.

Materials and Procedure

Teams were tested individually. Each experimental session consisted of two parts, a manipulation in the first step and an experimental task in the second step.

At the beginning of the experimental session, team members were asked to take on the role of strategic purchasers working for a fictitious company selling sport and leisure equipment. The team was informed that their major role was to choose products for the company's future product range (see Appendix B1). For reasons of standardization, we solely used written materials to inform the participants about the setting and their tasks. We manipulated team regulatory focus in the content of business strategy presentations and advertisements of outdoor articles, using cues that either implicated team promotion or team prevention focus (Friedman & Förster, 2001). In the first step (manipulation), the team task was to watch the company's business and communication strategy presentation to have an

initial basis for forthcoming decisions regarding the prospective expansion of the company's product range. In the promotion focus condition, the business strategy presentation consisted of several pictures with promotion-related content, such as people being in adventurous situations (e.g., standing on the top of a mountain after having climbed it and gazing into the distance) or celebrating athletic achievements (e.g., being overwhelmed after winning a marathon). The pictures' statements were emphasized by suitable slogans (e.g., "Experiencing unique adventures..." or "Stay focused on your goals...") and by music conveying power, strength, and energy. In the prevention-focus condition, the business strategy presentation consisted of several pictures, slogans, and music with prevention-related content. The pictures presented people being in rather unpleasant situations (e.g., freezing, sustaining sport injuries). The pictures' statements were emphasized by suitable slogans (e.g., "No chance for cold and damp..." or "Injuries and pain will be a thing of the past...") and by comparatively calm music with elements of tension.

After watching the business strategy presentation, team members were provided with advertisements of three similar outdoor articles (e.g., three running shoes). Each team member had to familiarize themselves with the three advertisements before the team as a whole had to discuss including the articles in the future product range (see Appendix B2). The team was instructed to take the decision in accordance with the company's business and communication strategies previously presented.

In the two conditions (team promotion focus vs. team prevention focus), the advertisements of outdoor articles (either outdoor jackets or running shoes) were based on either promotion-related or prevention-related content and included product pictures, brand names, slogans, short product descriptions, product details, and customer opinions. In the promotion-focus condition, this discussion task required teams to choose two out of three products for the future product range. In the prevention focus condition, the discussion task

required teams to decide against two out of three products as they do not appear to fit the future product range. After the team had announced its decision to the experimenter, each team member had to write down a short statement to explain the team's decision to the company's management. This was intended to strengthen the manipulation (see Appendix B2). Having completed the writing task, each team member answered a short paper-and-pencil questionnaire consisting of team regulatory focus items.

In the second step (experimental task), the team was presented with an innovation team task that they had to work on together (see Appendix B3). Each team was asked to imagine that the company's product development division had asked their team for assistance due to its specialist knowledge of markets and customers. The team was asked to develop a first draft for a specific new product, a mobile washing machine for backpacking travelers. The washing machine was expected to provide travelers with clean clothes while traveling and was expected to be easily stored in a backpack with clothes and other supplies. Team members had to brainstorm ideas and solutions and make a sketch on flipchart paper. For this task, they had a time limit of 15 minutes. The team was given a timer and was responsible for time management. While working on the innovation task, the team was video-recorded. Having completed the task, the team was briefed about the study's purpose. The duration of the experiment was approximately 75 minutes per team.

Measures

Team regulatory focus. After the manipulation, team regulatory focus was measured using the short version of the English RFQ-proverb scale (van Stekelenburg, 2006). The scale comprises 14 proverbs (7 promotion and 7 prevention items) that exist in many languages. Example items are "Nothing ventured, nothing gained" for the promotion focus subscale and "Let the cobbler stick to his last" for the prevention focus subscale. We used the back-and-

forth translation procedure recommended by Brislin (1970) to translate the proverbs into German. Each participant was tested individually and was presented with the 14 proverbs and indicated on a scale from 1 (“does not apply”) to 5 (“does apply”) how far those proverbs applied to the team’s attitudes and actions in the preceding task (see Appendix B4). The scale reliability was Cronbach’s $\alpha = .88$ for the promotion focus scale and $\alpha = .74$ for the prevention focus scale.

Idea generation and implementation activities. We used the video recorded during the innovation team task to operationalize idea generation and idea implementation activities. Our aim was to create a frequency rating of idea generation and implementation activities. Based on previous work describing activities or steps underlying the innovation process (e.g., Bledow et al., 2009; Farr et al., 2003; Rosing et al., 2018; West, 2002b), we developed a theory-driven coding scheme to determine how far team members’ statements and actions referred to either idea generation or idea implementation (see Appendix B4). For example, statements and actions dealing with “problem identification” or “discussing ideas/solutions” were coded as idea generation. Statements or actions dealing with, for example, “working out details of an idea” or “trial implementation of an idea” were coded as idea implementation. In an initial coding procedure, two raters coded team members’ statements and actions independently. The subsample for the initial coding procedure included six videos. Inter-rater reliability in this sample was good; intra-class correlation coefficients (ICC, Shrout & Fleiss, 1979) were .96 for idea generation activities and .86 for idea implementation activities (two-way mixed model). Based on these results, we intensively discussed all inconclusive cases. Subsequently, we redefined and finalized the coding scheme. After reaching agreement on the coding scheme, one of the raters coded team members’ statements and actions relevant to innovative activities in all 44 videos.

Finally, we divided each 15-minute video into five sections of equal length (three minutes) and counted the frequency of codings per category (idea generation vs. idea implementation) in each time unit. As a result, five points of measurement were available for both idea generation and idea implementation.

Innovative performance. We measured each team's innovative performance based on external ratings of the team's final idea. Two trained master students of business psychology blind to the experiment's purpose and conditions rated the teams' sketches independently. They were asked to evaluate two dimensions (originality, quality) for each sketch on a five-point-scale (1 = "very low", 5 = "very high"). For a better understanding of the sketches, the raters were able to refer to all notes taken by the teams during the 15-minute innovation task.

To test inter-rater reliability, we computed ICCs using a two-way mixed model. Values were .86 for originality and .72 for quality, indicating a good level of inter-rater reliability. Thus, the internal validity of our measure was confirmed.

Data Aggregation

As we proposed a theoretical model at the team level, we needed to aggregate the individual-level regulatory focus values to the team level, using mean scores. To justify the aggregation of individual assessments and to confirm the reliability and validity of the aggregated scores (Chan, 1998; Klein & Kozlowski, 2000), we calculated the value of within-group agreement index (r_{wg} ; L. R. James et al., 1993) and intra-class correlation coefficients (ICC[1] & ICC[2]; Bliese, 2000), using the Excel-based statistic tool provided by Biemann et al. (2012). The mean r_{wg} values were .73 for team promotion focus and .78 for team prevention focus. ICC[1] for team promotion focus and team prevention focus were .15 and .41, respectively. ICC[2] was .34 for team promotion focus and .67 for team prevention focus. As ICC[2] depends on the number of raters in each group, the low ICC[2] value for team

promotion focus may result from the relatively small team size in this study (Chiu et al., 2016; Gong et al., 2009). In sum, all values suggested that aggregation was justified.

Analytical Approach and Preliminary Analyses

We analyzed data using the “lavaan” package (Rosseel, 2012) of the open source software R (R Core Team, 2018). The analysis consisted of two steps. In the first step of the analysis, we used a latent growth curve modeling approach (LGC) to analyze growth trajectories of idea generation and implementation activities over time. Latent growth curves are well-suited to studying systematic changes in longitudinal data over a specific period of time (Hox & Roberts, 2011).

In the LGC model that we used to analyze the growth trajectories of idea generation activities, the five measurements of idea generation were modeled by two latent factors, one representing the intercept of the growth curve and the other representing the slope of the curve. Fit indices showed that the model fit the data well ($\chi^2 [7] = 1.82, p = .97$; CFI = 1.00; RMSEA = .00; SRMR = .04). In general, results revealed a decrease in idea generation over time ($B = -8.17, SE = 0.61, p < .001$). We used a second LGC model to analyze the growth trajectories of idea implementation activities. Again, the five measurements of idea implementation were modeled by two latent factors, one representing the intercept of the growth curve and the other representing the slope of the curve⁴. Fit indices showed that the model fit the data reasonably well ($\chi^2 [6] = 5.26, p = .51$; CFI = 1.00; RMSEA = .00; SRMR = .08). The results revealed an increase in idea implementation over time ($B = 4.33, SE = 0.44, p < .001$).

⁴ Based on modification indices, we added a *residual correlation between T2 and T5* to the model to improve the fit substantially.

Results

Manipulation Check

The team-level manipulation checks using the RFQ-proverb scale revealed that teams with an induced promotion focus indicated significantly higher mean scores on promotion ($M = 3.58, SD = 0.37$) than teams with an induced prevention focus ($M = 3.10, SD = 0.55$), Welsh two-sample t-test: $t(36.75) = 3.36 (p < .01)$. Likewise, teams with an induced prevention focus indicated significantly higher mean scores on prevention ($M = 2.65, SD = 0.39$) than teams with an induced promotion focus ($M = 2.37, SD = 0.44$), Welsh two-sample t-test: $t(41.39) = -2.22 (p < .05)$. Although the manipulation of team regulatory focus had an effect on the shared focus in the teams and operated as intended, we decided to look at the hypotheses in a more differentiated manner instead of testing the conditions against one another. In order to take into consideration the variance of promotion and prevention values within the conditions, we included the measured team regulatory focus instead of the manipulated team regulatory focus in our further analysis. In doing so, we were able to examine the whole range of promotion and prevention focus in teams.

Hypotheses Testing

Table 6 presents means, standard deviations, and intercorrelations of the main variables. Team promotion focus was significantly correlated with idea generation at T1, while correlations with originality did not show statistical significance. Team prevention focus and idea implementation were not related.

Table 6*Means, Standard Deviations, and Intercorrelations (Study 2)*

| Variable | Mean | SD | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. |
|-----------------------|-------|------|--------|-------------------|-------------------|-------------------|---------|-------------------|-------|-------------------|------|--------|------|------------------|-------|--------|
| 1. Manipulation | 0.50 | .51 | - | | | | | | | | | | | | | |
| 2. Team Prom. Focus | 3.34 | .52 | -.46** | - | | | | | | | | | | | | |
| 3. Team Prev. Focus | 2.51 | .44 | .32* | -.27 [†] | - | | | | | | | | | | | |
| 4. Generation T1 | 18.73 | 6.49 | .04 | .30* | -.13 | - | | | | | | | | | | |
| 5. Generation T2 | 10.61 | 4.62 | .30* | .01 | -.13 | .44** | - | | | | | | | | | |
| 6. Generation T3 | 5.68 | 3.44 | -.15 | .01 | -.35* | .05 | .19 | - | | | | | | | | |
| 7. Generation T4 | 3.89 | 2.53 | .08 | -.08 | -.15 | -.12 | .17 | .24 | - | | | | | | | |
| 8. Generation T5 | 3.05 | 2.72 | -.02 | -.02 | -.27 [†] | -.33* | .05 | .19 | .43** | - | | | | | | |
| 9. Implementation T1 | 2.50 | 3.42 | .09 | -.16 | .13 | -.57*** | -.38* | -.26 [†] | -.07 | .22 | - | | | | | |
| 10. Implementation T2 | 5.61 | 3.58 | .01 | .03 | .11 | -.25 [†] | -.53*** | -.51*** | -.18 | -.04 | .38* | - | | | | |
| 11. Implementation T3 | 9.43 | 3.67 | .06 | .10 | .19 | .27 [†] | .06 | -.46** | -.03 | -.08 | -.12 | .22 | - | | | |
| 12. Implementation T4 | 11.18 | 3.88 | .09 | .05 | -.21 | .17 | .05 | -.16 | -.11 | .04 | .16 | .17 | .24 | - | | |
| 13. Implementation T5 | 12.18 | 5.50 | -.01 | -.12 | -.24 | .11 | .52*** | .38* | .32* | .38** | .11 | -.46** | -.14 | .13 | - | |
| 14. Originality | 3.30 | .95 | .05 | -.16 | .10 | -.17 | -.34* | -.28 [†] | -.10 | -.27 [†] | .20 | .59*** | .16 | .08 | -.37* | - |
| 15. Quality | 3.03 | .83 | .18 | -.02 | .07 | .17 | .04 | -.18 | -.01 | -.12 | .04 | .48*** | .17 | .29 [†] | -.08 | .58*** |

Note. N = 44
[†] p < .10, * p < .05, ** p < .01, *** p < .001

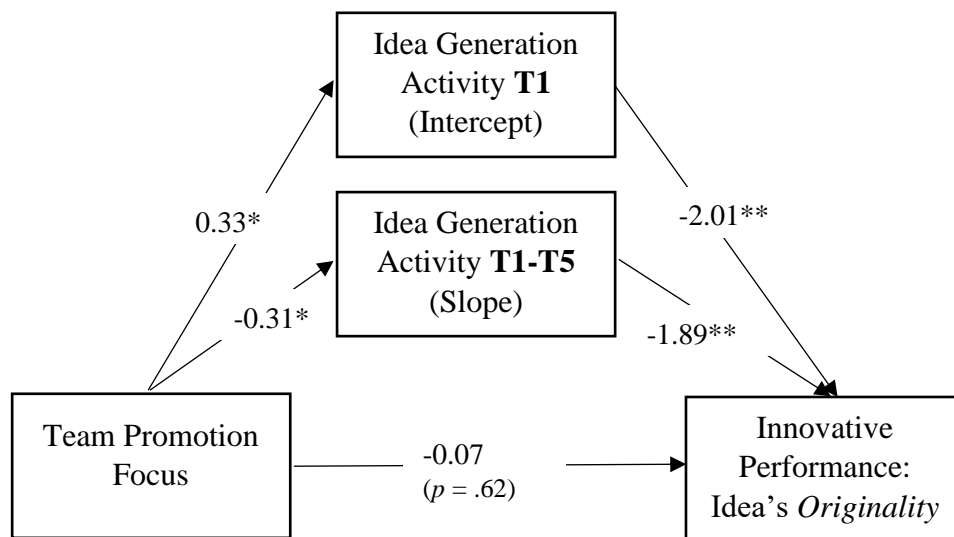
In the second step of the analysis, we tested our hypotheses using the two LGC models presented in above within the framework of structural equation modeling analysis (SEM). To test Hypotheses 1a and 1b, we set up a model with team promotion focus as the predictor and intercept and slope for idea generation as the criteria. The model showed good fit ($\chi^2 [10] = 4.55, p = .92$; CFI = 1.00; RMSEA = .00; SRMR = .05). Hypothesis 1a stated that team promotion focus would be positively related to idea generation activities at the beginning of an innovation project (intercept; T1). Inspection of the regression coefficients revealed that this was the case ($\beta = 0.33, p < .05$). The more the teams were in a promotion focus, the more they engaged in the activity of idea generation at the project's beginning. Thus, Hypothesis 1a was supported. Hypothesis 1b stated that team promotion focus would be negatively related to idea generation activities over time (slope; T1-T5). Again, regression coefficients revealed this relationship ($\beta = -0.31, p < .05$). The more the teams were in a promotion focus, the less they engaged in the activity of idea generation over time, which was represented by a strong decline in idea generation over time. Hence, Hypothesis 1b was supported too.

To test Hypotheses 1c and 1d, we set up another model with originality as the criterion and the predictors team promotion focus as well as intercept and slope for idea generation (see Figure 4). Fit indices reflected that the model we used fit the data reasonably well ($\chi^2 [13] = 8.83, p = .79$; CFI = 1.00; RMSEA = .00; SRMR = .06). Hypothesis 1c stated a positive indirect effect of team promotion focus on originality via a high level of idea generation activities at initial project stages. However, the analysis revealed a negative relationship between the team's idea generation activities and originality ($\beta = -2.01, p < .01$). The indirect effect from team promotion focus on the originality of the outcome through idea generation activities was not statistically significant ($\beta = -0.66, p = .08$). Thus, Hypothesis 1c was not supported. Finally, we assumed a negative indirect effect of team promotion focus on originality via a decrease of idea generation activities over time (Hypothesis 1d). However,

the results revealed a negative relationship between the team's idea generation activities over time and the originality of the outcome ($\beta = -1.89, p < .01$), which means that a strong decline of the idea generation curve is related to higher levels of originality. The indirect effect from the measured team promotion focus on the originality of the outcome through idea generation activities over time was not statistically significant ($\beta = 0.58, p = .10$). Therefore, Hypothesis 1d was not confirmed either (see Figure 4 for all results reported above).

Figure 4

Results of H1a-d (Study 2)



Note. For reasons of simplicity, only standardized parameter estimates (β) are depicted.

H1c: Indirect Effect $\beta = -0.66, p = .08$

H1d: Indirect Effect $\beta = 0.58, p = .10$

* $p < .05$.

** $p < .01$.

To test hypotheses 2a and 2b, we set up a model with team prevention focus as the predictor and intercept and slope for idea implementation as the criteria. Unfortunately, the model showed poor fit ($\chi^2 [9] = 18.84, p = .03$; CFI = .60; RMSEA = .16; SRMR = .12).

Hypothesis 2a stated that team prevention focus would be positively related to idea implementation activities at the beginning of an innovation project (intercept; T1). However, the effect was not significant ($\beta = 0.15, p = .39$). Hence, Hypothesis 2a was not supported. Hypothesis 2b stated that team prevention focus would be positively related to idea implementation activities over time (slope; T1–T5). However, results did not reveal this relationship ($\beta = -0.20, p = .32$). Thus, Hypothesis 2b was not supported either.

In Hypothesis 2c, we assumed a negative indirect effect of team prevention focus on quality via a high level of idea implementation activities at initial project stages. As H2a can be regarded as necessary condition for the analysis, H2c was not supported either. Finally, we assumed a positive indirect effect of team prevention focus on quality via an increase of idea implementation activities over time (Hypothesis 2d). Again, as the condition for the analysis (H2b) was also not met, Hypothesis 2d was not supported either.

Discussion

In this study, our purpose was to provide a comprehensive understanding of how team regulatory focus and the temporal trajectories of innovative activities are linked to innovative performance. We used an experimental and dynamic research approach with external ratings of innovative activities and innovative performance and analyzed our data by means of growth curve models.

Our findings suggest that team promotion focus influences idea generation activities, such that the more the teams are in a promotion focus, the more they engage in the activity of idea generation at the beginning of an innovative project. Interestingly, we found that these high levels of idea generation activities at the beginning of an innovative project were related to lower levels of originality. Concerning the temporal development of idea generation activities, the results showed a decline over time. We demonstrated that this decline was

related to promotion focus; that is, the more the teams were in a promotion focus, the less they engaged in idea generation over time. Moreover, and contrary to our expectations, we found a negative relationship between idea generation activities over time and the originality of the outcome, indicating that a stronger decline of idea generation over time is related to higher levels of originality. As none of the assumed indirect effects were significant, all associations have to be interpreted independently and we cannot draw any conclusions about the association between team promotion focus and the originality of the outcome. Further, we did not find any significant relationships between prevention focus, idea implementation, and the quality of the outcome.

Theoretical Contributions

Our study contributes to existing literature in several ways. First, our results underpin existing research dealing with the role and function of regulatory focus in innovative teams. Particularly, our results provide support for the link between team promotion focus and idea generation activities. In general, the motivational processes related to team promotion focus (i.e., collective motivation by accomplishments) appear to have the potential to foster idea generation. This is in line with existing research (e.g., Levine et al., 2000; Rietzschel, 2011; Shin et al., 2016). However, our results show that this positive relationship to idea generation is only true for the initial stage of an innovative project. Hence, our results stress that the association of team promotion focus with idea generation activities depends on whether idea generation is analyzed at the beginning of the project or with respect to its temporal development (i.e., analysis of intercept vs. slope). In contrast to the link between team promotion focus and idea generation, we did not find a relationship between team prevention focus and idea implementation. This is in line with team-level results provided by Rietzschel (2011), who emphasized that the realization of ideas is constrained by many factors outside

the team members' control. He argues that factors like organizational priorities and economic circumstances strongly impact idea realization, regardless of team regulatory focus. Nevertheless, in line with the results provided by Rosing et al. (2018), our data revealed an increase of idea implementation activities over time. However, neither intercept nor slope were significantly related to team prevention focus or innovative performance. A central problem might be the operationalization of idea implementation in innovation research. Several researchers have emphasized the need to consider not only idea generation but idea implementation as well (e.g., Anderson et al., 2014; West, 2002a, 2002b). Particularly, West (2002a) explicitly mentioned the urgent need to understand the construct of idea implementation in detail. He stated that for teams, the implementation of new products, processes, or procedures is much more difficult than the generation of ideas. However, he mentioned that idea implementation is an under-researched phenomenon. This is still the case, and we thus suggest that future studies need to take a closer look at idea implementation and identify its specific underlying behaviors and actions in order to better understand and study this innovative activity. As it is also possible that our experimental task did not involve enough authentic implementation activities, studying idea implementation in detail would also help to develop experimental tasks embracing all relevant innovative activities.

Second, we extend the existing line of research on team regulatory focus and innovation by also taking into account the impact of team regulatory focus on growth trajectories of innovative activities. As highlighted by Marks et al. (2001), most empirical studies on team effectiveness to date have focused on static relationships. This also applies to the research context of innovation. Thus, we differentiated between the project's beginning and its further course. Specifically, our results reveal that the achievement motivation of team promotion focus may be limited such that promotion-focused teams cannot maintain a high level of idea generation constantly over time. This is reflected in high initial levels of idea

generation in promotion-focused teams followed by a strong decrease of idea generation activities over time. This finding underlines the importance of a dynamic perspective on creativity and innovation that considers the shifting of the relative weight of activities or other processes (e.g., affect) over time (e.g., Bledow et al., 2009; Bledow et al., 2013). Moreover, our results suggest that time may be a critical factor for innovation projects. Specifically, the time horizon for goal attainment appears to be rather short in innovation projects and may even change at short notice due to dynamic developments in the environment. Thus, the results indicate that time pressure and a higher level of activation due to deadlines may dampen the positive effects of team promotion focus on idea generation activities. This is also in line with Marks et al. (2001), who have emphasized the relevance of time factors (e.g., project deadlines) for collective goals.

Third, we followed Montag et al. (2012), who have argued for the need to distinguish between behaviors and outcomes in creativity research. Accordingly, we differentiated between innovative activities and performance ratings and offer an integrated and more complete perspective on the team innovation process. Our result that team promotion focus is relevant for innovative activities but not for innovative performance underlines this need to differentiate. Similarly, our findings reveal that high levels of activities may not necessarily be related to high performance levels. Specifically, teams showing a high level of idea generation at the beginning of an innovative project do not work out strikingly original ideas. By contrast, in order to present an original idea, a strong decrease of idea generation activities over time appears to be beneficial. This is quite interesting, as it is not in line with the team-level results provided by Rosing et al. (2018), who found that high levels of creativity throughout an innovation project are positively related to team innovation (assessed as quality and novelty). However, a possible reason for this difference might be the method of assessing

innovative activities. While in our study innovation activities were assessed based on an external rating, Rosing et al. (2018) used students' self-reports to assess activities.

Limitations and Future Research

Our study has several limitations that need to be acknowledged. First, as the study is based on a relatively small team sample, statistical power is limited. Nonetheless, instead of relying on perceptions within the teams, we measured innovative activities as well as performance on the basis of different data sources (i.e., video ratings of innovative activities and external ratings of performance measures). As creativity measures based on self-perceptions should be evaluated with caution as they appear to be closely related to constructs like creative self-efficacy and not to creative performance measures (Reiter-Palmon et al., 2012), the external assessment of innovative activities and performance measures may strengthen the robustness of our study results. Consequently, as we obtained our measures from different sources, the risk for method bias is rather low (Podsakoff et al., 2003).

Second, we based our results on the measured team regulatory focus, although the experimental design and the results of the manipulation check would have made it possible to use the manipulated team regulatory focus and test the two conditions against one another. However, we preferred to cover the whole range of variance of team promotion and team prevention focus in our analysis and study both variables separately. Hence, we decided to include the differentiated manifestations of team promotion and prevention focus in our analysis. Taken together, this approach means that conclusions regarding causality cannot be drawn.

Finally, apart from studying the dynamics of innovative activities, it would also be interesting to take into account the dynamics of team regulatory focus. Thus, future research should explicitly explore the dynamics of team regulatory focus over time, for example, in

terms of possible shifts or interactions of team promotion and prevention focus and their impact on innovative activities and outcomes. In general, this would be in line with Kozlowski (2015), who emphasized the need for treating team processes as dynamic in research. As innovation is characterized by tensions, conflicting demands, and conflicting activities (Bledow et al., 2009), team regulatory foci may also shift according to these changing requirements. Considering the simultaneous occurrence of team promotion and team prevention focus as beneficial for innovative activities and outcomes would also correspond to Gebert et al. (2010), who emphasized that a combination of opposing action strategies may foster team innovation. For example, Bledow et al. (2013) studied this issue at the individual level and provided support for the assumption that interactions of positive and negative affect foster creativity. As affect and self-regulation are closely related constructs, it would be a promising avenue for future research to study dynamic shifts of (team) regulatory focus and their relationship with innovative activities and outcomes.

Practical Implications

Regulatory focus in innovation teams is also of practical interest. With respect to the central role of teamwork in innovative contexts (Hülshager et al., 2009), it is critical to know for both team members and leaders how team regulatory focus is associated with the activities in an innovation project. It will be helpful for team members to become aware of their regulatory focus and its specific impact on innovative activities at different time frames, as they will be able to reflect more effectively on strategies to reach their goals. Likewise, leaders will be able to motivate their team members in a goal-oriented manner, depending on the activities that have to be performed in a specific innovation project. However, our results also suggest that both leaders and teams who have to deliver original outcomes should be aware that generating a lot of ideas at the beginning of a project does not necessarily result in

particularly original ideas. Rather, contrary to what one might expect intuitively, they should be aware that a decrease of idea generation activities over time is not necessarily detrimental for the originality of the outcome but can also be fruitful. These considerations will also have an effect on the team's ability to consciously experience and reflect on the given situational requirements. As a result, regulatory fit (i.e., fit between goals and means; Higgins, 2000) will substantially improve.

6. Study 3:

A Qualitative Analysis on the Conceptual Integration of Exploration and Exploitation with Idea Generation and Implementation

Abstract

The aim of this study was to integrate two theoretical streams from innovation literature (i.e., idea generation/implementation and exploration/exploitation). Until now, these streams have remained separate, although they differentiate two sets of interrelated activities or strategies that are supposed to be relevant for achieving innovative outcomes. We conducted 40 qualitative interviews with founders ($n = 23$) and facilitators (e.g., coaches, trainers, and consultants; $n = 17$) of innovation processes, and we assessed to what degree our interviewees described their use of exploration and exploitation when generating and implementing ideas. By means of qualitative content analysis, we identified patterns, frequencies, and relative importance of exploration and exploitation within the context of both idea generation and idea implementation. The findings show that both exploration and exploitation are used within both idea generation and implementation activities. Within the context of idea generation, explorative strategies are used more frequently, while within the context of idea implementation, exploration and exploitation have nearly the same relevance. These and other results that emerged during the analysis were further explored in depth. The authors integrate and discuss the findings with respect to concept clarity within innovation literature.

Introduction

For decades, creativity and innovation have been of great interest in psychological research. Both creativity and innovation are central requirements for organizations to survive in competitive and fast changing environments (Anderson et al., 2014). An increasing amount of psychological research focuses on a variety of aspects relating to creativity and innovation, such as antecedents, underlying mechanisms, or consequences, referring to a variety of conceptual levels (i.e., individuals, teams, and organizations). Nevertheless, research reveals an inconsistent overall picture. Especially innovation is far from being defined homogeneously (Rosing & Zacher, 2017). However, conceptualizations of innovation commonly describe at least two different underlying sets of activities: the generation and the implementation of new and useful ideas (e.g., Anderson et al., 2014; Rosing et al., 2018; West & Farr, 1990).

Idea generation and implementation are not the only concepts frequently addressed in the innovation literature. In recent years, an additional set of concepts has become prominent: exploration and exploitation. Originally rooted in the organizational learning literature (March, 1991), exploration and exploitation have been used to describe strategies and antecedents relevant for innovation (e.g., Gibson & Birkinshaw, 2004; He & Wong, 2004; Junni et al., 2013). Specifically, when describing the interplay of exploration and exploitation, researchers refer to ambidexterity, that is, the organizational ability to simultaneously explore new possibilities or directions and exploit existing knowledge, such that both alignment toward goals and adaptability with respect to changing demands can be achieved within a single business unit (Gibson & Birkinshaw, 2004). Recently, both exploration/exploitation and ambidexterity have also been described at the individual level (e.g., Mom et al., 2007; Rogan & Mors, 2014; Zacher et al., 2016) and at the team level (e.g., Jansen et al., 2016, 2016; Kostopoulos & Bozionelos, 2011).

The two theoretical streams (i.e., idea generation/implementation and exploration/exploitation) have in common that they refer to the “duality of innovation” (Rosing & Zacher, 2017, p. 694), that is, they differentiate at least two sets of interrelated activities or strategies that are relevant for achieving an innovative outcome. However, to date, the two lines of research have remained separate and have not been meaningfully integrated. Such a missing integration is problematic because it remains unclear to what extent exploration and exploitation overlap with or are separate from idea generation and implementation.

We posit that specification about how these two theoretical streams may be integrated is needed. For example, constructs such as regulatory focus (Higgins, 1997, 1998) have been related to both idea generation/implementation and exploration/exploitation. As these lines of research are distinct, the interpretation and integration of the studies’ results is challenging for both researchers and practitioners. Thus, a better understanding of the similarities and differences of idea generation/implementation and exploration/exploitation is needed.

In our study, we addressed this research gap and aimed at conceptually integrating the two theoretical streams (i.e., idea generation/implementation and exploration/exploitation). Specifically, we aimed at understanding to what extent innovators use exploration and exploitation strategies when they engage in idea generation and implementation activities. To this end, we conducted a qualitative interview study with actors of innovation processes and adopted a concept-driven and deductive approach to data collection and analysis. Our analytical focus was on frequencies of both explorative and exploitative strategies within the actors’ descriptions of idea generation and implementation.

Our qualitative study adds to the innovation and ambidexterity literature in an important way. By conceptually examining and integrating the two sets of constructs (i.e., generation/implementation and exploration/exploitation), our study contributes to research on

the concept clarity of innovation-related constructs (e.g., Potočnik & Anderson, 2016). This is highly relevant as the number of concepts referring to how individuals, teams, and organizations survive in competitive and fast changing environments continually increases (Anderson et al., 2014). Thus, considering the constructs not only separately, but also understanding how they are interwoven contributes to a deeper understanding of the two theoretical lines and the innovation concept as a whole. Studying the interdependence of the concepts will also help to explain to what extent specific research results can be transferred from one of the research lines to the other.

Theoretical Background

Innovations and Innovation Research

Innovations are assumed to be crucial for organizations to remain competitive in demanding and dynamic environments (e.g., Anderson et al., 2014; Bledow et al., 2009; Rosenbusch et al., 2011). By definition, innovation refers to “the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, the organization or wider society” (West & Farr, 1990, p. 9). For decades, a large number of studies at the individual, team, and organizational level have addressed the question of how innovations emerge and have identified a multitude of factors fostering or hindering innovation (Bledow et al., 2009). Both the integration of study results and the transfer of these results into practice appear to be highly demanding. One central reason might be the large variety of constructs used by researchers to refer to innovation or related phenomena. For example, Potočnik and Anderson (2016) have reviewed change and innovation literature and highlighted the number of distinct but related constructs and sub-constructs, which have resulted in a high construct complexity in this field of research.

In line with this notion, we identified two distinct sub-fields in the innovation literature (i.e., idea generation/implementation and exploration/exploitation) that focus on the underlying activities, strategies, or behaviors in innovation processes, but do not specify the relevant similarities between and overlaps of these constructs. In the following sections, we will provide an overview on the two theoretical sub-fields.

Idea Generation and Implementation

Theoretical perspectives on the innovation process have one important aspect in common: They assume that there are at least two different kind of *activities*, which are carried out during the innovation process, namely, the generation and implementation of new ideas (Rosing et al., 2018). Idea generation encompasses aspects such as problem-solving or opportunity identification (e.g., Tierney et al., 1999), searching out new technologies, processes, techniques, or product ideas (e.g., Scott & Bruce, 1994), or suggesting new ways to achieve goals or to increase quality (e.g., George & Zhou, 2001). Idea implementation refers to aspects such as persuading others of an idea's value, (e.g., West, 2002a), monitoring processes (e.g., Farr et al., 2003) or putting plans and ideas into action (e.g., Rosing et al., 2018).

According to West (2002a, 2002b), idea generation is assumed to be most evident at the beginning of the innovation process, when a need for innovation or an opportunity is identified and ideas or solutions need to be developed. Likewise, aspects of idea generation can be necessary at other times. West (2002a) adds that creative thinking may also be necessary for developing implementation strategies while idea implementation itself can be assumed to be rather uncreative and to take place later in the process. In their recent team-level study, Rosing et al. (2018) addressed the issue of temporal patterns of creativity and implementation and found that project teams engaged in creativity throughout the whole

innovation project, whereas their focus on implementation increased over the course of a project.

Exploration and Exploitation

While the first research line refers to idea generation/creativity and idea implementation as two sets of innovative activities, the second line of research encompasses exploration and exploitation as two broader innovative *strategies*. In his theoretical paper on organizational learning, March (1991) proposed that exploration may be captured by at least eight features: search, variation, risk-taking, experimentation, play, flexibility, discovery, and innovation. Further, he suggested that exploitation may be described by seven features: refinement, choice, production, efficiency, selection, implementation, and execution. Innovation researchers adopted the concept of exploration and exploitation and transferred it to organizational adaption and innovation research, mainly referring to the organizational or business unit level (e.g., Benner & Tushman, 2003; Gibson & Birkinshaw, 2004; Gupta et al., 2006). At the individual level of analysis, Mom et al. (2007) contributed to an understanding of exploration and exploitation by describing managers' exploration in terms of, for example, searching for new possibilities, focusing on the renewal of products/services or processes, or engaging in activities requiring to learn new skills or knowledge. Further, they described managers' exploitation in terms of, for example, engaging in activities that clearly fit into the existing company policy, or engaging in activities that can be conducted by using current knowledge.

Although a large majority of empirical studies refer to ambidexterity, our study's focus is on exploration and exploitation as two interrelated and interdependent concepts. We argue that conceptually understanding exploration and exploitation in the first step is a necessary condition to derive further conceptual implications for ambidexterity in the second step.

Linking the Theoretical Lines

Most studies used either idea generation/implementation or exploration/exploitation to describe the innovation process. As an exception, Bledow et al. (2009) considered the relationship between idea generation/implementation and exploration/exploitation, stating that exploration may encompass idea generation and that implementation may be assumed as a subset of exploitation.

In this study, we suggest that both exploration and exploitation are strategies that are used in the context of idea generation and idea implementation as innovative activities. In other words, we assume that both strategies are used within both idea generation and implementation, but that the two strategies may differ in terms of their relative importance, depending on whether idea generation or implementation is analyzed. Consequently, we analyzed both exploration and exploitation within the context of both idea generation and implementation. With this assumption, we refer to the dialectic perspective on innovation (Bledow et al., 2009) and take into account that the relative importance of exploration and exploitation within the context of idea generation and implementation can shift over time due to the tensions and dynamics inherent to innovation. Overall, our study was guided by the following research question:

RQ: To what degree are exploration and exploitation as innovative strategies used within idea generation and implementation activities?

Methods

Research Design and Procedure

To answer the research question, we conducted a qualitative interview study with founders and facilitators (e.g., coaches, trainers, consultants) of innovation processes. We

came to the consensus that an explorative and qualitative research design is an appropriate method to better understand and integrate the theoretical concepts of idea generation/implementation and exploration/exploitation and to analyze them in depth. Therefore, and in line with our research question, we asked our interviewees to describe their experience with idea generation and idea implementation, and then used these descriptions to identify explorative and exploitative strategies.

We chose to conduct interviews with both founders and facilitators as both professional groups can be assumed to have direct and relevant expertise with innovation processes. Thus, we regarded founders and facilitators as experts having practical experience in the field of innovation. As facilitators may refer to other observations or experiences than founders, and vice versa, we decided to cover both perspectives with our interviews to yield as comprehensive a picture of the innovation process as possible. Specifically, we conducted semi-structured expert interviews with predefined interview questions concerning the interviewees' experience with idea generation and idea implementation which allowed for individual and subjective answers. In addition, interviewees were given the opportunity to add further content to their responses, and interviewers had the chance to further explore this content by asking additional questions.

We developed our focus questions on the basis of the critical incident technique (CIT; Flanagan, 1954) with the intent of inquiring about and identifying specific behaviors or conditions that are relevant for success or failure in certain situations. Using this method, we aimed at encouraging the interviewees to provide information about their experience with idea generation and implementation on the basis of specific situations. Therefore, we asked them to reflect on both positive and negative critical incidents within the scope of idea generation and implementation. We referred to positive critical incidents as the successful generation and implementation of an idea. Accordingly, we referred to negative critical

incidents as obstacles that occurred during the generation and implementation of an idea. In sum, the interviews followed a guideline consisting of four main parts (see Appendix C1):

- (1) Introductory questions in order to get to know the interviewee's professional background (e.g., description of current and preceding professional activities),
- (2) Focus questions on idea generation (based on CIT; description of situations in which an idea was successfully generated, or idea generation came to a halt),
- (3) Focus questions on idea implementation activities (based on CIT; description of situations in which an idea was successfully implemented, or idea implementation came to a halt), and
- (4) Socio-demographic questions (e.g., age, education) and concluding remarks (e.g., study's background, outstanding issues).

All interviewers referred to the order of this guideline, such that all interviewees were asked all questions. We asked founders directly about their experience with idea generation and implementation, while we asked facilitators indirectly about idea generation and implementation based on their observations.

The participants of our study were recruited via either personal contacts or based on internet research with a focus on incubators, start-up centers, or start-up initiatives. We contacted potential participants by email, telephone, or in person to ask about their general willingness to participate in our study. Further, we sent them an email including a short study description including the study's purpose and procedure, our contact data, and information on data protection and anonymization. Finally, we arranged appointments for the interviews.

In sum, four interviewers conducted 40 interviews using the guideline described above. We conducted 36 of our interviews during face-to-face meetings while four interviews were conducted using video calls. The interviews lasted for an average of 59.1 minutes,

ranging from 31.3 to 96.3 minutes, and they were transcribed for their further analysis (McLellan et al., 2003).

Sample

By determining founders and facilitators as experts having practical experience in the field of innovation, we used a purposeful sampling procedure (Palinkas et al., 2015; Patton, 2009) with the intention of identifying and selecting potential participants who had sufficient experience with the phenomenon of interest (i.e., innovation processes). We combined this procedure with aspects of theoretical sampling (Glaser & Strauss, 1967). Theoretical sampling allows the use of information, gathered during the research process, to decide which further participants could contribute with their experience or perspective to further insights within a certain study. The general aim of theoretical sampling is to yield as much detailed knowledge as possible until theoretical saturation is reached, that is, until no new findings emerge from data analysis (Glaser & Strauss, 1967).

Our final sample consisted of 23 founders and 17 facilitators of innovation processes from different cities in Germany. Founders were from 24 to 54 years old ($M = 34.61$, $SD = 9.19$), and four were female. On average, they had 10.09 years ($SD = 8.63$) of general practical experience and 6.10 years ($SD = 7.48$) of practical experience in the context of founding and/or innovation. A majority (20 founders) held an academic degree (bachelor/master/diploma). Facilitators were from 26 to 57 years old ($M = 38.76$, $SD = 10.62$), and 11 were female. On average, they had 14.76 years ($SD = 10.05$) of general practical experience and 8.12 years ($SD = 6.51$) of practical experience in the context of founding and/or innovation. Again, a majority (15 facilitators) held an academic degree (bachelor/master).

Data Analysis

We utilized qualitative content analysis (QCA) to analyze our data. QCA is based on the assignment of successive parts of the data to the categories of a coding scheme (Schreier, 2012). We followed Mayring (2015) who regards QCA as a hybrid method, indicating that it allows one to combine both qualitative and quantitative elements, for example, by including quantitative steps in the process of analysis. For instance, Mayring stresses that QCA allows one to interpret the frequencies of categories as indicators of relevance. As our study was aimed at identifying patterns and frequencies of exploration and exploitation within the context of both idea generation and idea implementation, we decided that QCA would be an appropriate strategy to analyze our data. We used MAXQDA 2018 (VERBI Software, 2019) for data analysis.

Following a theory-driven focus of analysis, we used March's (1991) definition of exploration and exploitation as the foundation for our coding procedure. We used the terms proposed by March (1991) as deductive categories and defined and specified them by further referring to Mom et al.'s (2007) individual-level exploration and exploitation items and Volery et al.'s (2015) overview of individual-level activities associated with exploration and exploitation.

In the first coding step, we assessed the reliability of our coding scheme. To this end, two researchers coded 30% of the data ($n = 12$ randomly selected interviews; 6 interviews with founders, 6 interviews with facilitators) independently. Differences in applying the deductive categories were iteratively discussed and resolved. This procedure is recommended to ensure that the categories are used consistently and that codings do not reflect the subjective assessment of a single coder (Schreier, 2012). After having coded this part of the data, we calculated intercoder agreement by using the coefficient *kappa* (Brennan & Prediger, 1981). The two coders achieved an average $\kappa = .87$ for the interviews with founders and an average

$\kappa = .80$ for the interviews with facilitators, indicating a very good agreement rate (Landis & Koch, 1977). The final coding scheme (see Appendix C2) consisted of 15 theory-driven categories (i.e., the features associated with exploration and exploitation as proposed by March, 1991). In the second coding step, one of the two coders continued the coding procedure for all interviews. We present our results in the next section.

Results

Overview

To answer our research question, we assessed to what extent our interviewees described the usage of exploration and exploitation when generating and implementing ideas. Specifically, we analyzed the subcategories of exploration and exploitation and their frequencies within idea generation and implementation. Doing so, we were able to identify the relative importance of explorative and exploitative strategies within idea generation and implementation and to explain why the two strategies may differ with respect to their perceived relevance.

In general, considering both founder and facilitator interviews, we found that both exploration and exploitation occur within both idea generation and implementation activities. However, there were differences with respect to their frequencies. Within the context of idea generation, exploration appeared to be the more relevant strategy (354 codings). Exploitation appeared also to be relevant for idea generation, but it was coded less frequently (126 codings). For idea implementation, we found a different pattern. Exploration and exploitation appeared to have nearly the same relevance, with a slight tendency for exploration to occur more frequently (172 codings) than exploitation (161 codings). In sum, explorative and exploitative strategies were described more frequently within the context of idea generation (480 codings in total) than in the context of idea implementation (333 codings in total).

The following sections are structured as follows. First, we will refer to the frequencies of exploration and exploitation within the context of idea generation. Second, we will describe the frequencies of exploration and exploitation within the context of idea implementation. Finally, we will explore several further results in depth that arose during the analysis.

Analysis of Exploration and Exploitation within Idea Generation

Table 7 depicts the deductive subcategories for exploration and exploitation and their frequencies within idea generation activities.

Table 7

Exploration and Exploitation and Their Frequencies within Idea Generation (Study 3)

| | Idea generation | | | Idea generation | |
|-----------------|------------------------|-------------|----------------|------------------------|-------------|
| Exploration: | Frequencies of codings | Percent (%) | Exploitation: | Frequencies of codings | Percent (%) |
| Search | 174 | 49.15 | Efficiency | 34 | 26.98 |
| Variation | 54 | 15.25 | Refinement | 30 | 23.81 |
| Play | 44 | 12.43 | Choice | 25 | 19.84 |
| Discovery | 29 | 8.19 | Selection | 21 | 16.67 |
| Experimentation | 23 | 6.50 | Production | 9 | 7.14 |
| Flexibility | 15 | 4.24 | Execution | 6 | 4.76 |
| Innovation | 12 | 3.39 | Implementation | 1 | 0.79 |
| Risk-taking | 3 | 0.85 | | | |
| Total Σ | 354 | 100.00 | Total Σ | 126 | 100.00 |

Our data revealed the following pattern. Concerning exploration, *search* was the strategy that was described most frequently in our interviews (174 out of 354 codings,

49.15%). Further, there was a considerable gap between *search* and the subsequent categories. *Variation* (54 out of 354 codings, 15.25%) and *play* (44 out of 354 codings, 12.43%) were the two explorative strategies that were described most frequently after *search*. *Risk-taking*, however, (3 out of 354 codings, 0.85%) was described least frequently.

Regarding exploitation, two strategies – *efficiency* and *refinement* – were described most frequently in our interviews. Specifically, the two strategies appeared to be similarly relevant within the context of idea generation (34 out of 126 codings, 26.98%, and 30 out of 126 codings, 23.81%, respectively). After *efficiency* and *refinement*, *choice* (25 out of 126 codings, 19.84%) and *selection* (21 out of 126 codings, 16.67%) were described most frequently, while *production* (9 out of 126 codings, 7.14%), *execution* (6 out of 126 codings, 4.76%), and *implementation* (1 out of 126 codings, 0.79%) were described least frequently.

The left half of Table 8 depicts the overall analysis for idea generation, that is, all 15 subcategories of exploration and exploitation and their frequencies within the context of idea generation. In the overall analysis, the explorative strategy *search* was the innovative strategy that was described most frequently within idea generation (174 out of 480 codings, 36.25%). Two other explorative strategies, *variation* (54 out of 480 codings, 11.25%) and *play* (44 out of 480 codings, 9.17%) were further described frequently in our interviews. *Efficiency* (34 out of 480 codings, 7.08%) and *refinement* (30 out of 480 codings, 6.25%), as two exploitative strategies, were next in rank. In the subsequent ranking, explorative and exploitative strategies alternate: *discovery* (29 out of 480 codings, 6.04%) is followed by *choice* (25 out of 480 codings, 5.21%), followed by *experimentation* (23 out of 480 codings, 4.79%). The alternation continued in the ranking almost without exception. *Risk-taking* (3 out of 480 codings, 0.63%) and *implementation* (1 out of 480 codings, 0.21%) ranked last. Taken together, the pattern indicated a remarkable focus on explorative strategies at the top of the ranking with the three strategies *search*, *variation*, and *play* constituting more than the half of

all codings within idea generation (272 out of 480 codings, 56.67%). Likewise, the subsequent alternating pattern also underlined the relevance of exploitation in the context of idea generation.

Table 8

Exploration and Exploitation within Idea Generation and Idea Implementation (Study 3)

| Exploration and Exploitation: | Idea generation | | Exploration and Exploitation: | Idea implementation | |
|-------------------------------|------------------------|-------------|-------------------------------|------------------------|-------------|
| | Frequencies of codings | Percent (%) | | Frequencies of codings | Percent (%) |
| Search* | 174 | 36.25 | Search* | 82 | 24.62 |
| Variation* | 54 | 11.25 | Efficiency | 59 | 17.72 |
| Play* | 44 | 9.17 | Refinement | 28 | 8.41 |
| Efficiency | 34 | 7.08 | Experimentation* | 28 | 8.41 |
| Refinement | 30 | 6.25 | Production | 23 | 6.91 |
| Discovery* | 29 | 6.04 | Variation* | 22 | 6.61 |
| Choice | 25 | 5.21 | Flexibility* | 20 | 6.01 |
| Experimentation* | 23 | 4.79 | Implementation | 20 | 6.01 |
| Selection | 21 | 4.38 | Choice | 14 | 4.20 |
| Flexibility* | 15 | 3.13 | Execution | 12 | 3.60 |
| Innovation* | 12 | 2.50 | Play* | 8 | 2.40 |
| Production | 9 | 1.88 | Risk-taking* | 6 | 1.80 |
| Execution | 6 | 1.25 | Selection | 5 | 1.50 |
| Risk-taking* | 3 | 0.63 | Innovation* | 3 | 0.90 |
| Implementation | 1 | 0.21 | Discovery* | 3 | 0.90 |
| Total Σ | 480 | 100.00 | Total Σ | 333 | 100.00 |

Note. For reasons of clarity, explorative strategies are marked with *.

Analysis of Exploration and Exploitation within Idea Implementation

Table 9 depicts the deductive subcategories for exploration and exploitation and their frequencies within idea implementation activities.

Table 9

Exploration and Exploitation and Their Frequencies within Idea Implementation (Study 3)

| | Idea implementation | | | Idea implementation | |
|-----------------|------------------------|-------------|----------------|------------------------|-------------|
| | Frequencies of codings | Percent (%) | | Frequencies of codings | Percent (%) |
| Exploration: | | | Exploitation: | | |
| Search | 82 | 47.67 | Efficiency | 59 | 36.65 |
| Experimentation | 28 | 16.28 | Refinement | 28 | 17.39 |
| Variation | 22 | 12.79 | Production | 23 | 14.29 |
| Flexibility | 20 | 11.63 | Implementation | 20 | 12.42 |
| Play | 8 | 4.65 | Choice | 14 | 8.70 |
| Risk-taking | 6 | 3.49 | Execution | 12 | 7.45 |
| Discovery | 3 | 1.74 | Selection | 5 | 3.11 |
| Innovation | 3 | 1.74 | | | |
| Total Σ | 172 | 100.00 | Total Σ | 161 | 100.00 |

Our data revealed the following pattern. With respect to exploration, *search* was the explorative strategy that was described most frequently in our interviews (82 out of 172 codings, 47.67%). Again, there was a considerable gap between *search* and the subsequent categories. *Experimentation* (28 out of 172 codings, 16.28%) and *variation* (22 out of 172 codings, 12.79%) were the two strategies that were described most frequently after *search*. The explorative strategies *play* (8 out of 172 codings, 4.65%), *risk-taking* (6 out of 172

codings, 3.49%), and *discovery* and *innovation* (3 out of 172 codings, 1.74%, respectively) were described least frequently within implementation.

With regard to exploitation, the data revealed a different frequency pattern than for exploration, inasmuch as there was no single strategy that was much more frequent than the other strategies. As within idea generation, two strategies - *efficiency* and *refinement* - were described most frequently in our interviews. However, there was a more considerable gap between *efficiency* (59 out of 161 codings, 36.65%) and *refinement* (28 out of 161 codings, 17.39%). After these two strategies, *production* (23 out of 161 codings, 14.29%) and *implementation* (20 out of 161 codings, 12.42%) were described similarly frequently, while *selection* was the exploitative strategy described least frequently within idea implementation (5 out of 161 codings, 3.11%).

The right half of Table 8 depicts the overall analysis for idea implementation, that is, the 15 subcategories of exploration and exploitation and their frequencies within the context of idea generation. In this overall analysis, again the explorative strategy *search* (82 out of 333 codings, 24.62%) was described most frequently by the interviewees. The exploitative strategy *efficiency* (59 out of 333 codings, 17.72%) was the second most frequently described strategy. In the further ranking, explorative and exploitative strategies alternated, with the subsequent strategies being *refinement* and *experimentation* (28 out of 333 codings, 8.41%, respectively), *production* (23 out of 333 codings, 6.91%), and *variation* (22 out of 333 codings, 6.61%). Several explorative strategies with only a few codings ranked last, including *play* (8 out of 333 codings, 2.40%), *risk-taking* (6 out of 333 codings, 1.80%), *innovation* and *discovery* (3 out of 333 codings, 0.90%). In sum, the alternating pattern indicated that exploration and exploitation may have a similar relevance for idea implementation.

As this alternating pattern of exploration and exploitation differed from the overall analysis of idea generation, which instead revealed an emphasis on exploration, we decided

to further investigate the idea implementation part of our interviews. In particular, we additionally explored in which cases idea implementation was described to be rather explorative and when it was described to be rather exploitative. While our data did not reveal differences depending on aspects such as time progress in the project, the interviews revealed slight differences depending on whether the interviewee was a founder or a facilitator. While founders tended to describe idea implementation in terms of exploitation, facilitators tended to describe it in terms of exploration. For example, founders stated the following:

“For example, we added a little feature yesterday, simply because the customer said, “Tell me, can we somehow download videos? I would like to download the videos somehow.” We’ve never had it. None of us have ever needed it. We thought that we would install such a button at some point, but never needed one. So now the customer has requested this, so after 2 hours of work, end, done with it.” (Interview 35, 474-480)

“Yeah, sure, communication channels. And clear assignment of tasks. Everyone must clearly know his or her field of activity and make an effort to keep to deadlines, target times in the end. If you say, okay, look, this has to be ready by Friday, yes, then it can’t be ready by Saturday. [...] or if someone needs support, then they have to say so.” (Interview 38, 332-340)

“It’s the first thing that you, um, have very clear responsibilities and then not only think about how we can do it now, what are the steps, but also say, the first step you take, the second step you take, the third step you take. That means responsibilities and deadlines.” (Interview 09, 146-147)

However, facilitators expressed idea implementation this way:

“They talked to a lot of architects and so on and kept on optimizing it. What do you actually need in there, and whose work can it make easier and how?” (Interview 02, 374-375)

“Well, you have to go up front and pick up people. Um, you have to be able to react flexibly. In other words, it’s important not only to go with plan A, but also to have plan B or C in your pocket.” (Interview 16, 305-307)

“[...] that you have to find these people who are really given the product and follow the whole process, how they use it and what they think and how they get the product. So this whole customer journey, uh, so that they can follow the whole customer journey, [...].” (Interview 32, 96)

Additional Analysis of Explorative Strategies

The above analyses indicated that exploration was used more frequently than exploitation within both idea generation and implementation. Thus, we additionally explored if the data showed differences concerning the function and goals of exploration, depending on whether the interviewees described it in the context of idea generation or implementation.

In the context of idea generation, both founders and facilitators described a relatively broad focus of exploration. Interviewees described exploration to be aimed at gaining a general orientation in an unknown field, often based on research work to get to know the market and potential customers or to develop general marketing strategies. To this end, the consultation of experts appeared to be highly relevant. Further, exploration in the context of idea generation encompassed a rather playful approach to the idea. In sum, the interviewees described a tendency of exploring the wider environment of an idea. For example, one founder expressed it this way:

“It’s a relatively long way, and you’re really sitting in front of a white sheet of paper and, uh, digging into the subject, and it’s quite extensive actually, but you wouldn’t think so. And you’re doing market research, basically, if you want to take it reasonably seriously. And then you can estimate, “Well, am I doing it? Do I take that risk? How do I distribute the risk? How do I keep the risk small? Is there even a market or am I alone with this idea?” And, uh, that’s quite a leap to be making. It’s very complex and it’s a lot of work and I’ve done that, yeah.” (Interview 23, 23-27)

As another example, a facilitator stated:

“And not to take all this as lawfulness, but to keep thinking about it, so to speak, and to keep moving. I think that is totally essential, to be honest. [...] Just ask someone a quick question. Or take a quick look on the internet. So, it’s not: oh God, we don’t know, but rather, is there

anyone we can talk about it with? Ah, okay, all right, so we've got a first impression, ah, can we find someone else to keep us going, so to speak?" (Interview 02, 292-300)

In the context of idea implementation, both founders and facilitators described a narrower focus of exploration. Hence, exploration aimed at a more specific investigation, often concerning only single factors of an idea or concrete aspects concerning the production process. Further, actors were concerned with trial-and-error learning or testing when they were faced with specific challenges. In sum, the interviewees described a tendency to explore the core of an idea, often by trying out several options. For example, a founder expressed exploration within idea implementation as follows:

"And I was really very systematic about that, so I really tested all the software packages and different workflows that were related to the idea and I did, yeah, more or less tabula rasa [to find out] what you can get out of them." (Interview 18, 96-100)

A facilitator expressed it this way:

"[...] again experiments with material. She sat down and said "I have to sew one of these things." And then? Material. And then she built this, did a moisture test, saw that it leaks. Other materials were too expensive, and then she researched. She had to clarify the issue of costs or materials. And she had to experiment with plants. She did not yet know exactly which ones she wanted to do." (Interview 05, 462-470)

Within our analyses, the explorative strategy *search* was the most frequently used strategy within both idea generation and implementation. Hence, we went one step further and investigated this strategy in depth to provide a more comprehensive understanding about the usage of this strategy. We additionally explored if the function or underlying behaviors of *search* would differ depending on whether participants described it within the frame of idea generation or idea implementation. In general, we found that *search* within idea generation and *search* within idea implementation did not differ essentially in terms of their function in

the innovation process. However, *search* within idea generation and *search* within idea implementation differed with respect to their contents.

For example, within idea generation, the interviewees referred to comprehensive analyses of the overall problem, needs, or market analyses, identifying and consulting experts in the field, or further research activities when describing search. Interviewees expressed search within idea generation as follows:

“At that time, I think I started to do some rough calculations, to do some market analysis. To see what competitors were doing, what were they charging for rent. Um, so how much money could theoretically come in? What will my costs be?” (Interview 08, founder, 285-291)

“[...] and I sat down again in the evening and did some research and just looked at, yes, in the portals, if the idea already exists and often you don’t find anything about it” (Interview 11, founder, 50)

“I remember them saying in one day, okay, we’ll just do another day of research on different topics and different ingredients, what we find and so on.” (Interview 06, facilitator, 186-188)

Within idea implementation, interviewees likewise referred to overall or market analyses, to the identification and consultation of experts, but also to concrete business-related questions concerning resources or finances, or the clarification of product and implementation details, when describing search. Thus, the idea’s feasibility played a more important role when interviewees described search within the context of idea implementation. For example, they expressed it this way:

“Well, if I now develop a coil, what forces should it withstand, how much should it cost, uh, how should it be manufactured, how should it be mounted, uh, what are my requirements for transport, maintenance, disposal?” (Interview 12, founder, 226)

“[...] or, if necessary, if there are gaps in knowledge, you have to use external know-how to help yourself.” (Interview 18, founder, 144)

“So they did a competitor analysis. And then they found out that their competitors are better positioned, already better positioned than they are.” (Interview 27, facilitator, 168-170)

Discussion

Our qualitative study aimed at conceptually integrating two different theoretical lines from the innovation literature. Specifically, we focused on the frequencies, patterns, and relative importance of exploration and exploitation within the context of idea generation and implementation. In general, our findings revealed that both exploration and exploitation were used within both idea generation and implementation activities. Nevertheless, there were differences with regard to their frequencies. Overall, explorative and exploitative strategies were described more frequently within the context of idea generation than within the context of idea implementation. Within the context of idea generation, exploration was the strategy used much more frequently. Exploitation, however, was also used within idea generation, but the interviewees described it less frequently than exploration. For idea implementation, we found a different pattern. Exploration and exploitation were used similarly frequently, with a slight tendency for exploration to be used more frequently than exploitation. Moreover, our results provided further insight that *search* was the single most frequently used strategy within both idea generation and implementation. The finding that exploration was relevant for both idea generation and implementation, highlights its great importance throughout the whole innovation process, which is assumed to be essentially based on idea generation and implementation as two main activities (e.g., Anderson et al., 2014; Baer, 2012; West, 2002b). Exploitation, in turn, differed in terms of its relative importance in the innovation process, dependent on whether idea generation or idea implementation was the focus of analysis.

Theoretical Contributions

Our study adds to literature in the following way. First, by conceptually examining and integrating the two lines of literature, our study contributes to research on concept clarity within innovation literature (e.g., Potočnik & Anderson, 2016). Our results revealed that both explorative and exploitative strategies are used within both idea generation and implementation. Much of the innovation literature seems to assume that exploration is mostly relevant in the context of idea generation, while exploitation is mostly relevant in the context of idea implementation (e.g., Bledow et al., 2009; Gilson et al., 2005; Rosing & Zacher, 2017). However, our findings highlighted that idea generation/implementation and exploration/exploitation are far from being similar constructs. In other words, innovative activities (i.e., idea generation and implementation) and innovative strategies (i.e., exploration and exploitation) can be observed independently and do not fulfil identical functions. For example, while idea generation explicitly aims at developing a specific idea, exploration may also aim at implementing a specific idea. Thus, supposing that exploration and exploitation are strategies that are used within the two broader sets of innovative activities (i.e., idea generation and implementation) appears to be a reasonable approach. Moreover, our finding that exploration and exploitation were described similarly frequently within idea implementation adds to a specific understanding of idea implementation and its underlying strategies and behaviors. This is highly relevant as a majority of studies have focused on idea generation and not on implementation (West, 2002a), such that idea implementation has remained a rather under-researched concept within the innovation literature. Our results revealed that exploration and exploitation are used similarly frequently within idea implementation. Specifically, this finding indicates that idea implementation is based on strategies aiming at both broadening the existing knowledge base (by means of exploration) and deepening the existing knowledge base (by means of exploitation).

Second, this study also contributes to ambidexterity research although its focus was on exploration and exploitation as two interrelated and interdependent concepts. We would argue that conceptually understanding exploration and exploitation is a necessary condition to derive further conceptual implications for ambidexterity in the second step. Ambidexterity research assumes that exploration and exploitation need to be integrated or balanced in order to achieve an innovative outcome (e.g., Birkinshaw & Gupta, 2013; Bledow et al., 2009; Lubatkin et al., 2006; Rosing & Zacher, 2017). For example, Rosing and Zacher (2017) found that individuals showed high innovative performance when they engaged in high levels of exploration and exploitation and when exploration and exploitation were at the same level. Our findings underline that innovators actually refer to both exploration and exploitation, and that this is also the case within the two main activities of innovation (i.e., idea generation and implementation). In other words, this study stresses that ambidexterity is not only relevant with respect to the innovation process as a whole, but also with respect to its two sub-activities. Specifically, the ambidexterity assumption that exploration and exploitation need to be at similar levels was reflected more strongly within idea implementation.

Third, our results contribute to a dialectic description of the innovation process (Bledow et al., 2009). The finding that exploration and exploitation had a different relative importance within idea generation but had a nearly similar importance within idea implementation emphasizes the general assumption of the dialectic perspective that the relative importance of activities may shift over time. Our results stress that this is the case for both innovative activities and innovative strategies. Given that idea generation refers to the beginning of an innovative project and that idea implementation refers to the end of a project (West, 2002a, 2002b), our results indicate that explorative strategies are more important than exploitative strategies within initial time frames of a project while they are as important as exploitative strategies within later time frames. According to Bledow et al. (2009), shifts of

activities' relative importance may be due to changing demands and requirements resulting from, for example, external circumstances and dynamics. Thus, our results underline the general argument that idea generation and implementation differ in terms of their requirements (e.g., Miron-Spektor, Erez, & Naveh, 2011). Specifically, idea generation may require a stronger focus on exploration to come up with an original idea, while idea implementation may require a rather balanced use of exploration and exploitation to implement that idea. This is in line with previous research, which argued that implementation requires one to react to unforeseen obstacles (e.g., Bledow et al., 2009; Mumford et al., 2002). Our findings suggest that explorative strategies such as search might be an adequate way to deal with such obstacles.

Finally, our results contribute to innovation research inasmuch as a comprehensive understanding about the interdependence of the two theoretical lines may help to explain how specific research results can be transferred from one of the research lines to the other. Thus, psychological constructs that are related to innovative activities cannot simply be assumed to be also related to innovative strategies or vice versa as idea generation is not as similar to exploration, and implementation is not as similar to exploitation as previously assumed. In other words, research efforts are needed to determine, for example, to what extent a specific psychological construct related to idea implementation is also related to exploitation. Hence, a deeper understanding about how the two theoretical lines may be interwoven is beneficial with regard to the interpretation of study results and will likewise contribute to practical innovation research. Researchers will also benefit from conceptual clarity when they plan study designs and need to decide on whether a study's focus should be on idea generation/implementation, exploration/exploitation, or on both.

Limitations and Future Research

This study has several limitations that also provide avenues for future research. The first limitation refers to our sample. As we exclusively interviewed founders and facilitators, the results cannot be easily transferred to innovations in organizations. As a large amount of the existing research on the innovation process was conducted in the organizational context, we cannot be sure that our study's results can be generalized to organizational innovation. More specifically, it is conceivable that the organizational environment differs from the entrepreneurial environment in terms of their requirements. Frese and Gielnik (2014) emphasized that the entrepreneurial environment is often extreme, for example with regard to the degree of uncertainty. They further stressed that, likewise, entrepreneurs can influence their environment more strongly, for example when they work in a specific niche. Therefore, we would argue that it is conceivable that the entrepreneurial environment is even more dynamic and unstable than the organizational environment. Thus, it might be possible that there is a different pattern within an organizational environment inasmuch as exploitation may have a greater relative importance within both idea generation and implementation as compared with an entrepreneurial environment because, to be successful in an organizational environment, the need for alignment towards, for example, overall organizational goals may be stronger. Nevertheless, we chose to conduct interviews with founders and facilitators as we assumed both professional groups to have direct and relevant expertise with the innovation processes as a whole. Organizational members (e.g., research and development [R&D] team members) may also have provided relevant knowledge, but due to organizational characteristics such as division of work or specialization, they might have merely referred to subfields of the innovation process. Nevertheless, future research needs to examine if our results also apply to the innovation process in organizations.

A second limitation refers to the retrospective of our interviews and the use of the critical incident technique. When describing critical incidents some founders and facilitators referred to situations, which had already taken place some time ago. Thus, we cannot rule out that these interviewees selectively relied on situations and explorative and exploitative approaches that specifically remained in their memories. In other words, it is likely that our interviewees mainly referred to especially salient situations and that the critical incident technique did not encourage them enough to reflect on several situations in which the use of exploration and exploitation differed. As a result, the descriptions of exploration and exploitation may have been biased. Consequently, observational studies should be conducted to determine if the interviewees' subjective descriptions refer to the actual use of exploration and exploitation within idea generation and implementation. In other words, observations of innovators in their natural environment would provide valuable insights into their use of different innovative strategies within the context of idea generation and implementation. Further, it would be an appropriate method to overcome potential biases.

Third, we aimed at assessing to what extent innovators use exploration and exploitation when they engage in idea generation and implementation. As innovators mostly work in teams, their description of exploration and exploitation within idea generation and implementation referred to both the individual and the team level. Thus, potential differences between individual-level and team-level exploration and exploitation could not be detected. However, we contend that providing a general understanding about the interdependence of the two conceptual frameworks will still serve as a good starting point for future research. Thus, further studies on the conceptual integration of exploration/exploitation with idea generation/implementation could explicitly focus on level-specific analyses.

Practical Implications

Although the aim of this study was the integration of theoretical concepts, our findings are also of practical interest. It is important for all groups of actors in innovation processes to know the underlying strategies and behaviors and their relative importance within both idea generation and idea implementation. In particular, founders and facilitators, but also members and leaders of organizational innovation teams may profit from such a knowledge, especially with regard to monitoring and evaluating the progress of an innovation process. For example, facilitators or organizational leaders can foster idea generation or implementation among single founders or members of an innovation team by initiating the use of explorative or exploitative strategies, depending on whether a specific project requires more generation or implementation efforts. More specifically, they may support an innovation team that struggles with the implementation of an idea by identifying if the team uses both explorative and exploitative strategies or if team members rely solely on exploitative strategies. By encouraging, guiding, and supporting such a team to engage in both exploration and exploitation, facilitators and/or leaders would not only foster the team's implementation efforts, but also ensure the overall success of an innovation project. Likewise, the team itself may analyze their use of innovative strategies by means of self-monitoring or self-evaluating that might be fostered by team reflection practices supported by facilitators or leaders. To this end, it is not only necessary to be aware of the relative importance of exploration and exploitation within idea generation and implementation but also to know the underlying strategies of exploration and exploitation as well as the frequencies of certain strategies such as search. This knowledge would be helpful as the team could reflect on their use of strategies and, if necessary, shift their focus to strategies that were neglected previously. Thus, innovation training may be a useful method to convey specific knowledge about how the use of innovative strategies may foster or even hinder idea generation and implementation.

7. General Discussion

The main goal of this dissertation was to advance the understanding of how the complexity and dynamics of innovation processes may be addressed by individual-level and team-level regulation efforts, mainly focusing on the role of self-regulation and affect. To better integrate these and other research results, it also aimed at gaining an understanding of how different concepts used in innovation research may be interwoven. In the following, I will summarize the findings of the four dissertation chapters and outline the main contributions of these findings with regard to psychological innovation research. Finally, I will discuss limitations and future research directions.

7.1 Summary of Findings

The literature review (see Chapter 3) examined the role of individual-level affect and its regulation for organizational creativity and innovation. The results indicated that both positive and negative affect are beneficial for creativity. Within the last decade, research has revealed that this is especially the case when both positive and negative affect are activating (e.g., Baas et al., 2011a). Thus, affect valence and affect activation interact to promote creativity. Activating positive affect leads to creativity by increasing individuals' cognitive flexibility, while activating negative affect fosters creativity by increasing individuals' persistence when working on creative tasks. While the majority of studies have focused on the affect–creativity relationship, the review revealed that the affect–innovation relationship has remained a rather under-researched phenomenon. In general, the review revealed that a static perspective on affect appears to be insufficient to address the challenges of the innovation process, emphasizing the need for interactive and dynamic perspectives (e.g., Bledow et al., 2013) that may integrate the effects of positive and negative affect in the context of innovation. The literature review further stressed the potential to consider the integration of regulatory focus

theory (Higgins, 1997, 1998) in research on affect and its relationship with creativity and innovation.

Study 1 (see Chapter 4) investigated the associations between team regulatory focus and innovative strategies by integrating research on self-regulation, future-related cognitions, and affect within the context of innovation. Building on the dialectic perspective on innovation (Bledow et al., 2009) as well as on the feelings-as-information-perspective (Schwarz, 1990, 2001) and the mood-as-input model (e.g., Martin et al., 1993), the longitudinal field study examined the underlying regulatory mechanisms of the relationships between team promotion focus and exploration and between team prevention focus and exploitation. Specifically, it was analyzed how far team future-related cognitions (Oettingen & Mayer, 2002) and team affective tone interact and complement each other. In the study, $N = 58$ work teams provided data once a week over a period of four weeks. As predicted, team promotion focus was positively related to team exploration, while team prevention focus was positively related to team exploitation. Multilevel moderated mediation analysis revealed that team positive fantasies mediated the relationship between team promotion focus and team exploration. The relationship between team positive fantasies and team exploration was moderated by negative team affective tone inasmuch as the indirect effect was weakest when negative team affective tone was low. Results suggested another interaction pattern for team barrier cognitions and positive team affective tone within the relationship between team prevention focus and team exploitation. The indirect effect of team prevention on team exploitation via team barrier cognitions only occurred when positive team affective tone was low.

Study 2 (see Chapter 5) also examined team regulatory focus at the team level but shed light on the relationships between team regulatory focus and both innovative activities and performance. Specifically, the purpose was to provide an understanding of how team

regulatory focus and the temporal trajectories of innovative activities were linked to innovative performance. The study was based on research on team regulatory focus and innovative activities (e.g., Rietzschel, 2011) and on research addressing the temporal dynamics of innovative activities (e.g., Rosing et al., 2018). Within an experimental design, regulatory focus was manipulated in $N = 44$ student teams (total $N = 132$). Moreover, the teams' innovative activities were assessed over time based on video data, while external raters assessed the teams' innovative performance. Structural equation models revealed that higher team promotion focus increased idea generation at the beginning of an innovative project but decreased this activity over time. Further, high levels of idea generation at the beginning of a project were related to lower levels of originality, while a decline in idea generation over time was related to higher levels of originality. None of the assumed indirect effects were significant, such that it was not possible to draw any conclusions about the association between team promotion focus and the originality of the outcome. Relationships among team prevention focus, idea implementation, and quality were not significant in this study.

Finally, Study 3 (see Chapter 6) aimed at conceptually integrating two different theoretical lines from the innovation literature, that is, innovative strategies (i.e., exploration/exploitation) and innovative activities (i.e., idea generation/implementation). The study addressed the field of concept clarity of innovation-related constructs (e.g., Potočnik & Anderson, 2016). $N = 40$ actors of innovation processes ($n = 23$ founders and $n = 17$ facilitators, i.e., coaches, trainers, and consultants) provided qualitative interview data by describing their experience with innovation processes. It was assessed to what degree the interviewees employed exploration and exploitation when generating and implementing ideas. By means of qualitative content analysis, the patterns, frequencies, and relative importance of exploration and exploitation were assessed within the context of both idea generation and idea implementation. The findings revealed that both exploration and

exploitation were used within both idea generation and implementation activities. Specifically, within the context of idea generation, explorative strategies were used more frequently, while within the context of idea implementation, exploration and exploitation had nearly the same relevance. The results provided further insight that *search* was the single most frequently used innovative strategy within both idea generation and implementation.

7.2 Overall Theoretical Contributions

In general, this dissertation provides a within-process perspective on innovation. The results of the four main parts (i.e., literature review, Studies 1 to 3) make several overall contributions to psychological research on the innovation process at both the individual and the team level of analysis. These contributions essentially relate to the dynamics of the innovation process, the role of team regulatory focus for innovation, and the issue of construct clarity in innovation research.

First, this dissertation contributes to the literature treating innovation as a dynamic phenomenon. The dynamics of innovative environments (West, 2002b) can be assumed to have an impact on the demands faced by individuals and teams, who, consequently, need to flexibly adapt to the fast-changing and unpredictable nature of innovation processes. The four parts of this dissertation address this issue from different angles and emphasize the benefits of studying the dynamics of the innovation process as follows. Overall, the findings reveal that dynamic approaches to individual-level and team-level innovation help to better understand how actors of innovation processes may ideally face unpredictable changes in their environments. In this regard, the findings of the literature review suggested that dynamic approaches to affect and innovation or related constructs (e.g., Akbari Chermahini & Hommel, 2012; Bledow et al., 2013) appear to be well-suited to address the rapidly changing nature of innovative work environments that may cause increases, decreases, and interactions

of positive and negative affect over time. While a static perspective would only focus on specific affectively charged moments, dynamically investigating the affect–innovation association also provides specific insight into the beneficial role of affect regulation (e.g., down-regulation of negative affect over time) for innovation. Further, Study 1 contributes to a dynamic perspective as it provides a within-team approach to team self-regulation and innovation, based on longitudinal data. By considering all variables on a weekly basis, this study explicitly incorporated the temporal fluctuations of the dependent variable (i.e., innovative strategies) as well as potential fluctuations of team regulatory focus and the associated cognitive-affective processes. Thus, apart from innovation dynamics, this study also contributes to team process dynamics (Kozlowski, 2015). Findings from Study 2 emphasize the need to consider the temporal dynamics of innovative activities that may shift in accordance with their relative importance (Bledow et al., 2009). In other words, the results stress the assumption that innovative teams do not carry out their activities on a constant level over time (Rosing et al., 2018), but rather engage in idea generation and implementation dependent on a project’s progress. Thus, a dynamic perspective on innovative activities exemplifies how actors of innovation processes need to flexibly react and adapt to a project’s progress. Although Study 3 addresses the conceptual level of innovation research, findings from this study also stress the dynamics of innovation processes by referring to the relative importance of innovative strategies in the innovation project. Specifically, results indicate that idea generation and implementation rely on both exploration and exploitation. However, the relevance of exploration and exploitation varies in the course of a project, depending on whether idea generation or implementation is required. This adds to a dialectical perspective on innovation (Bledow et al., 2009), generally assuming that the shifting importance of activities may be due to changing demands and requirements resulting from, for example, external circumstances and dynamics. In sum, the dissertation addresses the dynamics of the

innovation process in several respects. This also underlines the general importance of considering innovation as a process within complex and fast-changing environments and not as an outcome in terms of innovative products, as is often the case in empirical studies (Knight, 2015).

Second, the dissertation adds to research on team regulatory focus and innovation in two respects. To begin with, it extends the existing research line on team regulatory focus and innovative activities (e.g., Rietzschel, 2011; Shin et al., 2016) by considering temporal fluctuations of innovative activities. This is highly relevant, as innovative activities have been shown to fluctuate with respect to an innovative project's progress (Rosing et al., 2018). Further, not only research involving innovative activities has focused on static relationships, but empirical studies on team effectiveness in the context of innovation have also investigated static relationships. Thus, by building on longitudinal team data (Study 1) and by differentiating innovative activities with respect to a project's beginning and its further course (Study 2), this dissertation provides important insights into how team regulatory focus relates to both innovative activities and strategies over time. For example, the results of Study 2 essentially differed from static research on team regulatory focus and innovation. While static research has revealed that team promotion focus relates to idea generation, Study 2 indicated that the achievement motivation of team promotion focus may be rather limited inasmuch as promotion-focused teams did not maintain a high level of idea generation constantly over time. Rather, high initial levels of idea generation in promotion-focused teams were followed by a strong decrease in idea generation activities over time. Most importantly, this result points out that the positive effects of team promotion focus on idea generation activities may be dampened when considering time factors such as time pressure due to project deadlines. Moreover, the dissertation adds to research on team regulatory focus and innovation by identifying potential mechanisms and boundary conditions between team regulatory focus

and innovative strategies. More specifically, studying the role of cognitive–affective processes underlying the relationship between regulatory focus and innovative strategies (Study 1) contributes to a more comprehensive understanding of why team regulatory focus may be related to innovative strategies. Study 1 not only identified possible cognitive consequences of team promotion and prevention focus, but it likewise highlighted the specific functions of affect within the relationship between team regulatory focus and innovative strategies. The finding that the interaction of team positive fantasies and negative team affective tone fostered exploration supported the assumption of some researchers arguing for the benefits of opposing and conflicting strategies within the framework of innovation due to synergy effects (e.g., Bledow et al., 2009; Gebert et al., 2010; Miron-Spektor, Gino, & Argote, 2011). Such a dialectical effect was not found with respect to the interaction of team barrier cognitions and positive team affective tone, as barrier cognitions were positively related to exploitation only when positive team affective tone was low. Rather, this result indicates that high levels of positive affective tone possibly dampen potential favorable consequences of barrier cognitions (e.g., focusing on details, accuracy) such that team members cannot stay focused on their goal. In sum, by integrating research on self-regulation, future-related cognitions, and affect within the context of innovation, the dissertation has once again stressed the relevance of regarding innovation as a complex process (e.g., Anderson et al., 2004; Bledow et al., 2009) that, likewise, requires a complex form of regulation among the actors.

Third, the dissertation offers an integrated and more complete view of the innovation process. It contributes to research on the concept clarity of innovation-related constructs (e.g., Potočnik & Anderson, 2016) by providing a deepened understanding of the interdependence of two important theoretical lines in innovation research (i.e., idea generation/implementation and exploration/exploitation), which have often been used in parallel or inconsistently so far. More specifically, findings from Study 3 have underlined that idea generation/implementation

and exploration/exploitation should not be regarded as interchangeable constructs. Rather, they refer to two different but related levels in innovation research inasmuch as idea generation and implementation may represent higher-level activities that both contain and require the use of explorative and exploitative strategies. Apart from addressing the issues of concept clarity in innovation literature, the integration of these two specific sets of constructs should help to explain how specific research results can be transferred from one of the research lines to the other. Specifically, the findings of Study 3 may be useful for interpreting how results from Studies 1 and 2 may be interwoven, as the two studies focused on two different sets of dependent variables, that is, idea generation/implementation as innovative activities and exploration/exploitation as innovative strategies. Findings from Study 3 reveal that the implicit assumption of some innovation researchers (e.g., Bledow et al., 2009; Mom et al., 2007, 2009; Mom et al., 2015; Rosing & Zacher, 2017), that exploration is mostly relevant in the context of idea generation, while exploitation is mostly relevant in the context of idea implementation, needs to be reconsidered. For the results of Studies 1 and 2, for example, the relationship between team promotion focus and idea generation may not be assumed to be identical with the association between team promotion focus and exploration. Rather, in line with the finding that exploration and exploitation were both used within idea generation (Study 3), correlations in Studies 1 and 2 showed that team promotion focus was related to idea generation, but also to both exploration and exploitation. Apart from its contribution to concept clarity in innovation research, the dissertation adds to a more complete view of the innovation process in a further way. Findings of the literature review have emphasized an important shortcoming within innovation research by underlining that there is a lack of knowledge about processes underlying idea implementation, while idea generation or related aspects such as creativity have been studied with more intensity. Of course, this issue is of great importance not only in the field of affect, but also with respect to many other

antecedents and processes, which are relevant in the broad context of innovation. This important shortcoming in innovation literature was already hinted at nearly two decades ago. Specifically, West (2002a) indicated that deepening the understanding about the factors that promote creativity appears to be less urgent than deepening the understanding about the factors promoting the implementation of ideas into practice. One of his main arguments refers to the practical challenges of implementation. In other words, while the generation of creative ideas is comparatively easy, the actual implementation of those ideas in the form of new products, processes, or procedures can be regarded as much more difficult and time intensive because of, for example, change resistance or structural barriers, which can be frequently observed in organizations. Although West (2002a) explicitly referred to the team level, his call for research appears to still be relevant for both the individual and the team level of analysis. Thus, by focusing on both idea generation and implementation (and/or both exploration and exploitation) in all four of its parts, this dissertation adds to an understanding of the antecedents and underlying processes of idea implementation and, moreover, provides a more comprehensive and complete picture of the innovation process.

7.3 Limitations and Future Research Directions

This dissertation has some overall limitations, which indicate potential areas for future research. First, while this dissertation has addressed the specific dynamics of innovation processes in several manners, the results do not allow concrete conclusions regarding the dynamics of team regulatory focus. Thus, future research may consider dynamic models of (team) regulatory focus (Johnson et al., 2015). Instead of studying promotion and prevention focus as parallel processes, dynamic models of regulatory focus may particularly address possible shifts of promotion and prevention focus in the course of innovation projects. Similar to dynamic models of affect that have suggested that affective shifts are beneficial for both

work engagement and creativity (e.g., Bledow et al., 2011; Bledow et al., 2013), future research should explore possible shifts or interactions of promotion and prevention focus and their impact on innovation. According to Lam and Chui (2002), different stages of a creative project may require a “flexible alternation of regulatory foci” (p. 138). This is also in line with Friedman and Förster (2001) who stressed that both regulatory foci influence distinct processing strategies. Consequently, each focus may have crucial aspects that not only foster but also hinder the success of specific innovation activities. Therefore, regulatory shifts, that is, dynamic shifts between promotion and prevention focus, may have the potential to address the complex requirements of innovation processes. In other words, as innovation is characterized by tensions, conflicting demands, and conflicting activities (Bledow et al., 2009), regulatory foci may also shift according to these changing requirements. For example, idea generation activities may be fostered by promotion focus if it follows a phase of prevention focus. As an exclusive promotion focus may increase the likelihood of overlooking important details, the impact of a preceding prevention focus may absorb an excessive risk-taking propensity of promotion-focused individuals or teams in the context of idea generation activities. Regarding the simultaneous occurrence of promotion and prevention focus as beneficial for innovative activities would also correspond to Gebert et al. (2010), who emphasized that a combination of opposing action strategies may be beneficial for innovation. In line with that, Grote et al. (2018) have recently highlighted the relevance of adaptive coordination for team effectiveness.

Further, the two studies on team regulatory focus did not consider the individual regulatory foci of each team member. This reflects a general shortcoming in research on team regulatory focus and could be an interesting avenue for future research. Indeed, team regulatory focus may differ from the individual regulatory focus of single team members. Thus, the individual regulatory focus may have an additional impact on the studied team

processes. Several research directions are conceivable for integrating individual-level regulatory focus in research on team-level regulatory focus. For example, future studies may investigate the effects of a poor regulatory fit between the single team member and the team, or address cross-level effects of regulatory focus with respect to possible switches between individual and team regulatory focus (Johnson et al., 2015). Moreover, future research may examine how the team composition with respect to the team members' chronic regulatory foci may moderate the relationship between team regulatory focus and innovative activities. Hence, it would be interesting to investigate how far the association between, for example, team promotion focus and idea generation may be weakened or strengthened by the ratio of promotion-focused and prevention-focused team members. Recently, some promising areas for future research have been addressed in innovation literature. For example, within the framework of their integrative perspective on regulatory focus and affect, To and Fisher (2019) have also considered the issue of team composition. Referring to the concept of regulatory focus affect, they have proposed that a mixture of promotion-focused affect and prevention-focused affect among team members may foster team creativity. Further, they have emphasized that the right mixture of regulatory focus affect within the team may depend on the creative project's stage. For example, the authors have suggested that, in episodes that require the generation of new ideas, a majority of team members experiencing promotion-focused affect may offer the best regulatory fit (Dimotakis et al., 2012). Likewise, having some team members experiencing prevention-focused affect in such an episode may prevent phenomena such as groupthink, as prevention-focused affect may maintain the team's critical view on potential problems. In line with that, Emich and Vincent (2020) have recently investigated the role of affective diversity on team creativity. Also building on the concept of regulatory focus affect, they have integrated the facet of activation. Results of their studies have shown that activated promotion-focused affect (positive and negative) among team

members fosters their team's effort to generate ideas, while activated prevention-focused affect (positive and negative) among team members rather fosters their team's effort to idea selection, which resulted in reduced novelty. They have further highlighted that activation tends to dominate the creative process when multiple affective states occur within the same team. Thus, for example, team members with activated prevention-focused states can inhibit the team's creative process, given that the other team members are not able to overcome these hindrances. Finally, regarding team composition, it may also be interesting to further investigate the role of ambidextrous regulatory focus types, that is, individuals who simultaneously have both a high promotion and prevention focus (Imai, 2012). Results of a single study by Imai (2012) suggested that teams with higher proportions of ambidextrous team members achieve greater team creativity than teams with lower proportions of such individuals. Further research efforts are necessary to fully investigate the role of such members, as it is possible that they may be especially competent in situations in which both foci are beneficial. Imai (2012) suggested that it is possible that these team members are especially competent in adapting to the dynamics of the innovation process, inasmuch as they are able to flexibly shift between tasks that require either a promotion or a prevention focus. Taken together, as members of organizational teams are likely to experience different affective states and as they are likely to differ in terms of their regulatory motivation (Emich & Vincent, 2020), research on team regulation will profit from considering heterogenous patterns of affect and regulatory focus among team members.

7.4 Conclusion

This dissertation provides insight into how individuals and teams address the complexity and dynamics inherent to innovation processes. Specifically, it investigated how and why self-regulation as well as affect and its regulation may be beneficial to fostering innovation. To

better understand and integrate these and further research results, the dissertation also addressed the issue of conceptual variety and aimed at providing an understanding of how idea generation/implementation and exploration/exploitation as different concepts used in innovation research may be interwoven.

To this end, I chose a multi-perspective approach, referring to both the individual and the team level, to both quantitative and qualitative data, and to both longitudinal and cross-sectional data as well as to the conceptual level of innovation. Individual-level and team-level findings suggested that dynamic and complex forms of both affect regulation and self-regulation may foster innovative activities and strategies and, thus, better enable individuals and teams to meet the requirements of innovation processes that are often accompanied by tensions, paradoxes, or dilemmas. At the conceptual level, the results revealed that innovative activities and innovative strategies are interwoven constructs and that the relative importance of innovative strategies shifts within the innovation process, underlining the complex and dynamic nature of innovation processes. Future research should continue to study innovation processes from a complexity and dynamic, but also integrated perspective to gain further insights into how individuals and teams may optimally face the challenges of innovation processes and, finally, successfully create innovations.

References

- Ahmadi, S., Khanagha, S., Berchicci, L., & Jansen, J. J. P. (2017). Are managers motivated to explore in the face of a new technological change? The role of regulatory focus, fit, and complexity of decision-making. *Journal of Management Studies*, *54*(2), 209–237. <https://doi.org/10.1111/joms.12257>
- Akbari Chermahini, S., & Hommel, B. (2012). Creative mood swings: Divergent and convergent thinking affect mood in opposite ways. *Psychological Research*, *76*(5), 634–640. <https://doi.org/10.1007/s00426-011-0358-z>
- Allen, N. J., & Meyer, J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organization. *Journal of Occupational Psychology*, *63*(1), 1–18. <https://doi.org/10.1111/j.2044-8325.1990.tb00506.x>
- Amabile, T. M. (1983). The social psychology of creativity: A componential conceptualization. *Journal of Personality and Social Psychology*, *45*(2), 357–376. <https://doi.org/10.1037/0022-3514.45.2.357>
- Amabile, T. M. (1988). A model of creativity and innovation in organizations. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior* (10th ed., pp. 123–167). JAI Press.
- Amabile, T. M. (1996). *Creativity in context: Update to “The social psychology of creativity”*. Westview.
- Amabile, T. M., Barsade, S. G., Mueller, J. S., & Staw, B. M. (2005). Affect and creativity at work. *Administrative Science Quarterly*, *50*(3), 367–403. <https://doi.org/10.2189/asqu.2005.50.3.367>

REFERENCES

- Amabile, T. M., & Pratt, M. G. (2016). The dynamic componential model of creativity and innovation in organizations: Making progress, making meaning. *Research in Organizational Behavior*, *36*, 157–183. <https://doi.org/10.1016/j.riob.2016.10.001>
- Anderson, N., De Dreu, C. K. W., & Nijstad, B. A. (2004). The routinization of innovation research: A constructively critical review of the state-of-the-science. *Journal of Organizational Behavior*, *25*(2), 147–173. <https://doi.org/10.1002/job.236>
- Anderson, N., Potočnik, K., & Zhou, J [Jing] (2014). Innovation and creativity in organizations: A state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management*, *40*(5), 1297–1333.
<https://doi.org/10.1177/0149206314527128>
- Andriopoulos, C., & Lewis, M. W. (2009). Exploitation-exploration tensions and organizational ambidexterity: Managing paradoxes of innovation. *Organization Science*, *20*(4), 696–717. <https://doi.org/10.1287/orsc.1080.0406>
- Ashby, F. G., Isen, A. M., & Turken, A. U. (1999). A neuropsychological theory of positive affect and its influence on cognition. *Psychological Review*, *106*(3), 529–550.
<https://doi.org/10.1037/0033-295X.106.3.529>
- Baas, M., De Dreu, C. K. W., & Nijstad, B. A. (2008). A meta-analysis of 25 years of mood-creativity research: Hedonic tone, activation, or regulatory focus? *Psychological Bulletin*, *134*(6), 779–806. <https://doi.org/10.1037/a0012815>
- Baas, M., De Dreu, C. K., & Nijstad, B. A. (2011a). Creative production by angry people peaks early on, decreases over time, and is relatively unstructured. *Journal of Experimental Social Psychology*, *47*(6), 1107–1115.
<https://doi.org/10.1016/j.jesp.2011.05.009>

REFERENCES

- Baas, M., De Dreu, C. K. W., & Nijstad, B. A. (2011b). When prevention promotes creativity: The role of mood, regulatory focus, and regulatory closure. *Journal of Personality and Social Psychology, 100*(5), 794–809. <https://doi.org/10.1037/a0022981>
- Baer, M. (2012). Putting creativity to work: The implementation of creative ideas in organizations. *Academy of Management Journal, 55*(5), 1102–1119. <https://doi.org/10.5465/amj.2009.0470>
- Baer, M., & Oldham, G. R. (2006). The curvilinear relation between experienced creative time pressure and creativity: Moderating effects of openness to experience and support for creativity. *Journal of Applied Psychology, 91*(4), 963–970. <https://doi.org/10.1037/0021-9010.91.4.963>
- Baron, R. A., & Tang, J. (2011). The role of entrepreneurs in firm-level innovation: Joint effects of positive affect, creativity, and environmental dynamism. *Journal of Business Venturing, 26*(1), 49–60. <https://doi.org/10.1016/j.jbusvent.2009.06.002>
- Basadur, M., & Gelade, G. A. (2006). The role of knowledge management in the innovation process. *Creativity and Innovation Management, 15*(1), 45–62. <https://doi.org/10.1111/j.1467-8691.2006.00368.x>
- Beal, D. J., Weiss, H. M., Barros, E., & MacDermid, S. M. (2005). An episodic process model of affective influences on performance. *Journal of Applied Psychology, 90*(6), 1054–1068. <https://doi.org/10.1037/0021-9010.90.6.1054>
- Benner, M. J., & Tushman, M. L. (2003). Exploitation, exploration, and process management: The productivity dilemma revisited. *Academy of Management Review, 28*(2), 238–256. <https://doi.org/10.5465/amr.2003.9416096>
- Biemann, T., Cole, M. S., & Voelpel, S. (2012). Within-group agreement: On the use (and misuse) of rWG and rWG(J) in leadership research and some best practice guidelines. *The Leadership Quarterly, 23*(1), 66–80. <https://doi.org/10.1016/j.leaqua.2011.11.006>

REFERENCES

- Birkinshaw, J., & Gupta, K. (2013). Clarifying the distinctive contribution of ambidexterity to the field of organization Studies. *Academy of Management Perspectives*, 27(4), 287–298. <https://doi.org/10.5465/amp.2012.0167>
- Bledow, R. (2013). Kreative Leistung als selbstgesteuerte Integration psychischer Funktionen [Creative performance as self-directed integration of mental functions]. In D. E. Krause (Ed.), *Kreativität, Innovation, Entrepreneurship* (pp. 43–58). Springer Fachmedien Wiesbaden. https://doi.org/10.1007/978-3-658-02551-9_2
- Bledow, R., Frese, M., Anderson, N., Erez, M., & Farr, J. (2009). A dialectic perspective on innovation: Conflicting demands, multiple pathways, and ambidexterity. *Industrial and Organizational Psychology*, 2(03), 305–337. <https://doi.org/10.1111/j.1754-9434.2009.01154.x>
- Bledow, R., Rosing, K., & Frese, M. (2013). A dynamic perspective on affect and creativity. *Academy of Management Journal*, 56(2), 432–450. <https://doi.org/10.5465/amj.2010.0894>
- Bledow, R., Schmitt, A., Frese, M., & Kühnel, J. (2011). The affective shift model of work engagement. *Journal of Applied Psychology*, 96(6), 1246–1257. <https://doi.org/10.1037/a0024532>
- Bliese, P. D. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Frontiers of industrial and organizational psychology: Vol. 12. Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions* (pp. 374–381). Jossey-Bass.
- Boksem, M. A. S., & Tops, M. (2008). Mental fatigue: Costs and benefits. *Brain Research Reviews*, 59(1), 125–139. <https://doi.org/10.1016/j.brainresrev.2008.07.001>

REFERENCES

- Brennan, R. L., & Prediger, D. J. (1981). Coefficient kappa: Some uses, misuses, and alternatives. *Educational and Psychological Measurement, 41*(3), 687–699.
<https://doi.org/10.1177/001316448104100307>
- Brief, A. P., & Weiss, H. M. (2002). Organizational behavior: Affect in the workplace. *Annual Review of Psychology, 53*, 279–307.
<https://doi.org/10.1146/annurev.psych.53.100901.135156>
- Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology, 1*(3), 185–216. <https://doi.org/10.1177/135910457000100301>
- Brockner, J., & Higgins, E. T. (2001). Regulatory focus theory: Implications for the study of emotions at work. *Organizational Behavior and Human Decision Processes, 86*(1), 35–66. <https://doi.org/10.1006/obhd.2001.2972>
- Brockner, J., Higgins, E. T., & Low, M. B. (2004). Regulatory focus theory and the entrepreneurial process. *Journal of Business Venturing, 19*(2), 203–220.
[https://doi.org/10.1016/S0883-9026\(03\)00007-7](https://doi.org/10.1016/S0883-9026(03)00007-7)
- Carver, C. S. (2003). Pleasure as a sign you can attend to something else: Placing positive feelings within a general model of affect. *Cognition & Emotion, 17*(2), 241–261.
<https://doi.org/10.1080/026999303022294>
- Carver, C. S., & Scheier, M. F. (1981). *Attention and self-regulation: A control-theory approach to human behavior*. Springer. <https://doi.org/10.1007/978-1-4612-5887-2>
- Carver, C. S., & Scheier, M. F. (1990). Origins and functions of positive and negative affect: A control-process view. *Psychological Review, 97*(1), 19–35.
<https://doi.org/10.1037/0033-295X.97.1.19>

REFERENCES

- Carver, C. S., & Scheier, M. F. (2011). Self-regulation of action and affect. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications* (2nd ed., pp. 3–21). Guilford Press.
- Chan, D. (1998). Functional relations among constructs in the same content domain at different levels of analysis: A typology of composition models. *Journal of Applied Psychology, 83*(2), 234–246. <https://doi.org/10.1037//0021-9010.83.2.234>
- Cheng, Y.-T., & Van de Ven, A. H. (1996). Learning the innovation journey: Order out of chaos? *Organization Science, 7*(6), 593–614. <https://doi.org/10.1287/orsc.7.6.593>
- Chiu, C.-Y. C., Owens, B. P., & Tesluk, P. E. (2016). Initiating and utilizing shared leadership in teams: The role of leader humility, team proactive personality, and team performance capability. *Journal of Applied Psychology, 101*(12), 1705–1720. <https://doi.org/10.1037/apl0000159>
- Choi, J. N., Sung, S. Y., Lee, K., & Cho, D.-S. (2011). Balancing cognition and emotion: Innovation implementation as a function of cognitive appraisal and emotional reactions toward innovation. *Journal of Organizational Behavior, 32*(1), 107–124. <https://doi.org/10.1002/job.684>
- Crowe, E., & Higgins, E. T. (1997). Regulatory focus and strategic inclinations: promotion and prevention in decision-making. *Organizational Behavior and Human Decision Processes, 69*(2), 117–132. <https://doi.org/10.1006/obhd.1996.2675>
- Davis, M. A. (2009). Understanding the relationship between mood and creativity: A meta-analysis. *Organizational Behavior and Human Decision Processes, 108*(1), 25–38. <https://doi.org/10.1016/j.obhdp.2008.04.001>
- De Dreu, C. K. W., Baas, M., & Nijstad, B. A. (2008). Hedonic tone and activation level in the mood-creativity link: Toward a dual pathway to creativity model. *Journal of*

REFERENCES

- Personality and Social Psychology*, 94(5), 739–756. <https://doi.org/10.1037/0022-3514.94.5.739>
- De Stobbeleir, K. E. M., Ashford, S. J., & Buyens, D. (2011). Self-regulation of creativity at work: The role of feedback-seeking behavior in creative performance. *Academy of Management Journal*, 54(4), 811–831. <https://doi.org/10.5465/amj.2011.64870144>
- Dietz, B., van Knippenberg, D., Hirst, G., & Restubog, S. L. D. (2015). Outperforming whom? A multilevel study of performance-prove goal orientation, performance, and the moderating role of shared team identification. *Journal of Applied Psychology*, 100(6), 1811–1824. <https://doi.org/10.1037/a0038888>
- Dimotakis, N., Davison, R. B., & Hollenbeck, J. R. (2012). Team structure and regulatory focus: The impact of regulatory fit on team dynamic. *Journal of Applied Psychology*, 97(2), 421–434. <https://doi.org/10.1037/a0026701>
- Drach-Zahavy, A., & Somech, A. (2001). Understanding team innovation: The role of team processes and structures. *Group Dynamics: Theory, Research, and Practice*, 5(2), 111–123. <https://doi.org/10.1037//1089-2699.5.2.111>
- Emich, K. J., & Vincent, L. C. (2020). Shifting focus: The influence of affective diversity on team creativity. *Organizational Behavior and Human Decision Processes*, 156, 24–37. <https://doi.org/10.1016/j.obhdp.2019.10.002>
- Enders, C. K., & Tofighi, D. (2007). Centering predictor variables in cross-sectional multilevel models: A new look at an old issue. *Psychological Methods*, 12(2), 121–138. <https://doi.org/10.1037/1082-989X.12.2.121>
- Faddegon, K., Ellemers, N., & Scheepers, D. (2009). Eager to be the best, or vigilant not to be the worst: The emergence of regulatory focus in disjunctive and conjunctive group tasks. *Group Processes & Intergroup Relations*, 12(5), 653–671. <https://doi.org/10.1177/1368430209339922>

REFERENCES

- Faddegon, K., Scheepers, D., & Ellemers, N. (2008). If we have the will, there will be a way: regulatory focus as a group identity. *European Journal of Social Psychology, 38*(5), 880–895. <https://doi.org/10.1002/ejsp.483>
- Farh, J.-L., Lee, C., & Farh, C. I. C. (2010). Task conflict and team creativity: A question of how much and when. *The Journal of Applied Psychology, 95*(6), 1173–1180. <https://doi.org/10.1037/a0020015>
- Farr, J. L., Sin, H.-P., & Tesluk, P. E. (2003). Knowledge management processes and work group innovation. In L. V. Shavinina (Ed.), *The international handbook on innovation* (pp. 574–586). Elsevier. <https://doi.org/10.1016/B978-008044198-6/50039-5>
- Flanagan, J. C. (1954). The critical incident technique. *Psychological Bulletin, 51*(4), 327–358. <https://doi.org/10.1037/h0061470>
- Florack, A., & Hartmann, J. (2007). Regulatory focus and investment decisions in small groups. *Journal of Experimental Social Psychology, 43*(4), 626–632. <https://doi.org/10.1016/j.jesp.2006.05.005>
- Fong, C. T. (2006). The effects of emotional ambivalence on creativity. *Academy of Management Journal, 49*(5), 1016–1030. <https://doi.org/10.5465/amj.2006.22798182>
- Foo, M.-D., Uy, M. A., & Baron, R. A. (2009). How do feelings influence effort? An empirical study of entrepreneurs' affect and venture effort. *Journal of Applied Psychology, 94*(4), 1086–1094. <https://doi.org/10.1037/a0015599>
- Förster, J., Higgins, E. T., & Idson, L. C. (1998). Approach and avoidance strength during goal attainment: Regulatory focus and the "goal looms larger" effect. *Journal of Personality and Social Psychology, 75*(5), 1115–1131. <https://doi.org/10.1037//0022-3514.75.5.1115>

REFERENCES

- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology*, 2(3), 300–319. <https://doi.org/10.1037/1089-2680.2.3.300>
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56(3), 218–226. <https://doi.org/10.1037/0003-066X.56.3.218>
- Frese, M., & Gielnik, M. M. (2014). The psychology of entrepreneurship. *Annual Review of Organizational Psychology and Organizational Behavior*, 1(1), 413–438. <https://doi.org/10.1146/annurev-orgpsych-031413-091326>
- Friedman, R. S., & Förster, J. (2001). The effects of promotion and prevention cues on creativity. *Journal of Personality and Social Psychology*, 81(6), 1001–1013. <https://doi.org/10.1037//0022-3514.81.6.1001>
- Gebert, D., Boerner, S., & Kearney, E. (2010). Fostering team innovation: Why is it important to combine opposing action strategies? *Organization Science*, 21(3), 593–608. <https://doi.org/10.1287/orsc.1090.0485>
- George, J. M. (1990). Personality, affect, and behavior in groups. *Journal of Applied Psychology*, 75(2), 107–116. <https://doi.org/10.1037/0021-9010.75.2.107>
- George, J. M., & Brief, A. P. (1992). Feeling good-doing good: A conceptual analysis of the mood at work-organizational spontaneity relationship. *Psychological Bulletin*, 112(2), 310–329. <https://doi.org/10.1037/0033-2909.112.2.310>
- George, J. M., & Zhou, J [J.] (2001). When openness to experience and conscientiousness are related to creative behavior: An interactional approach. *Journal of Applied Psychology*, 86(3), 513–524. <https://doi.org/10.1037/0021-9010.86.3.513>

REFERENCES

- George, J. M., & Zhou, J [Jing] (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*(4), 687–697. <https://doi.org/10.1037/0021-9010.87.4.687>
- George, J. M., & Zhou, J [Jing] (2007). Dual tuning in a supportive context: Joint contributions of positive mood, negative mood, and supervisory behaviors to employee creativity. *Academy of Management Journal, 50*(3), 605–622. <https://doi.org/10.5465/amj.2007.25525934>
- Gibson, C. B., & Birkinshaw, J. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal, 47*(2), 209–226. <https://doi.org/10.5465/20159573>
- Gilson, L. L., Mathieu, J. E., Shalley, C. E., & Ruddy, T. M. (2005). Creativity and Standardization: Complementary or Conflicting Drivers of Team Effectiveness? *Academy of Management Journal, 48*(3), 521–531. <https://doi.org/10.5465/amj.2005.17407916>
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Aldine.
- Glick, W. H. (1985). Conceptualizing and measuring organizational and psychological climate: pitfalls in multilevel research. *The Academy of Management Review, 10*(3), 601. <https://doi.org/10.2307/258140>
- Gong, Y., Law, K. S., Chang, S., & Xin, K. R. (2009). Human resources management and firm performance: The differential role of managerial affective and continuance commitment. *Journal of Applied Psychology, 94*(1), 263–275. <https://doi.org/10.1037/a0013116>
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*(3), 271–299. <https://doi.org/10.1037/1089-2680.2.3.271>

REFERENCES

- Gross, J. J. (2015). Emotion regulation: Current status and future prospects. *Psychological Inquiry*, 26(1), 1–26. <https://doi.org/10.1080/1047840X.2014.940781>
- Grote, G., Kolbe, M., & Waller, M. J. (2018). The dual nature of adaptive coordination in teams. *Organizational Psychology Review*, 8(2-3), 125–148. <https://doi.org/10.1177/2041386618790112>
- Guilford, J. P. (1957). Creative abilities in the arts. *Psychological Review*, 64(2), 110–118. <https://doi.org/10.1037/h0048280>
- Gupta, A. K., Smith, K. G., & Shalley, C. E. (2006). The interplay between exploration and exploitation. *Academy of Management Journal*, 49(4), 693–706. <https://doi.org/10.5465/AMJ.2006.22083026>
- He, Z.-L., & Wong, P.-K. (2004). Exploration vs. exploitation: An empirical test of the ambidexterity hypothesis. *Organization Science*, 15(4), 481–494. <https://doi.org/10.1287/orsc.1040.0078>
- Herman, A., & Reiter-Palmon, R. (2011). The effect of regulatory focus on idea generation and idea evaluation. *Psychology of Aesthetics, Creativity, and the Arts*, 5(1), 13–20. <https://doi.org/10.1037/a0018587>
- Higgins, E. T. (1997). Beyond pleasure and pain. *American Psychologist*, 52(12), 1280–1300. <https://doi.org/10.1037/0003-066X.52.12.1280>
- Higgins, E. T. (1998). Promotion and prevention: Regulatory focus as a motivational principle. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (30th ed., pp. 1–46). Academic Press.
- Higgins, E. T. (2000). Making a good decision: Value from fit. *American Psychologist*, 55(11), 1217–1230.

REFERENCES

- Hirt, E. R., Devers, E. E., & McCrea, S. M. (2008). I want to be creative: Exploring the role of hedonic contingency theory in the positive mood-cognitive flexibility link. *Journal of Personality and Social Psychology, 94*(2), 214–230. <https://doi.org/10.1037/0022-3514.94.2.94.2.214>
- Hirt, E. R., Levine, G. M., McDonald, H. E., Melton, R. J., & Martin, L. L. (1997). The role of mood in quantitative and qualitative aspects of performance: Single or multiple mechanisms? *Journal of Experimental Social Psychology, 33*(6), 602–629. <https://doi.org/10.1006/jesp.1997.1335>
- Howell, J. M., & Shea, C. M. (2001). Individual differences, environmental scanning, innovation framing, and champion behavior: Key predictors of project performance. *Journal of Product Innovation Management, 18*(1), 15–27. <https://doi.org/10.1111/1540-5885.1810015>
- Hox, J. J., & Roberts, J. K. (2011). *Handbook of advanced multilevel analysis. European Association of Methodology Series*. Routledge. <https://www.routledgehandbooks.com/doi/10.4324/9780203848852>
- Hülshager, 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*(5), 1128–1145. <https://doi.org/10.1037/a0015978>
- Imai, L. (2012). *Promotion-focused and prevention-focused? Regulatory focus ambidexterity and its effects on team processes and outcomes*. Doctoral Dissertation.
- Isen, A. M. (1993). Positive affect and decision making. In M. Lewis & J. M. Haviland (Eds.), *Handbook of emotions* (pp. 261–277). Guilford Press.
- Isen, A. M. (1999). Positive affect. In T. Dalgleish & M. J. Power (Eds.), *Handbook of cognition and emotion* (pp. 521–539). Wiley.

REFERENCES

- Isen, A. M., Daubman, K. A., & Nowicki, G. P. (1987). Positive affect facilitates creative problem solving. *Journal of Personality and Social Psychology*, *52*(6), 1122–1131.
<https://doi.org/10.1037/0022-3514.52.6.1122>
- Ivcevic, Z., & Brackett, M. A. (2015). Predicting creativity: Interactive effects of openness to experience and emotion regulation ability. *Psychology of Aesthetics, Creativity, and the Arts*, *9*(4), 480–487. <https://doi.org/10.1037/a0039826>
- James, K., Brodersen, M., & Eisenberg, J. (2004). Workplace affect and workplace creativity: A review and preliminary model. *Human Performance*, *17*(2), 169–194.
https://doi.org/10.1207/s15327043hup1702_3
- James, L. R. (1982). Aggregation bias in estimates of perceptual agreement. *Journal of Applied Psychology*, *67*(2), 219–229. <https://doi.org/10.1037/0021-9010.67.2.219>
- James, L. R., Demaree, R. G., & Wolf, G. (1993). rwg: An assessment of within-group interrater agreement. *Journal of Applied Psychology*, *78*(2), 306–309.
<https://doi.org/10.1037/0021-9010.78.2.306>
- Jansen, J. J. P., Kostopoulos, K. C., Mihalache, O. R., & Papalexandris, A. (2016). A socio-psychological perspective on team ambidexterity: The contingency role of supportive leadership behaviours. *Journal of Management Studies*, *53*(6), 939–965.
<https://doi.org/10.1111/joms.12183>
- Johnson, P. D., Smith, M. B., Wallace, J. C., Hill, A. D., & Baron, R. A. (2015). A review of multilevel regulatory focus in organizations. *Journal of Management*, *41*(5), 1501–1529. <https://doi.org/10.1177/0149206315575552>
- Johnson, P. D., & Wallace, J. C. (2011). Increasing individual and team performance in an organizational setting through the situational adaptation of regulatory focus. *Consulting Psychology Journal: Practice and Research*, *63*(3), 190–201.
<https://doi.org/10.1037/a0025622>

REFERENCES

- Junni, P., Sarala, R. M., Taras, V., & Tarba, S. Y. (2013). Organizational ambidexterity and performance: A meta-analysis. *Academy of Management Perspectives*, 27(4), 299–312.
<https://doi.org/10.5465/amp.2012.0015>
- Kammerlander, N., Burger, D., Fust, A., & Fueglistaller, U. (2015). Exploration and exploitation in established small and medium-sized enterprises: The effect of CEOs' regulatory focus. *Journal of Business Venturing*, 30(4), 582–602.
<https://doi.org/10.1016/j.jbusvent.2014.09.004>
- Kaplan, S., & Berman, M. G. (2010). Directed attention as a common resource for executive functioning and self-regulation. *Perspectives on Psychological Science: A Journal of the Association for Psychological Science*, 5(1), 43–57.
<https://doi.org/10.1177/1745691609356784>
- Kark, R., & van Dijk, D. (2007). Motivation to lead, motivation to follow: The role of the self-regulatory focus in leadership processes. *Academy of Management Review*, 32(2), 500–528. <https://doi.org/10.5465/amr.2007.24351846>
- Kaufmann, G. (2003). The effect of mood on creativity in the innovative process. In L. V. Shavinina (Ed.), *The international handbook on innovation* (pp. 191–203). Elsevier.
- Kaufmann, G., & Vosburg, S. K. (1997). 'Paradoxical' mood effects on creative problem-solving. *Cognition & Emotion*, 11(2), 151–170.
<https://doi.org/10.1080/026999397379971>
- Kaufmann, G., & Vosburg, S. K. (2002). The effects of mood on early and late idea production. *Creativity Research Journal*, 14(3-4), 317–330.
https://doi.org/10.1207/S15326934CRJ1434_3
- Keller, J [Johannes], & Bless, H. (2006). Regulatory fit and cognitive performance: the interactive effect of chronic and situationally induced self-regulatory mechanisms on test

REFERENCES

- performance. *European Journal of Social Psychology*, 36(3), 393–405.
<https://doi.org/10.1002/ejsp.307>
- Kimberly, J. R., & Evanisko, M. J. (1981). Organizational innovation: The influence of individual, organizational, and contextual factors on hospital adoption of technological and administrative innovations. *Academy of Management Journal*, 24(4), 689–713.
<https://doi.org/10.5465/256170>
- Klein, K. J., & Kozlowski, S. W. J. (2000). From micro to meso: Critical steps in conceptualizing and conducting multilevel research. *Organizational Research Methods*, 3(3), 211–236. <https://doi.org/10.1177/109442810033001>
- Knight, A. P. (2015). Mood at the midpoint: Affect and change in exploratory search over time in teams that face a deadline. *Organization Science*, 26(1), 99–118.
<https://doi.org/10.1287/orsc.2013.0866>
- Kostopoulos, K. C., & Bozionelos, N. (2011). Team exploratory and exploitative learning: Psychological safety, task conflict, and team performance. *Group & Organization Management*, 36(3), 385–415. <https://doi.org/10.1177/1059601111405985>
- Kozlowski, S. W. J. (2015). Advancing research on team process dynamics. *Organizational Psychology Review*, 5(4), 270–299. <https://doi.org/10.1177/2041386614533586>
- Kozlowski, S. W. J., Gully, S. M., Salas, E., & Cannon-Bowers, J. A. (1996). Team leadership and development: Theory, principles, and guidelines for training leaders and teams. In M. M. Beyerlein, D. A. Johnson, & S. T. Beyerlein (Eds.), *Advances in interdisciplinary studies of work teams: Team leadership* (3rd ed., pp. 253–291). Elsevier Science/JAI Press.
- Kuhl, J. (2000). A functional-design approach to motivation and self-regulation: The dynamics of personality systems interactions. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 111–169). Elsevier/Academic Press.

REFERENCES

- Kuhl, J. (2001). *Motivation und Persönlichkeit: Interaktionen psychischer Systeme* [Motivation and personality: Interactions of psychological systems]. Hogrefe.
- Lam, T. W.-H., & Chiu, C.-Y. (2002). The motivational function of regulatory focus in creativity. *The Journal of Creative Behavior*, 36(2), 138–150.
<https://doi.org/10.1002/j.2162-6057.2002.tb01061.x>
- Lanaj, K., Chang, C.-H. D., & Johnson, R. E. (2012). Regulatory focus and work-related outcomes: A review and meta-analysis. *Psychological Bulletin*, 138(5), 998–1034.
<https://doi.org/10.1037/a0027723>
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33(1), 159. <https://doi.org/10.2307/2529310>
- Levine, J. M., Higgins, E. T., & Choi, H.-S. (2000). Development of strategic norms in groups. *Organizational Behavior and Human Decision Processes*, 82(1), 88–101.
<https://doi.org/10.1006/obhd.2000.2889>
- Lewin, K. (1935). *A dynamic theory of personality*. McGraw-Hill.
- Li, C.-R., Lin, C.-J., & Liu, J. (2019). The role of team regulatory focus and team learning in team radical and incremental creativity. *Group & Organization Management*, 44(6), 1036–1066. <https://doi.org/10.1177/1059601118775196>
- Lindebaum, D., & Jordan, P. J. (2014). When it can be good to feel bad and bad to feel good: Exploring asymmetries in workplace emotional outcomes. *Human Relations*, 67(9), 1037–1050. <https://doi.org/10.1177/0018726714535824>
- Lockwood, P., Jordan, C. H., & Kunda, Z. (2002). Motivation by positive or negative role models: Regulatory focus determines who will best inspire us. *Journal of Personality and Social Psychology*, 83(4), 854–864. <https://doi.org/10.1037//0022-3514.83.4.854>

REFERENCES

- Lubatkin, M. H., Simsek, Z., Ling, Y., & Veiga, J. F. (2006). Ambidexterity and performance in small-to medium-sized firms: The pivotal role of top management team behavioral integration. *Journal of Management*, *32*(5), 646–672.
<https://doi.org/10.1177/0149206306290712>
- Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin*, *131*(6), 803–855.
<https://doi.org/10.1037/0033-2909.131.6.803>
- March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, *2*(1), 71–87. <https://doi.org/10.1287/orsc.2.1.71>
- Marks, M. A., Mathieu, J. E., & Zaccaro, S. J. (2001). A temporally based framework and taxonomy of team processes. *Academy of Management Review*, *26*(3), 356–376.
<https://doi.org/10.5465/amr.2001.4845785>
- Martin, L. L., Ward, D. W., Achee, J. W., & Wyer, R. S. (1993). Mood as input: People have to interpret the motivational implications of their moods. *Journal of Personality and Social Psychology*, *64*(3), 317–326. <https://doi.org/10.1037/0022-3514.64.3.317>
- Mathieu, J. E., & Taylor, S. R. (2006). Clarifying conditions and decision points for mediational type inferences in organizational behavior. *Journal of Organizational Behavior*, *27*(8), 1031–1056. <https://doi.org/10.1002/job.406>
- Mayring, P. (2015). *Qualitative Inhaltsanalyse - Grundlagen und Techniken [Qualitative content analysis - fundamentals and techniques]* (12th ed.). Beltz.
- McCrae, R. R. (1994). Openness to experience: Expanding the boundaries of Factor V. *European Journal of Personality*, *8*(4), 251–272. <https://doi.org/10.1002/per.2410080404>
- McCrae, R. R. (1996). Social consequences of experiential openness. *Psychological Bulletin*, *120*(3), 323–337. <https://doi.org/10.1037/0033-2909.120.3.323>

REFERENCES

- McLellan, E., MacQueen, K. M., & Neidig, J. L. (2003). Beyond the qualitative interview: Data preparation and transcription. *Field Methods, 15*(1), 63–84.
<https://doi.org/10.1177/1525822X02239573>
- Miller, G. A., Galanter, E., & Pribram, K. H. (1960). *Plans and the structure of behavior*. Holt, Rinehart & Winston.
- Miller, N. M. (1944). Experimental studies of conflict. In J. McV. Hunt (Ed.), *Personality and the behavior disorders* (1st ed., pp. 431–465). Ronald Press.
- Miron, E., Erez, M., & Naveh, E. (2004). Do personal characteristics and cultural values that promote innovation, quality, and efficiency compete or complement each other? *Journal of Organizational Behavior, 25*(2), 175–199. <https://doi.org/10.1002/job.237>
- Miron-Spektor, E., Erez, M., & Naveh, E. (2011). The effect of conformist and attentive-to-detail members on team innovation: Reconciling the innovation paradox. *Academy of Management Journal, 54*(4), 740–760. <https://doi.org/10.5465/amj.2011.64870100>
- Miron-Spektor, E., Gino, F., & Argote, L. (2011). Paradoxical frames and creative sparks: Enhancing individual creativity through conflict and integration. *Organizational Behavior and Human Decision Processes, 116*(2), 229–240.
<https://doi.org/10.1016/j.obhdp.2011.03.006>
- Miron-Spektor, E., Ingram, A., Keller, J [Joshua], Smith, W. K., & Lewis, M. W. (2018). Microfoundations of organizational paradox: The problem is how we think about the problem. *Academy of Management Journal, 61*(1), 26–45.
<https://doi.org/10.5465/amj.2016.0594>
- Mom, T. J. M., Fourné, S. P. L., & Jansen, J. J. P. (2015). Managers' work experience, ambidexterity, and performance: The contingency role of the work context. *Human Resource Management, 54*(S1), 133–153. <https://doi.org/10.1002/hrm.21663>

REFERENCES

- Mom, T. J. M., van den Bosch, F. A. J., & Volberda, H. W. (2007). Investigating managers' exploration and exploitation activities: The influence of top-down, bottom-up, and horizontal knowledge inflows. *Journal of Management Studies*, *44*(6), 910–931.
<https://doi.org/10.1111/j.1467-6486.2007.00697.x>
- Mom, T. J. M., van den Bosch, F. A. J., & Volberda, H. W. (2009). Understanding variation in managers' ambidexterity: Investigating direct and interaction effects of formal structural and personal coordination mechanisms. *Organization Science*, *20*(4), 812–828.
<https://doi.org/10.1287/orsc.1090.0427>
- Montag, T., Maertz, C. P., & Baer, M. (2012). A critical analysis of the workplace creativity criterion space. *Journal of Management*, *38*(4), 1362–1386.
<https://doi.org/10.1177/0149206312441835>
- Mumford, M. D. (2003). Where have we been, where are we going? Taking stock in creativity research. *Creativity Research Journal*, *15*(2-3), 107–120.
<https://doi.org/10.1080/10400419.2003.9651403>
- Mumford, M. D., & Hunter, S. T. (2005). Innovation in organizations: A multi-level perspective on creativity. In F. Dansereau & F. J. Yammarino (Eds.), *Research in multi-level issues: Vol. 4. Multi-level issues in strategy and methods* (Vol. 4, pp. 9–73). Elsevier. [https://doi.org/10.1016/S1475-9144\(05\)04001-4](https://doi.org/10.1016/S1475-9144(05)04001-4)
- Mumford, M. D., Scott, G. M., Gaddis, B., & Strange, J. M. (2002). Leading creative people: Orchestrating expertise and relationships. *The Leadership Quarterly*, *13*(6), 705–750. [https://doi.org/10.1016/S1048-9843\(02\)00158-3](https://doi.org/10.1016/S1048-9843(02)00158-3)
- Muthén, L. K., & Muthén, B. O. (1998-2017). *Mplus user's guide* (Eighth Edition). Muthén & Muthén.
- Neill, S., Pathak, R. D., Ribbens, B. A., Noel, T. W., & Singh, G. (2018). The influence of managerial optimism and self-regulation on learning and business growth expectations

REFERENCES

- within an emerging economic context. *Asia Pacific Journal of Management*, 37(1), 187–204. <https://doi.org/10.1007/s10490-018-9612-x>
- Nijstad, B. A., De Dreu, C. K. W., Rietzschel, E. F., & Baas, M. (2010). The dual pathway to creativity model: Creative ideation as a function of flexibility and persistence. *European Review of Social Psychology*, 21(1), 34–77. <https://doi.org/10.1080/10463281003765323>
- O'Reilly, C. A., & Tushman, M. (2013). Organizational ambidexterity: Past, present and future. *SSRN Electronic Journal*. Advance online publication. <https://doi.org/10.2139/ssrn.2285704>
- Oettingen, G. (1996). Positive fantasy and motivation. In P. M. Gollwitzer & J. A. Bargh (Ed.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 236–259). Guilford Press.
- Oettingen, G. (1999). Free fantasies about the future and the emergence of developmental goals. In J. Brandtstädter & R. M. Lerner (Eds.), *Action & self-development: Theory and research through the life span* (pp. 315–342). Sage Publications.
- Oettingen, G. (2000). Expectancy effects on behavior depend on self-regulatory thought. *Social Cognition*, 18(2), 101–129. <https://doi.org/10.1521/soco.2000.18.2.101>
- Oettingen, G., & Mayer, D. (2002). The motivating function of thinking about the future: Expectations versus fantasies. *Journal of Personality and Social Psychology*, 83(5), 1198–1212. <https://doi.org/10.1037//0022-3514.83.5.1198>
- Oettingen, G., Mayer, D., Thorpe, J. S., Janetzke, H., & Lorenz, S. (2005). Turning fantasies about positive and negative futures into self-improvement goals. *Motivation and Emotion*, 29(4), 236–266. <https://doi.org/10.1007/s11031-006-9016-y>

REFERENCES

- Ohly, S., Sonnentag, S., & Pluntke, F. (2006). Routinization, work characteristics and their relationships with creative and proactive behaviors. *Journal of Organizational Behavior*, 27(3), 257–279. <https://doi.org/10.1002/job.376>
- Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health*, 42(5), 533–544. <https://doi.org/10.1007/s10488-013-0528-y>
- Patton, M. Q. (2009). *Qualitative research & evaluation methods* (3. ed.). Sage.
- Paulus, P. B. (2002). Different ponds for different fish: A contrasting perspective on team innovation. *Applied Psychology*, 51(3), 394–399. <https://doi.org/10.1111/1464-0597.00973>
- 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(5), 879–903. <https://doi.org/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(4), 481–494. <https://doi.org/10.1080/1359432X.2016.1176022>
- Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behavioral Research*, 42(1), 185–227. <https://doi.org/10.1080/00273170701341316>
- R Core Team. (2018). *R: A language and environment for statistical computing* [Computer software]. R Foundation for Statistical Computing. Vienna, Austria. <https://www.R-project.org/>

REFERENCES

- Rank, J., & Frese, M. (2008). The impact of emotions, moods and other affect-related variables on creativity, innovation and initiative. In N. Ashkanasy & C. Cooper (Eds.), *Research companion to emotion in organizations* (pp. 103–119). Edward Elgar Publishing.
- Rank, J., Pace, V. L., & Frese, M. (2004). Three avenues for future research on creativity, innovation, and initiative. *Applied Psychology, 53*(4), 518–528.
<https://doi.org/10.1111/j.1464-0597.2004.00185.x>
- Rego, A., Sousa, F., Marques, C., & Cunha, M. P. e. (2012). Optimism predicting employees' creativity: The mediating role of positive affect and the positivity ratio. *European Journal of Work and Organizational Psychology, 21*(2), 244–270.
<https://doi.org/10.1080/1359432X.2010.550679>
- Reiter-Palmon, R., Robinson-Morrall, E. J., Kaufman, J. C., & Santo, J. B. (2012). Evaluation of self-perceptions of creativity: Is it a useful criterion? *Creativity Research Journal, 24*(2-3), 107–114. <https://doi.org/10.1080/10400419.2012.676980>
- Rietzschel, E. F. (2011). Collective regulatory focus predicts specific aspects of team innovation. *Group Processes & Intergroup Relations, 14*(3), 337–345.
<https://doi.org/10.1177/1368430210392396>
- Rogan, M., & Mors, M. L. (2014). A network perspective on individual-level ambidexterity in organizations. *Organization Science, 25*(6), 1860–1877.
<https://doi.org/10.1287/orsc.2014.0901>
- Rosenbusch, N., Brinckmann, J., & Bausch, A. (2011). Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. *Journal of Business Venturing, 26*(4), 441–457. <https://doi.org/10.1016/j.jbusvent.2009.12.002>
- Rosing, K. (2011). *Dynamics of the innovation process: The linear-recursive model of innovation and the implications for leadership and self-regulation*. Doctoral Dissertation.

REFERENCES

- Rosing, K., Bledow, R., Frese, M., Baytalskaya, N., Johnson Lascano, J., & Farr, J. L. (2018). The temporal pattern of creativity and implementation in teams. *Journal of Occupational and Organizational Psychology, 91*(4), 798–822.
<https://doi.org/10.1111/joop.12226>
- Rosing, K., Frese, M., & Bausch, A. (2011). Explaining the heterogeneity of the leadership-innovation relationship: Ambidextrous leadership. *The Leadership Quarterly, 22*(5), 956–974. <https://doi.org/10.1016/j.leaqua.2011.07.014>
- Rosing, K., & Zacher, H. (2017). Individual ambidexterity: The duality of exploration and exploitation and its relationship with innovative performance. *European Journal of Work and Organizational Psychology, 26*(5), 694–709.
<https://doi.org/10.1080/1359432X.2016.1238358>
- Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software, 48*(2). <https://doi.org/10.18637/jss.v048.i02>
- Salas, E., Dickinson, T. L., Converse, S. A., & Tannenbaum, S. I. (1992). Toward an understanding of team performance and training. In R. W. Swezey & E. Salas (Eds.), *Teams: Their training and performance* (pp. 3–29). Ablex.
- Sassenberg, K., Jonas, K. J., Shah, J. Y., & Brazy, P. C. (2007). Why some groups just feel better: The regulatory fit of group power. *Journal of Personality and Social Psychology, 92*(2), 249–267. <https://doi.org/10.1037/0022-3514.92.2.249>
- Sassenberg, K., & Woltin, K.-A. (2008). Group-based self-regulation: The effects of regulatory focus. *European Review of Social Psychology, 19*(1), 126–164.
<https://doi.org/10.1080/10463280802201894>
- Schreier, M. (2012). *Qualitative content analysis in practice*. Sage.

REFERENCES

- Schroeder, R. G., Van de Ven, A. H., Scudder, G. D., & Polley, D. (1989). The development of innovation ideas. In A. H. Van de Ven, H. L. Angle, & M. S. Poole (Eds.), *Research on the management of innovation: The Minnesota studies* (pp. 107–134). Oxford University Press.
- Schwarz, N. (1990). Feelings-as-information: Informational and motivational functions of affective states. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (2nd ed., pp. 527–561). Guilford.
- Schwarz, N. (2001). Feelings-as-information: Implications for affective influences on information processing. In L. L. Martin & G. L. Clore (Eds.), *Theories of mood and cognition: A user's guidebook* (pp. 159–176). Lawrence Erlbaum.
- 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(3), 580–607. <https://doi.org/10.5465/256701>
- Sevastos, P., Smith, L., & Cordery, J. L. (1992). Evidence on the reliability and construct validity of Warr's (1990) well-being and mental health measures. *Journal of Occupational and Organizational Psychology*, 65(1), 33–49. <https://doi.org/10.1111/j.2044-8325.1992.tb00482.x>
- Shin, Y. (2014). Positive group affect and team creativity. *Small Group Research*, 45(3), 337–364. <https://doi.org/10.1177/1046496414533618>
- Shin, Y., Kim, M., Choi, J. N., & Lee, S.-H. (2016). Does team culture matter? Roles of team culture and collective regulatory focus in team task and creative performance. *Group & Organization Management*, 41(2), 232–265. <https://doi.org/10.1177/1059601115584998>

REFERENCES

- Shrout, P. E., & Fleiss, J. L. (1979). Intraclass correlations: Uses in assessing rater reliability. *Psychological Bulletin*, *86*(2), 420–428. <https://doi.org/10.1037/0033-2909.86.2.420>
- Taylor, A., & Greve, H. R. (2006). Superman or the fantastic four? Knowledge combination and experience in innovative teams. *Academy of Management Journal*, *49*(4), 723–740. <https://doi.org/10.5465/amj.2006.22083029>
- 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*(3), 591–620. <https://doi.org/10.1111/j.1744-6570.1999.tb00173.x>
- To, M. L., & Fisher, C. D. (2019). Affective influences on creativity in teams: A multilevel and regulatory focus perspective. In P. B. Paulus & B. Nijstad (Eds.), *The oxford handbook of group creativity and innovation* (pp. 103–117). Oxford University Press.
- To, M. L., Fisher, C. D., & Ashkanasy, N. M. (2015). Unleashing angst: Negative mood, learning goal orientation, psychological empowerment and creative behaviour. *Human Relations*, *68*(10), 1601–1622. <https://doi.org/10.1177/0018726714562235>
- To, M. L., Fisher, C. D., Ashkanasy, N. M., & Rowe, P. A. (2012). Within-person relationships between mood and creativity. *Journal of Applied Psychology*, *97*(3), 599–612. <https://doi.org/10.1037/a0026097>
- Tuncdogan, A., Boon, A., Mom, T. J. M., van den Bosch, F. A. J., & Volberda, H. (2017). Management teams' regulatory foci and organizational units' exploratory innovation: The mediating role of coordination mechanisms. *Long Range Planning*, *50*(5), 621–635. <https://doi.org/10.1016/j.lrp.2016.11.002>
- Tuncdogan, A., van den Bosch, F. A. J., & Volberda, H. (2015). Regulatory focus as a psychological micro-foundation of leaders' exploration and exploitation activities. *The Leadership Quarterly*, *26*(5), 838–850. <https://doi.org/10.1016/j.leaqua.2015.06.004>

REFERENCES

- Van de Ven, A. H. (1986). Central problems in the management of innovation. *Management Science*, 32(5), 590–607. <https://doi.org/10.1287/mnsc.32.5.590>
- van Knippenberg, D. (2017). Team innovation. *Annual Review of Organizational Psychology and Organizational Behavior*, 4(1), 211–233.
<https://doi.org/10.1146/annurev-orgpsych-032516-113240>
- van Stekelenburg, J. (2006). *Promoting or preventing social change: Instrumentality, identity, ideology and group-based anger as motives of protest participation*. Doctoral Dissertation.
- VERBI Software. (2019). *MAXQDA 2018* [Computer software]. VERBI Software.
Available from maxqda.com. Berlin, Germany.
- Volery, T., Mueller, S., & Siemens, B. von (2015). Entrepreneur ambidexterity: A study of entrepreneur behaviours and competencies in growth-oriented small and medium-sized enterprises. *International Small Business Journal: Researching Entrepreneurship*, 33(2), 109–129. <https://doi.org/10.1177/0266242613484777>
- Weiss, H. M., & Cropanzano, R. (1996). Affective events theory: A theoretical discussion of the structure, causes and consequences of affective experiences at work. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior: An annual series of analytical essays and critical reviews, Vol. 18* (pp. 1–74). JAI Press.
- West, M. A. (2002a). Ideas are ten a penny: It's team implementation not idea generation that counts. *Applied Psychology*, 51(3), 411–424. <https://doi.org/10.1111/1464-0597.01006>
- West, M. A. (2002b). Sparkling fountains or stagnant ponds: An integrative model of creativity and innovation implementation in work groups. *Applied Psychology*, 51(3), 355–387. <https://doi.org/10.1111/1464-0597.00951>

REFERENCES

- 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. 3–13). Wiley.
- Zacher, H., Robinson, A. J., & Rosing, K. (2016). Ambidextrous leadership and employees' self-reported innovative performance: The role of exploration and exploitation behaviors. *The Journal of Creative Behavior*, 50(1), 24–46. <https://doi.org/10.1002/jocb.66>
- Zaltman, G., Duncan, R., & Holbek, J. (1973). *Innovations and organizations*. Wiley.

Conference Contributions and Scope of Responsibility

| | Conference Contributions | Responsibility |
|-------------------|---|--|
| Literature Review | -- | Primarily responsible for manuscript development. |
| Study 1 | -- | Primarily responsible for conceptual development, study design and materials. Solely responsible for data collection and data analysis. Primarily responsible for manuscript development. |
| Study 2 | <p>Hundeling, M. & Rosing, K. (2016, August). <i>A dynamic perspective on team regulatory focus and its implications for idea generation and idea implementation</i>. Paper presented at the 76th Annual Meeting of the Academy of Management, Anaheim, California, USA.</p> <p>Hundeling, M., Shylivska, Y. & Rosing, K. (2016, September). <i>Innovation in Teams: Ein linearer oder chaotischer Prozess innovativer Aktivitäten?</i> Presentation at the 50th Kongress der Deutschen Gesellschaft für Psychologie, Leipzig.</p> <p>Hundeling, M., Auerswald, M. & Rosing, K. (2019, September). <i>Regulatorischer Fokus und Innovation in Teams: Eine dynamische Perspektive</i>. Symposium "Dynamiken im Innovationsprozess" presented at the 11th Tagung der Fachgruppe AOW der Deutschen Gesellschaft für Psychologie, Braunschweig.</p> | <p>Primarily responsible for conceptual development, study design and materials.</p> <p>Solely responsible for data collection.</p> <p>Jointly responsible for data analysis.</p> <p>Primarily responsible for manuscript development.</p> |
| Study 3 | -- | Primarily responsible for conceptual development, study design and materials. Solely responsible for data collection and data analysis. Primarily responsible for manuscript development. |

APPENDIX A (Study 1)

Measures (German Items)

Team Regulatory Focus

Inwiefern treffen die folgenden Aussagen auf Ihr Team zu? Bitte kreuzen Sie entsprechend an und beziehen Sie sich dabei auf die vergangene Woche.

In der vergangenen Woche ...

(Team Prevention Focus):

- war unser Vorgehen geprägt durch Vorsicht.
- war unsere Arbeit stärker darauf ausgerichtet, Verluste zu vermeiden als Gewinne zu erzielen.
- haben wir oft darüber gesprochen, wie wir Misserfolge vermeiden können.
- haben wir uns darauf konzentriert, unseren Pflichten und Verantwortungen nachzukommen.
- haben wir oft darüber gesprochen, wie wir bei unserer Arbeit schwerwiegende Fehler vermeiden können.

(Team Promotion Focus):

- war unser Vorgehen geprägt durch Risikofreude.
- war unsere Arbeit stärker darauf ausgerichtet, Gewinne zu erzielen als Verluste zu vermeiden.
- haben wir oft darüber gesprochen, wie wir unsere Ziele erreichen werden.
- haben wir uns darauf konzentriert, mit unserer Arbeit positive Ergebnisse zu erzielen.
- haben wir uns auf den Erfolg konzentriert, den wir mit unserer Arbeit erzielen möchten.

Team Future-Related Cognitions

Inwiefern treffen die folgenden Aussagen auf Ihr Team zu? Bitte kreuzen Sie entsprechend an und beziehen Sie sich dabei auf die vergangene Woche.

In der vergangenen Woche ...

(Team Positive Fantasies):

- haben wir uns die positiven Konsequenzen vorgestellt, die unsere laufenden Projekte für uns haben könnten.
- haben wir uns den zukünftigen Erfolg unserer laufenden Projekte ausgemalt.
- haben wir uns vorgestellt, dass unsere laufenden Projekte erfolgreich beendet seien.

(Team Barrier Cognitions):

- haben wir uns intensiv mit möglichen Hindernissen beschäftigt, die den Erfolg unserer laufenden Projekte gefährden könnten.
- haben wir über Fehler nachgedacht, die wir im Verlauf unserer laufenden Projekte machen könnten.
- haben wir an Schwierigkeiten gedacht, die im Verlauf des Projekts auftreten könnten.

Team Affective Tone

Bitte geben Sie an, inwieweit die folgenden Adjektive die Art und Weise beschreiben, wie Ihr Team in der vergangenen Woche gearbeitet hat. Bitte kreuzen Sie entsprechend an.

(Positive Team Affective Tone):

- enthusiastisch
- fröhlich
- ermutigt
- ruhig
- entspannt

(Negative Team Affective Tone):

- ängstlich
- ärgerlich
- schuldbewusst
- bedrückt
- entmutigt

Team Exploration and Exploitation

Inwiefern treffen die folgenden Aussagen auf Ihr Team zu? Bitte kreuzen Sie entsprechend an und beziehen Sie sich dabei auf die vergangene Woche.

In der vergangenen Woche ...

(Team Exploration):

- haben wir bei unserer Arbeit nach neuen Möglichkeiten gesucht.
- haben wir bei unserer Arbeit verschiedene Optionen verglichen.
- haben wir uns auf die Erneuerung von Produkten/Dienstleistungen oder Prozessen konzentriert.
- haben wir uns mit Aktivitäten beschäftigt, die Anpassungsfähigkeit erforderten.

- haben wir uns mit Aktivitäten beschäftigt, die es erforderten, neue Fähigkeiten oder neues Wissen zu erlernen.
- haben wir etablierte Abläufe in Frage gestellt.
- sind wir unkonventionelle Wege gegangen.

(Team Exploitation):

- haben wir uns mit Aktivitäten beschäftigt, in denen wir bereits viel Erfahrung gesammelt haben.
- haben wir bestehende Kunden mit bekannten Produkten/ Dienstleistungen versorgt.
- haben wir uns mit Aktivitäten beschäftigt, bei denen wir genau wussten, wie sie durchzuführen sind.
- haben wir uns mit Aktivitäten beschäftigt, die hauptsächlich auf die Erreichung kurzfristiger Ziele abzielen.
- haben wir uns mit Aktivitäten beschäftigt, die wir gut mit unserem vorhandenen Wissen ausführen konnten.
- haben wir uns mit Aktivitäten beschäftigt, die klar in die existierende Unternehmensstrategie passen.
- haben wir uns an bewährten Methoden orientiert.
- haben wir häufig auf etablierte Routinen vertraut.
- sind wir systematisch vorgegangen.

APPENDIX B (Study 2)

B1: Description of Situation:

Wir bitten Sie nun, sich in folgende Situation hineinzusetzen:

Sie sind ein dreiköpfiges Einkauferteam der *StepOut GmbH*, einem Unternehmen, das Sport- und Freizeitartikel an eine breite Zielgruppe von Männern und Frauen verkauft. Seit bereits über 20 Jahren statten sich Menschen jeder Altersklasse gerne bei der *StepOut GmbH* für ihre sportlichen Aktivitäten und Reisen aus. Das Unternehmen betreibt diverse Filialen in Deutschland, Österreich und der Schweiz und vertreibt seine Produkte mittlerweile zusätzlich auch online.

Als Einkäufer bei der *StepOut GmbH* besteht Ihre Aufgabe fortlaufend darin, Produkte auszuwählen, die zukünftig Teil des Sortiments werden sollen. Daher sitzen Sie auch heute wieder im Einkäufer-Team zusammen und beraten über die Aufnahme neuer Produkte in das bestehende Sortiment.

Die Marketing-Abteilung arbeitet aktuell am strategischen Kommunikationskonzept der *StepOut GmbH* und hat Ihnen und Ihren Einkäuferkollegen einen Arbeitsstand für dieses Konzept in Form einer kurzen Präsentation zugeschickt. Anhand von Bildern und kurzen Slogans verdeutlichen Ihnen die Marketing-Kollegen, wie die *StepOut GmbH* künftig auf sich aufmerksam machen möchte.

Auch bei der heutigen Produktauswahl möchten Sie als Einkäufer-Team Ihre Produktauswahl in Übereinstimmung mit dem strategischen Kommunikationskonzept des Unternehmens tätigen. Sie schauen sich daher gemeinsam mit Ihrem Team die Kurzpräsentation der Marketing-Abteilung an, um zu verstehen, worauf Sie bei der Produktauswahl Wert legen sollten.

B2: Manipulation (Decision Task, Promotion Focus Condition):

Eine Reihe neuer Produkte steht mal wieder zur Auswahl und Sie dürfen im Einkäufer-Team darüber entscheiden, welche Produkte in der kommenden Saison unbedingt ins Sortiment aufgenommen werden sollten.

Die folgenden Produkte kommen für die Neu-Aufnahme in das Sortiment in Frage.

Die Geschäftsleitung hat Sie bereits im Vorfeld informiert, dass genügend Budget zur Verfügung steht, um zwei der drei Produkte in das Sortiment aufzunehmen. Nun geht es darum, die zwei besten Produkte für das Sortiment auszuwählen. Die Entscheidung ist extrem wichtig, da Sie bei Ihren Kunden absolute Begeisterung hervorrufen möchten. Es ist das oberste Ziel Ihres Einkäufer-Teams, das Sortiment ständig zu verbessern und für das Unternehmen eine maximale Umsatzsteigerung anzustreben.

Bitte diskutieren Sie gemeinsam, welche beiden Produkte Sie am meisten überzeugen und daher am besten für eine gelungene Sortimentserweiterung geeignet sind! Berücksichtigen Sie dabei auch die Informationen zum strategischen Kommunikationskonzept, das Sie aus der Marketing-Abteilung erhalten haben.

Für den Austausch im Team haben Sie 5 Minuten Zeit. Die Versuchsleitung wird in Kürze das Startsignal für die Diskussion geben, sodass Sie zunächst Zeit haben, sich die Produkte allein anzuschauen.

Wenden Sie sich bitte an die Versuchsleitung, wenn Sie an dieser Stelle Fragen haben.

B2: Manipulation (Decision Task, Prevention Focus Condition):

Eine Reihe neuer Produkte steht mal wieder zur Auswahl und Sie müssen im Einkäufer-Team darüber entscheiden, welche Produkte in der kommenden Saison Teil Ihres Sortiments werden sollen.

Die folgenden drei Produkte kommen für die Neu-Aufnahme in das Sortiment in Frage.

Die Geschäftsleitung hat Sie bereits im Vorfeld informiert, dass aus Kostengründen lediglich eines der drei Produkte aufgenommen werden können. Nun geht es darum, die beiden Produkte auszusortieren, die am wenigsten in das Sortiment passen. Da Sie in der Vergangenheit mit Ihren Entscheidungen nicht immer richtig lagen, ist es diesmal besonders wichtig, eine Fehlentscheidung zu vermeiden! Ihre Verantwortung ist hoch, da Sie verhindern müssen, dass Ihre Kunden ein weiteres Mal von der Sortimentserweiterung enttäuscht sind und sinkende Umsätze die Folge wären.

Bitte diskutieren Sie gemeinsam, gegen welche beiden Produkte Sie sich entscheiden, weil sie nicht zu einer gelungenen Sortimentserweiterung beitragen. Berücksichtigen Sie dabei auch die Informationen zum strategischen Kommunikationskonzept, das Sie aus der Marketing-Abteilung erhalten haben.

Für den Austausch im Team haben Sie 5 Minuten Zeit. Die Versuchsleitung wird in Kürze das Startsignal für die Diskussion geben, sodass Sie zunächst Zeit haben, sich die Produkte allein anzuschauen.

Wenden Sie sich bitte an die Versuchsleitung, wenn Sie an dieser Stelle Fragen haben.

B2: Manipulation (Exemplary Advertisement, Promotion Focus Condition):



Run&Fun!

Spüren Sie das rasante Laufgefühl!

Durch atmungsaktive Materialien und das geringe Gewicht dieses Laufschuhs rückt Ihre Bestzeit in unmittelbare Nähe. Mit diesem Schuh können Sie jede Herausforderung annehmen und jedes Rennen gewinnen.

Produktdetails

- Atmungsaktive Materialien
- Ultraleichte Zwischensohle mit hohem Dynamikumfang
- Auswechselbares, flexibles Schnürsystem für leichteren Ein- und Ausstieg



Kundenmeinung

Carmen Sommer,
Leipzig

„Dieser Laufschuh hat mich besonders durch das puristische Design überzeugt, welches auf überflüssige Details verzichtet und dadurch besonders leicht ist. Alles in allem ein perfekter Schuh, der mir zu Höchstleistungen verhilft! Bei meinem nächsten Lauf bin ich ganz vorne mit dabei!“

B2: Manipulation (Exemplary Advertisement, Prevention Focus Condition):



Sicherheit auch auf schwierigen Routen!

LAUFBAR

Durch die zuverlässige Stabilität beim Abrollen des Fußes bietet der Schuh Ihnen Sicherheit auf allen Wegen. Auch auf schwierigen Routen und bei schlechtem Wetter haben Sie mit diesem Schuh ein sicheres Laufgefühl.

Produktdetails

- Stabilität und Führung durch das Dynamic Support System
- Schutz vor Feuchtigkeit durch wasserdichtes Obermaterial
- Sicherheit durch eine bewährte Passform



Kundenmeinung

Peter Steiner,
Chemnitz

„Dieser Schuh passt sich bei jedem Lauf an meinen Fuß an, was mir einen sicheren Halt und ein sicheres Gefühl gibt. Auch bei Regen bewährt sich der Schuh durch die wasserdichte Beschichtung. Diesen Schuh kann ich Ihnen als sicherheitsbewusster Läufer weiterempfehlen!“

B2: Manipulation (Explanation of Decision, Promotion Focus Condition)

Sie haben soeben in Ihrem Einkäufer-Team über die bevorstehende Sortimentserweiterung diskutiert und sind nun wieder an Ihrem Arbeitsplatz.

Da Sie bei Ihrer Entscheidung Vorgaben der Geschäftsleitung zu berücksichtigen hatten, erwartet diese von Ihnen eine kurze Begründung. Sie sollen in einigen kurzen Stichpunkten erläutern, welche Gründe für die Aufnahme der beiden von Ihnen gewählten Produkte sprechen und warum Sie davon überzeugt sind, mit Ihrer Sortimentserweiterung Ihre Kunden ausnahmslos zu begeistern.

Für die Bearbeitung dieser Aufgabe haben Sie 3 Minuten Zeit.

Begründung:

- ...

B2: Manipulation (Explanation of Decision, Prevention Focus Condition)

Sie haben soeben in Ihrem Einkäufer-Team über die bevorstehende Sortimentserweiterung diskutiert und sind nun wieder an Ihrem Arbeitsplatz.

Da Sie bei Ihrer Entscheidung Vorgaben der Geschäftsleitung zu berücksichtigen hatten, erwartet diese von Ihnen eine kurze Begründung. Sie sollen in einigen kurzen Stichpunkten erläutern, welche Gründe gegen die Aufnahme der von Ihnen gewählten Produkte sprechen und warum Sie glauben, diesmal keine Fehlentscheidung getroffen zu haben.

Für die Bearbeitung dieser Aufgabe haben Sie 3 Minuten Zeit.

Begründung:

- ...

B3: Innovation Task:

Sie als Einkäufer-Team werden aufgrund Ihrer langjährigen Expertise und aufgrund Ihrer guten Markt- und Kundenkenntnisse immer wieder von anderen Abteilungen Ihres Unternehmens um Unterstützung gebeten. Heute meldet sich die Abteilung für Produktentwicklung und braucht dringend Ihren Rat.

Die Kollegen wollen ein eigenes, innovatives Produkt entwickeln, das schnellstmöglich auf den Markt gebracht werden soll: **eine mobile Waschmaschine für Rucksackreisende!** Sie soll unterwegs für saubere Kleidung sorgen und gleichzeitig so konstruiert sein, dass sie sich zusammen mit weiterem Gepäck in einem Reise-Rucksack verstauen lässt.

Ihre Kollegen aus der Produktentwicklung bitten Sie nun um eine Ideensammlung und eine erste Skizze, aus der ersichtlich wird, wie das neue Produkt aussehen sollte und wie es funktionieren könnte!

Nutzen Sie die Erfahrungen und Kenntnisse Ihres Teams und brainstormen Sie zu dieser innovativen Produktidee, indem Sie verschiedene Ideen sammeln. Am Ende soll anhand einer Skizze auf Flipchartpapier ersichtlich werden, wie die mobile Waschmaschine für Rucksackreisende aussehen und funktionieren soll.

Sie haben insgesamt 15 Minuten Zeit!

Bei Fragen wenden Sie sich bitte an die Versuchsleitung.

B4: Measures***Team Regulatory Focus (German Items):***

Bitte geben Sie an, inwiefern die folgenden Ausdrücke und Redewendungen auf die Entscheidungsfindung Ihres Teams im Rahmen der vorangegangenen Team-Aufgabe zutreffen.

(Prevention Focus):

- Handle ganz normal, das ist schon verrückt genug.
- Schuster, bleib bei deinen Leisten.
- Vorsicht ist besser als Nachsicht.
- Sich nicht auf dünnes Eis begeben.
- Denke nicht an morgen, ein Tag hat schon genug Sorgen.
- Abwarten, woher der Wind weht.
- Osten, Westen – daheim ist's am besten.

(Promotion Focus):

- In der Abwechslung liegt die Würze des Lebens.
- Den Horizont erweitern.
- Wer nicht wagt, der nicht gewinnt.
- Wo ein Wille ist, ist auch ein Weg.
- Das Beste geben.
- Das Leben ist zum Leben da.
- Du weißt nie, was Du erreichen kannst – bis Du es versuchst.

Idea Generation and Implementation Activities (Coding Scheme):

| Kategorie: Ideengenerierung | |
|--|--|
| Untergeordnete Aktivitäten inkl. Beschreibung | Beispiele |
| Problemidentifikation/ Stimulierung von Ideen - Ideengenerierende Fragen - (Vorab-)Überlegungen bzw. Aussagen, die Ideengenerierung stimulieren | - Wollen wir erstmal ein Brainstorming machen? (151110 – 1, 00:00:36.1) - Aber wie soll die denn so funktionieren? Mit Strom, oder ... (151110 – 2, 00:00:26.8) - Aber ist das so ne Trommel, die sich dann dreht? Oder wie stellt Ihr euch das vor? (15110 – 2, 00:01:35.1) |

| | |
|---|--|
| <p>Ideen sammeln</p> <ul style="list-style-type: none"> - Einfache Kommentare & Vorschläge der TN hinsichtlich Materialien, Funktionen, Komponenten und Design der Waschmaschine - (z.T. auch als Folge der vorangegangenen Stimulierung) | <ul style="list-style-type: none"> - Klein, platzsparend ... (151110 – 2, 00:00:15.7) - Im Rucksack integriert, würde ich sagen (151110 – 2, 00:00:22.5) - Am besten faltbar (151110 – 3, 00:00:20.7) - Das System Salatschleuder! (151112 – 4, 00:00:00.0) |
| <p>Ideen sichern</p> <ul style="list-style-type: none"> - Festhalten/ Mitschreiben von (meistens im Brainstorming) genannten (groben) Ideen auf dem DIN-A4-Papier - Festhalten/ Mitschreiben des Gedankenverlaufs (Protokollfunktion) | <ul style="list-style-type: none"> - Schreibs auf. .../ Also, Kurbel und Solar ... (151117 – 2, 00:00:37.9) - Soll ich mal den Gedankenverlauf aufschreiben, damit wir nichts vergessen?! ... (151112 – 4, 00:00:15.4) |
| <p>Diskussion & Evaluation von Ideen / Lösungsansätzen</p> <ul style="list-style-type: none"> - Diskussion von Ideen hinsichtlich ihrer Umsetzbarkeit, Praktikabilität etc. - Evaluierung der eigenen Ideen und der Ideen anderer TN bezüglich des Materials, des Designs, der Komponenten, der Funktionen, sowie des Namens oder Slogans - Ablehnung anderer Ideen oder Widerruf eigener Ideen | <ul style="list-style-type: none"> - Ja also, von ner viereckigen Form mit ner Schleuder müssen wir uns eigentlich verabschieden, weil das passt ganz schlecht in nen Rucksack hinein. Auch in nen Backpacker-Rucksack, der ist zwar groß, aber (Kopfschütteln)/ Ja/ Ja, ich glaub, alles wo zu viel Extra-Gedöns dran ist/ Allerdings könnten wir dann auch weniger Kleider mitnehmen, weil wir dafür ja ne Waschmaschine haben/ Ja/ Ja stimmt (151113 – 2) |
| <p>Ideen kombinieren & integrieren</p> <ul style="list-style-type: none"> - Auf der Idee eines anderen TN aufbauen - Genannte Ideen aufgreifen und um weitere Aspekte ergänzen - Verschiedene Ideen kombinieren, integrieren, zusammenfügen | <ul style="list-style-type: none"> - ... sowohl als auch. Mit einer Kurbel und einer Batterie (151110 – 3, 00:00:55.2) - Man könnte ja auch überlegen, dass man so eine Art Advanced Edition macht. Also dass man sowohl Solarenergie nimmt als Möglichkeit das aufzuladen als auch einen Stecker, falls man irgendwo ist, wo Elektrizität ist, dass man dadurch auch den Akku aufladen kann, also dass das so ein Entweder/ Oder ist (151112 – 4, 00:03:20.4) |
| <p>Entscheiden, welche der gesammelten Ideen in Frage kommen</p> <ul style="list-style-type: none"> - Das Befürworten einer Idee in der Gruppe - Entscheidung wird durch einzelne Gruppenmitglieder getroffen | <ul style="list-style-type: none"> - Gut, wir machen sie auf jeden Fall, dass sie ohne Strom funktioniert, mit Deiner Kurbel-Idee, das ist glaub ich, das was ... / Okay (151117 – 2, 00:08:13.0) - Also, wichtig ist die abnehmbare Kurbel, die Solarzellen und dass man sie zusammenfalten kann, das ist das Wichtigste. Ok, schreibs so auf! (151117 – 2, 00:14:58.9) |

Kategorie: Ideenimplementierung

| Untergeordnete Aktivitäten inkl. Beschreibung | Beispiele |
|---|---|
| Stimulierung der Umsetzung <ul style="list-style-type: none"> - Impulse, mit der (probeweisen) Umsetzung zu beginnen - Übergang zur Umsetzung | <ul style="list-style-type: none"> - Ok, wir fangen jetzt an zu zeichnen, wir haben keine Zeit mehr (151117 – 2, 00:08:09.3) - Wollen wir mal ne kleine Skizze machen, damit wir das wissen, wie wir das aufs große Papier?/ Ok/ Also, ich glaube, Du hast da das beste Bild von/ Aber ich weiß nicht, wie eine Salatschleuder aussieht/ Mal doch erstmal provisorisch (151112 – 4, 00:05:09.3) |
| Details der Idee herausarbeiten / Detaillierte Ideen <ul style="list-style-type: none"> - Ideen genauer beschreiben, verfeinern, präzisieren - Konkrete Formulierungen bezüglich der Materialien, Funktionen, Komponenten, und des Designs. - Oft parallel zum Zeichenprozess - Genaue Funktionsweise wird erläuternd zusätzlich zur Skizze auf dem DIN-A4-Papier festgehalten | <ul style="list-style-type: none"> - Und jetzt kannst Du hier die Verbindung machen, von dem Wasser zur Trommel, denn das muss da irgendwie rein (151110 – 2, 00:09:44.0) - Dann brauchen wir noch so ein Gestänge, das wir da hineinstecken können – im Endeffekt wie ein Zelt, das man aufbaut. Genau, also sozusagen ein X, das man aufstellt wie einen Wäscheständer und dann klappst Du obendrauf diesen Rührmechanismus wie einen Deckel. Das ist quasi zusammengefaltet und dann klappst Du es darauf und dann hast Du die „Salatschleuder“ (151110 – 3, 00:04:44.5) |
| Idee probeweise umsetzen <ul style="list-style-type: none"> - Skizzieren/Andeuten eines ersten Entwurfes auf einem DIN-A4-Papier | <ul style="list-style-type: none"> - Wir müssen eine Sicht von der Seite und eine von oben machen ... (151112 – 4, 00:05:26.1) - Also, wenn das jetzt hier der Rucksack ist, dass die Waschmaschine diesen Teil einnimmt, dann hast Du hier unten noch ein bisschen Stauraum und rechts und links ... (151117 – 2, 00:03:37.2) |
| Idee umsetzen <ul style="list-style-type: none"> - Das Zeichnen der mobilen Waschmaschine (finale Idee) inklusive aller nötigen Komponenten und Details auf ein Flipchartpapier - Das finale Beschriften der Einzelteile des Geräts | Handlung: Das Zeichnen der fertigen Waschmaschine auf ein Flipchart & das Beschriften der Einzelteile: <ul style="list-style-type: none"> - Ich mal einfach mal großzügig ... (151113 – 2, 00:12:52.7) |
| Aufgabe fertigstellen <ul style="list-style-type: none"> - Anregung/ Hinweis, Impuls, langsam zum Abschluss zu kommen (mit Blick auf die Zeit) - Überlegung, ob noch etwas fehlt/noch notiert werden sollte | <ul style="list-style-type: none"> - Okay, noch zwölf Sekunden, was machen wir mit der Trommel? (151117, 00:14:48.0) - Wollen wir machen, einer malt das Ganze und einer malt die Einzelteile? Dann sind wir ein bisschen schneller, wir haben nur noch 5 Minuten (151112 – 4, 00:09:32.0) |

APPENDIX C (Study 3)

C1: Interview Guideline (Translated Version)⁵

Welcome and general information

1. Introductory questions

- To get started, please tell me something about your professional activity, that is, what exactly is your professional activity?
 - If necessary, check whether the interviewee works in a team or alone (if necessary, ask about his/her exact position/role on the team).
 - If necessary, find out when the interviewee started and what he/she did previously.
 - Check which branch he/she belongs to.
 - If necessary, check whether the interviewee has a leading position.

2. Focus questions on idea generation

Thank you very much. In the following, I would like to ask you about your experiences with innovation/innovation processes. In **Topic 1** of our interview, I am interested in the activity of idea generation, i.e., the development of ideas.

Situation 1.1

- Please recall a **situation/context** in which you had a new (business) idea. This can be your founding idea, but also a smaller idea that you have followed up. [Please recall the last concrete **situation/context** in which you followed an innovative (business) idea intensively from the beginning (i.e., from the emergence of the idea).] What was the history/background within which the idea arose?
 - If necessary, go into it and have the situation described in more detail.
 - Ask for concrete activities/steps: Please describe as precisely as possible: How did you [the actors] (then) proceed with the (further) development of this idea? What concrete activities did you [they] carry out? (What exactly did you [they] do? What steps did you [they] take?).
 - If necessary, keep social processes in mind (e.g., communication/negotiations/discussions).

⁵ The interviews were part of a comprehensive research project. Interview parts that were not relevant in the context of this study were deleted. Note that the facilitators' version of this guideline is displayed in square brackets.

Situation 1.2

- Please tell me about a concrete **situation/context** in which a process of idea generation stalled. This can be the situation you just described or another situation. What caused the process to stop—what were the obstacles that you remember?
 - If necessary, delve into it and have the situation described in more detail.
 - Ask for concrete activities/steps: When the process stalled: What did you/[what did the actors]/what did others do to push the idea forward?
 - If necessary, also ask about social processes (e.g., communication/negotiations/discussions).
 - Ask if activities/steps were effective: Did you [the actors] get anywhere with it? Why or why not?

Summary: What were the key activities/steps?

3. Focus questions on idea implementation

Thank you very much, now I come to **Topic 2** of the interview. Here, I would like to ask you about your experiences with the implementation of ideas.

Situation 2.1

- Please tell me about a concrete **situation/context** in which you have actually realized an idea (ideally your own or an idea of your own team). [Please tell me about a concrete **situation/context** in which you have accompanied the implementation of a project or idea.] This could be the idea/project we just talked about – but it could also be another idea.
 - If necessary, go into it and have the situation described in more detail.
 - Ask for concrete activities/steps: Please describe as precisely as possible: How did you [the actors] proceed with the implementation of your ideas? What did you (or others/the team) [they] do in concrete terms? What activities/steps did you [they] carry out?
 - If necessary, also keep social processes in mind (e.g., communication/negotiations/discussions).

Situation 2.2

- Please tell me about a concrete **situation/context** in which this process of implementing ideas stalled. How/why did the process come to a standstill, that is, what were the obstacles that you remember?
 - If necessary, go into it and have situations described in more detail.
 - Ask for concrete activities/steps: When the process stalled: What did you/[what did the actors]/what did others do concretely to further the implementation?

- If necessary, ask about social processes (e.g., communication, negotiations, discussions).
- Ask if activities/steps were effective: Did you [the actors] get anywhere with it? Why or why not?

Summary: What were the key activities/steps?

4. Concluding remarks and socio-demographic questions

Is there anything else that you think is important to say about idea generation and implementation that we have not talked about yet?

What other comments or questions do you have about the interview?

Socio-demographic questions:

Age, gender, professional experience in general, professional experience in the context of innovation, educational level.

Description of research project and farewell

C2: Final Coding Scheme (Study 3)

| Category | Definition | Coding Rule |
|---------------------|---|---|
| Exploration: | | |
| Search | Searching for opportunities, solutions, information, norms, routines, structures, and systems | Active search; this also includes conversations with or interviewing potential users/affected people/experts; investigation activities; discussions |
| Variation | Creating variation or variety | Variety emerges, e.g., when there are many different ideas or different perspectives; variety expands the wealth of experience |
| Risk-taking | Actions that require or include risk-taking | New ideas, products, or processes are pursued even if this involves a risk or the outcome is unclear |
| Experimentation | Experimenting with new ideas, processes, products, and new approaches toward technologies, business processes, or markets | New ideas, products or processes are tried out, tested, or implemented on a trial basis; also prototyping |
| Play | Exploring an idea playfully; reconsidering existing beliefs and decisions | New ideas, products or processes are thought through in a playful way; a very open approach without concrete goals or limitations; rethinking existing beliefs, ideas, or decisions |
| Flexibility | Being flexible in finding or adapting solutions or ideas | Flexible action and adaptation of the chosen solution or product (if necessary, in response to new information or development) |
| Discovery | Making a discovery | Something previously unknown is found/discovered |
| Innovation | Being innovative and adopting a long-term orientation | Dealing with the innovative potential (e.g., novelty, originality) of an idea; taking a more long-term perspective |

| Category | Definition | Coding Rule |
|----------------------|--|---|
| Exploitation: | | |
| Refinement | Refining or developing products, processes, relationships, or existing knowledge | Existing ideas, products, or processes are refined, improved, or further developed; knowledge is made more precise |
| Choice | Choosing among different processes or alternative ways to accomplish a goal | Situations in which there is a choice among different alternatives, although a choice is not necessarily made or has to be made |
| Production | Focusing on the production of products/services | Creation of the actual product |
| Efficiency | Improving the efficiency of existing products, services, or processes | Aiming at (more) efficient products, task fulfillment, or task distribution within the team or organization |
| Selection | Selecting one or a few ideas or opportunities out of an idea collection | Selection of one or a few idea(s) from a collection of previously collected ideas and approaches |
| Implementation | Implementation of existing ideas or projects | Already existing ideas or products are finally implemented or brought to market |
| Execution | Execution of routine activities, tasks, or processes with existing knowledge | Execution or completion of routine tasks or tasks with low complexity, short-term orientation |