

TECHNISCHE UNIVERSITÄT MÜNCHEN

TUM School of Management

Professur für Forschungs- und Wissenschaftsmanagement

Stimulating innovation:

The role of leadership, teamwork, and boundary spanning

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Vollständiger Abdruck der von der Fakultät für Wirtschaftswissenschaften der Technischen Universität München zur Erlangung des akademischen Grades eines Doktors der Wirtschaftswissenschaften (Dr. rer. pol.) genehmigten Dissertation.

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Prüfende der Dissertation: 1. Prof. Dr. Claudia Peus
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Die Dissertation wurde am 13.06.2016 bei der Technischen Universität München eingereicht und durch die Fakultät für Wirtschaftswissenschaften am 15.07.2016 angenommen.

ACKNOWLEDGEMENTS

This dissertation would not have been possible without the support of many persons who offered advice and direction and listened to the occasional complaint:

First and foremost, I would like to thank my supervisor Prof. Dr. Claudia Peus for giving me this opportunity, providing guidance and encouragement throughout the journey, and seeing it through to the end. I am greatly indebted to my advisor Dr. Jennifer L. Sparr for her support and the occasional push forward.

I am also thankful to my second examiner Prof. Dr. Nicola Breugst for her effort and understanding, and to Prof. Dr. Frank-Martin Belz for chairing my dissertation committee.

Thanks to my team, the past few years have been awesome. We have shared many battles and gained exciting victories. In seating order, my thanks go to:

Kerstin Löwe, Ellen Schmid, Kristin Knipfer, Armin Pircher Verdorfer,

Tanja Hentschel, Brooke Shaughnessy, Lisa Horvath, Ulf Steinberg, Anna Kraft,

Susanne Braun, Sebastian Mangold, Maxim Egorov.

Special thanks go to my parents and my brother for finding the right amount of times appropriate to ask when this dissertation will finally be done and their unconditional support. I am grateful to my friends for looking out for me, giving advice, and joining me in recharging our energies and for their hospitality in close and far away places.

You have all played a part in making this possible. Thank you.

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ABSTRACT

As team structures are common today, this dissertation examines team members' social relationships at work in the context of innovation and entrepreneurship. Effective interactions with the environment external to the team are considered to be paramount in this regard (West, 2002b), but research on antecedents remains lacking (Marrone, 2010). In this dissertation, leaders and coworkers are proposed to affect individual team members' boundary spanning behavior, which in turn is expected to positively relate to members' innovative behavior and the success of nascent entrepreneurial teams and their members.

In particular, I argue that individuals' team member exchange quality (TMX) positively influences the social process of implementing ideas, which has been neglected in the literature compared to the generation of ideas. In doing so, I recognize the need to consider the multilevel nature of TMX. An entrepreneurial team's ability to reflect on its goals and strategies is also expected to improve team and individual performance in the, so far less researched, pre-founding phase. I propose that charismatic leaders can increase team reflexivity by providing a shared vision and empowering the team members. The complementary opening and closing leader behaviors are expected to provide the necessary discretion and direction for team members' innovative behavior in organizations as the innovation process is characterized by high uncertainty and unpredictability. Furthermore, I hypothesize that leaders and coworkers influence team members' boundary spanning behavior, which is necessary to gather resources and support for innovation. I conducted a series of quantitative field studies to investigate these relationships and present empirical results as well as theoretical and practical implications.

1. INTRODUCTION

Today, team-based structures are popular within organizations (e.g. DeChurch & Mesmer-Magnus, 2010). Individuals are assumed to be worth more for organizational success when working in a team. In fact, it has consistently been noted that team effectiveness goes beyond the sum of each individual member's skills, knowledge, and abilities (Barczak, Lassk, & Mulki, 2010; Stevens & Campion, 1994). Their prevalence is matched by an extensive stream of research aimed at understanding the effectiveness of teams (Gist, Locke, & Taylor, 1987; Ilgen, 1999; Kozlowski & Bell, 2003).

Team structures are particularly prominent in the innovation context because they leverage the different perspectives available from their members leading to cross-fertilization and increased creativity and idea implementation (Hülshager, Anderson, & Salgado, 2009; Perry-Smith & Shalley, 2003; Pirola-Merlo & Mann, 2004). Effective teamwork, e.g. communication (Damanpour, 1991; Hirst & Mann, 2004), collaboration (Barczak et al., 2010), and identification (Glynn, Kazanjian, & Drazin, 2010) within teams, has been found to be a critical success factor for organizational innovation (Hoegl & Gemuenden, 2001; Hülshager et al., 2009; Mathieu, Maynard, Rapp, & Gilson, 2008).

Similarly, teams are predominant in the world of entrepreneurship (Cooney, 2005; Klotz, Hmieleski, Bradley, & Busenitz, 2014; Vyakarnam, Jacobs, & Handelberg, 1999), as entrepreneurial endeavors and innovative activities within organizations are related (Lechler, 2001). Entrepreneurial firms are to a large part responsible for the creation of high-quality innovations within an economy (Van Praag & Versloot, 2007). A majority of new ventures today is founded by teams, who benefit from the heterogeneity of the available skills, knowledge, and abilities of the team members (Baron, 2007; Cooper, Woo, & Dunkelberg, 1989; Ensley, Hmieleski, & Pearce, 2006a; Klotz et al., 2014; Lechler, 2001). The time of

lone inventors seems to have passed, although research on entrepreneurial teams is lagging behind.

Understanding factors that influence how work is completed within teams is, thus, central for business and society. In my dissertation, particular attention is focused on the different actors that team members interact with at work and their role in fostering team members' innovative behavior in organizations and entrepreneurial teams' activities previous to founding a new venture. Specifically, these actors are 1) team leaders, 2) other members of the own team, and 3) actors external to the team.

Leaders have a crucial role in the success of teams (Hackman, 2002; Mathieu et al., 2008; Zaccaro, Rittman, & Marks, 2001). The leadership style chosen by a team's leader has a strong impact on both individual members' emotions (Ashkanasy & Jordan, 2008) and behaviors (Gang, Oh, Courtright, & Colbert, 2011), as well as the climate within a team (Kozlowski & Doherty, 1989; Zohar & Tenne-Gazit, 2008). While the importance of leaders has been recognized in the innovation context (Burpitt & Bigoness, 1997; Hammond, Neff, Farr, Schwall, & Zhao, 2011; Paulsen, Maldonado, Callan, & Ayoko, 2009; Rank, Nelson, Allen, & Xu, 2009), previous results on the influence of leadership styles on team and individual innovation are ambiguous leading to calls for additional research studying the effectiveness of leaders throughout the innovation process (Anderson, Potocnik, & Zhou, 2014; Bledow, Frese, Anderson, Erez, & Farr, 2009; Chen, Farh, Campbell-Bush, Wu, & Wu, 2013; Rosing, Frese, & Bausch, 2011). Leadership has also been identified as a central success factor for the performance of new ventures (Cogliser & Brigham, 2004; Ensley, Pearce, & Hmieleski, 2006b; Fernald Jr., Solomon, & Tarabishy, 2005). However, it has been neglected in the literature on entrepreneurship (Antonakis & Autio, 2007; Hmieleski & Ensley, 2007) warranting more research on the influence of specific leader behaviors on the survival and success of entrepreneurial teams.

Furthermore, teams do not work independently of their organizational and broader industrial context (Ancona & Caldwell, 1992; Gist et al., 1987; West, 2002b; Yan & Louis, 1999). Interdependence between teams and external actors exists due to specialization where a focal team depends on others' inputs as prerequisites to accomplish its tasks while its output flows into the activities of teams working on later stages in the value creation chain (Marks, Mathieu, & Zaccaro, 2001; Marrone, 2010). In addition, the environment external to the team offers resources such as information, knowledge, and support that are not present within a focal team (Aldrich & Herker, 1977; Ancona & Caldwell, 1990; van Knippenberg, 2003). Acquiring external resources and addressing external demands is crucial for both innovative teams embedded in larger organizations and entrepreneurial new venture teams (Ancona & Caldwell, 1992; Baron & Tang, 2011; Glynn et al., 2010; Hammond et al., 2011; Hülshager et al., 2009; Jenssen & Koenig, 2002; Keller, 2001). However, relationships between internal and external interactions of teams and their individual members, especially antecedents of externally directed activities crossing the team boundaries have been neglected in the literature so far (Choi, 2002; Edmondson, 1999b; Joshi, Pandey, & Han, 2009; Marrone, 2010).

Examples for the value of teams, the importance of leaders, and the necessity to interact beyond the boundaries of the own work team have been discussed in both the popular media and the scientific literature with regard to innovation and entrepreneurship. Entrepreneurial teams originally founded the Microsoft Corporation, the Siemens AG, and many other globally successful companies, and today's new ventures are mainly also started by teams (Cooney, 2005; Klotz et al., 2014; Lechler, 2001; Vyakarnam et al., 1999) that need to interact with funding agencies, prospective customers, and many other actors to gather resources and support (Coviello, 2006; Leung, Zhang, Wong, & Foo, 2006; Neergaard, 2005; Shaw & Conway, 2000). Research and development activities within organizations are structured in teams as well to profit from increased idea generation and implementation

(Barczak et al., 2010; Hoegl & Gemuenden, 2001; Hülshager et al., 2009; Keller, 2001; Mathieu et al., 2008; Perry-Smith & Shalley, 2003; Pirola-Merlo & Mann, 2004; Stevens & Campion, 1994).

In particular, complex, large-scale innovation projects require the collaboration of large numbers of teams to create a final product or service and changes or ideas in one team often impact multiple others (Hoegl, Weinkauff, & Gemuenden, 2004; Marks, DeChurch, Mathieu, Panzer, & Alonso, 2005; Sabbagh, 1996). Common examples for these multiteam systems are space projects at NASA (Hoffman, 1997; Sayles & Chandler, 1992), the development of new automobiles (Clark & Fujimoto, 1991) and aircraft (Horwitch, 1982; Sabbagh, 1996), and the creation of software solutions (Cusumano & Selby, 1998; Guinan, Coopriider, & Faraj, 1998). Failures in the collaboration of different teams can have disastrous results as the publicly discussed cases of the Airbus A380 build by the European Aeronautic Defence and Space Company's (EADS) daughter Airbus SAS (Clark, 2006) and NASA's Mars Climate Orbiter spacecraft (Lloyd, 1999) clearly show. For the latter, a communication mistake between NASA and Lockheed Martin Aeronautics caused the use of different measurement metrics in the two organizations, which led to a total loss of the spacecraft. Airbus, which is set up as an European company with employees in Germany, France, Great Britain, and Spain working on different parts of the A380, encountered problems as wiring turned out to be too short, an issue that was traced back to the use of different software versions by the engineering teams in the different countries (Wong, 2006).

Notably, in both cases, the project leaders were also held responsible for the mistakes occurred (Clark, 2006; Lloyd, 1999). An experiment using an Air Combat Effectiveness simulation (Mathieu, Cobb, Marks, Zaccaro, & Marsh, 2004) also indicates the importance of leadership in multiteam systems (DeChurch & Marks, 2006). In addition, the impact of leaders on the success of innovations is often discussed using Steve Jobs, who led Apple Inc.

out of a crisis and into an era of innovation and profitability (Shontell, 2011), or the visionary CEO of both Space Exploration Technologies Corporation (SpaceX) and Tesla Motors, Elon Musk (Vance, 2015), as examples.

Overall, an individual's environment in a team-based workplace, therefore, consists of three different reference groups: 1) leaders, 2) coworkers within the own team, and 3) actors external to the focal team (Cole, Schaninger, & Harris, 2002; Hoegl et al., 2004). All three have been recognized to strongly influence individual team members' behaviors (Anderson et al., 2014; Hammond et al., 2011; Hülshager et al., 2009; West, 2002b), but research within the innovation or entrepreneurship domains has either been neglected or has led to ambiguous and contradictory findings (Anderson et al., 2014; Antonakis & Autio, 2007; Hmieleski & Ensley, 2007; Rosing et al., 2011). In addition, although a few studies do exist (Hoegl et al., 2004; Marrone, Tesluk, & Carson, 2007), combining multiple of these influence sources to study their dependencies is highly relevant but scarcely done (Choi, 2002; Klotz et al., 2014; Marrone, 2010). The studies in this dissertation, presented in the next three chapters, focus on these research gaps by addressing the relationships between different leadership styles and/or elements of teamwork and boundary spanning and the resulting influence on innovative behavior or entrepreneurial activities.

1.1 Research Questions and Methods

Because entrepreneurial teams and innovation teams within organizations are both confronted with an uncertain and dynamic environment in which to accomplish innovative tasks (Lechler, 2001), individual team members' activities at the team boundaries are the conjunctive element considered in all studies reported herein. Members' boundary spanning behavior is a central success factor in these contexts, but research addressing its antecedents is still lacking (Choi, 2002; Marrone, 2010; West, 2002b). I argue that their relationships with coworkers and leaders influence how team members act towards the teams' external

environment. In the following three chapters, I, thereby, also address recent calls to study leadership, teamwork, and multilevel models in the innovation process (Anderson et al., 2014; Rosing et al., 2011) and in entrepreneurial teams (Antonakis & Autio, 2007; Hmieleski & Ensley, 2007).

In chapter 2, I integrate individual team members' within-team relationships and their interactions with external actors as predictors of idea implementation behavior to answer the question: *How are individual team members' team internal and external relations linked in supporting the implementation of ideas?*

I draw attention to team member exchange (TMX), defined as members' social exchange relationships with their team (Seers, 1989), which, although less studied, completes the consideration of the exchange relationships of employees at work next to leader member exchange (LMX) and positive organizational support (POS) (Cole et al., 2002). It is expected to be positively related to team members' boundary spanning behavior, which, in turn, is proposed to support implementation behavior. Adopting a widely used two-phase model of innovation (Anderson et al., 2014; West & Farr, 1990), I focus on the implementation of ideas instead of the more researched idea generation (Axtell et al., 2000; Baer, 2012; West, 2002a), because it is more of a social process requiring the integration of diverse inputs (van de Ven, 1986). In addition, in line with recent research, I consider an individual team member's TMX compared to the other team members separately from the average level of TMX in the team. This allows to differentiate between within-team and between-team effects (Farmer, Van Dyne, & Kamdar, 2015).

The next chapters then focus on leadership as antecedent of innovation and entrepreneurial success. Chapter 3 addresses the question: *What leadership style is effective in pre-founding entrepreneurial teams and what are the team-level and individual-level mediating mechanisms?*

New ventures are recognized as a place where innovations are created (Harper, 2008; Hisrich, Langan-Fox, & Grant, 2007). Charismatic leadership establishes a vision and empowers employees, which I propose helps entrepreneurial teams to share tasks and work together increasing individual and team performance (Conger, 1999; DeGroot, Kiker, & Cross, 2000). Team reflexivity and individual boundary spanning behavior are expected to mediate the positive relationship between charismatic leadership and performance in this multilevel study.

In chapter 4, I take the ambidexterity theory into account, which considers the innovation process to constantly require opposed but complementary activities and behaviors like exploration and exploitation instead of the sequential presence of distinct phases (Bledow et al., 2009; Gibson & Birkinshaw, 2004; O'Reilly & Tushman, 2013). As previous research has shown ambiguous results for the influence of broad leadership styles on innovation, more specific leader behaviors need to be studied (Rosing et al., 2011). Therefore, I ask: *How does the simultaneous display of opposite but complementary leader behaviors influence employees' innovative behavior?*

Taking a paradoxical view on the newly introduced ambidextrous leadership theory, I expect employees' innovative behavior to be highest when leaders simultaneously show opening and closing leader behaviors. I propose boundary spanning behavior to mediate this relationship as opening and closing leader behavior allow the discretion needed but provide the direction necessary for employees to successfully interact with the environment external to their core team.

A variety of samples and designs were used in these three chapters, addressing shortcomings in the literature. Chapter 2 reports two studies. The first study is a cross-sectional study with two survey time points using participants from academic research teams conducting knowledge-intensive work. The second study is a cross-sectional study using a

sample of entrepreneurial teams in the pre-founding phase, who participated in an entrepreneurship training program. Hence, the hypothesized relationships are studied in both the entrepreneurial and the organizational context and cross-level effects are considered. The study in chapter 3 uses teams from different years of the same entrepreneurial training program. It takes the program's performance evaluations of the participating teams' business plans and each individual's performance in a business pitch into account as outcomes within a multilevel research model. Finally, chapter 4 contains a cross-sectional sample of innovation teams as a pre-study followed by a weekly diary study of individuals from a variety of industries. The latter allows the study of both within- and between-person effects.

Taken together, these studies' designs extend the literature by contributing a multilevel perspective on leadership and team member exchange and addressing the importance of temporal facets in the study of leadership, which have both been called for (Ancona, Goodman, Lawrence, & Tushman, 2001; Anderson et al., 2014; Klotz et al., 2014; Shamir, 2011). After detailing the theoretical basis, the empirical work and results, and the findings and limitations of all studies, I will conclude with a discussion of the general contributions of this dissertation in chapter 5.

2. THE SUCCESSFUL IMPLEMENTATION OF IDEAS: LINKING WITHIN-TEAM AND EXTERNAL INTERACTIONS¹

Introduction

An organization's innovative capabilities, which are increasingly regarded as the critical success factor for continuing performance (Anderson et al., 2014; West, 2002b), depend on individual employees both generating and implementing novel ideas (Axtell et al., 2000; Hammond et al., 2011). Research on innovation so far has mainly focused on the creative generation of ideas and less on idea implementation (Axtell et al., 2000; Baer, 2012; West, 2002a). Moreover, research has only begun to recognize that within organizations, individuals' innovation activities are largely organized in team-based structures (Taggar, 2002). In particular idea implementation is a social process and, thus, is expected to be more dependent than idea generation on factors originating from employees' exchange relationships in their work teams (Axtell et al., 2000; Baer, 2012; van de Ven, 1986), but also from exchanges beyond their team's borders than idea generation. Understanding the effects of employees' relationships to team-internal coworkers as well as their interactions with team-external actors, and the interplay between these interactions on employees' implementation behavior is, therefore, crucial for organizational success (Ancona & Caldwell, 1990; Taggar, 2002; West, 2002b).

Team member exchange (TMX), that is the quality of individuals' exchange relationships with the team as a whole (Seers, 1989), is an important aspect of collaboration within teams through which team members gather valuable social resources (e.g., loyalty, respect, or commitment). While TMX has been argued to support individual team members' creativity and innovative behavior (Agrifoglio & Metallo, 2010; Scott & Bruce, 1994), empirical evidence is scarce. We especially do not yet fully understand the effects underlying

the relationship between TMX and the previously neglected implementation of ideas. To fill this gap, I explicitly study the link between TMX and individual employees' idea implementation behavior in two field studies.

Furthermore, the need to examine the multilevel nature of social exchange relationships, including TMX, has been recognized (Farmer et al., 2015; Henderson, Wayne, Shore, Bommer, & Tetrick, 2008). A social exchange theory lens has been found to be valuable when considering between-person or between-group effects, which previous research has traditionally focused on (Banks et al., 2014; Seers, 1989). Additionally, social comparison processes offer an alternative view on within-team effects that consider an individual team members' perceptions of TMX relative to his or her coworkers' TMX quality (Tse, Ashkanasy, & Dasborough, 2012; Vidyarthi, Liden, Anand, Erdogan, & Ghosh, 2010; Wech, 2003). In line with recent results on both between- and within-group levels of analysis (Farmer et al., 2015), I explore the distinct relations of relative TMX compared to other team members on the individual level and average TMX on the group level with individual idea implementation.

Innovative behavior requires a multitude of resources, not all of which are available within a focal team (Anderson et al., 2014; Choi, 2002; Hammond et al., 2011; Marrone, 2010). Therefore, I propose boundary spanning behavior as a mediator in the positive relationship between TMX and the implementation of ideas. Individuals' boundary spanning behavior includes representing and protecting the team as well as gathering endorsement and information (Ancona & Caldwell, 1990). It is crucial for receiving resources and support for idea implementation from the team's external environment, augmenting the ones already present in the team (West, 2002b). According to social information processing theory, individuals' judgments regarding their work environment are strongly affected by social cues provided by their colleagues (Klein, Conn, Smith, & Sorra, 2001; Salancik & Pfeffer, 1978).

Therefore, TMX is likely to affect how individual team members view their work environment outside the team and act towards it. External interactions, in turn, have been positively connected to innovation success before (Ancona & Caldwell, 1992; Gumusluoglu & Ilsev, 2009; Hargadon, 1998). In my current studies, I, therefore, study employee boundary spanning behavior as a mediator in the relationship between TMX and idea implementation behavior.

My research makes three main contributions to the literature: First, I extend the innovation literature by explicitly focusing on antecedents of the less researched idea implementation within the innovation process. Second, I consider an individual's whole team as exchange partner extending the literature on social exchanges in the workplace and contribute a multilevel perspective allowing additional explanations of TMX's influence on innovation based on social comparison. Third, I examine boundary spanning behavior as mediator in the relationship between TMX and idea implementation by considering its role as an additional resource-generating mechanism. Thus, I broaden the previous literatures' perspective integrating within-team processes and interactions at the team boundaries and extend the scarce research on antecedents of boundary spanning (Choi, 2002; Joshi et al., 2009).

On a practical note, my research increases organizations' understanding of the conditions necessary for created ideas to be moved forward towards their application, reducing the risk of high quality ideas to be dismissed. It offers insights on how individuals can generate resources for idea implementation both from within and outside the team.

Theory

The Innovation Process

West and Farr (1990) defined innovation as “the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, organization or wider society” (p. 9). It has been widely recognized as competitive advantage and predictor of organizational performance and survival (Anderson et al., 2014).

The innovation process includes different kinds of activities and decisions that result in varying coordination and communication needs (Allen, 1977). While many different models exist (Janssen, 2000; Keller, 2006; Saren, 1984), most researchers recognize the need to at least differentiate between the creation of new ideas and their realization (Anderson et al., 2014; Rank, Pace, & Frese, 2004). In line with Farr, Sin, and Tesluk (2003) and West (2002b), I divide the innovation process into two phases, the generation and the implementation of ideas. Hereby, idea generation encompasses the identification of problems and the development of novel and original ideas and has been the main focus of research in the past (Axtell et al., 2000; Baer, 2012; Farr et al., 2003; West, 2002a, 2002b). Idea implementation, on the other hand, covers selecting and applying ideas to create new or improved products and processes providing actual value to the organization.

While not strictly separate and sequential (Bledow et al., 2009), foci and activities differ between the phases and there is first evidence that predictors have distinct effects on the success of idea generation versus implementation (Axtell et al., 2000; Hammond et al., 2011; Keller, 2006; Rank et al., 2004; West, 2002b). In my studies I explicitly focus on antecedents of the less-studied idea implementation phase which is more likely to be dependent on employees’ interactions with others than the idea generation phase which depends more on

individuals' personal factors (Agrifoglio & Metallo, 2010; Axtell et al., 2000; Baer, 2012; Hammond et al., 2011; van de Ven, 1986). Convergence and integration among individual team members' efforts are crucial for improving idea implementation, which has been called more relevant for organizational success compared to idea generation (Baer, 2012; West, 2002a).

TMX and Idea Implementation: Relationships at Different Levels

Team member exchange (TMX), which is originally based on social exchange theory (Blau, 1964), captures the quality of the social exchange relationship between a focal team member and the team as a whole (Seers, 1989; Seers, Petty, & Cashman, 1995). As such, it represents a generalized exchange where the reciprocal action does not stem from the recipient of the focal employee's action, but from anyone in the team (Ekeh, 1974). The resources exchanged in TMX relationships include positive affect, loyalty, respect, and contribution (Blau, 1964; Cropanzano & Mitchell, 2005). In turn, increased respect and loyalty support collaboration, the sharing of ideas and knowledge, and feedback among team members (Agrifoglio & Metallo, 2010). High quality TMX increases individual team members' acceptance of suggestions and the sharing and switching of responsibilities, facilitating team members' flexibility and their integrative and efficient work, which are central factors in idea implementation (Major, Kozlowski, Chao, & Gardner, 1995; Seers et al., 1995; Wech, 2003).

Absolute TMX and Idea Implementation. Previous research on the individual level, which has usually assessed between-person effects using a social exchange rationale (Farmer et al., 2015), has empirically shown TMX to have a positive relationship with organizational commitment, job satisfaction (Liden, Wayne, & Sparrowe, 2000), and helping coworkers (Kamdar & van Dyne, 2007) as well as perceived group effectiveness, perceived group performance, and perceived group cohesiveness (Keup, Bruning, & Seers, 2004).

Furthermore, it has been connected to positive emotions and friendship (Tse & Dasborough, 2008) and to organizational citizenship behavior (Love & Forret, 2008). Aggregate measures of TMX have been related to team performance, as well as individuals' in-role and extra-role performance (Chun, Cho, & Sosik, 2015) and intentions to share knowledge (Liu, Keller, & Shih, 2011). In line with Scott and Bruce (1994), who proposed a positive relationship between TMX and a general measure of innovative behavior and considering the positive effects of TMX on efficiency, collaboration, and knowledge sharing presented above, we propose a positive relation between individuals' absolute TMX quality and their idea implementation behavior. We refer to these perceptions as *absolute TMX* because, in line with the previous research presented above, they consider the absolute effect of between-person differences in the perceptions of TMX quality using a social exchange rationale, but do not consider the multilevel nature of TMX or explicitly address the focal individuals' team membership.

Hypothesis 1a: Absolute TMX is positively related to individual team members' idea implementation.

While the vast majority of the TMX literature so far considered either the team or the individual level when examining the influence of TMX focusing either on between-team or between-person effects (Farmer et al., 2015), a small amount of past studies has discussed the variance of TMX within a team as a meaningful variable on the team level, calling it TMX differentiation (e.g. Liao, Liu, & Loi, 2010; Liu et al., 2011). Only recently, empirical studies have begun to also address the relevance of within-team differences among team members' social exchange relationships, including TMX, on the individual level using social comparison processes to account for their findings (Farmer et al., 2015; Henderson et al., 2008; Tse et al., 2012; Vidyanthi et al., 2010).

Individual level studies examining the influence of TMX commonly used samples of independent employees each of whom, nonetheless, works in a team. Therefore, previous studies potentially confounded distinct explanatory mechanisms that might be at work for within-team and between-team differences in TMX (Farmer et al., 2015; Klein, Dansereau, & Hall, 1994). For leader member exchange (LMX) (Graen & Cashman, 1975), which is strongly related to TMX (Seers, 1989), between-team and within-team effects on a variety of relevant outcomes like cohesiveness and cooperation have been found (Cogliser & Schriesheim, 2000). To address this gap in the TMX literature, following Farmer et al. (2015), I separate the influence of TMX into two components, namely 1) the *average TMX* in the group (i.e. the aggregated group mean of team members' TMX) and 2) a team member's *relative TMX* (i.e. individual TMX compared to the group mean). Considering individual team members' relative position has been found to be superior to the use of a concept based on the variance within the team when in combination with an aggregated shared perception in the team (Schyns, van Veldhoven, & Wood, 2009).

Average TMX and Idea Implementation. In line with my arguments presented above, I expect a team's average TMX to support idea implementation behavior due to the creation of a favorable environment within the team increasing team members' efficiency, collaboration, and knowledge sharing (Agrifoglio & Metallo, 2010; Liu et al., 2011) and the bolstering of employees' self-efficacy (Liao et al., 2010) and empowerment (Schermuly & Meyer, 2015). Based on the established social exchange rationale, average TMX increases the availability of social resources like positive affect, loyalty, respect, and contribution (Blau, 1964; Cropanzano & Mitchell, 2005) within the team which, in turn, facilitate idea implementation by increasing team members' acceptance of suggestions, flexibility, and integrative work (Major et al., 1995; Seers et al., 1995; Wech, 2003).

Hypothesis 1b: Average TMX is positively related to individual team members' idea implementation.

Relative TMX and Idea Implementation. Team members' relative TMX, in contrast, influences team members' self-concept as it provides them with information on their standing within the team (Farmer et al., 2015; Festinger, 1954; Henderson et al., 2008; Tse et al., 2012). The relevance of team members' relative perceptions of their own relationships compared to coworkers beyond the influence of the actual quality of the relationship has recently been shown (Henderson et al., 2008; Schyns et al., 2009; Vidyarthi et al., 2010) as team members' are able to recognize the differences within a group in treatment received from an important social entity (Maslyn & Uhl-Bien, 2005; Sias & Jablin, 1995). Individuals' with high relative TMX are more inclined to focus on improving teamwork and reaching the team goals as they consider themselves to be highly valued and central for the team's success and strongly identify with their team. Envisioning and planning, two self-regulatory, goal-directed processes, have been found to increase individuals' innovative work behaviors (Montani, Odoardi, & Battistelli, 2014). High relative TMX also leads team members' to openly voice suggestions and to participate in decision-making increasing their ownership for the idea, a central element of successful implementation (Anderson & West, 1998; West, 1990). Additionally, increased prestige decreases individuals' resistance to the implementation of new ideas (e.g. Goltz & Hietapelto, 2003; West, 2002a).

On the other hand, low relative TMX leads to a negative self-perception and a focus on self-interest neglecting connections to coworkers (Farmer et al., 2015). Also, individuals' perceive a lack of fulfillment regarding the reciprocity obligations of the team. The resulting isolation inhibits the cooperation and integration necessary for successful idea implementation (Agrifoglio & Metallo, 2010; Axtell et al., 2000; Baer, 2012; Hammond et al., 2011; van de Ven, 1986). Additionally, employees' self-focus and feeling of separation from the team

resulting from low relative TMX prohibit their participation in a learning environment conducive to implementation (Klein & Knight, 2005). Previous research findings, however, show that, to implement an idea, individuals need to form strong relationships with coworkers to gain support and resources (Axtell et al., 2000; Baer, 2012).

Hypothesis 1c: Relative TMX is positively related to individual team members' idea implementation.

TMX and Boundary Spanning Behavior

Teams do not exist in a vacuum, but are part of larger organizations and value creation chains (Ancona & Caldwell, 1992; Gist et al., 1987; West, 2002b). A team's external environment is both a source of demands and uncertainty but also of information, support, and resources for the team members (Ancona & Caldwell, 1990; Elkins & Keller, 2003; West, 2002b). Hence, individual's boundary spanning behavior (BSB) has been introduced to capture interactions with actors external to the focal employees' team (Ancona & Caldwell, 1990, 1992; Marrone, 2010; Marrone et al., 2007). It includes representing the team and buffering outside pressure, coordinating with external actors, and searching for information. Effective boundary spanning behaviors support knowledge transfer within and between organizations (Argote, McEvily, & Reagans, 2003; Hansen, 1999) and organizational innovation (Hargadon, 1998) and effectiveness (Carlile, 2004).

Absolute TMX and BSB. The social resources like respect and loyalty obtained through TMX bolster employees' willingness to contribute (Blau, 1964; Cropanzano & Mitchell, 2005) and create positive emotions and friendship with coworkers strengthening team cohesion (Keup et al., 2004). Empirical evidence also reinforces the notion that high quality exchange relationships, through supportiveness and appreciation, encourage individuals to generate positive perceptions of themselves and their teams, increasing

employees feelings of both collective (Hill et al., 2013) and individual self-efficacy (Liao et al., 2010) as well as psychological empowerment (Schermuly & Meyer, 2015).

All boundary spanning behavior is challenging and taxing and contains a high amount of responsibilities, requiring team members to be confident about their competences and have the support of their coworkers (Edmondson & Boyer, 2013; Marrone, 2010; Marrone et al., 2007). Additionally, the constant need to shift attention from inside the team to the exterior is facilitated when individual members feel belonging to and safely embedded in their team (Edmondson, 1999b; Richter, West, van Dick, & Dawson, 2006). Therefore, I propose that a high absolute TMX quality will provide individuals with the social resources and the conditions within the team that will support them in finding the right strategies to successfully cross the team boundaries and manage their interactions with external actors.

Hypothesis 2a: Absolute TMX is positively related to individual team members' boundary spanning behavior.

Average TMX and BSB. In a second step I again consider the multilevel nature of TMX by separating the between-team from the within-team effect using average TMX as the shared perceptions of TMX in a team and relative TMX as individual team members' comparison of their TMX to their coworkers. By increasing the social resources available within the team, average TMX creates a sense of belonging for the employees and a shared feeling of obligation towards the team (Cropanzano & Mitchell, 2005; Farmer et al., 2015). A favorable view of their team motivates team members to represent it in a positive light (Ashfort & Mael, 1989). Thus, employees feel safe and are encouraged to interact with actors external to their own team (Edmondson, 1999b). Familiarity and identification with the team have been shown to foster boundary spanning behavior (Richter et al., 2006; Tesluk & Mathieu, 1999). A cross-level effect of average TMX on team members' in-role and extra-role behavior displayed to fulfill the obligation of reciprocity has been empirically found

(Chun et al., 2015). These and the aforementioned arguments supporting a social exchange explanation lead me to propose a positive relationship between average TMX and boundary spanning.

Hypothesis 2b: Average TMX is positively related to individual team members' boundary spanning behavior.

Relative TMX and BSB. Social comparison information influences team members' sense of their abilities, attitudes, and behavior (Wood, 1989). It allows them to understand whether they are respected and accepted in their team creating a feeling of safety and trust (Darley, 2004; Hu & Liden, 2013), a necessary precondition for boundary spanning behavior (Edmondson, 1999; Richter, West, van Dick, & Dawson, 2006). The uniqueness felt from high relative TMX leads team members to identify more with their coworkers (Farmer et al., 2015) and to increased self-efficacy (Greenberg, Ashton-James, & Ashkanasy, 2007) increasing their boundary spanning behavior. The sense of not being respected compared to others and not belonging to the team resulting from low relative TMX, on the other hand, decreases team members' perceptions of a safe and supportive team environment (Darley, 2004; Edmondson, 1999b; Richter et al., 2006). Feeling treated unfairly affects team members' commitment (Ansari, Kee Mui Hung, & Aafaqi, 2007) and can result in envy and dissatisfaction (Vecchio, 1995) preventing boundary spanning behavior.

Hypothesis 2c: Relative TMX is positively related to individual team members' boundary spanning behavior.

Boundary Spanning Behavior as Mediator between TMX and Idea Implementation

Boundary spanning behavior serves the optimization of the workflow in cooperation with external actors (Marks et al., 2001; Marrone, 2010). For instance, gaining the support of important decision makers allows proceeding with the intended solution selected by the team

members by reducing resistance in the organization (Baer, 2012; Dutton & Ashford, 1993). Furthermore, since the available skills within a team are limited, team members have to acquire additional expertise from the outside to implement new ideas (West, 2002b). Exchanging ideas, obtaining new knowledge and technologies, and learning new abilities through external interactions across team boundaries meet individuals' assistance and resource needs (Ancona & Caldwell, 1992; Burt, 2004; Denison, Hart, & Kahn, 1996; Hargadon & Sutton, 1997; Hülshager et al., 2009; Keller, 2001; Perry-Smith, 2006; Perry-Smith & Shalley, 2003). As such, boundary spanning behavior supports the production of results and also enables efficiency and increases the focus on completing the set goals during the idea implementation phase.

Previous empirical results show interactions across team boundaries to be positively related to team performance (Faraj & Yan, 2009; Hoegl et al., 2004; Marrone et al., 2007), organizational innovation (Gumusluoglu & Ilsev, 2009), and individual contribution within the team (Marrone, 2004). In a research context, the communication between teams has been found to support research and development effectiveness, number of publications, and scientific reputation (West, 2002b). For cross-functional research and development teams, Keller (2001) found external communication to be positively related to technical quality and budget and schedule performance. Edmondson (2003) found boundary spanning to be positively related to the implementation of new technologies in interdisciplinary action teams. Referring to this stream of research and the arguments presented above I expect individuals' boundary spanning behavior to be positively related to their idea implementation as they can access additional social capital and resources from external actors (Nahapiet & Ghoshal, 1998). Given that I have already discussed boundary spanning behavior to be positively influenced by all considerations of TMX, I argue that boundary spanning behavior represents a mediating mechanism for the relationship between TMX and individual idea implementation.

Hypothesis 3: Individuals' boundary spanning behavior mediates the relationship between (a) absolute, (b) average, and (c) relative TMX and individual idea implementation.

Cross-level Moderation of TMX

In line with previous studies, I, additionally, expect there to be a cross-level moderation effect of average TMX on the relative TMX – boundary spanning behavior – idea implementation behavior relationship (Chun et al., 2015; Farmer et al., 2015; Henderson et al., 2008; Tse et al., 2012). Considering that previous studies neglected to separate between-team and within-team effects, the consistently positive findings with regard to absolute TMX mentioned above point towards an augmentative interaction effect of relative and average TMX. In the case of high average TMX, individuals having a high relative TMX will receive the most social resources from the other team members. Thus, their sense of centrality and relevance within the team is strengthened, increasing the identification with their coworkers (Farmer et al., 2015). As argued above, I propose that this will facilitate boundary spanning behavior and subsequently idea implementation behavior (Richter et al., 2006; Tesluk & Mathieu, 1999). An individual with low relative TMX in the same team, however, will perceive a lack of reciprocity increasing their self-centeredness and lowering their identification with coworkers as their expectations based on the high average TMX are not fulfilled. Ultimately, this will reduce boundary spanning behavior, limiting idea implementation behavior as a result.

In a team with a low average TMX, a low relative TMX is not unexpected for individual team members. Thus, the effects of comparing negatively to coworkers are reduced. The loss of self-esteem perceived might be less strong than in teams with high average TMX (Greenberg et al., 2007). Having a high relative TMX in such a team might still not connect individuals to all coworkers. Therefore, they might not perceive themselves as being uniquely valued and central for the team success and their access to resources and

advice might, nonetheless, be limited. In addition, their high relative TMX is not in accordance with their expectations. I propose this to limit the perception of safety and identification within the team, which attenuates its impact on boundary spanning behavior and idea implementation behavior.

Furthermore, the degree to which relative differences impact individuals' sense of inequity depends upon the relevance of the target of comparison (Martin, 1981). Given that in low average TMX teams the coworkers might be less salient as team members are less connected compared to teams with a high average TMX, I expect social comparisons with them to carry less weight for individuals' behavioral decisions. Taking the presented arguments together, I expect the relationship between individuals' relative TMX and idea implementation behavior mediated by boundary spanning behavior to be stronger in teams with a high average than in those with a low average TMX. Therefore, I propose the following moderated mediation:

Hypothesis 4: Individuals' boundary spanning behavior mediates the interactive effect of individuals' relative TMX and their groups' average TMX on idea implementation, such that the mediated effect is higher when both types of TMX are high.

To test the proposed model displayed in Figure 1, I conducted two studies. The first study focuses on establishing the positive relationship of absolute TMX on individuals' idea implementation behavior and the mediation via boundary spanning behavior. Study 2 addresses the multilevel nature of TMX by considering within-team and between-team effects separately and examines the proposed moderated mediation.

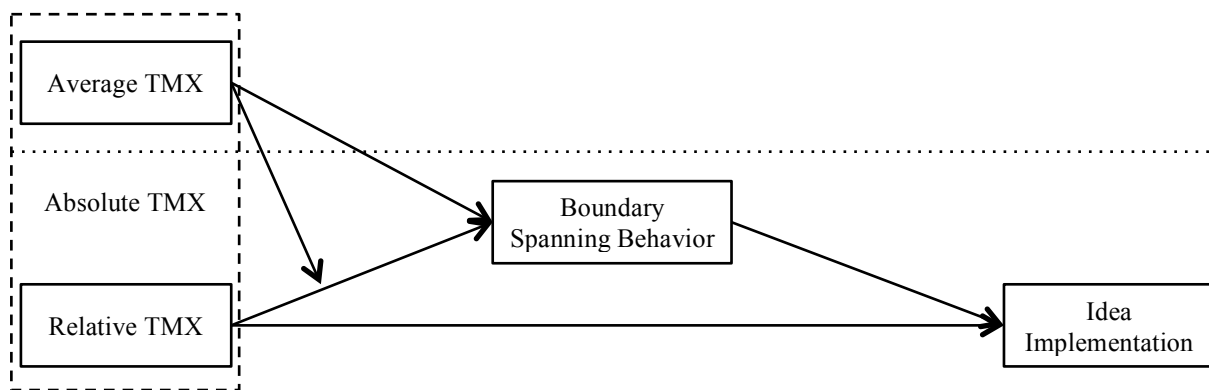


Figure 1. Theoretical model. TMX = team member exchange.

Study 1

Method

Sample and Data Collection

To acquire participants for Study 1 I contacted scientists from natural sciences and engineering departments of major German universities and research institutions. I selected individual scientists clearly working in identifiable research teams through the websites of their organizations. Participants received a short project description and the link to the first of two questionnaires, which contained items capturing TMX and demographic information via e-mail. 4 weeks later, participants received the link to the second questionnaire assessing boundary spanning behavior, idea generation, and idea implementation. Potential participants were told that the research project investigated collaboration within teams and with their environment to better understand what facilitates successful knowledge transfer and dissemination at work.

The final sample for Study 1 includes 76 independent individual participants who completed both questionnaires. Average age of all participants was 30.11 years ($SD = 6.58$)

and 74.70% were male (one person did not indicate a gender). Participants had worked an average of 2.77 years ($SD = 3.45$) in their teams and 3.15 years ($SD = 3.76$) in their departments. Average size of individual participants' teams was 10.55 ($SD = 6.67$) team members. The questionnaire was available both in German (93.40%) and English (6.60%).

Measures

Team Member Exchange. Following existing research, TMX was assessed using a 10-item scale based on Seers et al. (1995) with a German translation adapted from Trippel (2012). A sample item is "In busy situations, how often do other team members ask you to help out?". Items were administered on a 5-point Likert scale ranging from 1 (not at all) to 5 (always) and the reliability reached $\alpha = .73$.

Boundary Spanning Behavior. Individual boundary spanning behavior was measured using a 20-item scale adapted from Ancona and Caldwell (1990) covering the ambassador, task coordinator, and scout behaviors. One original task coordinator item was deleted, because it was not applicable in the context of universities and research institutions. A 5-point Likert scale was used ranging from 1 (not true at all) to 5 (absolutely true). Sample items are "Protect the team from outside interference.", "Coordinate activities with external groups.", and "Collect technical information/ideas from individuals outside of the team." The reliability of the scale was high ($\alpha = .94$).

Idea Implementation. Team members' idea implementation was assessed using the three items from Janssen's (2000) innovative work behavior scale that represent idea realization. A sample item is "Transforming innovative ideas into useful applications." and reliability was high ($\alpha = .82$). The 7-point Likert scale ranged from 1 (never) to 7 (always).

Control Variables. In line with previous research, participants' age, sex, and the size of their work teams were included to rule out potential confounds (Farmer et al., 2015). For the variable sex, the value zero indicates a female and the value one a male participant.

If scales were not available in German, back translation procedures described by Brislin (1970) were applied.

Table 1
Means, standard deviations, and correlations between Study 1 variables

	n	M	SD	1	2	3	4	5
1. Team member exchange	76	3.45	.47					
2. Boundary spanning behavior	76	3.10	.76	.22 ⁺				
4. Idea implementation	76	4.31	1.06	.20 ⁺	.40 ^{***}			
5. Age	76	30.11	6.58	.17	.14	-.15		
6. Sex	75	.75	.44	-.03	.00	-.04	.09	
7. Team size	76	10.55	6.67	-.11	.06	.00	-.03	-.05

Note. ⁺ $p < .10$, ^{***} $p < .001$.

Results

Table 1 shows the means, standard deviations, and bivariate correlations for the variables in the first study. From the outset, the significance level was set to $p < .10$ due to the small sample size in this study to increase the power to detect moderate effect sizes (Royall, 1986). TMX was significantly related to boundary spanning behavior ($r = .22, p < .10$) and idea implementation ($r = .20, p < .10$). Boundary spanning behavior was also related to idea implementation ($r = .40, p < .001$). In order to maximize power, I excluded age, sex, and team size from further analyses, as they were not correlated to other variables.

I conducted OLS regressions to test all hypotheses from the proposed model displayed in Figure 1 using the PROCESS tool (Hayes, 2008) for SPSS. Table 2 presents the results of

the mediation analyses. The positive relationship between absolute TMX and idea implementation proposed in Hypothesis 1a could be confirmed ($\beta = .20, p < .10$). Hypothesis 2a proposing a positive relation between absolute TMX and boundary spanning behavior was also confirmed ($\beta = .22, p < .10$). While controlling for absolute TMX, boundary spanning behavior had a positive direct relation to idea implementation ($\beta = .38, p < .01$). The relation of absolute TMX to idea implementation became non-significant ($\beta = .11, ns.$) when introducing boundary spanning behavior.

Table 2
Regression results testing boundary spanning as a mediator for Study 1

	Idea implementation			
	Model 1		Model 2	
	β	SE	β	SE
TMX	.20 ⁺	.26	.11	.25
BSB			.38 **	.15
R ²	.04		.17	
ΔR^2			.13 **	

Notes. n = 76; TMX = team member exchange, BSB = boundary spanning behavior.
⁺p < .10, **p < .01.

I obtained bias-corrected 90% confidence interval limits through bootstrapping procedures (MacKinnon, 2008; Shrout & Bolger, 2002; Taylor, MacKinnon, & Tein, 2008). The significant unstandardized indirect effect of TMX on idea implementation via boundary spanning behavior ($ab = .19, 90\% \text{ CI: } .03, .45$) confirms the proposed mediation while the direct effect of TMX on idea implementation is not significant ($c' = .26, 90\% \text{ CI: } -.15, .67$), supporting Hypothesis 3a.

Having confirmed the positive relationship of absolute TMX and idea implementation as well as boundary spanning behavior as a mediator, I then conducted the second study.

Thereby, I focused on separating within-team from between-team effects of TMX and testing a moderated mediation.

Study 2

Method

Sample and Data Collection

The data for Study 2 was gathered from the participants of a four months long entrepreneurial training program at a leading start-up and innovation center in Germany. The program is offered regularly for students of all levels and focuses on the recognition of entrepreneurial opportunities and the development of business models in a team. Weekly classes provide input on various topics related to an entrepreneurial endeavor while the teams develop their business plan and a prototype outside the classroom. Teams chose a leader whose responsibilities include coordinating their activities and interacting with the program instructors. At the end of the program, leaders submitted their team's business plan and all team members presented their business model to an expert jury. They were then asked to answer an English questionnaire about their past experiences in the program.

The sample in Study 2 consists of the 85 members from 27 teams who participated in the final presentation of their business models. Average age is 23.51 years ($SD = 2.65$; one person did not indicate an age) and 67 participants indicated to be male while 14 indicated to be female (four persons did not indicate a sex). Participants' background was mainly in Management (56.47%), Engineering (17.65%), and Computer Science (11.76%). On average, teams had 3.45 members ($SD = .78$).

Measures

Team Member Exchange. TMX was again assessed with the same 10 items on a 5-point Likert scale ranging from 1 (never) to 5 (very often) and the reliability was $\alpha = .85$. I aggregated TMX using the group mean to obtain values for average TMX and group-mean centered each participant's score to calculate relative TMX (Farmer et al., 2015). $ICC(1) = .18$ ($p < .05$), $ICC(2) = .41$ and mean $r_{wg} = .86$ values indicated that the aggregation was justified (Bliese, Halverson, & Schriesheim, 2002; James, Demaree, & Wolf, 1984; Shrout & Fleiss, 1979).

Boundary Spanning Behavior. Individual boundary spanning behavior was measured with a shortened, 13-item version of the same scale as in Studies 1 and 2 on a 5-point Likert scale ranging from 1 (not at all) to 5 (to a great extent). Reliability of the scale was $\alpha = .83$.

Idea Implementation. Team members' idea implementation was also assessed with the same items as in Study 1 on a 5-point Likert scale ranging from 1 (never) to 5 (very often) with a reliability of $\alpha = .79$.

Control Variables. I included participants' sex and whether they held the leader position in the team as controls on level 1 and team size on level 2. For the variable leader position, the value one represents leaders and the value zero regular team members.

Results

To account for the nested nature of my data (individuals nested within teams) I used hierarchical linear modeling (HLM) analyses (Raudenbush & Bryk, 2002) and introduced group-mean centered level 1 and uncentered level 2 study variables (Zhang, Zyphur, & Preacher, 2009). The effect sizes R^2_1 and R^2_2 represent the proportional reduction of error in the prediction compared to the null model (Snijders & Bosker, 1999).

Table 3*Means, standard deviations, and correlations between Study 2 variables*

	n	M	SD	1	2	3	4	5
1. Team member exchange	85	3.75	.64					
2. Boundary spanning behavior	84	3.47	.64	.22 *				
4. Idea implementation	84	3.80	.85	.21 +	.48 ***			
5. Leader position	82	.32	.47	-.02	.19 +	.18		
6. Sex	81	.83	.38	-.26 *	.01	-.09	-.10	
7. Team size	85	3.45	.78	-.09 ***	.05	.06 ***	-.17 ***	-.14 ***

Note. + $p < .10$, ** $p < .01$, *** $p < .001$.

Table 3 displays the means, standard deviations, and correlations for the variables in Study 2. As they do not take the non-interdependence into account, the correlations need to be interpreted carefully. The regression results predicting boundary spanning behavior, idea generation, and idea implementation are presented in Table 4.

In line with Hypothesis 2b, average TMX ($\gamma = .59, p < .001$) is significantly related to boundary spanning, while relative TMX is not ($\gamma = .03, ns.$), rejecting Hypotheses 2c and 3c. The interaction term of average TMX and relative TMX introduced in a second step is also not significant ($\gamma = .23, ns.$), contrary to Hypothesis 4.

In predicting idea implementation, average TMX shows a significant relation ($\gamma = .60, p < .01$) supporting Hypothesis 1b, while relative TMX does not ($\gamma = .12, ns.$), rejecting Hypothesis 1c. The interaction of average and relative TMX on idea implementation is also significant ($\gamma = .81, p < .05$). The mediator boundary spanning behavior, entered last, shows a significant positive relation to idea implementation ($\gamma = .45, p < .01$) as well.

Table 2
Results of multilevel linear modeling

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Dependent variable	Boundary spanning behavior	Boundary spanning behavior	Boundary spanning behavior	Idea implementation	Idea implementation	Idea implementation	Idea implementation
Fixed effects							
Constant	3.04 (.38)***	.54 (.61)	.52 (.61)	3.24 (.55)***	.75 (1.08)	.66 (1.05)	.83 (.97)
Level 1 control variables							
Sex	.04 (.15)	.19 (.14)	.20 (.14)	-.05 (.21)	.06 (.23)	.08 (.24)	.04 (.19)
Leader position	.32 (.17)+	.34 (.18)+	.37 (.21)+	.35 (.20)+	.38 (.19)+	.46 (.21)*	.34 (.20)
Level 2 control variables							
Team size	.08 (.10)	.12 (.08)	.12 (.08)	.15 (.15)	.19 (.13)	.20 (.13)	.18 (.13)
Level 1 independent variables							
Relative TMX		.03 (.18)	-.81 (2.03)		.12 (.17)	-2.80 (1.43)+	-2.54 (1.34)+
BSB							.45 (.15)**
Level 2 independent variables							
Average TMX		.59 (.15)***	.59 (.14)***		.60 (.22)**	.60 (.21)**	.59 (.21)**
Cross-level independent variables							
Relative TMX x average TMX			.23 (.55)			.81 (.39)*	.74 (.37)*
R ² ₁	.03	.15	.14	.02	.09	.10	.17
R ² ₂	.00	.06	.05	.06	.04	.06	.20

Note. $N = 27$, $n = 84$. Unstandardized coefficients with standard errors in parentheses. Level-1 variables group-mean centered. + $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Because of the significant interaction term, I plotted the effect of relative TMX conditional on average TMX on idea implementation and performed simple slope tests (Preacher, Curran, & Bauer, 2006). As displayed in Figure 2, relative TMX has a significant positive relationship to idea implementation when average TMX was high (1 *SD* above the mean; $\gamma = .58, p < .05$), but not at low levels of average TMX (1 *SD* below the mean; $\gamma = -.10, ns.$).

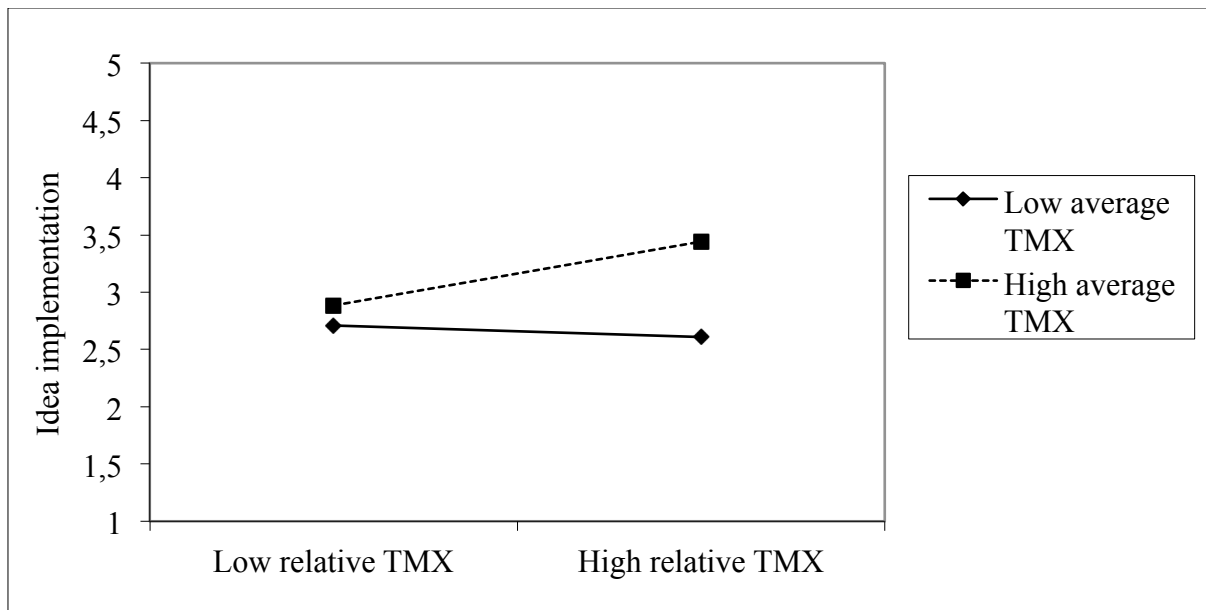


Figure 2. Average TMX as moderator of the relation between relative TMX and idea implementation.

Only average TMX, but not relative TMX, predicted boundary spanning which, in turn, was related to idea implementation. Therefore, I calculated the indirect effect and the corresponding 95% confidence interval using the product of the coefficient method (Tofighi & MacKinnon, 2011) for the mediation of the relation between average TMX and idea implementation via boundary spanning behavior. The unstandardized indirect effect was significant ($ab = .27, 95\% \text{ CI: } .08, .51$) confirming the mediation proposed in Hypothesis 3b.

Discussion

I set out to investigate antecedents of the previously neglected idea implementation phase of the innovation process. By focusing on team members' social interactions with their whole team, I recognize the important role peer colleagues play for everyday work processes. I adopted a multilevel perspective to separately study the within- and between-team variance in TMX, which allowed me to consider a social comparison explanation next to the traditional social exchange view. Additionally, I integrated within-team processes and externally directed activities extending the literature on antecedents of boundary spanning and establishing its value for idea implementation. Thus, I present a model based on resource accessibility that offers insights into the processes underlying the effect by which exchange relationships with their team affect individuals' innovative performance.

My findings confirm the positive relation between average TMX and idea implementation behavior rooted in social exchange theory and its mediation via boundary spanning behavior. Considering within-team differences, average TMX moderated the relationship between relative TMX, which is based on social comparisons, and idea implementation behavior. The outcome is highest when a focal individual's TMX compared positively to the other team members' TMX in a team with a high average quality of TMX. However, boundary spanning behavior did not act as a mediator for relative TMX or the interaction. Therefore, the influence mechanisms of average TMX and relative TMX are shown to differ as the social resources gained through the formers' social exchanges enable team members' to pay attention to the environment outside the team while the latters' social comparison does not. This might be due to the fact, that comparing themselves with other team members requires individuals to focus on the own team ignoring the external environment. In addition, a high average TMX is necessary for the comparison with other team members to have an impact on idea implementation behavior. Only in those teams does

a high relative TMX create the feeling that their work is central to the success of the whole team as members' are connected with everyone else , increasing the motivation to contribute (Maslyn & Uhl-Bien, 2005; Sias & Jablin, 1995).

My results extend the literature in several ways. I provide further evidence that an individual's coworkers are very influential in directing that person's behavior at work (Liao et al., 2010; Seers, 1989). By showing that TMX relationships influence idea implementation I support the notion that idea implementation is a social process. Hereby, I offer a possible explanation for the results of Scott and Bruce (1994) who proposed but could not confirm a positive effect of TMX on a general measure of individual innovative behavior by providing evidence for the need to differentiate between the phases of innovation in research. Focusing on idea implementation fills a void left by research so far, which mostly assessed creativity or neglected to differentiate the phases in the innovation process altogether (Baer, 2012). Without their implementation, however, creating novel ideas has no use (Levitt, 1963).

Additionally, I verify that interactions with entities external to the own core team are central for a successful implementation of ideas (Ancona & Caldwell, 1992; Marrone, 2010; West, 2002b). My results add to the existing literature that argues for the value of external social capital and resources in uncertain and changing environments (Keller, 2001; Nahapiet & Ghoshal, 1998). Specifically, they show how high quality interactions with the closest work colleagues can influence how individuals act throughout their work environment, ultimately influencing their success.

Although it completes the consideration of an individual's relationships at work, TMX has gained less attention in research so far compared to other social exchange relationships. I extend the literature by considering TMX at multiple levels of theory and presenting a model that offers insights into the different processes affecting individual implementation (Farmer et al., 2015). Between-team differences are suggested to be responsible for the results of

previous studies that used TMX and employed social exchange explanations. Average TMX in Study 2 shows the same pattern of results as Study 1, which employed independent participants who work in different teams, while relative TMX does not. I was able to show that team members' within-team comparisons influence implementation behavior dependent upon the general social context. My findings indicate that the underlying processes of the influence of social comparison compared to social exchange explanations differ as relative TMX did not influence boundary spanning behavior. Future research that specifically addresses the different mechanisms is, therefore, warranted.

Furthermore, the results suggest that for members of teams where social exchanges with coworkers are of a low quality, putting comparably more effort into such relationships is not helpful for their idea implementation. While future research is needed to address this issue more thoroughly, I propose a possible explanation for this phenomenon. In such a team, it might take a team member a considerable amount of both time as well as social resources to pursue high quality relationships that are unusual for her team, as routines and social barriers might have to be broken down. This might distract said team member from focusing on her intended task of idea implementation. Additionally, such a team member might experience friction between her own pursuit of social interactions and her team coworkers' indifference. It might also brand said team member as an outsider and misfit creating further obstacles for performance. While, Farmer et al. (2015) found that such team members, nonetheless, identify more with their coworkers than team members with a low relative TMX, their identification with their coworkers did not mediate the relationship of relative TMX to helping behavior. Additional mechanisms need to be studied to fully comprehend the effect of social comparisons regarding the quality of social exchange relationships within teams and their influence on team members' behaviors.

Practical Implications

The following practical implications can be drawn from my research regarding innovation in team-based environments. Since too much creativity can even be harmful to companies if the practical matters of the implementation of novel ideas are not considered (West, 2002a), these studies provide insights into success factors for idea implementation. Organizations need to be aware that some of the ideas created might not be selected and applied due to factors related to the work context instead of the actual usefulness or quality of the idea (Baer, 2012). It is, therefore, critical to foster meaningful exchange relationships in teams, e.g. via teambuilding exercises and trainings on interpersonal skills (Banks et al., 2014), to support their members in implementing ideas, which, in turn, ensures organizational survival and success. In doing so, attention needs to be given to the differences in the relationships of individual team members.

In addition, understanding the factors influencing how team members interact towards external parties is twofold beneficial. First, it allows optimizing knowledge and resource management strategies both between different teams in the organization as well as with external contacts (Ancona & Caldwell, 1992; Marrone et al., 2007). Second, it offers insights into the process that explains the image of their teams in the organization and beyond resulting from team members' behaviors displayed towards the team environment.

Limitations

Although my findings offer several important contributions, the following limitations need to be considered, which also indicate directions for further research. Considering design and measurement issues, all tests are based on cross-sectional, self-report data, limiting my ability to infer causal relationships (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

However, I deliberately separated the predictor from the mediator and outcomes in Study 1.

Then, I used a sample from a different context for Study 2. Together with the different scale endpoints and formats used this lessens the potential for common source bias and strong theory supports the hypothesized relationships (Chang, van Witteloostuijn, & Eden, 2010). In addition, the interaction effects in Study 2 should not be affected by common method bias (Evans, 1985; Siemsen, Roth, & Oliveira, 2010).

The interpretations of the results offered are based on the hypothesized theoretical model, albeit, it is possible that reciprocal relations between team-internal behaviors and behaviors at the team boundary exist. An effect of idea implementation on subsequent levels of these factors is also conceivable. Future research is warranted to longitudinally assess the effects of both the factors considered in this study as well as additional antecedents of idea implementation.

Furthermore, future research should extend the model beyond the one mediator as my results indicate that additional processes might be relevant to the relationship between social exchanges within the team and individual innovative behavior. Beliefs shared between the team members like collective efficacy but also structural characteristics like diversity or the distribution of power impact the behavior of individual team members (Barczak et al., 2010; Hülshager et al., 2009; Watson, Chemers, & Preiser, 2001). This might be true both for boundary spanning behaviors as well as for innovative behaviors. Characteristics of the organization a team is embedded in might also prove to be important influence factors (Banks et al., 2014; Damanpour, 1991). I, therefore, call for future studies to consider team and contextual factors when focusing on the processes that facilitate innovation. Thereby, it needs to be addressed that while factors might be beneficial for an individual's idea implementation, I expect a team's overall ability to implement creative ideas to be relevant for organizational success as well. Additionally, team members' traits, attitudes and behaviors on the individual level should also be considered in relation to idea implementation.

These limitations notwithstanding, my studies provided evidence for the value of social interactions within and between teams for individual team members' idea implementation behavior. Furthermore, my multilevel perspective offers insights into the importance of the social context when team members' compare themselves to coworkers. I hope my findings will be extended in future research on the process by which team internal factors and externally directed actions influence innovation.

3. LEADING NASCENT ENTREPRENEURIAL TEAMS: TEAM REFLEXIVITY AND BOUNDARY SPANNING BEHAVIOR AS MULTILEVEL MEDIATORS²

Introduction

Although the majority of new ventures is founded by teams, empirical research on entrepreneurial teams is still scarce (Klotz et al., 2014). This is especially true for entrepreneurial teams in the pre–founding phase, a phase that is considered to be qualitatively distinct from later phases as well as crucial for new venture success (Bamford, Dean, & McDougall, 2000; Bergmann & Stephan, 2013; Foo, Sin, & Yiong, 2006). In the first place, nascent entrepreneurial teams face the challenge to develop shared team goals and to establish clear team structures and processes (Ensley et al., 2006b; Fernald Jr. et al., 2005; Vyakarnam et al., 1999). This calls for a lead entrepreneur who creates a strong vision and commits others to follow this vision (Baum, Locke, & Kirkpatrick, 1998; Cooney, 2005). In fact, leadership has been recognized as a key factor for entrepreneurial team performance by previous research (Bryant, 2004; Cogliser & Brigham, 2004; Ensley, Carland, & Carland, 2000; Ensley et al., 2006a; Vecchio, 2003). At the same time, leadership is considered a neglected area of entrepreneurship research (Antonakis & Autio, 2007). To date, little is known about *which specific leadership behaviors* are effective in new venture creation (Hmieleski & Ensley, 2007). This study answers prior calls to integrate entrepreneurship with leadership research to learn more about leadership behaviors that move a new venture forward.

A leadership concept that seems particularly relevant for nascent entrepreneurial teams is *charismatic leadership*. Shamir and Howell (1999, p. 265) even state that entrepreneurship is “almost by definition, a charismatic act”. Charismatic leadership puts the articulation of an appealing vision at the center of the leader’s influence on followers and raises the importance of shared goals (House & Shamir, 1993; Paulsen et al., 2009; Shamir, House, & Arthur, 1993). In the managerial context, the positive impact of charismatic leadership on individual

as well as team performance has been shown manifold (e.g. Agle, Nagarajan, Sonnenfeld, & Srinivasan, 2006; Burke et al., 2006; Conger, Kanungo, & Menon, 2000; DeGroot et al., 2000; Keller, 2006; Kirkpatrick & Locke, 1996; Wilderom, van den Berg, & Wiersma, 2012). However, generalization of these results to nascent entrepreneurial teams is not trivial (Ensley et al., 2006a; Hmieleski & Ensley, 2007; Kuratko, 2007; Ucbasaran, Lockett, & Humphreys, 2011) because the goals, requirements, and the internal as well as external context of nascent entrepreneurial teams differ largely from those of established teams in organizations (Bergmann & Stephan, 2013; Foo et al., 2006; Kamm, Shuman, Seeger, & Nurick, 1990; Klotz et al., 2014). In this research, I explore the significance of charismatic leadership behaviors of the lead entrepreneur on the performance of entrepreneurial teams in the pre-founding phase. In doing so, I assume an indirect relationship of charismatic leadership to performance of nascent entrepreneurial teams and focus on the *mediating mechanisms* that drive the effects of charismatic leadership. Specifically, I examine behaviors pertaining to both the interaction within the team as well as interactions with the external environment of nascent entrepreneurial teams as multilevel mediators of the effect of charismatic leadership. I will argue that the relationship of charismatic leadership and entrepreneurial performance is mediated by *team reflexivity* as a team-level process and *boundary spanning behavior* as an individual-level process. Both team reflexivity and boundary spanning behavior have been shown to be related to leadership and/or performance; however, they have not been examined in terms of their mediating effects on entrepreneurial performance before. While previous research has mostly focused on individual-level effects (DeChurch, Hiller, Murase, Doty, & Salas, 2010; Lord & Dinh, 2012), the consideration of mediators on both levels will contribute to the understanding of leadership and entrepreneurship as multilevel phenomena.

In sum, I set out to test the research model shown in Figure 3. This research contributes to the emerging literature on nascent entrepreneurial teams in three ways: First, it is one of only a few studies shedding light on the success factors of entrepreneurial teams in

the pre–founding phase, thereby highlighting the role of a charismatic lead entrepreneur. Second, this research contributes to our understanding of the processes through which charismatic leadership influences entrepreneurial performance by exploring team reflexivity and boundary spanning behaviors as important intervening variables. And third, by considering both team–level and individual–level routes of leadership influence, my study answers calls to account for the multilevel nature of entrepreneurship as well as leadership (Chun, Yammarino, Dionne, Sosik, & Moon, 2009; Davidsson & Wiklund, 2001; West, 2007).

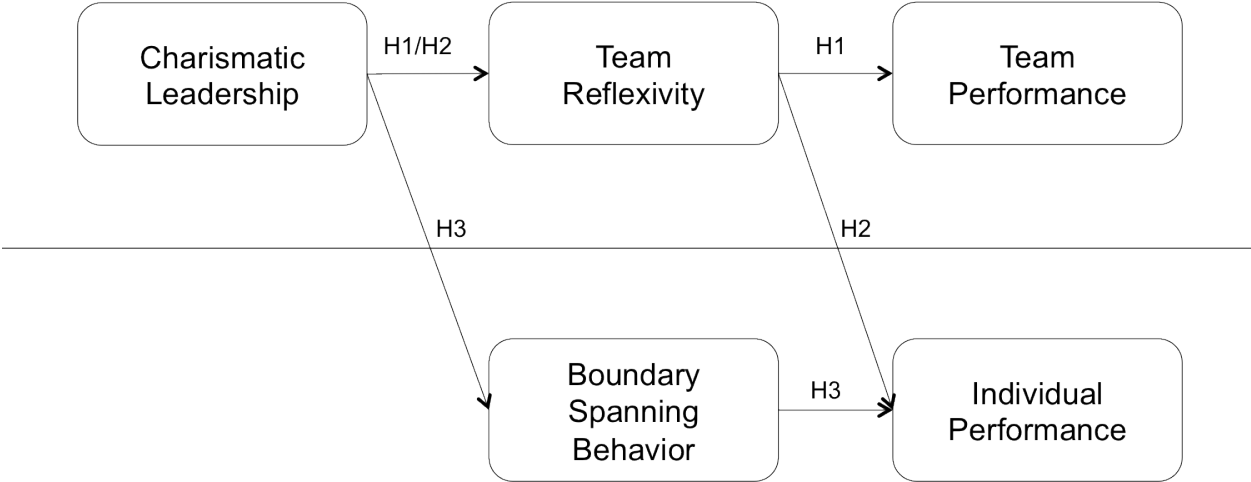


Figure 3. Multilevel mediation model predicting team and individual performance.

The upper part describes team–level relationships, the lower part individual–level relationships. H = hypothesis.

Theory and Hypotheses

The Significance of Charismatic Leadership in Nascent Entrepreneurial Teams

The pre–founding phase is typically conceptualized as the first phase of an entrepreneurial endeavor. It is characterized by several challenges that are very specific for this phase (Baron, 2002). For example, nascent entrepreneurs are required to recognize business opportunities, to select the most promising business idea without knowing the

opportunities and risks associated with this idea, and to develop and continuously refine their business model (Ardichvili, Cardozo, & Ray, 2003; Baron, 1998, 2004, 2006; Baron & Ensley, 2006; Brockner, Higgins, & Low, 2004). In addition to these task-related challenges, nascent entrepreneurial teams are facing unique team-related challenges: They are required to formulate and constantly re-formulate a shared vision of the nascent venture to guide joint action (Ensley et al., 2006a) and to develop a good team-work strategy, share tasks at hand, and perform individually and as a team (Brockner et al., 2004; Cardon, Zietsma, Saporito, Matherne, & Davis, 2005); all this while the team is still forming and changes in all facets of the nascent venture are commonly occurring (Foo et al., 2006; Johnson, Parker, & Wijbenga, 2006). Under such conditions people typically rely on a powerful team leader who has a compelling vision and is able to rally the team in support of shared goals (Cooney, 2005; Foo et al., 2006; Vyakarnam et al., 1999). A *charismatic leader* projects this picture (Jacobsen & House, 2001).

Charismatic leadership is conceptualized around three main components, namely a) communicating a vision, b) acting as a role model, and c) empowering followers to implement the shared vision (Conger, 1999). In their process theory of charismatic leadership, Jacobsen and House (2001) propose that charismatic leaders clearly articulate a vision that motivates and empowers their followers to implement this vision. They transform the needs, values, preferences, and aspirations of followers so that the collective interest becomes more salient than individual team members' self-interest. Thereby, they cause followers to become highly committed and to "perform above and beyond the call of duty" (Shamir et al., 1993, p. 577). Charismatic leaders are able to seize opportunities and to address external requirements as well as their followers' needs to change the status quo (Conger et al., 2000). Finally, charismatic leaders are an object of identification and inspiration because they are themselves willing to make significant personal sacrifices in the interest of the joint vision (Paulsen et al., 2009).

Conger et al. (2000, p. 748) consider charismatic leadership as “an attribution based on follower perceptions of their leader's behavior”. In line with that, Waldman, Javidan, and Varella (2004, p. 358) defined charismatic leadership as a “relationship between an individual (leader) and one or more followers based on leader behaviors”. These theoretical considerations have important methodological implications as they point to the necessity to capture followers’ perception of leadership behaviors rather than considering charisma as a characteristic of the leader. Based on *shared mental models* (e.g. Dionne & Dionne, 2008) and the *direct consensus model* (e.g. Chan, 1998), I further argue that followers’ perceptions of leader behaviors will converge in a team, resulting in a shared team perception of leadership (cf. Braun, Peus, Weisweiler, & Frey, 2013; Dionne, Sayama, Hao, & Bush, 2010; Schaubroeck, Lam, & Cha, 2007; Wang & Howell, 2010). In the following, I will elaborate on my assumptions on how this team perception of charismatic leadership influences entrepreneurial performance through team–level processes as well as individual–level processes.

Team–Reflexivity as a Team–Level Mediator of the Effects of Charismatic Leadership on Entrepreneurial Performance

I propose team reflexivity, that is “the extent that team members collectively reflect on the team’s objectives, strategies, processes and performance and make changes accordingly” (West, 1996, 2000; 2012, p. 5; Widmer, Schippers, & West, 2009), to be an important driver of the effect of charismatic leadership on the team level. Previous findings illustrate that a participative leadership style (i.e. fostering joint decision–making) as well as a facilitative leadership style (i.e., encouraging critical thinking and proactive behavior) enhance team reflexivity (Hirst, Mann, Bain, Pirola-Merlo, & Richver, 2004; Schippers, Den Hartog, & Koopman, 2008; Somech, 2006). Indeed, Schippers et al. (2008) attribute this mainly to the charismatic leadership behaviors. They further argue that the clear vision of charismatic

leaders functions as a shared frame of reference for reflective behaviors. At the same time, a charismatic lead entrepreneur is assumed to encourage the team to initiate new approaches to business planning and to experiment with ideas and strategies to implement this plan. They have been shown to motivate their teams to constantly challenge the status quo (Conger et al., 2000), while creating feelings of control in the team and reducing perceptions of threat (Mumford, 2006). As a consequence, team members feel encouraged and comfortable to challenge the team's goals and strategies (Paulsen et al., 2009).

Team reflexivity facilitates a group's self-organizational activities such as creating working conditions, initiating new tasks, improving routines, and expanding group autonomy in order to handle unexpected situations or to exploit new possibilities (e.g. Conger et al., 2000; Schippers, Den Hartog, & Koopman, 2007; Schippers, Den Hartog, Koopman, & Wienk, 2003; West, 2000). A growing number of studies link team reflexivity to better team performance, especially in contexts where team innovation is required (e.g. Carter & West, 1998; De Dreu, 2007; Gurtner, Tschan, Semmer, & Nägele, 2007; Hammedi, van Riel, & Sasovova, 2011; Hoegl & Parboteeah, 2006; Schippers, West, & Dawson, 2015; Tjosvold, Tang, & West, 2004). I think that team reflexivity is especially relevant for nascent entrepreneurial teams that are still forming. Yet, to the best of my knowledge, my study is the first that investigates team reflexivity as a major catalyst for the performance of nascent entrepreneurial teams and as a driver of the effect of charismatic leadership on entrepreneurial team performance. More specifically, I consider team reflexivity as a team-level mediator of the effect of charismatic leadership on team performance. Accordingly, I test the following hypothesis:

Hypothesis 1: Team reflexivity mediates the positive relationship of charismatic leadership and entrepreneurial team performance.

In line with previous research (e.g. Braun et al., 2013; Gilad Chen, Kirkman, Kanfer, Allen, & Rosen, 2007), I argue that shared team perceptions of charismatic leadership also exert a cross-level effect on individual performance. This assumption is based on recent discussions that “leadership is by nature a multiple-level phenomenon” (Chun et al., 2009, p. 689), and that individual outcomes vary due to team-level properties (cross-level effect or downward cross-level relationship; Mathieu & Taylor, 2007). The vision, which a charismatic entrepreneurial leader communicates to the entire team, is likely to motivate individual behavior targeted at achieving high levels of individual performance. Feelings of team empowerment and feelings of team efficacy enhanced by a charismatic lead entrepreneur will enable individual team members to achieve the high performance expectations put forward by the charismatic team leader (Conger et al., 2000; Shamir et al., 1993; Shea & Howell, 1999). In fact, previous research has provided first evidence for a cross-level effect of team perception of leadership on individual-level outcomes (e.g. Braun et al., 2013; Chen & Bliese, 2002; Chen et al., 2007).

Parallel to the team-level effect, I conceptualize the cross-level effect of charismatic leadership on individual performance to be an indirect effect through team reflexivity. This assumption is based on previous evidence that team reflexivity translates into individual outcomes such as member satisfaction (Schippers et al., 2003; West, 1996). Gurtner, Tschan, and Bogenstaetter (2009) found that team members perceive team reflexivity as positive for their individual performance. Reflexive teams have a more profound understanding of their task. Therefore, team members can more easily anticipate errors and disturbances and show proactive work behaviors in pursuing team goals (West, 2000). Further, team reflexivity is considered to create a “climate of task excellence” (West, 1996, p. 570) through the team’s continuous reflection on goals, strategies, and task achievement. Therefore, team members are encouraged and empowered to excel on their task fulfillment (West, 1996, 2000). I thus propose a cross-level effect, in that team reflexivity will enhance team members’ individual

performance. Taken together, team reflexivity is expected to mediate the effect of charismatic leadership on individual performance in a cross-level mediation.

Hypothesis 2: Team reflexivity partly mediates the positive relationship of charismatic leadership and followers' entrepreneurial performance.

Boundary Spanning Behavior as an Individual-Level Mediator of the Effect of Charismatic Leadership on Entrepreneurial Performance

While team reflexivity represents an internal team process, team members' boundary spanning behavior describes externally directed activities performed by individual members of the team (Gladstein, 1984; Marrone et al., 2007). Boundary spanning behavior includes team members' interactions with actors external to the team such as future customers, potential investors, and other teams (Ancona & Caldwell, 1990, 1992; Marrone, 2010). Two types of boundary spanning behaviors are especially relevant in the context of nascent entrepreneurial teams, namely those of the *scout* and the *ambassador* (Ancona & Caldwell, 1990, 1992; Marrone, 2004, 2010).³ Scout activities include the general search for information to gain a deeper understanding of the external environment and to acquire the skills and expertise necessary for task fulfillment. Ambassadorial behaviors include representing the team project towards stakeholders and acquiring external resources to pursue the business plan.

The team leader has already been recognized as an antecedent of boundary spanning behavior (e.g. Edmondson, 2003; Joshi et al., 2009). Charismatic team leaders pay attention to both internal processes as well as the external team environment and encourage their team members to follow suit (Ancona, 1990; Druskat & Wheeler, 2003; Marrone, 2010). They provide a clear direction as well as encourage followers' initiative, which was shown to support boundary spanning behavior (Marrone et al., 2007; Tesluk & Mathieu, 1999). By

putting emphasis on individual followers' contribution to the team endeavor, charismatic lead entrepreneurs create a "feeling of making a difference" (Conger et al., 2000, p. 752). In addition, charismatic leaders show strong beliefs in the abilities of their followers and increase individuals' self-efficacy and capacity to excel as well as team members' confidence to cross team boundaries (Shea & Howell, 1999). Based on these considerations, I propose that charismatic leadership positively affects individual boundary spanning behavior.

Team members' boundary spanning behavior is especially important in early phases of the entrepreneurial endeavor. Crossing a team's boundary shapes team members' reputation, develops team members' persuasion and impression management skills, and helps recognizing opportunities and specifying risks (Ardichvili et al., 2003; Baron & Tang, 2008; Janssen & Koenig, 2002; Lechler, 2001; Lechner & Dowling, 2003; Marrone, 2004; Nahapiet & Ghoshal, 1998; Sardana & Scott-Kemmis, 2010; Seibert, Kraimer, & Liden, 2001; Shane & Cable, 2002; Tushman, 1977). It further allows team members to collect necessary resources as well as social support, which in turn will influence their entrepreneurial capabilities in the long run (Coviello, 2006; Johannisson, 2000; Larson, 1991; Leung et al., 2006; Madsen & Servais, 1997; Neergaard, 2005; Shaw, 1997; Shaw & Conway, 2000). Furthermore, boundary spanning behavior bolsters individual team members' contribution to the team tasks (Marrone, 2004), and their contentment with their team membership (Ancona, 1990; Marrone et al., 2007). Based on the aforementioned relationship of charismatic leadership and boundary spanning behavior, I suggest that boundary spanning should be considered as the individual-level process driving the effect of charismatic leadership on individual performance.

Hypothesis 3: Boundary spanning behavior partly mediates the positive relationship of charismatic leadership and individual entrepreneurial performance.

Method

Sample and Procedure

Data was gathered in collaboration with an innovation and start-up center in Germany, which offers training and consulting for start-ups, spin-offs, and new business concepts. The teams studied had participated in a four month long entrepreneurial training and coaching program that focused on opportunity recognition and business model development (Baron, 2004, 2006; Morris, Kuratko, & Schindehutte, 2001). The program is offered on a regular basis and is advertised at the local technical university and beyond. A sub-sample of participants ($N=123$) was asked about their reasons for enrolment in this training program: They were mainly interested in “learning how to write a business plan” (84.2% rather agreed or agreed a lot) and to “learn about concrete tools and techniques to found a business” (82.5% rather agreed or agreed a lot). It is important to note that this sample tended towards teams in the idea conception and planning phase rather than advanced phases of the entrepreneurial endeavor. This context allowed me to overcome limitations of earlier research that focused on start-ups and new ventures after firm foundation (for a discussion on survivor-biased samples and retrospective case studies see e.g. Johnson et al., 2006).

Participants of the training program typically sign up individually. At the beginning of the training program, the participants meet at the so-called *idea fair*, where they discuss preliminary business ideas. They are instructed to form teams with up to five team members and to nominate a team leader who should guide the team’s work on the business model and move the new venture creation forward. The team leader has specific tasks and responsibilities, for example, coordinating the team’s activities and reporting the team’s progress to the instructors. After three months of weekly training and coaching sessions and continuous off-class teamwork on the business model, the teams submit a written business plan and present their business model to entrepreneurship experts.

Before the evaluations of both the business plan and the business pitch were made available to the participants, a survey was administered to 252 participants of this training program, who had been working together in 75 teams. This survey assessed team perceptions of charismatic leadership, team reflexivity, and boundary spanning behavior (two parallel versions in German and English were used). The participants were asked to sign a consent form in which they granted access to the performance evaluations. For data analysis, I only included data from those teams in which a) all team members granted access to their performance evaluations and b) perceptions of the team leader's charismatic leadership was available from at least two team members. The final sample included 196 participants working together in 58 teams of three to five team members (41.4 % with three team members, 53.4 % with four team members). Participants were on average 23.8 years old ($SD = 3.2$, $Min = 18.0$, $Max = 43.0$); 23.5 % of the participants were female. Their background was mainly Computer Science (25.5 %), Engineering (19.7 %), and Business Administration (19.4 %).

Measures

Charismatic Leadership. Followers evaluated their team leaders' charismatic leadership behavior by means of a composite score of five items from the Conger–Kanungo scale of charismatic leadership (Conger & Kanungo, 1994; Conger, Kanungo, Menon, & Mathur, 1997). The German version was taken from Rowold and Kersting (2008). A sample item is “My team leader engaged in unconventional behavior in order to achieve the goals of the team”. Followers rated these items on a Likert–scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Team Reflexivity. Team reflexivity was assessed with the team reflexivity measure by Schippers et al. (2007) using a composite score of eight items. The German translation was provided by Brahm and Schippers (<http://reflexivitynetwork.com>). A sample item is “We

regularly discussed whether the team is working effectively”. All team members rated these items on a Likert–scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Boundary Spanning Behavior. To assess individual boundary spanning behavior, I adapted seven items from Ancona and Caldwell’s questionnaire (1990, 1992) to fit the entrepreneurial context (e.g., references to the organization were changed to refer to the program). A German version of these items was created following Brislin’s (1980) translation–back–translation procedure. All items asked about the team member’s individual boundary spanning behavior. The items covered both *ambassador* (e.g., “I reported the progress of the team to the instructor”) and *scout* activities (e.g., “I scanned the environment inside or outside of the training for marketing ideas/expertise”). Followers rated these items on a Likert–scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Performance Measures. Measures typically applied to assess venture success such as sales, profits, and positive cash flows are neither valid nor relevant for nascent entrepreneurs (Bergmann & Stephan, 2013; Carter, Gartner, & Reynolds, 1996; for a review on success criteria see Gorgievski, Ascalon, & Stephan, 2011). Instead, I included a) *quality of business planning* as a performance measure at the team–level and b) *performance in a business pitch* as an individual–level performance measure in this research.

Quality of Business Planning (team–level performance measure). The teams submitted a written business plan at the end of the training program. The business plan covered all aspects that are typically required in a full business plan and that investors would request for screening: It included an executive summary, the description of the product/service, the team’s expertise, a market analysis, the marketing and sales strategy, and a summary of the business model. An entrepreneurship expert with several years of experience in training and coaching of entrepreneurial teams, who was blind to the research aims and specific hypotheses, rated the business plans based on predefined assessment criteria displayed in

Table 5 using a Likert-scale ranging from 1.0 (very poor) to 10.0 (outstanding). These assessment criteria had been developed by the program director entirely independently of this research, thereby taking issues of interest to potential investors and bankers into consideration. For our research, a second entrepreneurship expert evaluated 30 % of the business plans to check for reliability of the assessment. The two experts' judgments were positively correlated, $r = .79, p < .001$. Interrater reliability computed as intraclass correlation was $.77, p < .001$, indicating strong agreement (LeBreton & Senter, 2008).⁴ The evaluation of business plans has been used as outcome measure before (e.g. Foo, Wong, & Ong, 2005; Foo, 2010; Shepherd, Zacharakis, & Baron, 2003), and I agree with others that the quality of business planning is a critical factor in starting a new venture (e.g. Cassar, 2009; Davidsson & Wiklund, 2001; Delmar & Shane, 2003, 2004; Eckhardt, Shane, & Delmar, 2006; Frank, Plaschka, & Roessl, 1989; Frese et al., 2007; Lange, Mollov, Pearlmutter, Singh, & Bygrave, 2007; Liao & Gartner, 2006; Perry, 2001; Rauch, Frese, & Sonnentag, 2000).

Table 5

Assessment criteria for the evaluation of the business plan as a measure for team performance

Criteria	Weight
1. Executive summary	
1a. Raising interest	0,1
1b. Consideration of relevant aspects	0,1
2. Product / Service	
2a. Customer value	0,2
2b. Business position	0,15
3. Entrepreneurial team	–
4. Market analysis	
4a. Industry and market segment	0,15
4b. Competition	0,1
5. Marketing and sales	–
6. Business model	0,1
Formal requirements	0,1

Note: Assessment criteria were weighted according to the target learning outcomes of the training program. Since the training program aimed at supporting entrepreneurial teams in the “ideation” (i.e., the idea specification) phase, the paragraphs on “Customer Value”, “Business Position”, and “Industry and Market Segment” had the highest impact on evaluation of the business plan.

Individual Performance in the Business Pitch (individual–level performance measure).

Baron and Tang (2008) have pointed out that impression management, social perception, and expressiveness may have a huge impact on new ventures’ success because investors base their evaluation of a new venture on an overall picture that usually includes oral presentations

(“business pitch”; De Clercq, Fried, Lehtonen, & Sapienza, 2006). Business pitches transport intangible factors such as preparedness and credibility of the individual team members, which investors typically assess before an investment decision (Grégoire, De Koning, & Oviatt, 2008). Therefore, the business pitch is “a critical portion of the entrepreneur’s signaling and enticement strategy” (Pollack, Rutherford, & Nagy, 2012, p. 916). It can be considered as a persuasion situation where every team members’ individual contribution decides about success or failure in convincing experts about the potential of the business idea (e.g. Zacharakis & Shepherd, 2001). I agree with Pollack et al. (2012, p. 917) that “the pitch is often the best proxy and predictor of success available”. In fact, Chen, Yao, and Kotha (2009) found a positive relationship of oral presentations on investment decisions. Other research has found relationships between characteristics of oral presentations and venture–growth/success (Baum, Locke, & Smith, 2001), financial success in later phases of the new venture (e.g. Baron & Markman, 2000, 2003), and funding decisions of stakeholders (Cardon, Wincent, Singh, & Drnovsek, 2009; Pollack et al., 2012).

For these reasons, performance in an oral presentation of the business model was included as a performance measure on the individual level in this research. Specifically, I requested access to the expert panel’s evaluations of individual team members’ contributions in the business pitch. The team members had limited time to convince the jury of the team’s business idea. Each team member presented one part of the business model individually followed by a question and answer session. Two entrepreneurship experts who had several years of experience in training and coaching of entrepreneurial teams and who were blind to the research aims and hypotheses evaluated individual performance in the business pitch using a 10–point Likert–scale ranging from 1.0 (very poor) to 10.0 (outstanding). This assessment was based on structure and argumentation of the presentation, focusing on the question of how confident and convincing every team member presented the business idea. Evaluators were instructed to focus on every team members’ *individual* contribution to the

overall presentation and to account for even small differences in individual performances in their judgments.

Control Variables. I considered team size as well as age and gender of the lead entrepreneur as control variables. Differences with regard to the control variables were limited between groups, and all correlations with performance at the team level were not significant with r ranging from $r = -.09$ to $r = .13$, *ns.* ($N = 58$). To maintain good power and validity of a multiple regression analysis, Cohen, Cohen, West, and Aiken (2003) recommend that only the relevant variables should be included. I therefore proceeded testing our hypotheses without control variables in order to preserve degrees of freedom and to minimize the chances for a type I error.

Data Aggregation

In line with state of the art research, the theoretical conceptualizations of both charismatic leadership and team reflexivity in this research refer to higher-level phenomena: The measure for charismatic leadership aims at representing the *shared* perception of all team members. Similarly, team reflexivity is conceptualized as a *team property*, and the items refer to the whole team accordingly. For both measures, the “aggregate variable presumably benefits from having multiple ratings” (Bliese, 2000, p. 375). Since charismatic leadership and the proposed team-level mediator team reflexivity were assessed using individual ratings, aggregation to team-level variables was required. To legitimize data aggregation, I calculated r_{wg} , $ICC(1)$, and $ICC(2)$ as indicators for within-team agreement and between-team variance and tested for significance of the $ICC(1)$ values. Cut-off values for r_{wg} between .60 and .70 have been recommended (Bliese, 2000). $ICC(1)$ values are typically interpreted as a measure of effect size (small effect $< .10$, medium effect $< .25$, large effect $> .25$) indicating the extent to which team membership explains variance in individual ratings (Bliese et al., 2002).

For charismatic leadership, the average r_{wg} was .78 (*Median* = .86), the *ICC(1)* was .26 ($p < .01$), and the *ICC(2)* was .45. For team reflexivity, the average r_{wg} was .76 (*Median* = .87), the *ICC(1)* was .14 ($p < .05$), and *ICC(2)* was .36, respectively. The r_{wg} values indicate medium to high within-team agreement for perceptions of charismatic leadership as well as team reflexivity. The *ICC(1)* values revealed medium to large team effects for both variables; I conclude that the team effect is not only statistically but also practically significant. The high r_{wg} and significant *ICC(1)* values indicate that a significant proportion of variance of individual responses can be attributed to group level properties. Whereas *ICC(1)* is not influenced by team size, *ICC(2)* depends largely on the team size (Bliese, 1998, 2000) and is considered to be rather conservative when all team members are sampled because “it supposes a sub-sample of raters of an infinite pool of potential raters” (Simons & Peterson, 2000, p. 105). The *ICC(2)* values mainly reflect the small team sizes in this study (Klein et al., 1994; Richter et al., 2006; as well as Srivastava, Bartol, & Locke, 2006 report similar values in their research). Still, the *ICC(2)* values represent acceptable values for these statistic considering that the team size was rather small with three to five team members per team. Team reflexivity was calculated using the mean of all team member ratings (including the lead entrepreneur’s ratings); team perception of charismatic leadership was calculated using the mean of follower ratings.

Results

This study proposes effects of charismatic leadership at multiple levels and considers team reflexivity as a team-level mediator and boundary spanning behavior as an individual-level mediator for these effects. Table 6 shows the means, standard deviations, and intercorrelations of the study variables. For team-level relationships, I applied Ordinary Least Squares (OLS) regression; I tested the individual-level and cross-level relationships using multilevel data modeling (Raudenbush & Bryk, 2002).

Table 6*Descriptives and intercorrelations of study variables*

Variable	Data source	M	SD	1	2
<i>Team level</i>					
1. Charismatic leadership	FO	3.55	0.57	(.73)	
2. Team reflexivity	TM	3.59	0.46	.57***	(.86)
3. Team performance	EA	8.19	1.19	.26*	.46***
<i>Individual level</i>					
1. Boundary spanning behavior	FO	2.82	0.82	(.79)	
2. Individual performance	EA	8.17	1.23		.17°

Note. Level-1 $N = 133$ (follower only); Level-2 $N = 58$. Internal consistency reliability estimates (alphas) are on the diagonal if available. FO = follower ratings; TM = ratings of all team members (including the lead entrepreneur); EA = expert assessment. Please interpret the individual-level correlation cautiously because this analysis did not take into account non-independence of individual ratings.

° $p < .10$

* $p < .05$

*** $p < .001$ (two-tailed test).

First, I hypothesized that team reflexivity will mediate the relationship of team perception of charismatic leadership and team performance as measured by the quality of business planning (H1, 2–2–2 design). OLS regression in SPSS revealed a significant total effect of team perception of charismatic leadership on team performance ($\beta = .26, p < .05$). I conclude that further examination of the proposed mediating effects was justified. We tested the hypothesized mediation using the SPSS Macro for Simple Mediation provided by Preacher and Hayes (2004, 2008). Charismatic leadership was predictive of team reflexivity ($\beta = .57, p < .001$). When controlling for charismatic leadership, team reflexivity was predictive for team performance ($\beta = .46, p < .01$). The estimated direct effect of charismatic

leadership was minimized to a null–correlation when controlling for team reflexivity ($\beta = -.01$, *ns.*). Team performance was predicted from team perception of charismatic leadership and team reflexivity quite well with $R^2 = .21$, $F(1, 55) = 10.08$, $p < .01$. The indirect effect of charismatic leadership on team performance was $ab = .55$. This was judged to be significant using the Sobel (1982) test, $z = 2.677$, $p < .01$. Bootstrapping has been recommended for testing indirect effects, especially with smaller sample sizes, because it has no assumptions regarding underlying sampling distributions (e.g. Shrout & Bolger, 2002). The bias–corrected and accelerated confidence interval (CI) obtained from bootstrapping (5000 resamples) revealed a lower limit for this 95 % CI of .12 and an upper limit of 1.06, not including zero. I conclude that Hypothesis 1 was fully supported.

Multilevel data modeling (Raudenbush & Bryk, 2002) was applied to test our hypotheses that team reflexivity is a team–level mediator (H2, 2–2–1 design) and boundary spanning behavior is an individual–level mediator (H3, 2–1–1 design) for the relationship of charismatic leadership and individual performance in the business pitch. Specifically, I used HLM 7.0 with restricted maximum–likelihood (RML) estimation for data analysis (Raudenbush, Bryk, & Congdon, 2005). Similar to unstandardized regression coefficients, the coefficients appearing in Table 7 can be interpreted as the magnitude of the effect of a predictor on the criterion while controlling for other variables in the model. All analyses were based on group–mean centered level–1 variables and uncentered level–2 variables (i.e. centered within context, Zhang et al., 2009).

The null model revealed that individual performance varied significantly between teams ($\chi^2(55) = 867.958$, $p < .001$); multilevel modeling was necessary and appropriate to test the proposed relationships. To establish mediation, I first predicted individual performance from team perception of charismatic leadership while including individual ratings of charismatic leadership as a covariate. Team perception of charismatic leadership was

positively related to individual performance ($\gamma = .52, p < .05$). The effect of team perception of charismatic leadership on the team-level mediator team reflexivity has already been established in the team-level analysis. Also, the proposed individual-level mediator boundary spanning behavior was predicted by team perception of charismatic leadership ($\gamma = .40, p < .001$). In a final step, I predicted individual performance from team perception of charismatic leadership while introducing team reflexivity as level-2 mediator and boundary spanning behavior as level-1 mediator. To be able to differentiate effects at the individual and the team level, I introduced individual ratings of charismatic leadership and team reflexivity as level-1 covariates as well as boundary spanning behavior as level-2 covariate (see Zhang et al., 2009). As anticipated, team reflexivity significantly predicted individual performance ($\gamma = 1.01, p < .01$). The effect of team perception of charismatic leadership on individual performance was reduced to a null correlation ($\gamma = -.03, ns.$). The Sobel (1982) test confirmed that the level-2 mediation effect of team reflexivity was significant ($z = 2.403, p < .05$). I conclude that Hypothesis 2 was supported by the data. Contrary to Hypothesis 3, boundary spanning behavior was not related to individual performance in the final model ($\gamma = .06, ns.$).

Table 7

Results of multilevel linear modeling for individual performance.

Dependent variable	Model 1	Model 2	Model 3	Model 4
	Individual performance	Team reflexivity	Boundary spanning behavior	Individual performance
Fixed effects				
Constant	6.28 (0.77)***	1.66 (0.40)***	1.43 (0.40)***	3.80 (1.25)**
Level 1				
<i>Charismatic leadership</i>	-0.07 (0.08)	0.42 (0.10)***	0.57 (0.12)***	-0.15 (0.10)
<i>Boundary spanning behavior</i>				0.06 (0.07)
<i>Team reflexivity</i>				0.10 (0.11)
Level 2				
<i>Charismatic leadership</i>	0.52 (0.21)*	0.55 (0.11)***	0.40 (0.11)***	-0.03 (0.22)
<i>Boundary spanning behavior</i>				0.28 (0.25)
<i>Team reflexivity</i>				1.01 (0.37)**

Note. Maximum number of Level-1 $N = 139$ (follower only); Maximum number of Level-2 $N = 58$. Robust standard errors are in parentheses.

° $p < .10$

* $p < .05$

** $p < .01$

*** $p < .001$ (two tailed test).

Discussion

The presented study answers the call for research on early phases of the entrepreneurial endeavor (Bergmann & Stephan, 2013; Davidsson & Wiklund, 2001; Hisrich et al., 2007; Kamm et al., 1990); it is one of a few studies on nascent entrepreneurial teams (for notable exceptions see e.g. Greve & Salaff, 2003; and Hopp & Stephan, 2012). Specifically, I examined charismatic leadership as a crucial factor impacting the performance of nascent entrepreneurial teams and took a multilevel perspective investigating the team-level and individual-level drivers of the effects of charismatic leadership on entrepreneurial performance. To my knowledge, this study is the first to investigate the processes and emergent states through which charismatic lead entrepreneurs influence outcomes of entrepreneurial teams in the pre-founding phase and one of a few to examine the effects of leadership on performance at the individual as well as at the team level.

The findings suggest three main conclusions: First, a charismatic lead entrepreneur has a significant impact on entrepreneurial performance in the pre-founding phase. Second, team processes shape the performance of entrepreneurial teams as well as of individual team members to a significant extent. Third, my findings further support previous calls to understand entrepreneurship as a multilevel phenomenon (Davidsson & Wiklund, 2001; West, 2007). In the following, I will further elaborate on these conclusions to delineate the theoretical implications from my findings.

Theoretical Implications

Antonakis and Autio (2007) as well as Roomi and Harrison (2011) have pointed to the fact that our understanding of effective leadership in entrepreneurial contexts is still scarce. Although the significance of leadership in entrepreneurship has been long established (Bryant, 2004; Cogliser & Brigham, 2004; Vecchio, 2003), empirical examinations of concrete

leadership behaviors are still lacking (for a notable exception see Hmieleski & Ensley, 2007). My findings imply that charismatic leadership is a significant predictor of entrepreneurial performance in the pre–founding phase. This result is in line with organizational research on the positive impact of charismatic leadership on various outcomes but extends previous research by showing that charismatic leadership is effective in the entrepreneurship context and, more specifically, in the pre–founding phase.

Moreover, my study answers Klotz et al.'s (2014) call to study the processes and emergent states through which leaders influence outcomes of entrepreneurial teams: My findings imply that team reflexivity is a relevant process variable that drives the effect of charismatic leadership. In my research, team reflexivity mediated the effect of charismatic leadership on team performance as measured by the quality of business planning as well as on individual performance in the business pitch. This study extends research on the significance of leadership for team reflexivity, which was often proposed but hardly ever tested before (cp. Schippers et al., 2008). This is especially relevant if we consider that teams in general are not very reflexive (West, 1996, 2000). My results highlight that one crucial factor in enhancing team reflexivity is the lead entrepreneur's charismatic leadership. This challenges earlier assumptions that charismatic leadership, by aligning followers to a shared vision, might reduce critical thinking within the team, thereby increasing the likelihood of group think phenomena (e.g. Den Hartog & Koopman, 2001). Instead, my results imply that charismatic leadership enhances team reflexivity. The results further suggest that team reflexivity not only drives the effect of charismatic leadership at the team level but that it also has effects on individual performance. This is in line with West (2000) who argued that members of reflexive teams are more likely to show proactive work behaviors in pursuing team goals than members of non–reflexive teams. While learning has been considered to be central to entrepreneurship before (Bailey, 1986; Cooney, 2005; Cope, 2003, 2005, 2011; Cope & Watts, 2000; Feurer & Chaharbaghi, 1995; Sardana & Scott-Kemmis, 2010; Smilor, 1997),

empirical examinations of learning in and of entrepreneurial teams are still scarce.

Considering team reflexivity as a crucial team-level process contributes to the advancement of research on entrepreneurial cognition and learning (Zheng, 2012).

My research also adds to the literature on external activities of entrepreneurial teams. The value of social capital resulting from access to and position in various networks for the success of new ventures has been recognized in the entrepreneurship literature before (Brinckmann & Hoegl, 2011; Grandi & Grimaldi, 2003; Klotz et al., 2014; West, 2002b). I focused on the previously neglected external interactions of individual team members in the pre-founding phase and their effect on individual performance in the present study (Ancona & Caldwell, 1990; Busenitz et al., 2003; Neergaard, 2005; Shaw, 1997). My findings imply that charismatic leadership encourages individual boundary spanning behavior and augment previous research on the impact of the team leader on team members' boundary spanning (DeChurch & Marks, 2006; Edmondson, 2003; Marrone, 2004, 2010). Still, boundary spanning behavior was not related to follower performance in the business pitch. Although teams have been shown to benefit from boundary spanning behavior (Ancona, 1990; Ancona & Caldwell, 1992; Druskat & Wheeler, 2003), it remains a central, still open question *who* and *how many* team members should engage in boundary spanning behavior (Choi, 2002; Marrone, 2010; Marrone et al., 2007; Tushman, 1977). Marrone et al. (2007) found that team members may suffer from role overload when challenged to balance internal and external activities during team work; this may, in run, have had detrimental effects on task performance in our research.

Finally, I provide evidence for the viability of a multilevel model of leadership and performance in entrepreneurial teams. I found team perception of charismatic leadership to predict entrepreneurial performance as measured by the quality of business planning as well as individual performance in the business pitch. An important aspect of the multilevel

research model pertains to downward cross-level influences: In my study, team perception of charismatic leadership was predictive of an expert assessment of individual performance in the business pitch through team reflexivity. Although warranting replication, our pattern of results indicates that research should consider cross-level effects of leadership flowing from the team to the individual level at least as interesting as individual-level effects, which previous research has mostly focused on (Chen et al., 2007; DeChurch et al., 2010; Lord & Dinh, 2012).

To summarize, my research makes the following contributions: First, the current research extends our understanding of success factors in nascent entrepreneurial teams in the pre-founding phase, on which there are only limited studies. Second, my study echoes prior calls to integrate entrepreneurship research with leadership research to learn more about the leadership behaviors that are effective in moving a new venture forward. Third, the current research extends previous theorizing and research on the relevance of team processes beyond an input-output model of team performance and responds to prior calls to complement theoretical work on the significance of team learning for performance by empirical investigations.

Limitations and Future Research

While the study provides several important contributions, its limitations need to be considered. A first limitation is that the data used for testing the hypotheses were mainly cross-sectional. The major weakness of cross-sectional data is that relationships can hardly be interpreted as causal, and if it is done, causation must be considered reciprocal instead of unidirectional. This applies to the detected relationships of charismatic leadership and both mediators. Although strong theory supports the hypothesized causal relationships, future research should include longitudinal designs to investigate antecedents and processes at different points of measurement. A major strength of my study is the integration of separate-

source assessments for performance. In addition, the evaluation of the business plan and the business pitch became available only several weeks after the assessment of charismatic leadership, team reflexivity, and boundary spanning, thereby representing a second point of measurement. I also varied the basis for data aggregation when calculating measures for charismatic leadership (other-ratings by followers only) and team reflexivity (both team leaders' and followers' ratings) to reduce single-source biases. Both means make it unlikely that the effects only occurred due to single-source and common-method biases (Chang et al., 2010; Podsakoff et al., 2003).

Second, the sample size at the team level as well as the small average team size resulted in analyses that were less powerful than desirable for multilevel analyses. Still, the average team size reflects typical entrepreneurial teams (e.g. Beckman, Burton, & O'Reilly, 2007, report average team sizes of 2.84 in 14,731 founding teams). The results should still be replicated based on larger sample sizes to allow for more valid conclusions for theory and practice.

Third, my research model was restricted to the effect of charismatic leadership on entrepreneurial (team) performance mediated by team reflexivity and boundary spanning behavior. Thereby, we neglected other forms of leadership and additional mediators. The focus on charismatic leadership was purposeful, because charismatic leadership, in particular, empowers entrepreneurial teams to face the team- and task-related challenges in the pre-founding phase and is, therefore, at the very core of entrepreneurship. Still, besides the examination of other charismatic leadership styles such as transformational leadership (Bass, 1991, 1999), the examination of the significance and the effects of shared leadership would contribute to the understanding of entrepreneurial leadership. The focus on internal and external learning activities as mediators was very promising because nascent entrepreneurial teams are required to adapt to rapidly changing circumstances, to acquire new knowledge and

information, and to extend the team's entrepreneurial abilities (Corbett, 2005; Shamir & Howell, 1999). Future research might consider other mediators such as trust (e.g. Braun et al., 2013).

Conclusion

This study makes a substantial contribution to current entrepreneurship research by examining the effect of charismatic leadership of the lead entrepreneur and entrepreneurial performance in the pre-founding phase of a new venture. I took a multilevel perspective and considered team reflexivity as team-level driver and boundary spanning behavior as individual-level driver of the effect of charismatic leadership on entrepreneurial performance. My results revealed that team perception of charismatic leadership predicted both team and individual performance and that team reflexivity mediated both relationships. The current research is a promising example for the integration of leadership and entrepreneurship research to advance our understanding of entrepreneurship.

4. A MULTILEVEL INVESTIGATION OF AMBIDEXTROUS LEADERSHIP IN THE INNOVATION PROCESS: THE MEDIATING ROLE OF BOUNDARY SPANNING BEHAVIOR⁵

Introduction

In today's uncertain and rapidly changing environment, innovation has been widely recognized as a critical success factor for organizational survival and performance and as a source for competitive advantages (Anderson et al., 2014; West, 2002b). Within organizations, innovation lies in the hands of individual employees (Axtell et al., 2000; Hammond et al., 2011) largely working in team-based structures (Elkins & Keller, 2003; Taggar, 2002). Thus, promoting individual team members' innovative behavior at work is of crucial interest to organizations.

In particular, leadership has been identified as a main driver for innovation (Anderson et al., 2014; Elkins & Keller, 2003). Nonetheless, the literature in this area is rather limited (Anderson et al., 2014). Furthermore, for popular leadership styles (e.g., transformational leadership) research has not been able to provide unambiguous results (Eisenbeiss, van Knippenberg, & Boerner, 2008; Keller, 2006; Rank et al., 2004; Rosing et al., 2011). A major reason for these unclear results might be the neglect of tailoring the leadership perspective to the tensions and challenges of the innovation process resulting from the competing requirements of exploration and exploitation (Andriopoulos & Lewis, 2009; Bledow et al., 2009; Lewis & Smith, 2014; Smith & Lewis, 2011). In addition, previous researchers have argued that the study of leadership requires time-related questions to be addressed, particularly the temporal connection between leader behavior and related outcomes and leaders' dynamic capabilities to simultaneously achieve success in the present and prepare for the future (Ancona et al., 2001; Shamir, 2011). Both average and time-specific occurrences of the same factor can influence individuals' behavior at a specific time (Ohly & Fritz, 2009).

Concordantly, in order to address the exploration-exploitation paradox in the innovation process, ambidextrous leadership – the combination of complementary opening and closing leader behavior – was recently introduced (Bledow et al., 2009; Rosing et al., 2011; Rosing, Rosenbusch, & Frese, 2010; Turner, Swart, & Maylor, 2013). In their review Anderson et al. (2014) consider the ambidexterity perspective to be highly relevant for future research on leadership in innovation processes. Ambidextrous leadership is proposed to foster employees' innovativeness by supporting both explorative and exploitative follower behavior (Gibson & Birkinshaw, 2004; Good & Michel, 2013; Rosing et al., 2011). While first evidence indicates the beneficial nature of ambidextrous leadership for innovation (Zacher, Robinson, & Rosing, 2014; Zacher & Wilden, 2014), previous conceptualizations of ambidextrous leadership still adhere to an “either/or” view with regard to opening and closing leader behavior, while the value of a “both/and” perspective when dealing with tensions and uncertainty in organizations has been broadly recognized (Bartunek, 1988; Smith & Lewis, 2011; Smith & Tushman, 2005; Zhang, Waldman, Han, & Li, 2015). Therefore, and in order to address the paradoxical nature of innovation, I adopt a paradoxical lens on ambidextrous leadership (Lewis & Smith, 2014; Smith & Lewis, 2011). Specifically, I conceptualize ambidextrous leadership as the simultaneous, integrated display of the complementary opening leader behavior and closing leader behavior. Additionally, in comparison to more stable leadership theories (e.g. transformational leadership), ambidextrous leadership is explicitly considered as a situational leadership approach (Rosing et al., 2011) demanding a temporal perspective when examining its effects. I address this under-researched issue using a weekly diary study. Furthermore, I shed light on the mechanisms underlying the effects of ambidextrous leadership, an issue that has not yet been addressed in previous research.

I introduce boundary spanning behavior as mediator of the effects of ambidextrous leadership on employee innovation based on the following argument. Research on individual innovative behavior shows that employees need a multitude of resources (e.g. finances,

materials, information) to engage in this behavior (Anderson et al., 2014; Hammond et al., 2011). Not all of these resources are directly available within employees' work teams; instead, they need to be collected from outside of the team (Ancona, 1990; Choi, 2002; Marrone, 2010). Ambidextrous leadership provides the necessary discretion (opening leader behavior) for employees to seek out and integrate important resources, like information, from their environment. At the same time, ambidextrous leadership sets boundaries and provides direction (closing leader behavior) supporting goal-oriented and structured interactions with external actors (see also Gebert, Boerner, & Kearney, 2010). Therefore, I propose individuals' boundary spanning behavior as a mediator in the relationship between ambidextrous leadership and employee innovative behavior, because they are crucial for receiving the necessary resources and support for innovation from a team's external environment. Although they drive individual success (Fleming & Waguespack, 2007; Marrone, 2004), research on the antecedents of boundary spanning behavior is scarce (Choi, 2002; Joshi et al., 2009). I expect ambidextrous leadership to offer the encouragement and empowerment as well as to provide the structure and direction needed for individual team members to undertake boundary spanning, which in turn supports innovative work.

With this weekly diary study, I offer three main contributions to the literature: First, I highlight that employing a paradoxical lens (Lewis & Smith, 2014; Smith & Lewis, 2011) on leader behavior is particularly useful in examining relations between leadership and employee innovation. This is due to the fact that the innovation process is characterized by unpredictable and unstructured requirements and progress (Anderson et al., 2014; Bledow et al., 2009). Second, taking on a temporal perspective I not only consider average, chronic effects of ambidextrous leadership but also immediate impacts of leader behavior on employee innovative behavior. Third, I establish boundary spanning behavior as a mediator in the relationship of ambidextrous leadership and innovative work behavior. Thereby, I expand both the literatures on ambidextrous leadership and boundary spanning by looking at leader

behavior as antecedents of boundary spanning behavior. My findings, which support ambidextrous leadership as important antecedent of both boundary spanning and innovative follower behavior, also guide practitioners' efforts to deal with complexity in the innovation process.

Theory

I follow West and Farr's (1990) definition of innovation as "the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, organization or wider society" (p. 9). More specifically, my focus lies on technical innovation of products or processes as opposed to administrative innovations, whether organizational or social (Damanpour & Evan, 1984). Within companies, the development of such technical innovations is organized in team-based structures bringing together the necessary people for the task (Pirola-Merlo & Mann, 2004; Taggar, 2002). In accordance with Hackman (1987) and Kozlowski and Bell (2003), I define a team as a social entity with boundaries within an organizational context where individual members work interdependently towards one or more common, organizationally relevant goals with measurable output.

The innovation process includes different kinds of activities and decisions that result in varying coordination and communication needs (Allen, 1977; Bledow et al., 2009; Zaltman, Duncan, & Holbek, 1973). Researchers have argued that innovation does not happen in a strictly discrete and sequential way (Andriopoulos & Lewis, 2009; Bledow et al., 2009; Gibson & Birkinshaw, 2004; Hammond et al., 2011; Rosing et al., 2011). Seemingly contradictory activities and behaviors, like exploration and exploitation behavior, are not limited to specific phases or a chronology but are simultaneously required throughout the whole innovation process. Therefore, I study ambidextrous leadership that is leadership

behavior that addresses the resulting tensions and has been posited to successfully guide and support employees' work behavior across the entire innovation process (Bledow et al., 2009; Good & Michel, 2013; Hunter, Thoroughgood, Myer, & Ligon, 2011; Rosing et al., 2011).

Ambidextrous Leadership

Ambidextrous leadership is a recent leadership approach that is tailored to the innovation paradox of exploration and exploitation (Bledow et al., 2009; Rosing et al., 2011). Specifically, it addresses how leaders can encourage the seemingly contradictory, yet interrelated employee behaviors of exploring and exploiting. Ambidextrous leadership was first defined as comprising two opposing leader behaviors, opening behavior and closing behavior, and the flexibility to switch between these behaviors as the situation requires (Rosing et al., 2011). While it contains some elements of established leadership concepts like consideration or relation-oriented leadership on the one hand and initiating structure or task-oriented leadership on the other hand (Fleishman, 1953; Judge, Piccolo, & Ilies, 2004), ambidextrous leadership is not concerned with contrasting a focus on the job to be done with a focus on the people doing it (for a detailed differentiation of ambidextrous leadership from other leadership approaches see Rosing et al., 2011). Instead, opening leader behavior (e.g., giving employees room for own ideas) encourages employee experimentation fostering exploration, while closing leader behavior (e.g., establishing routines) supports employee alignment fostering exploitation. Rosing et al. (2011) claim that leaders need to show these behaviors flexibly throughout the innovation process, thus responding to the specific needs and requirements of the given situation at any point of the innovation process. Therefore, ambidextrous leadership should allow us to better understand and predict innovation than leadership approaches that are more general and stable (e.g., transformational leadership) and, therefore, more heterogeneous in their relations to innovation (Hunter et al., 2011; Rosing et al., 2011).

First studies show promising results for the positive relation of ambidextrous leadership and innovation (Zacher & Rosing, 2015; Zacher & Wilden, 2014), however, evidence for the value of the flexibility aspect in the definition describing the need to switch between opening and closing leader behavior and for what factors might trigger and/or warrant such a switch is missing. The idea of “switching” between the leader behaviors is problematic both in terms of theory and measurement. Current theory does not allow us to make specific predictions on how and when a leader shows opening or closing behavior or when to switch exactly. In addition, the operationalization suggested by Rosing et al. (2011) and used in previous empirical studies (Zacher & Rosing, 2015; Zacher & Wilden, 2014) considers closing behavior to positively moderate the positive relationship between opening behavior and innovation and vice versa. This implies that the impact of one aspect of ambidextrous leadership – e.g. opening leader behavior – on innovative employee behavior is even stronger when the other aspect – e.g. closing leader behavior – is also being displayed. However, this does not represent a leaders’ need to switch between these two behaviors – which has been at the core of the theoretical conceptualization to date.

To address these limitations in existing research on ambidextrous leadership, I apply a paradoxical lens to the construct and tailor the operationalization to meet this perspective. Specifically, I argue that leaders and employees need to embrace the contradictory demands simultaneously to successfully manage the innovation paradox of both exploring and exploiting – a shift from “either/or-thinking” to “both/and-thinking” is required (Bartunek, 1988; Smith & Lewis, 2011). Therefore, I re-define ambidextrous leadership as the integrated, not alternative, use of both opening and closing behavior. The use of a “both/and” approach to meet competing demands by embracing their opposing but integrated nature instead of an “either/or” approach based on a contingency perspective has been widely supported when dealing with tensions, uncertainty, and paradoxes in organizations (Andriopoulos & Lewis, 2009, 2010; Fredberg, 2014; Gebert et al., 2010; Lewis & Smith, 2014; Smith & Lewis,

2011). The literature on contextual ambidexterity agrees that exploration and exploitation need to be present together in an integrated fashion rather than being mutually exclusive (Andriopoulos & Lewis, 2009; Bledow et al., 2009; Gibson & Birkinshaw, 2004). Research on paradoxes in organizations helps us to better understand the paradoxical nature of innovation and, thus, the necessity of paradoxical leader and follower behaviors to achieve innovation (Lewis & Smith, 2014; Smith & Lewis, 2011).

Paradoxes in organizations are defined as “contradictory yet interrelated elements that exist simultaneously and persist over time” (Smith & Lewis, 2011, p. 382). The paradoxical lens dismisses the need to solve tensions created by viewing them as problems that require decisions selecting opposing alternatives to be aligned with the present conditions to reach optimal performance. Instead, it focuses on coexistence and synergies between opposing forces and the resulting acceptance to profit from tensions. For the exploration-exploitation tension, Lewis and Smith (2014) describe the “either/or” approach as trying to resolve the tension by suggesting an appropriate temporal sequence or by separating the activities into different entities. The “both/and” approach, on the other hand, promotes simultaneous efforts, dual orientations, and interplay to foster long-term success and puts a significant amount of influence and accountability in the hands of the leaders. Research findings suggest that leaders are aware of the need to accept paradoxes and pursue integrated strategies (Andriopoulos & Lewis, 2010; Fredberg, 2014; Hunter et al., 2011). However, particularly quantitative research on the simultaneous combination of leader behaviors to address organizational tensions is lacking.

Concordantly, I adapt the definition introduced by Rosing et al. (2011) to combine these convincing arguments with the idea of ambidextrous leadership. This conceptual adaptation of course has implications for the measurement of ambidextrous leadership, which I will elaborate on in the methods section. In short, I define ambidextrous leadership as the

simultaneous combination of two specific, opposed but complementary sets of leader behavior – opening leader behavior and closing leader behavior (Rosing et al., 2011) – into one leadership strategy (Bledow et al., 2009). In line with previous research using a contextual ambidexterity approach and the literature on paradoxes in organizations, the leader behaviors are considered to be non-substitutable and required to be simultaneously present to best foster employees' success in the innovation process (Andriopoulos & Lewis, 2009; Bledow et al., 2009; Gibson & Birkinshaw, 2004; Raisch & Birkinshaw, 2008; Smith & Lewis, 2011; Zhang et al., 2015). Ambidextrous leaders are able to promote the exploration of new ideas and new developments while at the same time pursuing the exploitation of current knowledge and activities (Gibson & Birkinshaw, 2004; Mom, van den Bosch, & Volberda, 2009; Probst, Raisch, & Tushman, 2011). Following previous research on ambidexterity which concludes that both exploration and exploitation are required simultaneously throughout the innovation process (Andriopoulos & Lewis, 2009; Gibson & Birkinshaw, 2004), I expect ambidextrous leadership to be positively related to employees' innovative work behavior. Therefore, I hypothesize:

Hypothesis 1: Individual perceptions of ambidextrous leadership are positively related to individual employees' innovative work behavior.

Boundary Spanning Behavior as Mediator

Individuals' work teams do not exist in a vacuum, but are part of larger organizations and value creation chains (Ancona & Caldwell, 1992; Gist et al., 1987; West, 2002b). While it can be a source of demands and uncertainty for individual employees, their team's external environment offers much needed information, support, and other resources required for innovation that might be lacking within a focal team (Ancona & Caldwell, 1992; Anderson et al., 2014; Elkins & Keller, 2003; West, 2002b). Therefore, objectives can only be met if individual employees manage their interactions at the team boundary effectively acquiring

missing resources and preventing excessive demands (Elkins & Keller, 2003; Hammond et al., 2011; Sundstrom, De Meuse, & Futrell, 1990). Previous research has shown that interdependence and communication with other organizational actors can increase innovation (Glynn et al., 2010; Hülshager et al., 2009). However, leaders are called upon to both encourage and direct employees' perceptions of and interactions with team-external actors.

A large, historical body of literature on boundary spanning activities exists indicating their importance for individual, team, and organizational success (e.g. Aldrich & Herker, 1977; Dailey, 1979; Tushman, 1977). In their work Ancona and Caldwell (1990) describe the full range of externally directed activities that employees apply when dealing with the environment outside of their core work team providing a comprehensive picture (Marrone, 2010). Their concept of boundary spanning refers to behavior that can be displayed towards targets external to one's own work team to establish linkages and manage interactions, even across organizational boundaries (Ancona, 1990; Ancona & Caldwell, 1990, 1992; Marrone, 2010; Marrone et al., 2007). It includes representing the own team, buffering outside pressure, coordinating with external actors, searching for information, and procuring resources.

Although leaders tend to assume some of the boundary activities themselves (Ancona & Caldwell, 1990; Brion, 2012), earlier research suggests that they also influence their employees' display of such behavior (Ancona, 1990; Joshi et al., 2009). Meanwhile, the importance of the acquisition and integration of external knowledge as a major challenge for ambidextrous leaders has been recognized (Raisch, Birkinshaw, Probst, & Tushman, 2009; Rothaermel & Alexandre, 2009). The value of knowledge exchange for individuals' performance has also been discussed (Bryant, 2003; Mehra, Kilduff, & Brass, 2001) and interteam coordination has previously been found to mediate the relationship between functional leadership and performance in multiteam systems (DeChurch & Marks, 2006). In the following, I, therefore, propose employees' boundary spanning behavior to act as a

mediator of the positive relationship of ambidextrous leadership on employees' innovative behavior.

Through opening leader behavior, ambidextrous leaders offer their team members autonomy, intellectual freedom, and latitude in their approaches towards work activities and support them in reviewing these approaches, creating a sense of personal empowerment (Ancona, 1990; Marrone, 2010; Marrone et al., 2007; Rosing et al., 2011). This encourages team members to venture outside the team boundaries and acquire contacts and resources which is challenging and demanding, requiring team members to be confident about their competences and flexible in their behavior (Edmondson, 1999a, 2003; Marrone, 2004, 2010). At the same time, closing leader behavior help employees to structure their activities and provide clarity regarding what is required and needs to be procured from outside of the team for efficient and target-oriented goal completion (Rosing et al., 2011). The guidelines set in place by their leaders support employees in facing the uncertainty associated with the environment external to their own core team (Edmondson, 1999a, 2003; Marrone, 2004, 2010). Put together, ambidextrous leadership is uniquely appropriate to bolster employees' boundary spanning behavior by providing discretion and autonomy and at the same time direction and structure.

Boundary spanning, on the other hand, enable individuals' innovative work behavior. Cooperation with and information from sources outside of the own team are necessary to gather missing resources for innovation and coordinate activities (Ancona & Caldwell, 1990; Elkins & Keller, 2003; West, 2002b). Employees need to search for ideas and acquire information, project-related knowledge, and new skills from outside of their direct work teams to stay up-to-date and competitive (Ancona & Caldwell, 1990, 1992; Marrone, 2010; Raisch et al., 2009; Rosenkopf & Nerkar, 2001; Rothaermel & Alexandre, 2009). The introduction of diverse sources of information and new perspectives and opportunities

through boundary spanning behavior foster employee learning (Choi & Thompson, 2005; Perry-Smith, 2006). Additionally, individuals' missions and tasks and their requirements need to be determined and resources and support need to be secured within the own organization, especially from important decision makers, while employees need to protect themselves from being overwhelmed with responsibilities (Ancona & Caldwell, 1990, 1992; Hoegl et al., 2004).

Boundary spanning behavior also serve the optimization of the workflow in cooperation with interdependent external actors (Hoegl et al., 2004; Marks et al., 2001; Marrone, 2010). Evidence shows that, e.g., a tighter coupling of manufacturing and marketing in new product development is necessary for the implementation of innovations (Song & Swink, 2002). Design issues need to be discussed and the feasibility of the chosen solutions checked (Ancona & Caldwell, 1992). Having the support of the higher management allows employees to proceed with their selected solutions by reducing resistance in the organization (Baer, 2012; Dutton & Ashford, 1993). Overall, effective boundary spanning behavior has been found to support knowledge transfer within and between organizations (Argote et al., 2003; Hansen, 1999) and organizational innovation (Hargadon, 1998) and effectiveness (Carlile, 2004).

Taken together, the considerations presented above suggest that ambidextrous leadership's influence is based on its support of individuals' boundary spanning behavior, which is crucial for successful innovation. Based on these arguments, I posit:

Hypothesis 2: Individual employees' boundary spanning behavior mediates the positive relationship between employees' individual perceptions of ambidextrous leadership and their innovative work behavior.

In seeking to test the hypotheses stated above, I first conducted a cross-sectional pilot study to confirm my research model using the adapted operationalization of ambidextrous leadership. Under the premise that ambidextrous leadership is a more situational and behavior-based phenomenon where outcomes are instantaneous, in comparison to stable and broad leadership styles like transformational leadership (Rosing et al., 2011; Shamir, 2011), I then conducted a weekly diary study to examine in more detail how and in what time horizon ambidextrous leadership affects employees' behavior. Previous diary studies have shown that both average and time-specific occurrences of the same factor influence individuals' behavior at a specific time (Ohly & Fritz, 2009) and demonstrated the usefulness of a weekly interval (Bakker & Bal, 2010; Schreurs, van Emmerik, Günter, & Germeys, 2012). Additionally, it has previously been argued that leader behavior is able to fluctuate on a short-term basis (Tims, Bakker, & Xanthopoulou, 2011).

I expect that not only the average individual perceptions of ambidextrous leadership but also weekly differences in said perceptions significantly influence employees' boundary spanning and resulting innovative behavior in a given week. The average, general level of ambidextrous leadership displayed supports individuals in understanding and gaining experience in coping with the tensions and challenges throughout the innovation process and in gaining confidence to and experience with boundary spanning (Bledow et al., 2009; Turner et al., 2013). Individuals develop the knowledge that opposing activities, e.g. exploration and exploitation, are necessary and devise appropriate strategies. In each specific week, ambidextrous leadership aids individuals in dealing with current tasks and tensions and reinforces employees' extra effort in boundary spanning and innovative behavior.

Given that it is probable that relations and mechanisms described above are equally valid on the weekly level, as is common in diary studies (e.g. Ohly & Fritz, 2009), I build on

my previous arguments and expand my research model to include additional hypotheses.

Figure 4 shows all proposed relationships.

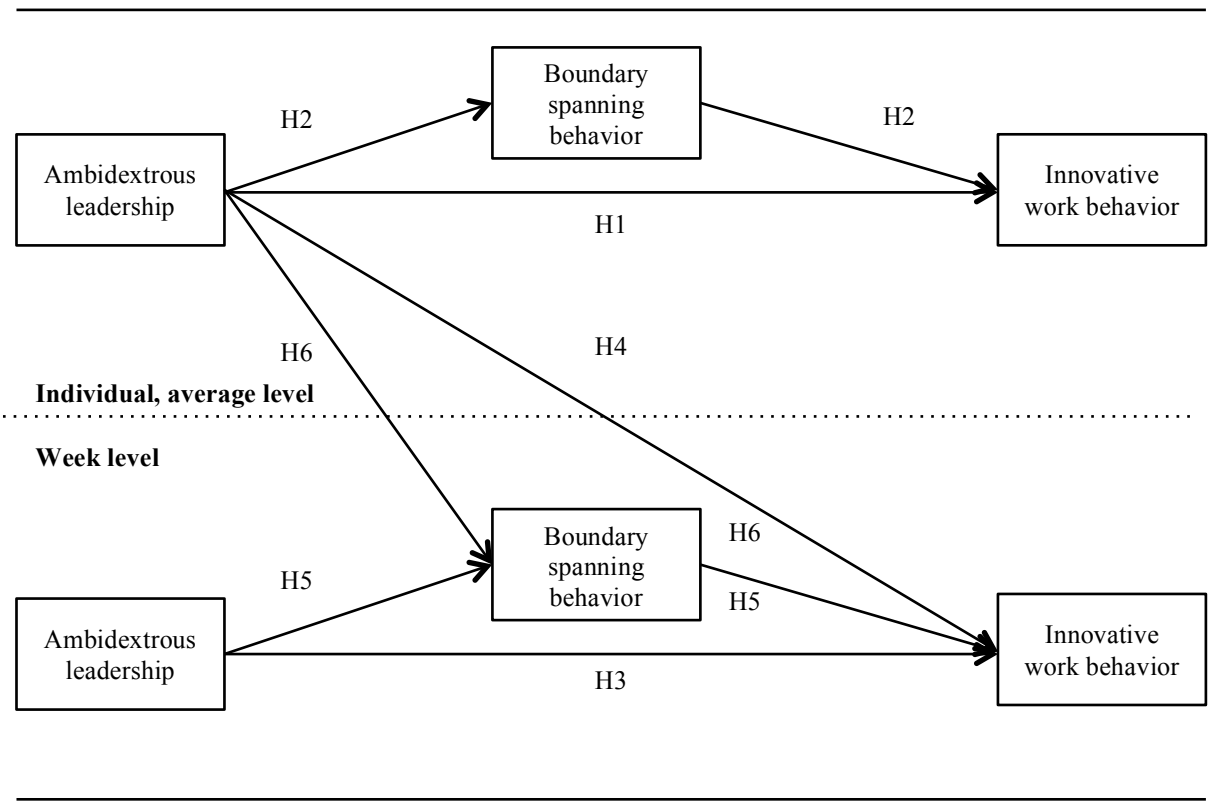


Figure 4. Theoretical model.

Hypothesis 3: Weekly perceptions of ambidextrous leadership are positively related to weekly innovative work behavior.

Hypothesis 4: Average perceptions of ambidextrous leadership are positively related to weekly innovative work behavior.

Hypothesis 5: Weekly boundary spanning behavior mediates the positive relationship between weekly perceptions of ambidextrous leadership and weekly innovative work behavior.

Hypothesis 6: Weekly boundary spanning behavior mediates the positive relationship between average perceptions of ambidextrous leadership and weekly innovative work behavior.

Pilot study

I conducted a cross-sectional pilot study with team members working on process or product innovation in small and medium-sized companies. To be able to control for potential team-level effects, at least 30% and at least two of the team members had to participate in the study leading to a final sample of 144 individuals from 36 teams. Participants were recruited via phone and e-mail and then received a short e-mail containing a thank-you note and the link to the online questionnaire. The questionnaire was available in German or English. It contained five items each for opening and closing leader behavior (Rosing et al., 2011; Zacher & Rosing, 2015), ten items for boundary spanning behavior (Ancona & Caldwell, 1990), and six items for innovative work behavior (Janssen, 2000) as well as demographic variables.

My re-definition of ambidextrous leadership has implications for the measurement of the construct. A moderation approach between opening and closing leader behaviors as suggested by Rosing et al. (2011) does not capture the paradoxical nature of a “both/and” perspective (Smith & Lewis, 2011). Following an approach common in the literature on organizational ambidexterity, I integrated the measure of opening behavior with the measure of closing behavior by simply multiplying the two scales to reflect that they are non-substitutable and need to be simultaneously present (Gibson & Birkinshaw, 2004). High values of this integrated measure reflect a high use of both behaviors, while low levels reflect a low use of both behaviors. In addition, a medium use of both behaviors simultaneously is favorable to a very high presence of one behavior and a very low presence of the other behavior in this operationalization, which is in line with a paradoxical perspective. Also,

combined measures have been shown to better determine the performance effect of organizational ambidexterity than balanced measures (Junni, Sarala, Taras, & Tarba, 2013).

Table 8

Means, standard deviations, and correlations between pilot study variables on level 1

	n	M	SD	r_{wg}	ICC1	ICC2	1	2	3	4	5	6
1. Ambidextrous leadership	144	13.88	4.16	-	6.49%	21.73%						
2. Boundary spanning behavior	144	3.11	.65	.82	17.26% **	45.49%	.29***					
3. Innovation	144	4.69	1.15	.52	18.99% **	48.39%	.46***	.46***				
4. Age	141	37.76	11.96				.04	.13	.08			
5. Gender	142	1.61	.49				.11	-.11	-.02	.14		
6. Team size	144	7.56	2.93				.02	.03	.06	.26**	.28***	
7. Team tenure	138	5.09	6.13				.10	.17*	.20*	.66***	.10	.17

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

Table 8 shows demographic information and ICC1, ICC2, (Bliese et al., 2002; Shrout & Fleiss, 1979) and r_{wg} values (James et al., 1984) for the pilot study. Given that there was no variance residing between groups for ambidextrous leadership, as indicated by the non-significant ICC1 score, I did not aggregate to the team level, limiting the analyses to the individual level. I group-mean centered all level 1 variables to focus on within-team effects on the individual level (Hofmann & Gavin, 1998; Marrone et al., 2007). Due to the significant ICC1 values for boundary spanning behavior and innovation, I, nonetheless, conducted HLM analyses (Raudenbush & Bryk, 2002).

Table 9
Results of multilevel linear modeling for the pilot study

Dependent Variable	Model 1		Model 2		Model 3	
	Boundary spanning behavior		Innovation		Innovation	
Fixed effects						
Constant	3.03	(.07) ***	4.47	(.17) ***	4.51	(.17) ***
Control variables						
<i>Team tenure</i>	.02	(.01) *	.05	(.02) **	.04	(.02) *
Level 1						
<i>Ambidextrous leadership</i>	.04	(.01) **	.08	(.03) **	.05	(.03)
<i>Boundary spanning behavior</i>					.56	(.17) ***
R ² ₁	.05		.05		.10	
R ² ₂	.09		.12		.21	

Note. N=36, n=138. Level 1 variables are group-mean centered.

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

The results, summarized in Table 9, show that ambidextrous leadership is positively related to both boundary spanning behavior (a: $\gamma = .04, p < .01$) and innovative behavior (c: $\gamma = .08, p < .01$), in line with Hypothesis 1. Furthermore, as posited by Hypothesis 2, boundary spanning mediates the relationship between ambidextrous leadership and innovative behavior (b: $\gamma = .56, p < .001$; c': $\gamma = .05, ns.$) and the indirect effect (Tofighi & MacKinnon, 2011) was significant ($ab = .02, 95\% CI: .01, .04$). Overall, the pilot study provides first evidence for the value of my conceptualization of ambidextrous leadership and the mediating role of boundary spanning behavior in the relationship between individual perceptions of ambidextrous leadership and innovative work behavior (Hypotheses 1 and 2). Thus, I proceeded with the weekly diary study in order to probe the effects of weekly perceptions of

ambidextrous leadership on employee innovation in addition to the effects of average, individual-level perceptions.

Method

Sample and Data Collection

For the weekly diary study, I asked participants to complete measures about their perceptions of their own and their leaders' behaviors during the past week at work. I chose a weekly interval to ensure that the participants had had a chance to interact with their leaders and that participants' perceptions and innovation-related task requirements could change between survey rounds.

Participants for this study were recruited via online business networks Xing and LinkedIn by posting calls and short descriptions of the study's purpose in innovation-related groups. Eligible individuals needed to work on product or process innovations in a team setting with a direct supervisor. When signing up – via e-mail or through a homepage – participants indicated a starting date and a preferred day of the week on which to receive the links to the weekly questionnaires. For five consecutive weeks, they then received e-mails containing a short thank-you note and the respective links on their specified weekday. These e-mails were sent out in the morning and participants were asked to answer the questionnaires on the same day. They were told that all responses should relate to their past work week. The questionnaires could be answered in German or English and were identical except for the first one, which included an additional section on demographic information at the end.

10 women and 34 men with an average age of 34.23 years ($SD = 12.19$) and 3 persons who did not provide this information make up the final sample of this study. Of these 47 individuals who responded to four or more weekly questionnaires (54.65% of initial participants), 87.23% did so in German. Participants most commonly worked in mechanical

engineering and automotive ($n = 14$), telecommunication and IT ($n = 8$), and electronic systems and energy ($n = 4$) industries and had been part of their company for an average of 7.98 years ($SD = 9.75$) (6 persons did not indicate their organizational tenure). Analyses of variance did not reveal substantial between-industry variance in the study variables. Therefore, I pooled all data and do not consider the industrial sector further.

Measures

Where no validated translations existed, multiple experts in the research field with excellent knowledge of German and English back-translated the items and then discussed divergences according to the procedure described by Brislin (1970).

Ambidextrous Leadership. Ambidextrous leadership was measured using three items each for opening leader behavior and closing leader behavior from Zacher and Rosing (2015) based on Rosing et al. (2011). Kathrin Rosing kindly provided the German translation upon request. I shortened the scales for opening and closing leader behavior using the highest loading items from the pilot study. Items for opening leader behavior include “My leader allows different ways of accomplishing a task” and for closing leader behavior include “My leader monitors and controls goal attainment”. All items were assessed on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Cronbach’s alpha for opening leader behavior was $\alpha = .84$ and for closing leader behavior $\alpha = .83$. I again calculated ambidextrous leadership by simply multiplying the opening leader behavior and the closing leader behavior scales as described in the pilot study.

Boundary Spanning Behavior. Boundary spanning behavior was measured with 10 items adapted from the ambassador, task coordinator, and scout dimensions of Ancona and Caldwell (1990) in line with the pilot study. Sample items are “persuade others to support the

team's decisions", "negotiate with others for delivery deadlines", "collect technical information/ideas from individuals outside of the team" and Cronbach's alpha was $\alpha = .86$.

Innovative Work Behavior. Consistent with the pilot study, I measured innovative work behavior using six items covering idea generation and idea realization from Janssen's (2000) innovative work behavior scale. Sample items are "Creating new ideas for difficult issues." and "Transforming innovative ideas into useful applications.". Cronbach's alpha was $\alpha = .92$ and the 7-point Likert scale ranged from 1 (never) to 7 (always).

Control Variables. I included the innovation *phase* as control variable on level 1. It represents a person's opinion on what the focus of the own work was during the last week measured on a continuum via a 6-point slide control ranging from 1 (focus on creativity, no complete specifications yet) to 6 (focus on efficiency, completion of the technical tasks). I collected this measure to control for the variation in work requirements between weeks. Initially, participants' age, gender, and organizational tenure were also considered as control variables. In addition, I considered time, ranging from 0 for the first week to 4 for the last week, as a variable on level 1 representing the successive measurement occasions. However, none of these variables were found to be significantly correlated to the dependent variables. To maximize power, I omitted these variables in the analyses presented here (Cohen et al., 2003).

Analyses

Due to the nested nature of the data (i.e. weeks nested within individuals), I used hierarchical linear modeling (HLM) analyses for regressions with level 1 dependent variables to take the inherent non-independence into account (Raudenbush & Bryk, 2002). Before testing my hypotheses I first ran null models with no predictors for all variables on level 1 to determine the variance within and between persons and the appropriateness of HLM analyses.

Following recommendations from the literature (Hofmann & Gavin, 1998; Mathieu & Taylor, 2007), when testing the hypotheses, I group-mean centered ambidextrous leadership on level 1 which removes between-person variance to separate within-person and between-person effects. I grand-mean centered our mediator boundary spanning on level 1, on the other hand, to allow for a cross-level indirect effect, which requires between-person variance in the lower-level mediator. For regressions purely on the individual level (level 2), I used ordinary least squares (OLS) regression.

Variable values for the analyses on level 2 are calculated by aggregating over all available weeks of each person. To permit the study of lagged effects, for the HLM analyses, I always aggregated ambidextrous leadership over all but the last week available per person, while boundary spanning was aggregated in the same way for regressions with a dependent variable in the same week and aggregated over all but the first week when a lagged dependent variable was used.

Results

The means, standard deviations, and correlations for all variables in this study are presented in Table 10. One should note, that the correlations are to be interpreted carefully as they do not take the non-interdependence within the data into consideration. Results of the null models show that between 43.64% and 61.38% of the variance of level 1 outcomes reside on the person level (level 2). Therefore, the use of multilevel modeling is required to test our hypotheses (Raudenbush & Bryk, 2002). The effect sizes R^2_1 on level 1 and R^2_2 on level 2 represent the proportional reduction of error in the prediction (Ohly & Fritz, 2009; Snijders & Bosker, 1999).

Table 10
Means, standard deviations, and correlations between study variables

Level 2 variables	n	M	SD	1	2	3	4	5	6	7
1. Ambidextrous leadership	47	9.05	3.76							
2. Boundary spanning behavior	47	2.79	.63	.53 ***						
3. Innovation	47	3.84	.99	.70 ***	.58 ***					
4. Age	44	34.23	12.19	-.01	.08	.06				
5. Gender	45	1.73	.50	.05	-.08	.06	.14			
6. Organizational tenure	44	2.94	24.42	.04	-.82	.12	.48 **	.40 **		
Level 1 variables	n	M	SD	1	2	3	4	5	6	7
1. Ambidextrous leadership t	181	9.72	4.57							
2. Boundary spanning behavior t	181	2.80	.75	.41 ***						
3. Boundary spanning behavior t+1	181	2.82	.79	.33 ***	.65 ***					
4. Innovation t	181	3.89	1.32	.51 ***	.43 ***	.31 ***				
5. Innovation t+1	181	3.74	1.36	.55 ***	.40 ***	.53 ***	.58 ***			
6. Phase t	180	3.78	1.34	.00	.14	.08	-.27 ***	-.13		
7. Phase t+1	181	3.83	1.32	.05	.13	.18 *	-.15 *	-.12	.58 ***	
8. Week t	181			-.08	.17	.08	-.06	-.06	.11	.16 *

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

The OLS regression results for Hypotheses 1 and 2 are displayed in Table 11. As posited by Hypothesis 1, average ambidextrous leadership is positively related to individuals' average innovative work behavior ($\beta = .70, p < .001$). Additionally, average ambidextrous leadership also shows a positive relation to individuals' average boundary spanning behavior

($\beta = .53, p < .001$). While controlling for average ambidextrous leadership, average boundary spanning behavior has a positive relationship to average innovative behavior ($\beta = .30, p < .05$). The direct relationship between average ambidextrous leadership and average innovative behavior ($\beta = .54, p < .001$) remained significant, alluding to a partial mediation. In order to test Hypothesis 2, I obtained bias-corrected 95% confidence interval limits through bootstrapping procedures (MacKinnon, 2008; Shrout & Bolger, 2002; Taylor et al., 2008). The significant unstandardized indirect effect of average ambidextrous leadership via average boundary spanning behavior on average innovative behavior ($ab = .04, 95\% \text{ CI: } .01, .10$) supports the proposed mediation.

Table 11
Regression results testing boundary spanning as a mediator

Dependent Variable	Boundary spanning behavior		Innovation			
	Model 1		Model 2		Model 3	
	β	SE	β	SE	β	SE
<i>Ambidextrous leadership</i>	.53***	(.02)	.70***	(.03)	.54***	(.03)
<i>Boundary spanning behavior</i>					.30*	(.19)
R^2	.28		.49		.55	
ΔR^2					.07 *	

Notes. N = 47. *** $p < .001$, ** $p < .01$, * $p < .05$

Table 12 shows the HLM regression results for dependent variables in the same week. Weekly ambidextrous leadership is positively related to weekly innovative behavior ($\gamma = .08, p < .01$), confirming Hypothesis 3, but not to weekly boundary spanning behavior ($\gamma = .02, ns.$), rejecting Hypothesis 5. In support of Hypothesis 4, the cross-level effect of average ambidextrous leadership on weekly innovative behavior ($\gamma = .15, p < .001$) is positive and significant. Its effect on boundary spanning behavior ($\gamma = .08, p < .001$) is also significant.

The relationship between average ambidextrous leadership and weekly innovative behavior ($\gamma = .10, p < .01$) is weaker while boundary spanning shows a positive relationship with innovative behavior ($\gamma = .56, p < .05$) when it is added as predictor. I again calculated 95% confidence intervals for the indirect effect. The indirect effect via boundary spanning of average ambidextrous leadership on weekly innovative behavior ($ab = .08, 95\% \text{ CI: } .02, .16$) is significant, supporting Hypothesis 6.

Table 12
Results of multilevel linear modeling for the diary study with same week outcomes

Dependent Variable	Model 1	Model 2	Model 3	Model 4	Model 5
	Boundary spanning behavior t	Boundary spanning behavior t	Innovation t	Innovation t	Innovation t
Fixed effects					
Constant	2.49 (.20) ***	1.74 (.24) ***	4.90 (.37) ***	3.39 (.43) ***	3.92 (.78) ***
Control variables					
<i>Phase t</i>	.10 (.05)	.10 (.05)	-.25 (.10) *	-.25 (.08) **	-.30 (.07) ***
Level 1					
<i>Ambidextrous leadership^a</i>		.02 (.01)		.08 (.03) **	.07 (.03) *
<i>Boundary spanning behavior t^b</i>					.56 (.21) *
Level 2					
<i>Ambidextrous leadership</i>		.08 (.02) ***		.15 (.03) ***	.10 (.04) **
<i>Boundary spanning behavior</i>					.05 (.31)
R^2_1	.00	.19	.08	.33	.40
R^2_2	.06	.06	.05	.10	.14

Note. N=47, n=180. ^agroup-mean-centered. ^bgrand-mean centered. * $p < .05$, ** $p < .01$, *** $p < .001$.

The regression results for lagged dependent variables are displayed in Table 13. Average ambidextrous leadership is again positively related to both weekly boundary spanning ($\gamma = .08, p < .01$) and weekly innovative behavior ($\gamma = .20, p < .001$). The latter result strengthens Hypothesis 4. When adding boundary spanning behavior as predictor of innovative behavior ($\gamma = .08, p < .001$), the effect of average ambidextrous leadership weakens ($\gamma = .13, p < .001$). Consistent with the results described above, the indirect effect of average ambidextrous leadership via weekly boundary spanning on innovative behavior is significant ($ab = .16, 95\% \text{ CI: } .07, .26$), further confirming Hypothesis 6. However, ambidextrous leadership in one week is not significantly related to innovative behavior in the following week ($\gamma = .05, ns.$). Additionally, the relationship to next week's boundary spanning behavior is also not significant ($\gamma = -.03, ns.$).

Table 13*Results of multilevel linear modeling for the diary study with lagged outcomes*

Dependent Variable	Model 1	Model 2	Model 3	Model 4	Model 5
	Boundary spanning behavior t+1	Boundary spanning behavior t+1	Innovation t+1	Innovation t+1	Innovation t+1
Fixed effects					
Constant	2.33 (.19) ***	1.66 (.24) ***	4.23 (.37) ***	2.45 (.43) ***	1.16 (.46) *
Control variables					
<i>Phase t+1</i>	.13 (.05) *	.11 (.05) *	-.12 (.10)	-.15 (.07) *	-.22 (.07) **
Level 1					
<i>Ambidextrous leadership *</i>		-.03 (.02)		.05 (.03)	.07 (.03) *
<i>Boundary spanning behavior t+1 **</i>					.79 (.21) ***
Level 2					
<i>Ambidextrous leadership</i>		.08 (.02) **		.20 (.03) ***	.13 (.03) ***
<i>Boundary spanning behavior</i>					-.03 (.25)
R^2_1	.03	.20	.06	.39	.50
R^2_2	.04	.06	.02	.03	.16

Note. N=47, n=181. *group-mean-centered. **grand-mean centered. * p < .05, ** p < .01, *** p < .001.

In summary, my results provide evidence for a mediating effect of boundary spanning behavior for the relationship between average ambidextrous leadership and innovative behavior both on the between-person level and as a cross-level (2-1-1) mediation. Ambidextrous leadership in a specific week is also related to innovative behavior in the same week, but not to innovative behavior in the following week, indicating that fluctuations have short-term effects. Furthermore, on the weekly level, it does not predict boundary spanning behavior.

Discussion

I investigated the influence of ambidextrous leadership on innovative work behavior and the mediating role of boundary spanning behavior on multiple levels. In doing so, I introduced a new conceptualization of ambidextrous leadership that takes a paradoxical perspective by integrating opening and closing leader behavior and recognizing the need for their simultaneous presence. I conducted two studies using this refined approach to illustrate its value as specific leadership concept for the innovation process. My results show that perceptions of their leaders' ambidextrous leadership have a positive effect on employees' innovative work behavior. These findings are in line with previous research on ambidextrous leadership (Zacher & Wilden, 2014). Zacher et al. (2014) confirmed that opening and closing leader behavior's effects arise by fostering employees' exploration and exploitation activities, respectively. Balancing exploration and exploitation is strenuous for individuals (Keller & Weibler, 2015) but both are needed in the innovation process (Bledow et al., 2009; Good & Michel, 2013; Rosing et al., 2011).

My findings also show the hypothesized mediating role of employees' boundary spanning behavior in the positive relationship between individual employees' average perceptions of ambidextrous leadership and their average innovative work behavior answering calls to study leadership as antecedent of boundary spanning behavior (Marrone, 2010) and the appropriateness of external activities in the innovation process (Raisch et al., 2009). I was able to show that a combination of complementary leader behaviors encourages individual employees to successfully tackle the multitude of activities required at their work team boundary (Ancona & Caldwell, 1990; Marrone, 2010).

I specifically conducted my research to consider temporal questions related to the influence of ambidextrous leadership on employees' behavior. I postulated that specific ambidextrous leader behavior in a week relative to the average has an immediate impact

beyond that of the average perceptions. To this end, I used a weekly diary study design assessing within-person differences in the study variables. The results show that weekly perceptions of ambidextrous leadership are positively related to employees' innovative work behavior in the same week confirming the relevance of short-term fluctuations in leader behavior (Tims et al., 2011). However, this relationship was not mediated by weekly boundary spanning behavior. Moreover, I did not find a positive relationship of weekly ambidextrous leadership to innovative work behavior in the following week, which supports the notion that ambidextrous leadership is indeed a situational approach to leadership with instantaneous reactions to the inputs provided in addition to the effects of average behavioral tendencies of the leader.

Furthermore, I found a positive effect of average perceptions of ambidextrous leadership on weekly innovative work behavior, which was indeed mediated by weekly boundary spanning behavior. This provides evidence for the notion that the general relationship between a leader and an individual team member has behavioral effects beyond the current exchange. Additionally, my results show that ambidextrous leadership influences the boundary spanning behavior of individual employees at present, but fluctuations are dictated by other situational factors.

Theoretical Contributions

I contribute to the literature on leadership in innovation by exploring in-depth the role of leader behavior in promoting individuals' innovative behavior. My results are in line with prior research establishing the value of combining complementary leader behaviors to better manage the uncertainty and tensions inherent in the innovation process (Bledow et al., 2009; Hunter et al., 2011; Rosing et al., 2011). Thereby, I advance the ambidextrous leadership research by aligning the construct with the literature on organizational paradoxes (Smith & Lewis, 2011) focusing on the *simultaneous* presence of the complementary leader behaviors

to represent their interrelated and non-substitutable nature. Expanding previous findings (Zacher et al., 2014; Zacher & Rosing, 2015; Zacher & Wilden, 2014), I confirm that ambidextrous leadership fosters relevant team member behavior in the innovation process. My multi-level approach contributes to the leadership literature by showing the relevance of time-related considerations in both theory and research designs and the (partial) rejection of homology indicates the need for theory refinement (Chen, Bliese, & Mathieu, 2005).

I did establish that ambidextrous leadership supports boundary spanning behavior which in turn increases innovation answering a call to study further antecedents of boundary spanning, especially leadership (Marrone, 2010). The complementary leader behaviors guide and support team members in dealing with the variety of interactions necessary at the team boundary. However, my results suggest the need for further research on additional antecedents using longitudinal diary studies, as the level of boundary spanning in a specific instant appears to be dependent on additional factors.

Practical Implications

The following tentative practical implications for leading innovation processes can be drawn from my research: Team leaders need to execute „leadership with both hands“ in order to stimulate their subordinates' innovative performance in the innovation process and enable them to handle conflicting demands. Moreover, leaders need to keep track of their interactions with individual team members in order to provide each with the necessary individualized support and guidance for successful innovation activities.

Additionally, leaders and employees both need to establish their roles regarding activities that cross their team's boundary. Understanding how ambidextrous leadership does and does not influence how team members interact towards external parties allows optimizing knowledge and resource management strategies both between different teams in the

organization as well as with external contacts. While these preliminary recommendations are in line with results from related studies (e.g. Andriopoulos & Lewis, 2010; Zacher & Wilden, 2014; Zhang et al., 2015), extensive replication is necessary to validate the adapted conceptualization of ambidextrous leadership proposed and according empirical results.

Limitations and Suggestions for Future Research

While my findings offer several important contributions, the following possible limitations, which indicate directions for further research, need to be considered. Regarding measurement and design issues, all data was self-reported and collected via online questionnaires in the field limiting our ability to infer causal relationships. However, causal interpretation of results is based on a strong theoretical model. Additionally, the sample size of 47 persons with 181 data points on the within-person level in the diary study was comparable to other diary studies (e.g. Tims et al., 2011).

Further, single source and common method biases might be present and third variables could be relevant for our relationships, although the diary study design reduces such risks (Chang et al., 2010; Podsakoff et al., 2003; Podsakoff, MacKenzie, & Podsakoff, 2012). To address these limitations, I have also centered the predictor variables at the group-mean for the pilot study and the person-mean for the main study, respectively, when investigating level-1 relationships, which eliminates level-2 variance (Hofmann, Griffin, & Gavin, 2000) and should further ameliorate my results. Nonetheless, objective performance data and innovative measures and collection intervals will surely be beneficial for future research. Additionally, time as an influence factor in itself needs to be addressed in future research since innovation is such an uncertain and volatile context and innovation processes differ strongly in their timeframes.

Furthermore, future research considering team level relationships, especially incorporating team performance variables would be highly beneficial, since it is common practice in businesses nowadays to assess success on a team basis. Such research should also address whether ambidextrous leadership can emerge as a shared perception within a team or is rather a dyadic person-related phenomenon. I, therefore, call for future studies to investigate the role of ambidextrous leadership on the team level and to consider team and contextual factors when focusing on the processes that facilitate innovation. In addition, future research should also consider followers' personal attributes when trying to explain the effectiveness of ambidextrous leadership.

Moreover, the person of the leader will most certainly have an influence on the variables investigated in this study. As such it is compelling for future research to consider these effects and examine possible predictors of leaders' abilities to show ambidextrous leadership. My results also suggest that the literature would benefit from further studying the occurrence and effects of ambidextrous leadership on a micro level and consider time-specific situational factors regarding followers, e.g. affect, that vary between occurrences.

5. GENERAL CONCLUSIONS

5.1. Summary of Findings

This dissertation focuses on the innovative individual at work in her social context and addresses inconsistencies in the literature and neglected relationships. Thereby, it considers both innovative activities within larger organizations and entrepreneurial endeavors, as both are crucial for innovation within a society. Leaders, coworkers, and the external environment are important sources for individuals working in teams to acquire the necessary resources and support for innovation (Anderson et al., 2014; Hammond et al., 2011; Hülshager et al., 2009; West, 2002b). However, previous research on the effectiveness of leadership styles for innovation has resulted in ambiguous and contradictory results (Rosing et al., 2011) while the topic of leadership has been neglected in entrepreneurship research altogether (Antonakis & Aitio, 2007; Hmieleski & Ensley, 2007). In addition, although individual team members probably spend the most time at work interacting with coworkers compared to leaders, lateral relationships at work have received less attention than vertical ones (Cole et al., 2002) and the relative quality of a focal member's relationship to the team has only recently been introduced as a relevant factor (Farmer et al., 2015). Finally, team members' boundary spanning behavior is considered as mediator in all studies acting as connective element because the team's external environment poses demands and offers resources for team members' tasks (Marrone, 2010).

In chapter 2, I investigated the question: *How are individual members' team internal and external relations linked in supporting the implementation of ideas?* In two studies, I found that both the average quality of social exchange relationships in a team as well as an individual member's standing relative to others are positively related to said member's innovative work behavior. The underlying mechanisms, however, differ, as the social resources gained from the average quality of TMX in the team foster members' boundary

spanning behavior, while relative TMX does not, providing support for the need to consider both social exchange and social comparison explanations for the influence of TMX.

Additionally, I found support for the notion that the environment within the team needs to be safe for members' to efficiently interact with external actors (Edmondson, 1999b).

The multilevel study in chapter 3 addressed the following question: *What leadership style is effective in pre-founding entrepreneurial teams and what are the team-level and individual-level mediating mechanisms?* This study adds to the very limited amount of studies examining nascent entrepreneurial teams previous to the founding of a new venture (Foo et al., 2006; Johnson et al., 2006). It shows that charismatic leadership increases team and individual performance in entrepreneurial tasks. Team reflexivity mediates both relationships establishing the importance of team processes for entrepreneurship. Furthermore, charismatic leadership was positively related to boundary spanning, although the latter did not influence performance.

The results from chapter 4 show that the simultaneous presence of the complementary opening and closing leader behaviors at a specific time does support individual team members' innovative behavior within the same week but not for a following week. An average level of ambidextrous leadership is generally beneficial. Hence, it answers the posed question: *How does the simultaneous display of opposite but complementary leader behaviors influence employees' innovative behavior?* A leader's average ability to be ambidextrous (i.e. simultaneously showing opening and closing leader behavior) also predicted team members' boundary spanning behavior, while time-specific occurrences of opening and closing leader behavior did not. My clarification and advancement of the ambidextrous leadership theory by aligning it with a paradoxical lens on organizational tensions (Smith & Lewis, 2011) is shown to be of value.

5.2 Main Contributions for Theory

The main contributions of my dissertation are as follows: First, I provide evidence for the influence of coworkers on focal team members' idea implementation. Extending the literature by considering TMX at multiple levels, I show, that coworkers influence a person's work behaviors and that different mechanisms are at work for social comparison and social exchange effects affecting individual level outcomes (Cole et al., 2002; Farmer et al., 2015; Liao et al., 2010). I also fill a gap by focusing on idea implementation instead of the better-researched idea generation and providing evidence that it is dependent upon social factors (Axtell et al., 2000; Baer, 2012; van de Ven, 1986). This is essential because generated ideas need to be implemented to be of value (Baer, 2012).

Second, I show that team processes are also crucial in nascent entrepreneurial teams and that leaders strongly influence these processes. Following research on the positive impact of charismatic leadership in organizations (DeGroot et al., 2000; Paulsen et al., 2009) I find that it is also a predictor of entrepreneurial performance specifically in the previously neglected pre-founding phase (Foo et al., 2006; Johnson et al., 2006). In contrast to previous thoughts that they would increase group think in teams (Den Hartog & Koopman, 2001), I show that charismatic leaders are able to support team reflexivity, which, in turn, is a key team process for entrepreneurial success.

Third, a paradoxical lens on leadership for innovation is valuable as the simultaneous presence of opposite but complementary leader behaviors supports innovative behaviors. To address the tensions resulting from the uncertainty and competing demands in the innovation process we show the value of integrating opening and closing leader behaviors. Advancing previous conceptualizations of ambidextrous leadership to be in line with the paradoxical lens on organizational tensions (Rosing et al., 2011; Smith & Lewis, 2011), I show that the leader behaviors are interrelated and not substitutable. I also address the relevance of temporal

considerations for leadership research (Ancona et al., 2001; Shamir, 2011) showing that ambidextrous leadership has time-dependent effects.

Fourth, leaders and coworkers are shown to influence how team members interact with actors external to the own team and the effectiveness of these interactions affects their innovative behavior. In line with previous research, the value of external resources and social capital for innovation was confirmed (Keller, 2001; Nahapiet & Ghoshal, 1998). I found that leaders and coworkers influence team members' boundary spanning behavior, answering calls to study further antecedents of boundary spanning and the relationship of team-internal and externally directed activities (Choi, 2002; Marrone, 2010). While I have discussed avenues for future research in detail in the previous chapters, the overarching question in what contexts boundary spanning might be crucial and when it might even hinder performance remains open, as it was not related to the entrepreneurial performance measures in the study reported in chapter 3.

5.3 Implications for Practice

Practice has long recognized the value of effective teamwork making the ability to work in teams a common factor in job descriptions and creating companies specialized in teambuilding. This dissertation extends previous knowledge providing practitioners with an understanding of key team processes that foster innovation and entrepreneurial activities. Furthermore, my findings indicate that improving relationships in the work teams is a starting-point for organizations to ensure that creative employee ideas are implemented and not discarded (Baer, 2012).

Team leaders can greatly impact team processes and members' behaviors (Hackman, 2002). In uncertain and highly variable conditions, having a strong vision of the team's future and a leader as role model helps members to evaluate and adjust the team objectives and

strategies. In addition, leaders can support team members facing conflicting demands by providing the necessary structure and direction but allowing for latitude and discretion in members' activities (Andriopoulos & Lewis, 2010; Lewis, Andriopoulos, & Smith, 2014). Organizations may design leadership training programs to educate leaders to be able to deal with the tension resulting from having to display opposing but complementary behaviors to enable ambidexterity in their teams. In addition, the top management could provide a strong overall vision and endeavor to spread it throughout the organization.

Furthermore, leaders and coworkers influence how team members interact towards external parties, optimizing knowledge and resource management strategies between organizational teams and with external actors. A team's image in the organization and beyond also results from team members' behaviors displayed towards the team environment, which can greatly influence a team's success in the long run. Social events, also spanning different units, could help create beneficial ties within organizations.

Overall, the studies in this dissertation have shown that individual team members' interactions at work with leaders, coworkers, and external actors significantly influence their behavior and all three reference groups need to be considered when aiming to improve innovation and entrepreneurial performance.

FOOTNOTES

¹ A shortened version of chapter 2 will be submitted as:

Schreiner, E., Sparr, J. L., Peus, C. (To be submitted). *Linking TMX and idea implementation: The mediating role of boundary spanning*.

² A version of chapter 3 is currently under review:

Knipfer, K., Schreiner, E., Schmid, E., & Peus, C. (Revise and Resubmit). *Charismatic leadership and performance of nascent entrepreneurial teams: Testing team reflexivity and boundary spanning behavior as multilevel mediators*. *Applied Psychology: An International Review*.

³ Ancona & Caldwell (1990, 1992) introduced two additional types of boundary spanning behavior, task coordinator and guard. However, task coordinator behaviors, i.e. the interaction with closely associated actors (e.g., other teams) on the same hierarchical level to negotiate deadlines and monitor interdependent work flows, seemed not relevant in nascent entrepreneurial teams that do not yet perform their intended business activities. Guard behaviors, i.e. actions undertaken to limit the release of information, are strongly inward focused and generally dismissed when focusing on externally directed activities (Faraj & Yan, 2009, Marrone, 2010).

⁴ To further validate the quality of the business plan as outcome measure, we hand-collected information about the teams using archival data of the entrepreneurship and innovation center as well as the internet. We looked for information about whether a team was granted access to further training and coaching sessions on an advanced level, whether a team's business idea was awarded in business idea competitions or received funding, and whether a team pursued founding activities and/or founded a business ultimately. From this data, we can conclude that of 23 teams, whose business plan was evaluated very positively (expert judgment was 9.0 or 10.0), seven were granted access to advanced training and coaching sessions, nine were awarded in business competitions and/or received funding, and three pursued concrete

activities to start a business. In contrast, of the 35 teams, whose business plan was evaluated as 8.0 or worse, only one was granted access to advanced training and coaching sessions, only one was awarded/received funding, and two pursued activities to start a business.

⁵ A version of chapter 4 is currently in the second round of review:

Schreiner, E., Sparr, J. L., Peus, C. (Revise and Resubmit). *A multilevel investigation of ambidextrous leadership in the innovation process: The mediating role of boundary spanning behavior*. *The Leadership Quarterly*.

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