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Leadership Support for Innovation: The Intervening Role of the Climate for Creativity

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Abstract

This multi-method study examined the mediating effect of climate for creativity between leadership behavior and innovation at the work-unit (proximal) and organizational (distal) levels. The study was conducted with a sample of 180 engineers in the aerospace industry. Creative autonomy, idea-support, challenge and involvement, and conflict were identified as underlying constructs for the climate for creativity. The analysis revealed that climate for creativity complementarily mediates the relationship between leadership support for innovation and innovation, with idea-support as the most influential dimension. A distinction between work-unit innovation and organizational-level innovation showed that the conflict dimension was influential only at the more proximal work-unit innovation level. Qualitative analysis confirmed these dimensions and identified the underlying constructs for leadership behavior in relation to climate for creativity, for both helping and hindering innovation.

Keywords: *leadership behavior, climate for creativity, organization innovation, work unit innovation*

INTRODUCTION

Meeting the innovation challenge is one of the top-priority strategic goals organizations strive to achieve. Some studies report that over 70% of senior managers perceive innovation as a top three priority for their organization (Barsh, Capozzi, & Davidson, 2008). In order to succeed at innovation, organizations need employees that provide discretionary efforts for the organization and feel committed, challenged, and dedicated to the organization. Yet, some recent surveys indicate a dramatically low level of global employee engagement. A Gallup study (O'Boyle & Harter, 2013) including over 140 countries, showed that only 13% of the global workforce was actually engaged. The same study found that 63% were not engaged, meaning they are emotionally disconnected at work and less likely to be productive. Close to one quarter of the employees were actively disengaged meaning these

employees are negative and potentially hostile to their organization.

Engaged employees provide the energy, commitment, and ideas that help organizations meet their innovation challenges. The degree to which employees are engaged depends, in large part, on the quality of their work environment (Lofquist, Isaksen, & Dahl, 2018). This observation has led to a dramatic increase in interest and research on the work environment (Kuenzi & Schminke, 2009).

There are two major streams of literature within the broad domain of work environment (Denison, 1996). One stream focuses on culture, and includes deep assumptions, values and beliefs that create norms for behavior. Culture reflects the deeper foundations of the organization. The other stream focuses on climate, which includes observations of actual behavior that characterizes the working atmosphere of the organization (Ekvall, 1996). Climate is what members of the organization experience.

This study focused on the facet-specific climate for creativity and innovation. Creativity is defined as the production of novel and useful ideas by individuals in any domain (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Woodman, Sawyer & Griffin, 1993). Innovation is the transformation of these ideas and insights into deliverable business results (OECD & Eurostat, 2005). The necessity of creativity for innovation and better performances in organizations is supported by many scholars (e.g. Gilson, 2008).

Many factors influence the climate for creativity and innovation (Scott & Bruce, 1994; Shalley, Gilson, & Blum, 2009). Leadership behavior is one of the most influential antecedents for the kind of climate that supports creativity, innovation, and change (Amabile, Schatzel, Moneta, & Kramer, 2004; Ekvall & Ryhammar, 1998). The way leaders behave determines how employees feel and behave at work, the level of energy they put into their work, how they use their creative ability.

This study attempts to make a number of contributions to the existing literature. First, inspired by previous work on the relationship between leadership and organizational climate (e.g. Jung, Wu & Chow, 2008; Li, Zhoa & Begley, 2015) we identify the dimensions of the climate for creativity that come into play when examining the relation between leadership support for innovation and innovation. At present, there is no consensus concerning how many dimensions of creative climate there are (Hunter, Bedell, & Mumford, 2007). Ekvall's (1983; 1996) foundational work to identify dimensions of creative climate that distinguished between innovative and stagnated organizations utilized the initial version of the Creative Climate Questionnaire (CCQ) with 10 dimensions. After repeated exploratory factor analytic (EFA) studies on the CCQ, these were reduced to nine in the Situational Outlook Questionnaire (SOQ) (Isaksen, Lauer, & Ekvall, 1999): challenge/involvement, freedom, trust/openness, idea-time, playfulness/humor, conflict, idea-support, debate and risk-taking. Other studies have included a six-dimensional model of the creative work environment (Lapierre & Giroux, 2003), three main dimensions of open innovation climate (Remneland-Wikhamn & Wikhamn, 2011), or four team innovation climate dimensions (West, 1990). Shanker & Bhanugopan (2014) utilized the SOQ with a Malaysian sample of 202 managers, and although EFA supported nine distinct factors, their confirmatory factor analysis (CFA) produced six, higher-order factors. These included: debate, challenge, idea-time, playfulness, conflict, and idea-support. We add to the literature by offering the first examination of the CFA conducted with the SOQ on a North American sample, and linking the latent factors identified to other commonly identified dimensions within the literature related to this study.

Second, previous studies with the Situational Outlook Questionnaire (SOQ) have included diverse individuals from various nationalities (e.g. Isaksen, 2007; Isaksen & Akkermans, 2011). Following through on their recommendations, and to address the converging findings in the literature on the dimensions of climate for creativity, this study utilizes a slightly larger and more homogeneous sample of engineers within the aerospace industry. This allows a more focused examination of previous relationships reported in the literature.

Third, we take into account that innovation is a multi-level construct and test for differences between the organization (distal) and the work-unit (proximal) levels (Gopalakrishnan and Daman-

pour, 1997; Damanpour & Schneider, 2006). The proximal-distal distinction has already been addressed within the safety climate literature. Zohar (2010) reviewed thirty years of safety climate research and found substantial variation in safety climates depending on proximal and distal levels of analysis. Fugas, Silva, and Melia (2012) identified both proximal and distal antecedents of safety behaviors in their examination of cognitive and social mediator mechanisms. The proximal-distal distinction has also been recently applied within the group leadership literature. Yu, Matta, and Cornfield (2018) conducted a meta-analytic investigation on leader-member exchange differentiation within work groups. They found meaningful differences in proximal and distal group outcomes. Isaksen and Akkermans (2011) reported results for both proximal and distal innovation in their investigation on creative climate using the SOQ, but no additional analyses were conducted. This study represents one of the first to include an examination of this distinction.

Fourth, most previous studies examining the relationship between leadership and work environment have been either purely quantitative, or purely qualitative (Amabile, Schatzel, Moneta, & Kramer, 2004; Isci, Çakmak, & Karadag, 2015). We take a multi-method approach to the question of linking innovation, leadership, and climate for creativity (Molina-Azorin, 2011). This allows breadth of comparison to other studies using a quantitative approach, and more in-depth qualitative analysis when it comes to understanding the specific leadership behaviors that promote or hinder innovation. This addresses the darker side of leadership which has not yet been adequately addressed in the literature (Anderson, Potocnik, & Zhou, 2014).

The following section reviews the literature and presents the research questions. Section 3 provides insights in the data and presents the method. In Section 4, the dimensions of climate for creativity mediating between leadership support for innovation and innovation are quantitatively and qualitatively tested. Section 5 provides managerial implications.

THEORETICAL BACKGROUND

In this section, we shed light on existing insights regarding underlying dimensions of the climate for creativity, the link with leadership behavior, and innovation at the work unit and organization level. The section includes the research questions addressed in this study.

Leadership Behavior

Leadership behavior is one of the most researched constructs in the organizational literature (Burns, 1982). Isaksen (2017, p.134) described leadership, in the context of creativity and innovation, as "any actions initiated by leaders aimed at the transformative aspects of the organization. Acts of leadership occur whenever strategic problems are solved, decisions are made, or information exchanges result in actions". Leaders who are at the top of organizations and have the power to influence organizational performance, make responsible decisions and set goals and priorities. They exert influence through direct decision-making, and also through how their behavior is perceived and observed by others (Isaksen & Akkermans, 2011).

Leadership behavior has been identified as a key factor influencing the climate for creativity and the level of innovative productivity within organizations (Elenkov & Manev, 2005; Jung, Chow, & Wu, 2003; Sarros, Cooper & Santora, 2008). Leadership behavior is often considered an antecedent factor having both direct, and indirect influences on the climate for creativity (Isaksen, 2017).

The way leadership behavior is approached within this study is related to many types of leadership mentioned in the literature including: transformational leadership (employees see their leader as supportive, rewarding, intellectually stimulating, and communicative), more relational leader-member exchange (LMX), and more servant-oriented leadership.

Climate for Creativity

There is little agreement on the nature and number of dimensions comprising the multidimensional concept of the climate for creativity and innovation. Two previous studies asserted that Ekvall's ten dimensions of creative climate were too broad to be

useful. Moultrie and Young (2009) simplified the CCQ into two higher-order factors—attitude toward work, and atmosphere for work. In their study to compare Amabile's (1997) and Ekvall's (1996) models of creative climate, they concluded that there may be a hierarchy of dimensions. Cokpekin and Knudsen's (2012) study on process and product innovation followed up on Moultrie and Young (2009). Their resultant survey included seven dimensions (organizational motivation, resources, challenge, freedom, idea support, proactiveness and idea-time). These dimensions provided mixed support for both product and process innovation. A concern regarding both these studies is the conceptual distinction between elements that clearly belong to the broader work environment construct, and those that belong within the bounded climate concept. For example, the availability of resources clearly belongs within the conceptual boundary of work environment, but not within the broadly accepted definition of climate—as perceived patterns of behavior.

Informed by both an extensive review of the literature, confirmatory factor analysis, and a quantitative and qualitative analysis (Section 4), this study focuses on four dimensions of climate that are relevant for leadership behavior to influence innovation: creative autonomy, idea-support, challenge and involvement, and conflict.

There is a great deal of support in the literature to use creative autonomy as a dimension of the climate for creativity (Sagiv, Arielli, Goldenberg & Goldschmidt, 2010; Scott & Bruce, 1994). Shalley, Gilson and Blum (2009) examined the relationship between an individual's desire to grow and learn within the job and a supportive work context in terms of adequate time and resources available to pursue creative ideas. Dul and Ceylan (2014) found that organizations with high levels of job autonomy (decision latitude in the job), and time for thinking (the availability of time for idea generation without the time pressure of everyday work), introduced more new products to the market and generated more sales from these new products. Wang and Cheng (2010) found job autonomy to be a significant moderator between the benevolent leadership and creativity relationship.

The idea-support dimension is referred to as the degree of encouragement and attention given for the consideration of new ideas (Madrid, Patterson, Birdi, Leiva & Kausel, 2014; Somech & Drach-Zahavy, 2013; Yuan & Woodman, 2010). Gong, Kim, Lee & Zhu (2013, p.833) defined the supportive climate for innovation as "the norms of innovation or the expectation, approval and practical support of attempts to introduce new and improved ways of doing things". They confirmed the intervening role of a supportive climate for innovation on team creativity. DiLiello, Houghton, and Dawley (2011) examined the moderating effect of perceived support for creativity. They found that an idea-supportive climate intensified the relationship between creative self-efficacy and self-perceived creativity.

The challenge and involvement dimension concerns the feeling of engagement and is well-supported in the literature (Kark & Carmeli, 2009). Carmeli, Cohen-Meitar and Elizur (2007) examined the relationship between job challenge and employees' creative behavior. They found employees who perceived their job as challenging had higher levels of creative behavior. In addition, they concluded organizational identification mediated this relationship. Shalley et al. (2009) found that people who are challenged by their job need to make more use of their creative ability. Zhang and Bartol (2010) looked at the intervening nature of creative process engagement between the empowering leadership and employee creativity relationship. One of their findings is that involvement in creativity-relevant methods or processes positively affects creativity.

The conflict dimension reflects the degree to which there is personal and emotional tension in the workplace. The literature makes clear distinctions amongst three types of conflict (De Dreu, 2008, Tjosvold, Wong & Chen, 2014). Task conflict refers to debates over task development. Process conflict refers to disagreements over the approach or methods used to handle tasks. Relationship conflict is characterized by personal tension, anger, aggression, or frustration among individuals. Task and process conflict often result in positive effects on creativity (Janssen & Giebels, 2013). However, relationship conflict, which is the type of conflict used in this study, has a negative effect on creativity.

For example, Isaksen and Ekvall (2010) found that lower levels of personal conflict in organizations are more conducive to organizational creativity and innovation. Schulze, Stade and Netzel (2014) investigated the effects of different conflict management styles in order to deal more effectively with this negative dimension.

Climate for Creativity and Innovation at Proximal and Distal Level

A substantial amount of literature confirms the important role that climate plays for organizational level creativity and innovation outcomes (Crespell & Hansen, 2008; Dul & Ceylan, 2014; Hsu & Fan, 2010; Isaksen, 2013). Most of these studies examine innovation and creativity outcomes at a distal, omnibus, or molar level (overall organizational performance). For example, Wu and Lin (2011) used structural equation modeling to look at the relationship between the business strategy and the overall innovation success of the organization. They found that organizations with a strong innovation strategy achieved higher quality of innovation (product or service quality) which yielded higher innovative performance (innovation success rate, market share, and innovation profitability).

A more recent trend in the literature has been to study the climate and outcomes at a team level of analysis (Chen, Farh, Campbell-Bush, Wu, & Wu, 2013; Mitchell & Boyle, 2015). Since studies of other facet-specific climates and outcomes yield meaningful differences when examining the distal-proximal distinction, it seems reasonable that we should see differences when studying the climate for creativity and innovation outcomes. Few studies have compared climate and outcomes from this point of view, and the only previous study we could find that utilized the SOQ and considered this distinction was Isaksen and Akkermans (2011).

Climate for Creativity as an Intervening Variable

The creative climate construct has been utilized as an antecedent and dependent variable in some studies, but more recent research has considered climate as an intervening variable—particularly influencing the relationship between leadership and innovation outcomes (Eisenbeiss, van Knippenberg, & Boerner, 2008; Ekvall & Ryhammar, 1998; Koene, Vogelaar & Soeters, 2002; Olsson, Hemlin & Pousette, 2012).

Jung, Wu, and Chow (2008) and Jung, Chow and Wu (2003) examined how transformational leadership can indirectly affect an organization's innovativeness through the climate for innovation. Both studies concluded that transformational leadership is positively related to organizational innovation and that climate for innovation moderated this effect. Volmer, Spurk and Niessen (2012) focused on the quality of the leader-employee interaction and creativity at work. They found that job autonomy (which is part of the climate for creativity) plays a crucial moderating role in this relationship. LMX and creativity had a direct and positive relationship and this relationship becomes stronger with high levels of job autonomy. These studies have implied that leadership influences innovative productivity through the climate for creativity.

The insights presented above lead to the following quantitative research questions we consider for this study:

Research Question 1. Do the four dimensions of creative climate (creative autonomy, idea-support, challenge/involvement, and conflict) mediate the relationship between leadership support for innovation, and innovation at the work-unit (proximal), as well as at the organizational (distal) levels?

Research Question 2. What is the mediating effect, respectively, of creative autonomy, idea-support, challenge/involvement, and conflict in the relationship between leadership support for innovation and innovation at work-unit, as well as at the organizational levels?

Climate related Leadership Behaviors that Help and Hinder Innovation

Most of the literature dedicated to identifying leadership behaviors that influence creativity and innovation focus mainly on positive behaviors (Isaksen, 2017). For example, de Jong and Den Hartog (2007) provided an inventory of different leadership behaviors that enhance employees' innovative capabilities such as generating and applying new ideas. Combining in-depth interviews and literature, they identified 13 leadership behaviors that could be connected to improved innovative behav-

ior. These behaviors included: innovative role modeling, intellectual stimulation, stimulating knowledge diffusion, providing vision, consulting, delegating, support for innovation, organizing feedback, recognition, rewards, providing resources, monitoring and task assignments. These behaviors provide an example of what leaders should do in order to stimulate creativity and innovation.

There have also been calls for an improved understanding of the "darker" side of leadership—referred to as destructive leadership, among other terms (Denti & Hemlim, 2012; Hughes & Harris, 2015). The dangers and drawbacks of this type of leadership behavior are well established in the literature (Erickson, Shaw, Murray, & Branch, 2015; Higgs, 2009; Schyns & Schilling, 2013). Knowing the behaviors leaders should avoid in the workplace may be even more important than the positive or supporting behaviors. Baumeister, Bratlavsky, Finkinenauer, and Vohs (2001) found that, with hardly any exceptions, exposure to bad or negative events had more impact than good or positive events.

Exploring the darker side of leadership for creativity and innovation has been rather limited (Roskes, 2015). One of the most influential studies in this area was done by Amabile, Schatzel, Moneta, & Kramer (2004). They conducted a qualitative study to identify specific leadership behaviors related to leadership support that were effective, as well as ineffective for the creative potential of employees. They identified the following negative leadership behaviors: giving assignments that are not appropriate for an individual, inadequate understanding of subordinates' capabilities or work, creating high time-pressure with assignments, not providing enough clarity about an assignment, and over-checking on the status of assigned work. They concluded that future research needed to highlight the negative aspects of leadership as well as the positive.

In addition to examining quantitative relationships among leadership behavior, the climate for creativity, and innovation, qualitative analysis was conducted to identify specific leadership behaviors that help and hinder moving innovation forward. Using the climate for creativity as the construct, an additional level of qualitative analysis looked at links between the identified leadership behaviors and the dimensions of the climate for creativity. In that way, specific behaviors per dimension can be identified. This also provided the opportunity for qualitative confirmation of the four underlying dimensions (creative autonomy, idea-support, challenge/involvement, conflict) of the creative climate as mediators between leadership support for innovation and innovation. In order to do so, the two following research questions were addressed.

Research Question 3. What are creative climate related leadership behaviors that help move innovation forward?

Research Question 4. What are creative climate related leadership behaviors that hinder innovation moving forward?

METHOD

Sample and Context

The target population included engineers and technical experts in the aerospace sector. Aerospace products such as military fighter aircraft, commercial airplanes, or weather satellites are characterized by a high technicality and strong integration of a multitude of highly complex skills and technology (Norris, 2009). Engineers and technical experts in this sector are confronted with an accelerating pace of technology development, increasing speed of market change, while at the same time being faced with reduced resources. Their workplaces challenge them to apply their creativity and they need a climate for creativity and innovation in order to be successful (Brown, 2007; Richard, 2003).

All engineers surveyed belong to a US-based aerospace engineering and technical union society with over twenty thousand members. Taking into account generally accepted characteristics that potentially influence the responses, this population was stratified according to age, work experience, engineering background or technical expertise (e.g. aerodynamics, manufacturing engineering, etc.). Within the strata, and proportional to the size of each stratum, simple random sampling was relied upon to select a sampling frame of 1800 members. Each of the members of the sampling frame was addressed and 180 respondents completed the Situ-

ational Outlook Questionnaire (SOQ) for a doctoral dissertation (Retz, 2011).

The number of respondents was appropriate since the SOQ has nine dimensions and a minimum of between 10 (Zhao, 2001) and 20 (Statnotes, 2007) responses for each target area are required to achieve good data correlation. For electronic surveys, a response rate around 10% can be expected. The survey offered anonymous responses over a password-protected secure internet server, and lasted for 3 weeks, with a reminder after two weeks for those who had not yet completed the assessment. Partial responses were not coded since a complete submission was a requirement for participation consent and to register the responses. The main engineering groups the respondents belonged to included: aerodynamics, manufacturing, quality, and structural or systems. Thirty percent of the respondents had a master degree and 50% had at least some degree (e.g. bachelors). Thirty percent had tenure of more than 20 years, 24% between 10 and 20 years, and 5% of the respondents were in their first two years working within their organization. Since no indication of differences in response rate within the strata was found, each of the responses is given an equal weight in the analysis.

Measures

All assessments were conducted at an individual level, centered on the exploration of impressions of engineers to determine the factors they believe affect creativity and innovation within their organization, as expressed within the SOQ. The 53 closed-ended questions in the SOQ were organized on a Likert-type scale (0 = not at all applicable, 1 = applicable to some extent, 2 = fairly applicable, 3 = applicable to a high degree). The SOQ was scored for both the nine-dimensional design, and was recalculated to reflect the four higher-order dimensions.

Leadership Support for Innovation

Leadership support for innovation (LSI) was measured with the question: "Leaders and managers I observe are effective in creating an environment that supports innovation". Asking this question is partially based on the work of Kozlowski & Doherty (1989) who identified that the nature and quality of interactions with supervisors may be a key filter in the interpretations that provide the basis for subordinates' climate perceptions. The negotiating altitude they refer to is based on close and direct interaction with their supervisors. The closer this interaction, the stronger the effects and climate.

More recent theoretical development suggests a more unit-specific focus on leadership processes in contrast with an average organizational-level focus (Kozlowski & Doherty, 1989). Processes that characterize the interactions within the immediate organizational context are expected to have closer links to perceptions (Schneider, Salvaggio, & Subirats, 2002). Therefore, leadership is simultaneously measured at work-unit and at the organizational level.

Climate for Creativity

Climate for creativity included the four dimensions of the SOQ as highlighted in the literature review: creative autonomy (4 items, e.g. "most people have time to think through new ideas here"), idea-support (4 items, e.g. "people here receive support and encouragement when presenting new ideas"), challenge/involvement (4 items, e.g. "most people here enjoy contributing to the success of the organization") and conflict (4 items, e.g. "the atmosphere here is filled with gossip and slander"). In-depth assessments of the SOQ have shown adequate levels of internal reliability and stability of these dimensions over time (Isaksen & Ekvall, 2007; Isaksen, Lauer & Ekvall, 1999).

Confirmatory factor analysis (See Table 1) shows that the four-factor model provides a good fit and indicates that treating the climate for creativity as a four-dimensional construct is more appropriate than treating it as a nine-dimensional construct for this study. In addition, the Harman's single factor test showed that the measurement does not suffer from common method variance (CMV). Results indicated that the climate for creativity did not explain the majority of the variance (46%) and suggests the absence of CMV in this measurement.

Since the dimensions of the climate for creativity are aggregates of individual responses (members of the organization) inter-rater agreement is tested using two well established methods. The first was

Table 1: Confirmatory factor analysis results for climate for creativity as nine and four-dimensional construct

Fit indicators CFA	Model with 9 dimensions	Model with 4 dimensions
Chi-square (χ^2)	2404.73	209.52
Goodness-of-fit index (GFI)	0.78	0.93
Adjusted goodness-of-fit index (AGFI)	0.75	0.90
Normed fit index (NFI)	0.83	0.94
Incremental fit index (IFI)	0.91	0.97
Tucker-Lewis index (TLI)	0.90	0.97
Comparative fit index (CFI)	0.91	0.97
Root mean square error (RMSE)	0.05	0.06

r_{wg}, (James, Demaree, & Wolf, 1993; Pirola-Merlo & Mann, 2004). Intra-class correlation (*ICC (1)* and *ICC (2)*) was also utilized to assess the level of group homogeneity (Hallgren, 2012; Patterson, Payne, & West, 1996; Shrout & Fleiss, 1979). Creative autonomy, idea-support, challenge/involvement and conflict had r_{wg} values of 0.71, 0.73, 0.80, and 0.55, respectively, yielding an average of 0.70 for the climate for creativity and meet the r_{wg} criterion of 0.70 (James, Demaree & Wolf, 1993). The *ICC (1)* values of the four dimensions of the climate for creativity had an average of 0.87 with a range of 0.85 and 0.89. The *ICC (2)* values of the climate for creativity had an average of 0.88 with a range of 0.87 and 0.90. These *ICC* results meet and exceed accepted standards (Campion, Medsker, & Higgs, 1993; Kirkman, Chen, Farh, Chen, & Lowe, 2009). The results of these tests provided support for aggregation of the climate for creativity responses.

Innovation

Innovation was measured using two items. The first item asked respondents about their level of innovative success within their immediate work unit: "We are successful in implementing new ideas to obtain results in the work unit" (innovation at work-unit or proximal level). The other item focused on the organizational level of innovative success: "In general, my organization has been successful at innovation" (innovation at organizational, omnibus, or distal level). Only one question was utilized for each level, so aggregation was not an issue.

Since the distinction is made between innovation at the work unit and at the organizational levels, the level of analysis issue is related to the conceptual distance of the assessment (Kanfer, 1990). Individual judgments and perceptions may differ when responding to proximal versus distal issues. They are conceptually distinct, yet may offer complementary insights and implications (Bandura & Schunk, 1981). We believe this is one of the first studies to raise and examine this issue within the context of innovative performance.

Table 2 presents an overview of all variables, all measured at a four-point Likert scale.

Open-ended questions

Two open-ended questions were integrated into the web-based SOQ in order to identify specific leadership behaviors that helped or hindered creativity and innovation. Based on the critical incident technique (Flanagan, 1954), the respondents were asked to consider and recall a situation where these types of behavior were present. The question for helpful leadership behavior was: "Consider a real and recent situation in which your project leader, manager, or supervisor did something that really helped you and your colleagues move innovation forward". The question for hindering leadership behavior was: "Consider a real and recent situation in which your project leader, manager or supervisor did something that provided a barrier to you and your colleagues in moving innovation forward".

Mediation Analysis

To investigate the mediating role of creative climate in the relation between leadership support for innovation and innovation, a quantitative approach was used combining the Baron and Kenny (1986) methodology and the bootstrapping technique by

Table 2: Variable descriptions

Variable	Definition
LSI	Level of perceived leadership support to act innovatively: "Leaders and managers I observe are effective in creating an environment that supports innovation".
Creative autonomy	Refers to the independence in behavior exerted in experimenting with new ideas by the people in the organization. People are given the freedom to use some of their time for elaborating new ideas. In a high autonomy situation, possibilities exist to discuss and test impulses and fresh suggestions that are not planned or included in the task assignment.
Idea-support	In the supportive climate, ideas and suggestions are received in an attentive positive, constructive and professional way by bosses, peers, and subordinates. People listen to each other and encourage initiatives. Possibilities for trying out new ideas are created.
Challenge and involvement	The degree to which people are involved in daily operations, long-term goals, and visions. High levels mean that people are intrinsically motivated and committed to making contributions to the success of the organization. People find joy and meaningfulness in their work, and therefore, they invest much energy.
Conflict	Reflects the presence of personal and emotional tensions in the organization. When the level of conflict is high, groups and individuals dislike, and may even hate each other. The climate can be characterized by "interpersonal warfare". Plots, traps, power and territory struggles are usual elements in the life of the organization. Personal differences yield gossip and slander. Unlike the others, conflict is a negative dimension, meaning lower is better.
Work Unit Innovation	Refers to the level of innovative success of the immediate work unit: "We are successful in implementing new ideas to obtain results in the work unit".
Organizational Innovation	Refers to the level of innovative success of the organization as a whole: "In general, my organization has been successful at innovation".

Note : For all variables, a four-point Likert scale was used with 0 = not at all applicable, 1 = applicable to some extent, 2 = fairly applicable, 3 = applicable to a high degree.

Preacher and Hayes (2004). Baron and Kenny (1986) proposed a three-step method to test for mediation. First, the mediator is regressed on the independent variable. Second, the dependent variable is regressed on the independent variable. And third, the dependent variable is regressed both on the independent variable and on the mediator. To establish mediation, Baron and Kenny (1986, p.1177) asserted that the following conditions must hold: "first, the independent variable must affect the mediator in the first equation; second, the independent variable must be shown to affect the dependent variable in the second equation; and third, the mediator must affect the dependent variable in the third equation. If these conditions all hold in the predicted direction, then the effect of the independent variable on the dependent variable must be less in the third equation than in the second". For this procedure, another indicator of mediation is an increased R^2.

Zhao, Lynch and Chen (2010) reconsidered the approach by Baron and Kenny (1986) and proposed a typology of mediation and non-mediation ranging from complementary mediation (overlapping with partial mediation by Baron and Kenny, 1986), competitive mediation, indirect-only-mediation (overlapping with full mediation by Baron and Kenny, 1986), direct-only non-mediation, and no-effect non-mediation. This approach we followed combined the Baron and Kenny (1986) approach with the nonparametric bootstrap technique as proposed by Preacher and Hayes (2004). The latter approach identifies the indirect effect of the independent variable (leadership support for innovation in our case) on the dependent variable (innovation) through the mediator (creative climate). It is accomplished by taking a large number of samples of size n (where n is the original sample size) from the data, sampling with replacement, and computing the simple mean of the indirect effect in each sample. A lower and an upper limit of the 95% confidence interval is obtained by sorting the estimates of the indirect effect from low to high.

Qualitative analysis

To address this study's qualitative research ques-

Table 3: Descriptive statistics and correlation matrix of the variables

Variable	Mean	SD	Range	CA	1	2	3	4	5	6
LSI	1.24	0.94	0-3		1.00					
Creative autonomy	1.33	0.74	0-3	0.87	0.57**	1.00				
Idea-support	1.51	0.75	0-3	0.88	0.70**	0.78**	1.00			
Challenge/Involvement	1.97	0.67	0-3	0.87	0.50**	0.48**	0.58**	1.00		
Conflict	0.91	0.85	0-3	0.89	-0.31**	-0.25**	-0.40**	-0.42**	1.00	
Work unit innovation	1.44	0.92	0-3		0.63**	0.64**	0.75**	0.50**	-0.34**	1.00
Organizational innovation	1.27	0.87	0-3	0.87	0.61**	0.65**	0.70**	0.50**	-0.23**	0.76**

Note: N = 180, **p < 0.01. CA: Cronbach's Alpha

tions regarding leadership behaviors related to creative climate that help or hinder innovation, the narrative data were analyzed using the qualitative technique of constant comparison (Glaser & Strauss, 2017). Content analysis was conducted first including the process of identifying, coding, and categorizing the primary patterns in the data (Patton, 1990). This created the basis set for the organization and conceptualization of the data (Dey, 1993). This resulted in a broad set of initial categories of leadership behaviors. In the next step, a closer look was given to every coded narrative within the categories. Dey (1993) concluded that categories must be meaningful both internally, in relation to the data understood in context; and externally, in relation to the data understood through comparison. To obtain these categories, every narrative was compared to all other narratives that were present in the category. If one was not completely related to the meaning of the category, that specific narrative was put aside or placed in another category. This ongoing process of refinement in which the meaning of categories constantly evolved; resulted in new, clearly-defined and close-fitting categories of leadership behavior.

RESULTS

Quantitative Results

Table 3 presents the descriptive statistics and the correlation matrix for all variables used in this study along with Cronbach's Alpha statistics to report internal reliability. Correlations among the constructs were significant and in the predicted direction. These results indicated a positive relationship among leadership support for innovation (LSI), the three positive climate dimensions, and innovation at the work-unit and organizational level, and a negative relationship with the conflict dimension.

Table 4 distinguishes between innovation at the work-unit (models 1-3) and at the organizational (models 4-6) levels. Model 1 presents the relationship between LSI and climate for creativity. To test for mediation, the LSI variable is treated as a dummy variable (Likert scale values 0 and 1 became 0, while values 2 and 3 became 1). LSI is significantly related to all dimensions of the climate for creativity, namely creative autonomy (β = 0.73), idea-support (β = 0.95), challenge and involvement (β = 0.58), and conflict (β = -0.50). The total explained variance on the endogenous variables (R^2), creative autonomy, idea-support, challenge and involvement, and conflict are 0.23, 0.38, 0.17, and 0.08, respectively.

Model 2 represents the relationship between LSI and innovation. Results demonstrate that LSI is significantly and positively related to innovation (β = 1.02). The R^2 value in this model was 0.29.

Model 3 presents the relationship between LSI and innovation while controlling for the climate for creativity. All dimensions of the climate for creativity significantly relate to innovation, namely creative autonomy (β = 0.60), idea-support (β = 0.81), challenge/involvement (β = 0.46) and conflict (β = -0.22). The R^2 of these dimensions are 0.48, 0.57, 0.39, and 0.33, respectively. Further, the results show that LSI is still significant on innovation when controlling for every dimension of the climate for creativity. The results suggest that the inclusion of the climate for creativity, in terms of creative

Table 4: Creative Climate Mediation between LSI and Innovation

Relationships			Work unit			Organization		
			Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Creative autonomy								
Leadership support for innovation	→	Creative autonomy	0.73**			0.73**		
Leadership support for innovation	→	Innovation		1.02**	0.58**		1.02**	0.60**
Creative autonomy	→	Innovation			0.60**			0.58**
		R^2	0.23	0.29	0.48	0.23	0.33	0.52
Idea-support								
Leadership support for innovation	→	Idea-support	0.95**			0.95**		
Leadership support for innovation	→	Innovation		1.02**	0.25*		1.02**	0.40*
Idea-support	→	Innovation			0.81**			0.66**
		R^2	0.38	0.29	0.57	0.38	0.33	0.53
Challenge/involvement								
Leadership support for innovation	→	Challenge/involvement	0.58**			0.58**		
Leadership support for innovation	→	Innovation		1.02**	0.76**		1.02**	0.79**
Challenge/involvement	→	Innovation			0.46**			0.41**
		R^2	0.17	0.29	0.39	0.17	0.33	0.41
Conflict								
Leadership support for innovation	→	Conflict	-0.50**			-0.50**		
Leadership support for innovation	→	Innovation		1.02**	0.91**		1.02**	0.98**
Conflict	→	Innovation			-0.22*			-0.08
		R^2	0.08	0.29	0.33	0.08	0.33	0.33

Note 1: **p <0 .01, *p<0.05. Note 2: Based on their measurement scale (Table 3), the numerical distances between the four subsequent categories of the dependent variable, innovation, can be supposed to be equal, justifying an OLS approach.

autonomy, idea-support, challenge/involvement and conflict, as a mediator reduces the effect of LSI on innovation and increases the R^2.

A similar analysis at organizational level reveals both similarities and differences with the work unit level. First, idea-support remains the predominant dimension explaining innovation. However, its importance is lower compared to the work-unit level. Creative autonomy remains more or less of equal importance and, therefore, ranks closely to idea-support for explaining innovation at the organizational level. These effects are also reflected in a higher r-square for creative autonomy and a lower one for idea-support (in comparison with the work-unit level). The results for challenge and involvement are more or less stable. An important difference can be found in the conflict dimension. This dimension is no longer significant in the organizational level model. This indicates that conflicts tend to influence innovation at a proximal (team or work unit) level, but not at the organizational level. This is true both in terms of significance and magnitude. The absence of effect of conflict on innovation also is reflected in the absence of increase in the r- square value between model 5 and model 6.

To identify the exact type of mediation (Zhao et

Table 5: Creative Climate Mediation between LSI and Innovation - Indirect Effect Preacher and Hayes Bootstrapping

	Work unit level			Organizational level		
	Estimate of indirect effect	95% confidence interval		Estimate of indirect effect	95% confidence interval	
		Lower bound	Upper bound		Lower bound	Upper bound
Creative autonomy	0.44	0.28	0.62	0.42	0.28	0.60
Idea-support	0.77	0.59	0.96	0.62	0.45	0.83
Challenge/involvement	0.26	0.15	0.42	0.23	0.13	0.38
Conflict	0.11	0.03	0.23	0.04	-0.02	0.13

al., 2010), the results of the bootstrapping technique (Preacher and Hayes, 2004) on the indirect path are reported in Table 5. The 95% confidence interval of the indirect effect was obtained with 5000 bootstrap resamples (Preacher & Hayes, 2008). The estimates of the paths via creative autonomy, idea-support, challenge/involvement, and conflict are within the interval and hence can be considered significant.

The relation between leadership for innovation and creative climate and between creative climate and innovation is significant in each of the models, as is the product of the coefficients (the indirect path as reported above). Also, the relation between leadership for innovation and innovation is significant, and the product of (i) the coefficient of the relationship between leadership for innovation and (ii) the coefficient of creative climate with the relationship of creative climate with innovation, and (iii) the coefficient of the relationship between leadership for innovation, and innovation, is positive. This implies that the indirect path of leadership for innovation and creative climate, and creative climate and innovation, is of the same sign as the direct path between leadership for innovation and innovation, signaling complementary mediation (Zhao et al., 2010). The finding of complementary mediation implies that the creative climate as a mediator is consistent with the hypothesized framework. However, it also points to the likelihood of omitted mediators in the "direct" path. This finding supports the need for qualitative investigation in order to identify other underlying dimensions of the link between leadership for innovation and creative climate. This is the subject of the next section.

Qualitative Results

As highlighted in the literature review, there is a need for more in-depth understanding of the underlying drivers, as well as the darker side of leadership. Supported by the quantitative finding of complementary mediation, there was an incomplete conceptual framework for the relation between leadership for innovation, creative climate, and innovation. As a result, we qualitatively identified dimensions of leadership behavior that are related to the climate for creativity. Further, we examined the full themes in order to classify the themes in terms of the four climate dimensions. These are noted within Tables 6 and 7.

Leadership behaviors related to climate for creativity that help innovation

Ten supportive leadership behavior themes were identified after analyzing the narratives from the participants to the open-ended question concerning leadership behaviors that help move innovation forward (see Table 6). One of the most frequently noted themes was related to leadership providing a diverse range of resources for employees to support innovative and creative initiatives. Other specific kinds of support were highlighted from the other themes including: encouraging involvement in idea generation and discussions, challenging assumptions, and dealing with failure as learning opportunities. These themes are well corroborated in the literature (e.g. Amabile, et. al., 2004; de Jong & Den Hartog, 2007).

A few less-common themes also emerged from our analysis. For example, leaders engaging in careful listening to the opinions of others, publicly reinforcing the importance and value of innova-

Table 6: Leadership behaviors that help move innovation forward

Leadership Behavior	Sample Quotes
Provide resources (time, funding, people and training)*	"Allowed us time to implement and learn about new software." "Acquired funding for exploring a radical new idea." "The manager decided to add a person to the team to work on the innovation." "We got support to attend a 2 day workshop designed to orientate and train us in how to use creative problem solving techniques."
Encourage and show support**	"Visible show of support through actions and communications." "Leader encouraged an idea to move forward." "Our leadership team supported our decision and encouraged our efforts."
Empower people**	"Giving people empowerment over tasks and responsibilities." "My manager stepped out of the way to allow me to work directly with my counterpart." "Allowed someone with passion about a new development approach to run with it."
Share knowledge and expertise**	"She often shows her confidence in the team by sharing her personal point of view and her own personal stories." "He gave me contacts to his network/relations." "Provided technical support and suggestions with just enough direction to enable me to move forward."
Encourage open discussion about ideas°	"Providing an open, non-judgmental forum for new ideas." "Inviting other parts of the company for joint brainstorming." "Get people to come together." "Open exchange of ideas and viewpoints is encouraged."
Listen and pay attention to every individual°	"Gathering of options from all involved." "Leader asked what others thought, participated as an equal with his own ideas, incorporated others' thinking and concepts into a final solution." "Show respect for individuals and listen more than the normal level."
Challenge assumptions**	"He is not afraid to ask why (at least five times) to help us get to the root cause of an issue." "Helped us challenge the status quo." "Managers asking: "what else have you considered" to ensure that our thinking is expanded."
Improve or make work processes more efficient*	"Constantly looking how new communication lines/social networks allow to improve our work." "Leader modified the reward system to allow more diversity of successes." "Decreased the amount of time it took to find info."
Profile innovation as a value*	"New GM started this week and has already demonstrated commitment to supporting innovation." "Innovation is mentioned a lot in speeches." "Innovation targets are included in target letters."
Allow failure°°	"Very high tolerance of failure and resiliency of the organization." "Established that failure was a learning opportunity."

Note: Underlying dimension of *creative autonomy, °idea-support, ** challenge/engagement, °°conflict

tion, and improving the efficiency of systems to provide time and attention for creative efforts were other helpful behaviors.

The identified helpful leadership behaviors can all be related to one of the four dimensions selected for climate for creativity, confirming the appropriateness of focusing on these dimensions as underlying the climate for creativity mediating between leadership for innovation and innovation. In addition, and as expected, other factors potentially influencing the relationship among leadership, climate, and innovation were identified.

Leadership behaviors related to climate for creativity that hinder innovation

After analyzing the narrative responses to the open-ended question concerning leadership behaviors that hinder moving innovation forward, 9 leadership behavior themes were identified (see Table 7). In general, the leadership behaviors that hindered innovation were the complete opposite of those that helped. For example, resource constraints (time and budget) was identified as one of the most important hindrances. Leaders rejecting, rather than encouraging ideas from others, or showing low levels of trust were other key themes. These findings are generally supported in previous literature (e.g. Amabile, et. al., 2004). There were a few hindering themes that are not commonly found in the literature. These included: an exclusive focus on the short-term, being risk-averse, and focusing only on the status quo—being fearful of changing

Table 7: Leadership behaviors that hinder innovation

Leadership Behavior	Sample Quotes
Provide limited resources*	"My headcount and resources are constantly being constrained for business reasons." "Barriers are usually money." "They say we need to do more with less when we are already doing everything with nothing."
Provide insufficient time*	"If the time I am spending on my innovative project begins to impact my daily performance, I'll have to give up the innovative work." "An idea is approved, but there is no time to explore or develop." "Initiatives are hindered because of time limitations."
Show low level of trust°	"Leader did not give full buy-in to proposed concept." "Did not trust the team to make decisions." "Sometimes we feel micro-managed and not free to run with our ideas."
Reject ideas without consideration°	"Rejected my ideas for a new product/service." "Managers make a snap decision regarding the viability of a new idea rather than deferring judgment until greater consideration is made of the details."
Behave unethically°°	"He was not helping with doing the work, if not even boycotting." "Backstabbing and bureaucracy." "Leader orientation to his personal career."
Give unclear communication and information**	"He sometimes puts new ideas in jeopardy because the next people were not given the information he agreed to pass on." "They lack proper feedback language. They keep us out of the information loop."
Have lack of knowledge**	"Lack of expert discussion." "The person was too removed from the inventive environment to be of help." "They are not very knowledgeable of what the innovation process really entails."
Focus on the short term**	"Senior management wants growth, but is risk-averse and quarterly results driven." "Focus on quick wins." "Fear of decreasing temporary output or results while changes were implemented."
Stick with status-quo**	"They protect the old "safe" way and get very narrow minded in the way they perform." "The leader did consider it too far from the actual way of doing." "The new product should meet the same performance criteria of existing products."

Note: Underlying dimension of *creative autonomy, °idea-support, ** challenge/engagement, °°conflict

existing ways of doing things, and leaders engaging in unethical behavior.

The leadership behaviors hindering innovation are inversely related to one of the four dimensions selected for climate for creativity, confirming the appropriateness of focusing on these dimensions as underlying the climate for creativity mediating between leadership support for innovation and innovation. Other factors that may influence the relationship among leadership, climate, and innovation also emerge from this analysis.

DISCUSSION AND CONCLUSIONS

The purpose of this study was to investigate the intervening role of the climate for creativity between leadership support for innovation, and innovation. The empirical work presented in this paper adds to the literature in four ways.

First, based on theoretical insights and previous research, our analysis empirically confirms four underlying dimensions for the climate for creativity mediating between leadership and innovation. We found that the most important dimension was idea-support (i.e. norms of innovation or the expectation, approval and practical support to introduce new or improved ways of doing things). A climate for creativity characterized by supporting ideas clearly increases the likelihood of innovation (e.g. Gong, Kim, Lee, Zhu, 2013). Creative autonomy (reflected in job autonomy and slack resources) was also found to be an important climate dimension. When employees perceive that they have freedom and independence to determine their own work, the result is higher levels of innovation, as well as increased likelihood of implementing ideas (Dul & Ceylan, 2014; Hammond, Neff, Farr, Schwall, & Zhao, 2010). Challenge and involvement (the feeling of engagement and job complexity) was also identified as a key dimension of the climate for creativity. When employees perceive their job as challenging, they are more likely to identify with

their organization which often translates into creative behavior (Carmeli, Cohen-Meitar, & Elizur, 2007; Kark & Carmeli, 2009). The negative conflict dimension appears to be more salient at the work unit or proximal level, rather than on the organizational or distal level. This finding implies that the management of personal tension is more productively addressed in contexts that are most readily observable (Isaksen & Ekvall, 2010). Taken together, these findings support a multi-dimensional facet—specific approach for climate for creativity.

Second, the paper introduced a conceptual distance measure (Kanfer, 1990) by distinguishing between proximal innovation at work-unit level and distal innovation at the organizational level. The difference between both levels reveals idea-support was the most decisive factor for creative climate at work-unit level. The way new ideas are treated and handled seems to have greater salience at a more local, and more directly observable, work-unit level. Creative autonomy and challenge and involvement are of a more-or-less equal importance at the work-unit and organizational levels. Relational conflict turns out to influence innovation at the work-unit level, but does not seem to hamper innovation at organizational level. Again, the degree to which interpersonal tension exists seems to be more salient at a closer, more proximal, level. These findings add to the recent literature distinguishing between distal and proximal levels of innovation (Damanpour & Schneider, 2006), and shed new light on overall positive influence of team cohesion and absence of relational conflict to enhance innovation (Crespel & Hansen, 2008; Isaksen & Ekvall, 2010; Dul & Ceylan, 2014).

Third, complementary mediation was found for the climate for creativity between leadership support for innovation and innovation as an outcome. This finding is consistent with Denti and Hemlim (2012), who highlighted the important influence leaders have through direct decision-making and through how their behavior is perceived and observed by others. This finding also highlights the central role leadership plays for innovation through establishing the appropriate working environment.

Fourth, our finding of complementary mediation suggested that other factors (beyond creative climate) are playing a role between leadership behavior and innovation. We were able to examine the narrative results from our sample to identify leadership behaviors that help and hinder innovation. The qualitative research largely confirmed the four dimensions of climate for creativity as identified in the quantitative analysis, providing additional insight into these dimensions, as well as others that characterize the climate for creativity mediating between leadership support for innovation and innovation.

There are a number of managerial implications from these findings. First, the findings confirm the important influence leaders have on climate for creativity, and on the intervening role of climate for creativity on innovation. These findings are consistent with previous research (Jung et al., 2008; Li et al., 2015). Given the discrepancy between high priorities on innovation (Anderson, et al., 2014) and low levels of employee engagement (O'Boyle & Harter, 2013), leaders would do well to consider their role in deliberate climate creation (Denti & Hemlim, 2012; Eisenbeiss et al., 2008; Isaksen, 2017). Second, the climate for creativity was significantly related to innovation at both the proximal and distal levels, reinforcing the importance of creating the appropriate climate at multiple levels. Leaders have numerous levers, beyond their own direct behavior, to influence the climate for creativity (Isaksen & Akkermans, 2011) Organizations with high levels of creative autonomy, idea-support, challenge and involvement, and low levels of conflict achieve greater innovation. These results confirm the findings of Crespel and Hansen (2008), Dul and Ceylan (2014), and Hsu and Fan (2010). Since the effects of idea support and conflict were stronger at the more local work-unit level, managers should focus on the leadership behaviors of those closest to observed behavior. This implies that supervisors and team leaders should be considered as key partners in climate creation.

The paper demonstrated that a comprehensive understanding of how leaders influence the creative climate to result in innovation requires a multi-dimensional approach. The climate for creativity clearly plays an important role, and other antecedent factors will need to be considered, as well as, at multiple levels. Further, when climate is defined as observed patterns of behavior, a multi-method

approach can provide for identification of other factors to supplement the results from questionnaires or measures of specific climate dimensions.

This research also revealed a need for context specificity. This study focused on engineers in aerospace in the US, a unique yet homogeneous sample. It is likely that this group of rather highly skilled people who work in this type of organizational context may see the relationships among leadership, climate, and innovation in a different manner from other samples in other industries.

Although this study addressed a limitation from earlier research that examined a diverse global sample (Isaksen and Akkermanns, 2011) by using a more homogeneous sample, further research on larger and diverse (other industries) samples is required to generalize our findings to other contexts. The four underlying constructs of climate for creativity identified in the qualitative and confirmatory factor analyses should be tested in other contexts, and form a basis for further refinement of the concepts. Overcoming this limitation in future studies is particularly important for multi-method studies. The qualitative analysis did provide deeper insights into specific leadership behaviors, but mainly for this rather homogeneous sample. Future and further research should be conducted to examine both the positive and negative leadership behaviors in order to provide a more comprehensive understanding of how these behaviors influence climate and innovation.

Another limitation for this study is that we used short, simple, self-report assessments of both leadership and innovation. Future research must apply more robust assessments of both constructs—and, in the best-case, on a more longitudinal time-span. The measurement of innovation at the work unit (proximal), and at the organizational (distal) level could be refined by measuring it with a continuous rather than ordinal scale, and by specifying the level of the managers responsible for them, as well as the specific elements related to leadership behavior and climate for creativity.

REFERENCES

Amabile, T. M. (1997) Motivating creativity in organizations. *California Management Review*, 40, 39– 58.

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

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

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

Bandura, A., & Schunk, D. H. (1981). Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology*, 41, 586-598.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–82.

Barsh, J., Capozzi, M. M., & Davidson, J. (2008). Leadership and innovation. *The McKinsey Quarterly*, 1, 37-47.

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, 5, 323-370.

Brown, A. (2007). The creative impulse. *Mechanical Engineering*, 129, 24-29.

Burns, J. M. (1982). *Leadership*. New York, Harper Perennial.

Campion, M. A., Medsker, G. J., & Higgs, A. C. (1993). Relations between work group characteristics and effectiveness: Implications for designing effective work groups. *Personnel Psychology*, 46, 823–850.

Carmeli, A., Cohen-Meitar, R., & Elizur, D. (2007). The role of job challenge and organizational identification in enhancing creative behavior among employees in the workplace. *Journal of Creative Behavior*, 41, 75-90.

Chen, G., Farh, J-L., Campbell-Bush, E. M., Wu, Z., & Wu, X. (2013). Teams as innovative systems: Multilevel motivational antecedents of innova-

tion in R&D teams. *Journal of Applied Psychology*, 9, 1018-1027.

Choudhary, A. I., Akhtar, S. A., & Zaheer, A. (2013). Impact of transformational and servant leadership on organizational performance: A comparative analysis. *Journal of Business Ethics*, 116, 433-440.

Cokpekin, O., & Knudsen, M. P. (2012). Does organizing for creativity lead to innovation? *Creativity and Innovation Management*, 21, 304-314.

Crespell, P., & Hansen, E. (2008). Work climate, innovativeness, and firm performance in the US forest sector: In search of a conceptual framework. *Canadian Journal for Resources*, 38, 1703-1715.

Damanpour, F., & Schneider, M. (2006). Phases of the adoption of innovation in organizations: Effects of environment, organization and top managers. *British Journal of Management*, 17, 215-236.

De Dreu, C. K. (2008). The virtue and vice of workplace conflict: Food for (pessimistic) thought. *Journal of Organizational Behavior*, 29, 5-18.

de Jong, J. P. J., & Den Hartog, D. N. (2007). How leaders influence employees' innovative behavior. *European Journal of Innovation Management*, 10, 41-64.

Denison, D. R. (1996). What is the difference between organizational culture and organizational climate? A native's point of view on a decade of paradigm wars. *Academy of Management Review*, 21, 619-654.

Denti, L., & Hemlim, S. (2012). Leadership and innovation in organizations: A systematic review of factors that mediate or moderate the relationship. *International Journal of Innovation Management*, 16, 1-20. doi: 10.1142/S1363919612400075.

Dey, I. (1993). Creating categories. *Qualitative data analysis*, 94-112. London: Routledge.

DiLiello, T. C., Houghton, J. D., & Dawley, D. (2011). Narrowing the creativity gap: The moderating effects of perceived support for creativity. *The Journal of Psychology*, 145, 151-172.

Dul, J., & Ceylan, C. (2014). The impact of a creativity-supporting work environment on a firm's product innovation performance. *Journal of Product Innovation Management*, 31, 1254-1267.

Einarsen, S., Aasland, M. S., & Skogstad, A. (2007). Destructive leadership behaviour: A definition and conceptual model. *The Leadership Quarterly*, 18, 207-216.

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

Ekvall, G. (1983). *Climate, structure and innovativeness of organizations: A theoretical framework and an experiment*. Stockholm: The Swedish Council for Management and Organizational Behavior.

Ekvall, G. (1996). The organizational climate for creativity and innovation. *European Journal of Work and Organizational Psychology*, 5, 105-123.

Ekvall, G., & Ryhammar, L. (1998). Leadership style, social climate and organizational outcomes: A study of a Swedish University College. *Creativity and Innovation Management*, 7, 126-130.

Elenkov, D. S., & Manev, I. M. (2005). Top management leadership and influence on innovation: The role of sociocultural context. *Journal of Management*, 31, 381-402.

Erickson, A., Shaw, B., Murray, J., & Branch, S. (2015). Destructive leadership: Causes, consequences and countermeasures. *Organizational Dynamics*, 44, 266-272.

Flanagan, J. C. (1954). The critical incident technique. *Psychological bulletin*, 51, 327-358.

Fugas, C. S. Silva, S. A., & Melia, J. L. (2012). Another look at safety climate and safety behavior: Deepening the cognitive and social mediator mechanisms. *Accident Analysis and Prevention*, 45, 468-477.

Gilson, L.L. (2008). Why be creative: A review of the practical outcomes associated with creativity at the individual, group, and organizational levels. In J. Zhou & C. E. Shalley (Eds.), *Handbook of Organizational Creativity* (pp. 303-322). New York, NY: Erlbaum.

Glaser, B. G., & Strauss, A. L. (2017). *The discovery of grounded theory: Strategies for qualitative research*. New York: Routledge.

Gong, Y., Kim, T-Y., Lee, D-R., & Zhu, J. (2013). A

multilevel model of team goal orientation, information exchange, and creativity. *Academy of Management Journal*, 56, 827-851.

Gopalakrishnan, S., & Damanpour, F. (1997). A review of innovation research in economics, sociology, and technology management, *Omega, International Journal of Management Science*, 25, 15–28.

Hallgren, K. A. (2012). Computing inter-rater reliability for observational data: An overview and tutorial. *Tutor in Quantitative Methods in Psychology*, 8, 23-34.

Hammond, M. M., Neff, N. L., Farr, J. L., Schwall, A. R., & Zhao, X. (2010). Predictors of individual-level innovation at work: A meta-analysis. *Psychology of Aesthetics, Creativity, and the Arts*, 5, 90-105.

Higgs, M. (2009). The good, the bad and the ugly: Leadership and Narcissism. *Journal of Change Management*, 9, 165-178.

Hsu, M. L. A., & Fan, H-L. (2010). Organizational innovation climate and creative outcomes: Exploring the moderating effect of time pressure. *Creativity Research Journal*, 22, 378-386.

Hughes, P. J., & Harris, M. D. (2015). Leading change and innovation through "organizational laundering". *Journal of Leadership Studies*, 9, 66-68.

Hunter, S. T., Bedell, K. E., & Mumford, M. D. (2007). Climate for creativity: A quantitative review. *Creativity Research Journal*, 19, 69-90.

Isaksen, S. G. (2007). The climate for transformation: Lessons for leaders. *Creativity and Innovation Management*, 16, 3-15.

Isaksen, S. G. (2013). Managing for innovation: Examination of a climate-centric model for organizational creativity. *Kindai Management Review*, 1, 41-58.

Isaksen, S. G. (2017). Leadership's role in creative climate creation. In M. D. Mumford & S. Hemlin (Eds.), *Handbook of research on leadership and creativity* (pp.131-158). Cheltenham, UK: Edward Elgar Publishing.

Isaksen, S. G., & Akkermans, H. (2011). Creative climate: A leadership lever for innovation. *Journal of Creative Behavior*, 45, 161-187.

Isaksen, S. G., & Ekvall, G., (with contributions from Akkermans, H., Wilson, G. V., & Gaulin, J. P.) (2007). *Assessing your context for change: A technical manual for the SOQ* (2nd ed.). Orchard Park, NY: The Creative Problem Solving Group, Inc.

Isaksen, S. G., & Ekvall, G. (2010). Managing for innovation: The two faces of tension in creative climates. *Creativity and Innovation Management*, 19, 73-88.

Isaksen, S. G., Lauer, K. J., & Ekvall, G. (1999). Situational Outlook Questionnaire: A measure of the climate for creativity and change. *Psychological Reports*, 85, 665-674.

Isci, S., Çakmak, & Karadag, E. (2015). The effect of leadership on organizational climate. In E. Karadag (Ed.). *Leadership and organizational outcomes* (pp. 123-144). Switzerland: Springer International Publishing.

James, L. R., Demaree, R. G., & Wolf, G. (1993). rwg: An assessment of within-group interrater agreement. *Journal of Applied Psychology*, 78, 306-309.

Janssen, O., & Giebels, E. (2013). When and why creativity-related conflict with coworkers can hamper creative employees' individual job performance. *European Journal of Work and Organizational Psychology*, 22, 574-587.

Jung, D. I., Chow, C., & Wu, A. (2003). The role of transformational leadership in enhancing organizational innovation: Hypotheses and some preliminary findings. *The Leadership Quarterly*, 14, 525-544.

Jung, D., Wu, A., & Chow, C. W. (2008). Towards understanding the direct and indirect effects of CEOs' transformational leadership on firm innovation. *The Leadership Quarterly*, 19, 582-594.

Kanfer, R. (1990). Motivation theory and industrial/organizational psychology. In M. D. Dunnette and L. Hough (Eds.), *Handbook of industrial and organizational psychology. Volume 1. Theory in industrial and organizational psychology*, (pp. 75-170). Palo Alto, CA: Consulting Psychologists Press.

Kark, R., & Carmeli, A. (2009). Alive and creating: The mediating role of vitality and aliveness in the relationship between psychological safety and creative work involvement. *Journal of Organizational Behavior*, 30, 785-804. doi: 10.1002/

job.571

Kirkman, B. L., Chen, G., Farh, J., Chen, Z. X., & Lowe, K. B. (2009). Individual power distance orientation and follower reactions to transformational leaders: A cross-level, cross-cultural examination. *Academy of Management Journal*, 52, 744–764.

Koene, B. A. S., Vogelaar, A. L. W., & Soeters, J. L. (2002). Leadership effects on organizational climate and financial performance: Local leadership effects in chain organizations. *The Leadership Quarterly*, 13, 193-215.

Kozlowski, S. W. J., & Doherty, M. L. (1989), Integration of climate and leadership: Examination of a neglected Issue, *Journal of Applied Psychology*, 74, 4, 546-553.

Kuenzi, M., & Schminke, M. (2009). Assembling fragments into a lens: A review, critique, and proposed research agenda for the organizational work climate literature. *Journal of Management*, 35, 634-717.

Lapierre, J., & Giroux, V-P. (2003). Creativity and work environment in a high-tech context. *Creativity and Innovation Management*, 12, 11-23.

Li, C., Zhao, H., & Begley, T. M. (2015). Transformational leadership dimensions and employee creativity in China: A cross-level analysis. *Journal of Business Research*, 68, 1149-1156.

Lofquist, E. A., Isaksen, S. G., Dahl, T. J. (2018). Something fishy: Exploring change, job engagement and work environment in the Norwegian Directorate of Fisheries. *Journal of Change Management* (published online April 24, 2018).

Madrid, H. P., Patterson, M. G., Birdi, K. S., Leiva, I., & Kausel, E. E. (2014). The role of weekly high-activated positive mood, context, and personality in innovative work behavior: A multilevel and interactional model. *Journal of Organizational Behavior*, 35, 234-256.

Mitchell, R., & Boyle, B. (2015). Professional diversity, identity salience and team innovation: The moderating role of open-mindedness norms. *Journal of Organizational Behavior*, 36, 873-894.

Molina-Azorin, J. (2011). The use and added value of mixed methods in management research. *Journal of Mixed Methods Research*, 5, 7-24.

Moultrie, J., & Young, A. (2009). Exploratory study of organizational creativity in creative organizations. *Creativity and Innovation Management*, 18, 299-312.

Norris, G. (2009). Cultivating ideas. *Aviation Week & Space Technology*, 171, 60-61.

O'Boyle, E., & Harter, J. (2013). *State of the global workplace: Employee engagement insights for business leaders worldwide*. Washington, DC: Gallup.

OECD and Eurostat (2005), *Oslo Manual—Guidelines for Collecting and Interpreting Innovation Data*, OECD, Paris.

Olsson, L., Hemlin, S., & Pousette, A. (2012). A multi-level analysis of leader–member exchange and creative performance in research groups. *The Leadership Quarterly*, 23, 604-619.

Patterson, M., Payne, R., & West, M. (1996). Collective climates: A test of their sociopsychological significance. *The Academy of Management Journal*, 39, 1675-1691.

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: Sage.

Pirola-Merlo, A., & Mann, L. (2004). The relationship between individual creativity and team creativity: Aggregating across people and time. *Journal of Organizational Behavior*, 25, 235-257.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, and Computers*, 36, 717-731.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40, 879-891.

Remneland-Wikhamn, B., & Wikhamn, W. (2011). Open innovation climate measure: The introduction of a validated scale. *Creativity and Innovation Management*, 20, 284-295.

Retz, K. (2011). Factors that affect the climate for creativity and innovation in an aerospace engineering organization (Unpublished doctoral dissertation). Apollos University, Huntington Beach, CA, USA.

Richard, J. (2003). Ideas on fostering creative prob-

lem solving in executive coaching. Consulting *Psychology Journal: Practice and Research*, 55, 249-256.

Roskes, M. (2015). Constraints that help or hinder creative performance: A motivational approach. *Creativity and Innovation Management*, 24, 197-206.

Sagiv, L., Arielli, S., Goldenberg, J., & Goldschmidt, A. (2010). Structure and freedom in creativity: The interplay between externally imposed structure and personal cognitive style. *Journal of Organizational Behavior*, 31, 1086-1110.

Sarros, J. C., Cooper, B. K., & Santora, J. C. (2008). Building a climate for innovation through transformational leadership and organizational culture. *Journal of Leadership and Organizational Studies*, 15, 145-158.

Schneider, D. Salvaggio, A. N., & Subirats, M. (2002). Climate strength: A new direction for climate research. *Journal of Applied Psychology*, 87, 220-229.

Schulze, A. D., Stade, M. J. C., & Netzel, J. (2014). Conflict and conflict management in innovation processes in the life sciences. *Creativity and Innovation Management*, 23, 57-75.

Schyns, B., & Schilling, J. (2013). How bad are the effects of bad leaders? A meta-analysis of destructive leadership and its outcomes. *The Leadership Quarterly*, 24, 138-158.

Scott, S. G., & Bruce, R. A. (1994). Determinates of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*, 137, 580-607.

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

Shanker, R., & Bhanugopan, R. (2014). Relationship between organizational climate for innovation and innovative work behavior in government-linked companies. *Proceedings of the 4th Annual International Conference on Human Resource Management and Professional Development in the Digital Age*, 16-24.

Shrout. P. E., & Fleiss, J. L. (1979). Intra-class correlations: Uses in assessing rater reliability. *Psychological Bulletin*, 86, 420-428.

Somech, A., & Drach-Zahavy, A. (2013). Translating team creativity to innovation implementation: The role of team composition and climate for innovation. *Journal of Management*, 39, 684-708.

Statnotes. (2007). Canonical correlation, pa 275 research methodology. Retrieved April 20, 2008, from http://www2chass.ncsu.edu

Tjosvold, D., Wong, A. S., & Chen, N. Y. (2014). Constructively managing conflicts in organizations. *Annual Review of Organizational Psychology and Organizational Behavior*, 1, 545-568.

Volmer, J., Spurk, D. & Niessen, C. (2012). Leader–member exchange (LMX), job autonomy, and creative work involvement. *The Leadership Quarterly*, 23, 456-465.

Wang, A-C., & Cheng, B-S. (2010). When does benevolent leadership lead to creativity? The moderating role of creative role identity and job autonomy. *Journal of Organizational Behavior*, 31, 106-121. 2

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

Woodman, R. A., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *Academy of Management Review*, 18, 293–321.

Wu, S-I., & Lin, C-L. (2011). The influence of innovation strategy and organizational innovation on innovation quality and performance. *The International Journal of Organizational Innovation*, 3, 46-81.

Yu, A., Matta, F. K., Cornfield, B. (2018). Is leader-member exchange differentiation beneficial or detrimental for group effectiveness? A meta-analytic investigation and theoretical integration. *Academy of Management Journal*, 61, 1158-1188.

Yuan, F., & Woodman, R. W. (2010). Innovative behavior in the workplace: The role of performance and image outcome expectations. *Academy of Management Journal*, 53, 323-342.

Zhang, X., & Bartol, K. M. (2010). Linking empowering leadership and employee creativity: The influence of psychological empowerment,

intrinsic motivation, and creative process engagement. *Academy of Management Journal*, 53, 107-128.

Zhao, Y. (2001) Enhancing firm innovation performance through strategic management of new product development. *Dissertation Abstracts International*, (Publication No. AAT 3021870).

Zhao, X., Lynch, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *The Journal of Consumer Research*, 37(2): 197-206.

Zohar, D. (2010). Thirty years of safety climate research: Reflections and future directions. *Accident Analysis and Prevention*, 42, 1517-1522.

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