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Innovation and Quality: Compete or Complete? The Mediating Role of Managerial Risk Taking

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Abstract

Purpose: The purpose of this study was to explore the complex relationship between innovation and quality in context with the two main paradigms. The traditional paradigm that claims that the tension that exists between innovation and quality, results from the fact that they both rely on the same organizational resources and the second paradgim which offers a more complementary point of view, in which innovation and quality coexist and balance one another. Innovation and quality are two core elements in today business world. Organizations who want to maintain a competitive advantage need to generate innovative and applicable ideas, by the side of maintaining and ensuring quality standards. Research suggests two opposing paradigms to explore the relationship between innovation and quality – the complementary approach and the competing approach. To reconcile the existing complexity, this study uses the paradox theory, and particularly the paradoxical leadership behavior theory. In addition, we examined the mechanism underlying the well-established relation between innovation climate and innovative performance. Specifically, we offer managerial risk taking as a mediator in the association between the two.

Design/Methodology: A quantitative research was conducted with a comprehensive questionnaire that was held in one time period. A total of 344 employees among 72 teams from nineteen Israeli companies (different sectors) participated in the study. For each team, we collected data from both team members and managers, aggregating their responses separately into team level of analysis. Each team member filled out the questionnaires regarding the project that their team addresses.

Findings: evidence shows that both competing and complementary approaches, offering comprehensive understanding of the conditions in which each one of them exists. In addition, the mediating role of managerial risk taking in the relation between innovation climate and innovative performance is being displayed, demonstrating the mechanism underlying this relation. Theoretical contributions and practical implementations are discussed.

Originality: The article offers organizations an original formula to achieve high innovative performance without neglecting quality climate, and in some cases, without the existence of a quality environment in the organization. Another original insight is the paper also introduces the mediating role of managerial risk taking in relation to inno-

vation climate and innovative performance (when PLB and quality climate serve as moderators).

Limitations: Data for this study was collected during one time period among teams who are located in the same country and possess the same culture identity. Such research design is problematic since data changes over time, and it is not possible to consider the whole variety of influences.

Practical Implementations: This study sheds light on the fact that there is more than one way to achieve high innovative performance. The paper offers a wide understanding for each one of the approaches, both the competing and the complementary.

Keywords: Innovation, quality, organization, PLB theory and managerial risk taking.

Introduction

Innovation and quality are cardinal for the success of businesses around the world. Organizations invest extensive efforts to produce innovative products, as well as maintaining high quality standards (Katz-Navon, Naveh, & Stern, 2005; Miron, Erez, & Naveh, 2004; Miron-Spektor, Erez, & Naveh, 2011). This study deals with the complex relationship between those demands while specifying two main paradigms. The first and traditional approach states for the tension that exists between innovation and quality, resulting from the fact that they both rely on the same organizational resources (Blank & Naveh, 2014; Lavie, Stettner, & Tushman, 2010). The second approach offers a more complementary point of view, in which innovation and quality coexist and balance one another (Bledow, Frese, Anderson, Erez, & Farr, 2009; Kim, Kumar, & Kumar, 2012; Prajogo & Sohal, 2003; Smith & Lewis, 2011; Wang, 2014).

There is a theoretical and practical importance for understanding the relationship between innovation and quality, together with identifying the factors and circumstances in which they coexist. This duality is important as innovation and quality are essential to the survival of organizations in today's versatile business world (Naveh & Erez, 2004; Nieto & Santamaría, 2007). In addition, current literature encompasses both the tension and the complementary approaches (e.g., Gupta, Smith, & Shalley, 2006; Lin, McDonough III, Lin, & Lin, 2013). Therefore, the main objective of this study is to bridge the gap between the two approaches. To do so, we examined the potential theoretical framework that might underlie the complementary approach, the theory of paradox. Specifically, we focused on the paradoxical leadership behavior (Zhang, Waldman, Han, & Li, 2015). In accordance to this theory, the coexistence of competing demands can enhance organizational efficiency when managers possess paradoxical mindset. Thus, we claim that the existence of paradoxical leadership behavior will be positively related to the existence of both innovation and quality in organizations.

Additionally, there is an extensive research that claims there is a link between innovation climate and innovative performance (Bain, Mann, & Pirola-Merlo, 2001; West, 1990). Researchers also suggest that risk taking is related to innovative performance (Latham & Braun, 2009) and managers particularly have critical role in taking risky decisions (Wu & Parker, 2017). Considering the relationship between all these variables, we examined in this research the combine association between innovation climate, managerial risk taking and innovative performance. To the best of our knowledge, this set of variables have not yet been examined in the literature. Particularly, we propose that innovation climate will enable higher managerial risk taking, resulting in higher innovative performance. In other words, we claim that managerial

risk taking will be the mediator and the mechanism underlying the relation between innovation climate and innovative performance.

The paper begins with a brief theoretical review of innovation in organizational contexts. Then, we introduce the relevance of our model predictors, emphasizing the mediating role of managerial risk taking for organizational innovation. In the following we test our model on a sample of 72 teams from nineteen Israeli companies. Finally, we present our results, findings, limitations, and some managerial implications.

Theoretical Background

Today, the business world is competitive and dynamic, companies must implement innovation processes while developing products and procedures that are significantly different from those currently exist in the industry (Garcia & Calantone, 2002; Janssen, 2000). These products must meet user's needs in order to provide added value (Baer, 2012). This is the only path that will promise companies to be able to sustain long-run competitive advantage, maintain their existence and extend their market share (Ireland & Webb, 2007; West & Anderson, 1996).

Once defining innovation, we also must consider the concept of creativity. Creativity, manifesting in an array of skills, enables an individual to generate original ideas. Creative people can harness an ability to perceive the world in new ways, find hidden patterns, and create connections between seemingly unrelated phenomena and events to offer original solutions (Suss, 2020). Creativity in organizations refers to "the production of novel and useful ideas by individuals working together" (Amabile, 1988, p. 126). Based on this, organizational innovation is the successful implementation of creative ideas within an organization (Amabile, 1988). This definition of organizational innovation is comprehensive, as it addresses both raising new ideas, but more important, the implementation of them into new products, procedures, and policies inside the organization (Amabile, 2000; West & Anderson, 1996).

There are some antecedents, both internal and external, influencing level of innovation inside organizations. Examples starting with market competition, through organizational size, structure and culture, strategy, and ending with managerial practices and employees' characteristics like tenure and gender (Damanpour, 1991; Damanpour & Aravind, 2012; De Vries, Bekkers, & Tummers, 2016; Haneda & Ito, 2018; Sarros, Cooper, & Santora, 2008). In this research we focused on internal factors leading to innovation, emphasizing the contribution of climate and leader's role.

One of the various factors influencing innovative performance is innovation climate (Somech & Drach-Zahavy, 2013). Climate refers to employees shared perceptions concerning the practices, procedures, and kinds of behavior that get rewarded, supported, and are expected in a workplace setting (Schneider, 1990). Climate may vary between different departments and business units within the same organization as a result of their work characteristics, interactions, work requirements, or managerial behaviors (Schneider, White, and Paul, 1998). The term climate usually does not stand alone, but rather has a reference to another concept. In other words, a climate is a climate for something, such as a climate for innovation or for quality (Schneider, Gunnarson, & Niles-Jolly, 1994). Climate inspires actions that contribute to the related subject performance (Schneider et al., 1998). Due to that, it was found to be a powerful predictor of organizational performance outcomes (Naveh, Katz-Navon, and Stern, 2011; Zohar, 2010).

The first climate to be discussed in this article is innovation climate. Innovation climate refers to employees' shared perceptions that they are expected to generate breakthrough new ideas aimed to be useful, and implement them into new products, processes, and procedures (Anderson & West, 1998). Such climate usually results with openness to original ideas, breaking existing paradigms, taking risks, experimenting,

trial and error, and tolerating mistakes (Scott and Bruce, 1994; Wang, Rode, Shi, Luo, & Chen, 2013). Given that, it is only natural that innovation climate will be positively associated with innovative performance (Hülsheger, Anderson, & Salgado, 2009; Shanker, Bhanugopan, Van der Heijden, & Farrell, 2017).

Quality Climate

So far, we have mentioned innovation as an essential need in today's business world. Likewise, there is a growing demand for keeping high quality standards, both in process level and in product level (Blank & Naveh, 2014; Bon & Mustafa, 2013; Naveh & Erez 2004). One way to do it is to maintain high quality climate across the organization (McFadden, Stock, & Gowen III, 2015). Research has suggested that there is a strong link between climate perceptions and organizational performance (Lindell & Brandt, 2000; Patterson, Warr, & West, 2004). Thus, organizations who pay attention to quality will have higher level of organizational quality climate (Schneider, White, & Paul, 1998; Zohar & Luria, 2005).

Quality climate relates to employees' shared perception regarding the importance of accuracy and standardization at work (Blank & Naveh, 2014). Quality climate emphasizes attention to details, adherence to norms and organized work processes (Luria, 2008). In such way, errors are more likely to be reduced and quality remains high (Hackman & Wageman, 1995).

When considering the relation between quality climate and innovation performance, the tension which exists among them arises (Lages, Silva, & Styles, 2009; López-Mielgo, Montes-Peón, & Vázquez-Ordás, 2009). While innovation is associated with a sense of ambiguity and uncertainty, striving for quality is usually done by diving into details and maintaining accurate boundaries across work routines (Perdomo-Ortiz, González-Benito, & Galende, 2006). Moreover, quality climate promotes systematic procedures and stable routines which may interfere with generation of novel and creative ideas. Thus, thinking out of the box, attempts to break conventions and take risks will decrease, and organizational innovation level will decline accordingly (Naveh, 2007).

On the other hand, other studies offer a complementary approach, in which the existence of quality climate can contribute to higher level of innovation. According to this point of view, quality practices allow a fertile environment for innovation since they both rely on similar principles (Prajogo & Sohal, 2003). They also show that organization that strive to reconcile the contradictions in their work routine, will achieve better outcomes (Miron et al., 2004). Following the complementary approach, we hypothesized that the relationship between innovation climate and innovative performance depends upon the level of quality climate:

> ***H1.*** *Quality climate will moderate the relationship between innovation climate and innovative performance, so that when quality climate is high – high innovation climate will result in higher innovative performance.*

Managerial Risk Taking

Another key contributor for innovative performance is risk-taking (Adams, Bessant, & Phelps, 2006). Risk-taking involves taking enterprising actions while investing majorly in substantial resources (Miller, 2011). Those actions occur in uncertain atmosphere without completely understanding the outcome of these moves (Rauch, Wiklund, Lumpkin, & Frese, 2009). Taking into consideration the organizational concept, since these processes inherently include a sense of ambiguity and uncertainty, results can be either beneficial or costly for the company (García-Granero., Llopis., Fernández-Mesa, & Alegre, 2015).

Risk taking occur across different levels of the organization hierarchy; at the individual level, at the managerial level and at the whole organization level (Zahra, 2005). At the organization level, scholars found a close relation between innovation and risk-taking, as conveyed by organizational culture, atmosphere, and settings (Lumpkin & Dess, 1996; March & Shapira, 1987).

From a managerial approach, managers who take risks add an element of uncertainty to their work by allowing time and resources to be invested in processes that may have potentially failed (Wiseman & Gomez-Mejia, 1998). At the same time, managerial risk taking is associated with higher innovative performance since some of these risky decisions lead to significant outcomes (Latham & Braun, 2009). It can be said that managers have a central role in identifying opportunities and encouraging innovation, and most of their success depends on strategic decisions while managing risky situations (Alexiev, Jansen, Van den Bosch, & Volberda, 2010; Elenkov, Judge, & Wright, 2005; Suss, 2015 & Wu & Parker, 2017).

Shortell et al., (1995) also found that quality improvement was related to risk taking organizational culture. Moreover, implementing of quality practices in organizations with higher risk taking was found to be more successful compared to organizations with lower risk taking (Mohammad Mosadegh Rad, 2006). This pattern can be explained by the contribution of quality practices for total risk management. We suggest that quality procedures can help to identify risks, be more prepared toward them and manage them properly. Taking everything together, it leads us to hypothesize that:

> ***H2.*** *Quality climate will moderate the relationship between managerial risk taking and innovative performance, so that when quality climate is high – high level of managerial risk taking will result in high level of innovative performance.*

Paradoxical Leadership Behaviour

As was mentioned before, tension might arise while trying to maintain high level of innovation by the side of ensuring quality standards (López-Mielgo et al., 2009). One of the theoretical frameworks for dealing with this tension is the meta theory of paradox (Schad, Lewis, Raisch, & Smith, 2016). Paradox theory has roots in the Eastern and Western philosophy (Chen, 2002). In Eastern cultures for example, Buddhist and Hindu philosophies emphasize the wholeness and completeness of the system, taking into consideration interdependence between opposing elements. From their point of view, there is no need to solve the tension or the paradox, but rather accept it the way it is (Capra, 1975). On the other hand, western philosophers put more emphasis on the contradictions, as expressed in the interpretation from the Greek word, *para* (contrast), *doxa* (opinion) (Schad et al., 2016). In today's modern global world, paradox is receiving even more attention since various interest groups holds competing but equally valid demands (Scherer, Palazzo, & Seidl, 2013).

Paradox as a meta-theory refers to tensions and their management across different contexts. According to this attitude, one should adopt a “both-and” perspective, rather than "either-or" (Lewis & Smith, 2014). Paradox is defined as a persistent contradiction between interdependent elements (Schad et al., 2016). From this definition we can identify two core elements which are inherently part of the paradox: contradiction and interdependence. Taken into the organizational concept, these two core elements are an integral part from the daily routine. Tension may arise when employees face with conflicting demands, which seem logical in separation but irrational when appearing side by side (Lewis, 2000). At the same time, these opposing elements might create together a feeling of wholeness, which in turn increases effectivity in the organizational performance (Poole & Van de Ven, 1989). Thus, demonstrating the second core element, interdependence, which reflects the way in which to opposites are intertwined.

Managers have an important role in influencing team members and other organizational performance (Wu & Parker, 2017). *Paradoxical leadership behavior* (PLB) refers to supervisors' engagement in holistic thinking, while allowing competing demands to exist simultaneously (Zhang et al., 2015). Dealing with the tension between innovation and quality, we adapted Zhang et al. (2015) fourth dimension from the paradoxical leadership behavior measure, focusing on enforcing work requirements , while allowing flexibility. These two poles represent a complexity that exists also in the relationship between innovation and quality. Relying on previous evidence, high PLB was found to be associated with more efficiency, proficiency and proactivity among employees at work (Zhang et al., 2015). Thus, we will expect that paradoxical leadership behavior will magnify the effect of innovation climate on innovative performance, so that having high PLB together with innovation climate will lead to higher innovative performance. This leads to our third hypothesis:

> ***H3.*** *Paradoxical leadership behavior will moderate the relationship between innovation climate and innovative performance, so that when PLB is high – high innovation climate will result in high innovative performance.*

We previously highlighted the relationship between risk taking and innovation (Latham & Braun, 2009), claiming that managerial risk taking will be associated with higher innovative performance. However, it should be noted that managers differ in their tendency to take risks (March & Shapira, 1987). This tendency is influenced by personal and environmental factors, such as organizational climate (Williams & Narendran, 1999). Given the established relationship between risk taking and innovation, it is reasonable to hypothesize that high innovation climate will be associated with high managerial risk taking. In addition, as was said before, PLB relates to supervisors' ability to manage competing demands simultaneously (Zhang et al., 2015). When PLB level is high, it is reasonable to hypothesize that the relation between innovation climate and managerial risk taking will be intensified. More specifically, managers that engage in holistic thinking, will provide more freedom and flexibility in work environment, thus allowing to the relation between innovation climate and managerial risk taking to take place. In a view of the above, our fourth hypothesis will be:

> ***H4.*** *Paradoxical leadership behavior will moderate the relationship between innovation climate and managerial risk taking, so that when PLB is high – high innovation climate will result in high managerial risk taking.*

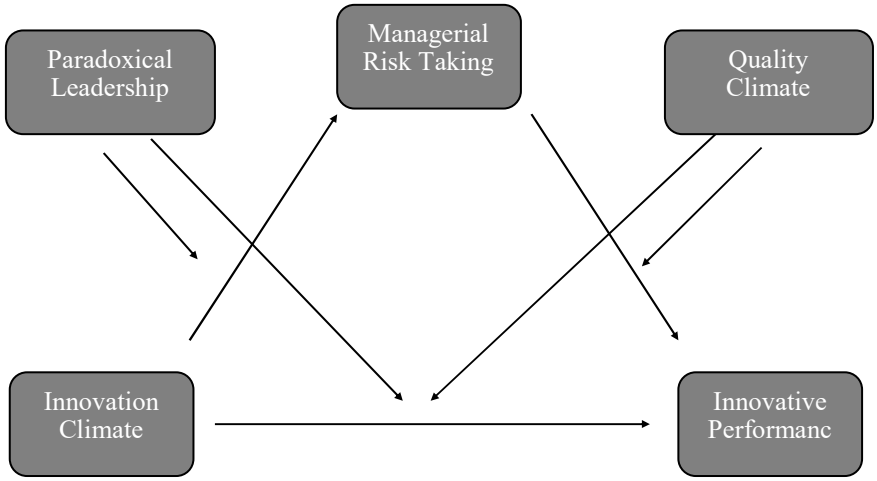
Finally, the meta-theory of paradox provides an opportunity to understand the complex dynamics that exist in organizations, and particularly the innovation quality tension (Schad et al., 2016). We use this lens in our model to get a better theoretical and practical understanding of these two poles in the organizational context. Thus, we will expect managers characterized with high level of paradoxical leadership behavior, to maintain high innovative performance together with ensuring quality standards. In other words, we hypothesize that managers with high PLB will support innovation by allowing flexibility and autonomously at work, while at the same time, they will control subordinates' behavior and enforce work requirements in order to keep also quality standards. Otherwise, managers with low level of paradoxical leadership behavior will be expected to enforce either innovative or quality acts, leaving accordingly the other acts neglected.

In addition, we identify managerial risk taking as a central factor in the innovative process. Despite the difficulties involved in taking risks (i.e., higher level of professional conflicts resulting by challenging the status quo), this is one of the strongest drivers for organizational growth (Gormley & Matsa, 2016). It is therefore important to deepen the understanding of the way risk perception fits into the organization and

its antecedents. Based on all the above, we speculate that managerial risk taking can be the mechanism underlying the relationship between innovation climate and innovative performance. The fifth hypothesis which is also graphically presented in Figure 1. will be as follows:

> ***H5.*** *Managerial risk taking will mediate the relationship between innovation climate and innovative performance, when PLB and quality climate will be high.*

Figure 1: Hypothesized Theoretical Model – The Moderated Mediating Effect of Innovation Climate, PLB, Managerial Risk Taking and Quality Climate on Innovative Performance



Methodology

Participants

Seventy-two teams from nineteen Israeli-based organizations participated in the study, while each team worked on the same project. Organizations included hi-tech, biotechnological, industrial, and military companies. For each team, two to three team members were randomly selected to participate in the study. Team sizes were average for organization, including a proportion of 7 2percent men among the respondents. The mean age was 36.3 years (standard deviation [SD] = 8.9). In addition, for each team, two managers answered the questionnaire, while at least one of them managed the team directly. To eliminate a common source bias, we did not ask managers to reply the independent-variable questionnaires. A total of 344 employees participated in our research; 200 were team members and 144 were managers.

Measures

Independent Variables. *Innovation climate* was measured by five items questionnaire taken from Anderson & West's (1998) model called Team Climate Inventory (α=.87).

Paradoxical leadership behavior was measured by four items questionnaire adopted from Zhang et al. (2015; α=.78). We used the RF sub-scale, measuring how much a leader enforces work requirements while allowing flexibility.

Quality Climate was measured by five items sub scale taken from Katz-Navon et al. (2005; α=.87).

Mediator. *Managerial risk taking* was assessed by two items taken from Andrews & Smith (1996; α=.81).

Dependent Variables. *Innovative Performance* was measured by five items Radicalness sub scale taken from Gatignon, Tushman, Smith, & Anderson (2002; α=.87). Managers were asked to rate innovative performance level regarding their team's product.

Control Variables. We used four control variables. The first variable was *Time Pressure*, adopted from Maruping, Venkatesh, Thatcher, & Patel (2015) and the second was an item taken from Temporal Leadership scale (Maruping at al., 2015), regarding managerial engagement in reminding team members about important deadlines. Since time pressure was found to effect project outcomes, and specifically employees creative and innovative performance (e.g., Baer & Oldham, 2006), we controlled for these two variables. The third control variable was *Project Stage*, differentiating between development and manufacture stages. Each stage has different insights and might change employees and managers perspective of the project outcomes. Finally, we used *Team Tenure* as a control variable, calculated as the mean tenure of total team members who participated for each team. This parameter ranged from 1 to 36 years (M=7.9, SD=7.14). We controlled for it since tenure was found to influence the way team members perceive project processes (Stamper & Masterson, 2002).

Procedure

First, we conducted unstructured interviews with eight managers who were responsible for innovation or quality in three major Israeli industrial organizations. The purpose of these interviews was to get a better understanding of product development process from a managerial perspective. Special emphasis was given to the presence of the quality aspect in innovative processes. Managers were also asked about internal work processes such as product development and quality measurement tracing.

With the given insights, we formulated our research questionnaire, relying on existing and validated scales in the research literature. After receiving a positive response from several Israeli organizations, employees from each team filled out the questionnaires regarding the project that their team addresses. At the same time, their managers rated the same project from their perspective, filling out a separated questionnaire (with a very high response rate). For all the items, respondents were asked to indicate the extent to which each statement was true for their project on a 5-point scale ranging from l=strongly disagree to 5=strongly agree. All responses were aggregated into team level.

Data Analysis

Scale reliability was operationalized as internal consistency and was calculated using Cronbach's coefficient alpha. Confirmatory factor analysis (CFA) was conducted to ensure scale validity. Individual responses were aggregated into team level. To justify aggregation to the team level, r_{wg} homogeneity coefficients and intraclass correlations (ICC1, ICC2) of these variables were calculated for each of the teams (James, Demaree, & Wolf, 1984).

Table1: Means, Standard Deviations, Correlations and Alpha Cronbach [a]

Variable	Mean	SD	1	2	3	4	5	6	7	8
1. Innovation Climate	3.75	.53	(.87)							
2. Risk Willingness	2.67	.68	.02	(.81)						
3.Paradoxical Leadership Behavior	3.57	.47	.46**	.00	(.78)					
4. Quality Climate	3.65	.69	.00	-.26*	-.15	(.87)				
5. Innovation	3.71	.78	.38**	.04	.35**	-.37**	(.87)			
6. Time Pressure	3.58	.72	-.01	.17	.15	.05	-.08			
7. Project Stage	1.33	.47	-.10	-.14	.00	.32**	-.31**	.09		
8. Team Tenure	7.95	7.14	-.35**	-.10	-.33**	-.16	-.08	-.24*	-.12	
9. Temporal Leadership	3.91	.72	.13	-.14	.23*	.48**	-.16	.11	.17	-.30**

a These statistics are at the team level of analysis. Cronbach alpha coefficients are on the diagonal in parentheses.
n =72
* $p < .05$
** $p < .01$

Findings

Table 1 summarizes the means, standard deviations, correlations, and Alpha Cronbach among research variables at the team level of analysis. Because teams were nested within nineteen different organizations, we examined the assumption of independence by dividing all organizations into three sub-categories: military organizations, high-tech companies, and manufactural organizations. We tested whether organization type was a significant predictor for innovative performance or managerial risk taking, and we found no significant contribution of this parameter to differences in the dependent variables. Accordingly, we analyzed the data at the team level.

Construct Validation

To examine construct validity of all measures used in the study, we conducted a confirmatory factor analysis (CFA) at the individual level. The CFA yielded an acceptable fit level (Hu & Bentler, 1999) (χ^2= 73.61, df=58, n=91, p=.08; goodness-of-fit index [GFI] = .95, NFI = .94, comparative fit index [CFI] = .99, root-mean-square error of approximation [RMSEA] = .04). All standardized factor loadings in the model were above .58 (most of the loadings were in the .70s and .80s). All item loadings were significant (p < .01). This calculation had better fit than the two-factor model in which managerial risk taking and innovation climate were treated together as one factor, while quality climate and PLB were treated as a separated factor (χ^2= 546.69, df=75,

n=105, p=.00; goodness-of-fit index [GFI] = .73, NFI = .58, comparative fit index [CFI] = .61, root-mean-square error of approximation [RMSEA] = .18). We also examined an alternative model where all the items loaded onto one factor, which also demonstrated a worse fit than the original model (χ^2= 707.21, *df*=76, *n*=105, p=.00; goodness-of-fit index [GFI] = .66, NFI = .45, comparative fit index [CFI] = .48, root-mean-square error of approximation [RMSEA] = .21). Thus, the CFA results suggesting that our four measures were indeed separated constructs.

Level of Analysis

Level of Analysis

We collected our data at the individual level, and then aggregated it into team level. This enabled us to reflect how processes occurring at team level are being perceived by all individuals that compose this specific team. Independent variables of innovation climate, managerial risk taking, paradoxical leadership behavior and quality climate, and dependent variable of innovative performance, were team-level variables. To justify the aggregation of all individual responses to the average team level, one must calculate a within-unit agreement (i.e., the r_{wg} agreement index; James, Demaree, & Wolf, 1993). In addition, intraclass correlations (ICCs) indicate whether the measurements are sufficiently reliable to reflect homogeneity of responses and model effects at the team level (Bliese, 2000).

We calculated r_{wg} coefficients of each variable for all 72 participating teams. We based the calculations on a uniform expected variance distribution (James et al., 1984). The $r_{wg(j)}$'s for the independent dimensions were as follow: for innovation climate, r_{wg} was .89; for managerial risk taking, r_{wg} was 0.99; for paradoxical leadership behavior r_{wg} was 0.78 and for quality climate, r_{wg} was 0.82. For innovative performance, r_{wg} was 0.87.

Homogeneity was also tested by interclass correlations (ICC1) and by the reliability of the mean (ICC2; Bliese, 2000). Results for ICC1 and ICC2 for innovative performance were 0.66 and 0.79, respectively; for innovation climate, 0.46 and 0.7, respectively; for managerial risk taking, 0.35 and 0.6, respectively; for paradoxical leadership behavior, 0.14 and 0.31, respectively; and for quality climate, 0.41 and 0.66, respectively. These statistics justified aggregation of the independent variables to the unit level (Bliese, 2000).

Hypothesis Testing

To test research hypotheses and exam the overall model with managerial risk-taking mediating the relation between innovation climate and innovative performance, moderated by paradoxical leadership behavior and quality climate, we conducted a multiple regression analysis using Hayes PROCESS macro tool (Model 29; Hayes, 2017). All variables were aggregated into team level of analysis. Results for this model are presented in table 2.

Table 2: Results of Moderated Mediated Regression Model Analysis

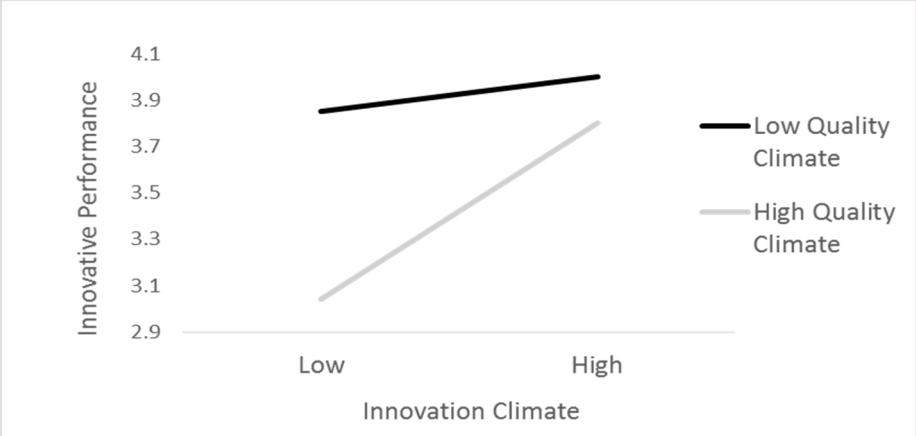
	Model 1 Managerial Risk Taking	**Model 2 Innovative Performance**
Predictor	**B**	**B**
Intercept	–11.38 (4.38)	8.47 (3.34)
Innovation climate	3.88** (1.14)	–1.29* (0.86)
Paradoxical leadership behavior	3.89** (1.16)	--
Innovation climate * Paradoxical leadership behavior	–1.07** (0.31)	--
Risk willingness perception	--	0.89* (0.56)
Quality climate	--	–1.38 (0.86)
Innovation climate * Quality climate	--	0.47* (0.22)
Risk willingness perception * Quality climate	--	–0.30† (0.16)
Time Pressure	0.27* (0.11)	0.00 (0.11)
Project Stage	–0.08 (0.16)	–0.32† (0.17)
Team Tenure	0.00 (0.01)	–0.01 (0.01)
Temporal Leadership	–0.21† (0.11)	–0.08 (0.13)
Model R^2	0.23*	0.38***

Notes: These statistics are at the team level of analysis. Coefficient estimate with standard error in parentheses.
n =72
† < .1.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Testing the first hypothesis, we found support for the moderating role of quality climate in the relation between innovation climate and innovative performance (B=.47, $p<.05$). This interaction, as shown graphically in Figure 2. demonstrates that

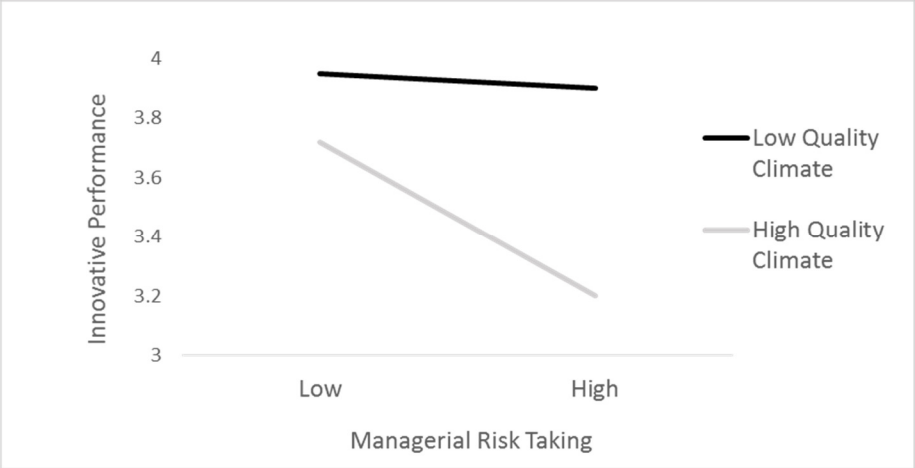
the relation between innovation climate and innovative performance was significantly positive (effect size = .72, $p < .001$) when quality climate was high (+1 *sd*). When quality climate was low (-1 *sd*), there was no significant relation between innovation climate and innovative performance ($p = .54$).

FIGURE 2: Conditional Effect of Innovation Climate on Innovative Performance at Different Values of Quality Climate



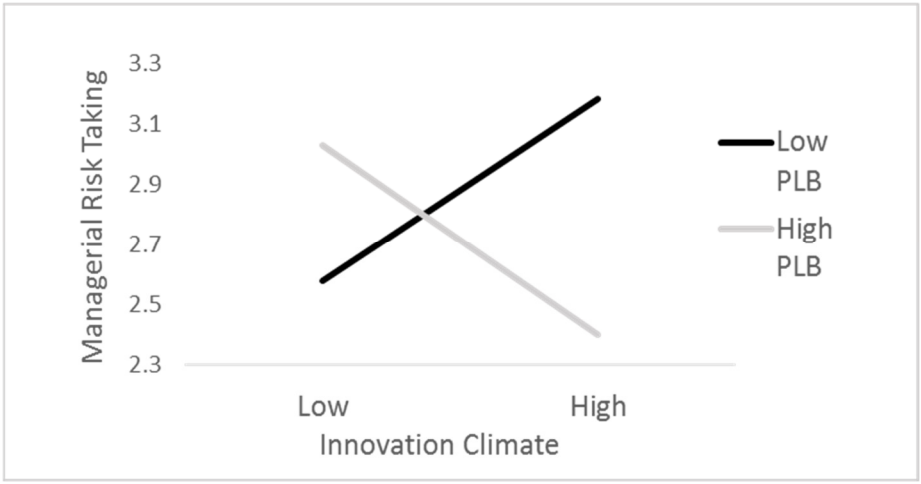
The second hypothesis was not supported. The moderating role of quality climate in the relation between managerial risk taking and innovative performance was found to be marginally significant (B= –.30, $p = .06$), but results were different than what we expected. This interaction, as shown graphically in Figure 3. demonstrates that the relation between managerial risk taking and innovative performance was significantly negative (effect size = –.38, $p < .05$) when quality climate was high (+1 *sd*). When quality climate was low (-1 *sd*), there was no significant relation between managerial risk taking and innovative performance ($p = .89$).

Figure 3: Conditional Effect of Managerial Risk Taking on Innovative Performance at Different Values of Quality Climate



The third hypothesis was not supported since the interaction between innovation climate and paradoxical leadership behavior was not found to be significant. Testing the fourth hypothesis, we found partial support for our hypothesis. The moderating role of paradoxical leadership behavior in the relation between innovation climate and managerial risk taking was found to be significant (B=3.88, p<.01), but the interaction, as shown graphically in Figure 4. was not in line with our expectations. Results show that the relation between innovation climate and managerial risk taking was significantly negative (effect size = –.54, p < .05) when paradoxical leadership behavior was high (+1 *sd*), and was significantly positive (effect size = .52, p < .05) when paradoxical leadership behavior was low (-1 *sd*).

Figure 4: Conditional Effect of Innovation Climate on Managerial Risk Taking at Different Values of Paradoxical Leadership Behavior



Finally, testing the overall model, we found support for the fifth hypothesis on the mediating role of managerial risk taking in the presence of the moderating variables. The indirect effect of innovation climate on innovative performance, mediated through managerial risk taking in the presence of paradoxical leadership behavior and quality climate, was significant ([CI]: 0.01 < CI < 0.85). This indirect effect is significantly positive as the bootstrap confidence interval is entirely above zero. At the same time, the direct effect size of innovation climate on innovative performance remained significant (.50, p < .001), indicating the presence of partial mediation.

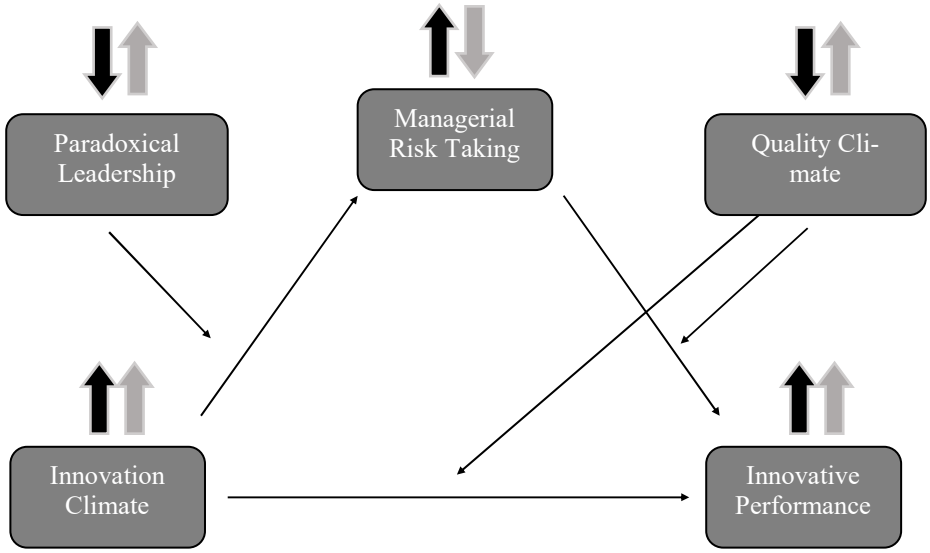
Discussion

This study contributes to the existing literature and organizations in search to understand the relationship between innovation and quality by identifying the settings in which innovative performance level remains high in teamwork. Both innovation and quality are essential for organizations success (Thai Hoang, Igel, & Laosirihongthong, 2006). While some researchers claim for tension others suggest a complementary point of view. Diving into our results and examining the entire model, we found a justification for both paradigms. In other words, one way to achieve high level of innovative performance in teams is to have high level of innovation climate and quality climate. In this case, managerial risk taking should be low and paradoxical leadership behavior should be high. The second way to achieve high level of innovative performance in teams is to have high innovation climate and low-quality climate. In this case, managerial risk taking should be high and paradoxical leadership behavior should be low.

These combinations of the variables above, which are also presented in Figure 5 are required for teams who desire to maintain high level of innovative performance.

As hypothesized, quality climate was found to moderate the relationship between innovation climate and innovative performance. When quality climate was high, as innovation climate level increased, it resulted with higher innovative performance. This pattern supports the complementary approach since high innovative performance is achieved by maintaining high levels of both quality climate and innovation climate. These results align with findings regarding the coexistence of innovation and quality in the organizational setting (Roldán Bravo, Lloréns Montes, & Ruiz Moreno, 2017; Zeng, Phan, & Matsui, 2015). Additional interesting observation that arises from this interaction is that when quality climate is low, innovative performance level is higher than its level when quality climate is high, regardless of the innovation climate level. This pattern demonstrates that innovative performance can be accomplished also without investing resources in innovation climate or quality climate, what leads us to assume that there are other determinants for innovation which were not addressed yet.

Figure 5: The Moderated Mediating Effect of Innovation Climate, PLB, Managerial Risk Taking and Quality Climate on Innovative Performance



Our second hypothesize was partly supported by research findings. Quality climate indeed moderated the relationship between managerial risk taking and innovative performance. While we assumed that at high quality climate – innovative performance will be related to high managerial risk taking, we found that it was associated with low managerial risk level. Our hypothesis relied on the complementary approach, nevertheless, results indicated that the tension between quality climate and innovative performance exists in the presence of managerial risk taking.

The third hypothesis was that paradoxical leadership behavior will moderate the relationship between innovation climate and innovative performance in such way that when paradoxical leadership behavior will be high, innovation climate and innovative performance will be positively associated. Findings for this hypothesis were not significant. For that reason, we chose to use a more parsimony statistical analysis, moving from model 29 to model 28 (Hayes, 2017).

According to the fourth hypothesis, paradoxical leadership behavior was supposed to moderate the relationship between innovation climate and managerial risk

taking. We speculated that in high level of PLB – high innovation climate will be associated with high managerial risk taking. This hypothesize was also partly supported. There was a significant moderation effect in which at high PLB level – more innovation climate was related to decrease in managerial risk taking, while at low PLB level – more innovation climate was related to increase in managerial risk taking.

Our findings are inconsistent with previous findings regarding to PLB, stating that its presence allows innovation climate to exist simultaneously with other factors such as managerial risk taking (Li, She, & Yang, 2018; Waldman & Bowen, 2016). Results suggest that the combination of high PLB and high innovation climate leads to lower level of managerial risk taking. One can assume that the reason for that is the confusion and unpredictable way in which the manager behavior is being perceived by team members (Dewulf, Craps, Bouwen, Taillieu, & Pahl-Wostl, 2005; Michie, 2002). Another explanation for the different pattern in which PLB affected innovative performance in our research is from cultural perspective. While paradoxical leadership behavior may serve as a performance accelerator in eastern collectivistic cultures, in more individualistic nations it might act differently (Barkema, Chen, George, Luo, & Tsui, 2015). Until now, PLB was extensively examined in eastern cultures (Zhang & Han, 2019), but the current study was conducted in Israel, which is a western culture, thus potentially impacting its influence on organizational performance.

Finally, we found support to the moderated mediation hypothesis, so that managerial risk taking mediated the relationship between innovation climate and innovative performance, when PLB and quality climate were presence as moderators.

Conclusions

Our research provides new insights to the complex relationship of innovation and quality in organizations. Although there is an extensive research both regarding the competing and the complementary approaches, our findings suggest a better theoretical understanding of the specific circumstances in which any of these approaches exist. In particularly, which variable can perform as mediators or moderator and have a positive impact on the mechanism that is in the base of this relationship.

The complementary approach states that innovation climate and quality climate can coexist. We found in our research that the presence of high quality climate enabled the impact of the various factors on the innovation climate in a way that lead to high innovation performance. According to that, when both climates are high, we found that higher innovative performance will be achieved by maintaining high PLB and low managerial risk taking. We suggest that in this situation when both climates are high, PLB will enable the coexistence of the two poles at the same time without harming total innovative performance. In addition, since PLB inherently allows all options to exist simultaneously without taking an explicit position, which is fundamentally different from taking a risk, it is only natural that managerial risk taking will be low. The understanding of this ecosystem will allow organizations to maintain their competitive advantage within the field of innovation performance without having to compromise on quality standards. All of that by managing their resources wisely.

On the other hand, the competing approach states for the tension that exist between innovation and quality. According to this approach, we found that high level of innovative performance can also be obtained when innovation climate is high and quality climate is low. In this dynamic, maintaining low PLB and high managerial risk taking is needed. We suggest that when there is only one main climate (innovation climate) and lower tension, managers are more likely to take risks based on the well-known association between innovation and risk taking. To enable higher managerial risk-taking perception, we will prefer lower PLB. This way, managers are being perceived as more decisive, and in turn it leads to higher innovation performance.

Looking at innovation performance as a key elements for organizations to succeed and survive in today's competitive arena, we can now offer them more than one way to achieve high innovation performance. The positive aspect is that it can be done with or without the existence of quality environment. The catch is to combine the right setting with the right management techniques.

Additional contribution is introducing the mediating role of managerial risk taking in the relation between innovation climate and innovative performance, when PLB and quality climate serve as moderators. To the best of our knowledge, literature has dealt with the relation between innovation climate and innovative performance without looking closely in the mechanism underlying it. We contribute another layer to the theoretical understanding of this process by emphasizing the importance of a mediator variable in general and the managerial risk taking in particular. The main impact is that the manager can possess either high or low risk taking approach (according to the organization cultural environment). Each direction will need to be complete with the right setting of PLB and quality climate but in both cases the result will be high innovation performance.

Limitations and Future research

Data for this study was collected during one time period among teams who are located in the same country and possess the same culture identity. Such research design is problematic since data changes over time, and it is not possible to consider the whole variety of influences. In addition, culture has a major influence on the nature of work processes and outcomes. For example, the term PLB was examined in eastern collectivistic culture (Zhang & Han, 2019) while the current study was conducted in western and individualistic culture. Future research should take the time and the culture into consideration by collecting data from various cultures and over few time periods. This will also allow us to hypothesize about causality relationship between research variables, which we could not address in the current research.

In addition, we assessed innovation be relying on managers reports regarding innovative performance in their teams. The use of self-report measure can be considered as a limitation (Venkatraman, 1989). We suggest conducting future research in which the dependent variable of innovative preference will be collected also by objective measures. The combination of objective and subjective measures will strength the reliability of the results.

Third, nineteen companies participated in our research, and we did not find any significant contribution of organization types to our results. Since we did not take into consideration the role of organization type in the current research, we suggest that in the future, research should control this variable as well by enlarging research sample for each type of organization. On the other hand, our research enables generalization of the results to various contexts because it was conducted across different industries.

Finally, this research demonstrated the role of managerial risk taking in the process of innovative performance, particularly by gaining a better understanding of the relationship between quality and innovation. Future research should elaborate the theoretical contribution of managerial risk taking to the process of innovation. We also suggest that future research will examine the influence of this set of variables on quality performance among teams.

Practical Implementations

This study sheds light on the fact that there is more than one way to achieve high innovative performance. While the literature today shows contradictory findings regarding the relationship between innovation and quality, we offer a wide understanding for each one of the approaches, both the competing and the complementary. Regarding the

results in this study, in order to achieve innovative performance, manager has the flexibility to either have high PLB and low managerial risk taking, or have low PLB and high managerial risk taking, in accordance with the innovation and quality climates surrounding in the team.

Another practical contribution is for teams who strive to achieve high innovative performance without neglecting quality climate. For those teams we offer a guideline to choose and direct the best fit between managerial characteristics and team needs. In conclusion, by relating also to managerial practices through the lens of the paradox theory, we add new insights for bridging the gap relating to the relationship of innovation and quality. In such way, we identify new mechanisms underlying organizational processes and answer unresolved issues.

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APPENDIX

Measures – Items details

Independent Variables. Items included: "In this team we take the time needed to develop new ideas", "People in the team cooperate in order to help develop and apply new ideas". This subscale originally included three additional items who were omitted due to low standardized factor loadings.

Paradoxical leadership behavior. Items included: "My manager clarifies work requirements, but does not micromanage work", "My manager has high requirements, but allows subordinates to make mistakes".

Quality Climate. Items included: "Whenever pressure builds up, the preference is to keep quality standards, even if that means compromising time schedules", "Safety rules and procedures are highly prioritized". Two items were deleted in the analysis process because of low standardized factor loadings.

Mediator. Additional item was omitted due to low standardized factor loadings. Items were: "My manager likes to play it safe when developing new ideas", "My manager prefers to think conservatively when developing new ideas". By answering these questions, team members described how they perceive their manager's willingness to take risks.

Dependent Variables. Items included: "Our products include major improvement over previous technology", "Products include a breakthrough innovation". Answers were aggregated to team level, taking into consideration two responses of different managers for each team.