

Entrepreneurial leadership and employees' innovative behavior: A sequential mediation analysis of innovation climate and employees' intellectual agility



Mashaël Abdulaziz Malibari^a, Saleh Bajaba^{b,*}

^a Department of Business Administration, Umm Al Qura University, P.O 24381, Makkah 4299, Saudi Arabia

^b Department of Business Administration, King Abdulaziz University, P.O. 80201, Jeddah 21589, Saudi Arabia

ARTICLE INFO

Article History:

Received 29 June 2022

Accepted 24 August 2022

Available online 26 September 2022

Keywords:

Innovative behavior

Entrepreneurial leadership

Innovation climate

Employees' intellectual agility

Social cognitive theory

JEL codes:

M12

M14

L26

D23

O31

ABSTRACT

Despite previous research demonstrating the importance of entrepreneurial leadership in fostering innovative behavior among employees, less is known about the mechanisms and processes through which leaders influence their employees' innovative behavior. By utilizing social cognitive theory, the purpose of this paper is to examine the sequential role of innovation climate and employees' intellectual agility in mediating the link between entrepreneurial leadership and employees' innovative behavior. We collected 241 data points from full-time employees in the US using the survey method and tested our hypotheses using hierarchical multiple regression and PROCESS Macro. Entrepreneurial leadership was found to significantly impact employees' innovative behavior through the innovation climate and their intellectual agility. These findings allow leaders to pinpoint their critical roles in fostering innovation in their businesses and establishing the ideal culture and climate for innovation. It also allows leaders to create innovative settings to encourage employees to share ideas and concepts in a confident manner. A discussion of the findings, implications, limitations, and future research avenues is included.

© 2022 The Author(s). Published by Elsevier España, S.L.U. on behalf of Journal of Innovation & Knowledge.

This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>)

Introduction

As an organization looks to succeed in an ambiguous, competitive environment, entrepreneurial behaviors are crucial to supporting inventiveness, adaptation, and innovation (Anderson et al., 2019; Li et al., 2020; Pidduck et al., 2021). García-Vidal et al. (2019) claim that organizations that want to succeed in today's rapidly changing business environment cannot rely on outdated management theories and that effective leadership is one of the primary drivers for effective change. There is ample evidence that leaders can influence employee outcomes in significant ways (Althnayan et al., 2022; Bajaba et al., 2021, 2022a; Basahal et al., 2022; Fuller et al., 2022). In addition, as the corporate environment has become increasingly hostile and turbulent, a new type of leadership is required, known as entrepreneurial leadership (EL), which differs from traditional managerial leadership in that it emphasizes those attributes and behaviors of a leader that may contribute to entrepreneurial behaviors, such as recognizing and exploiting opportunities (Renko et al., 2015). The

importance of EL has been growing in recent years as businesses strive for increased performance, adaptability, and sustainability (Gupta et al., 2004; Subramaniam & Shankar, 2020).

Since the early 1990s, the body of knowledge in EL has increased significantly. Recent studies by Arshi & Burns (2018) and Hughes et al. (2018) have called for scholars to explore mediating factors concurrently for a more comprehensive and nuanced understanding of how leaders influence employees' innovative behavior (EIB). Moreover, because there has been so little empirical research investigating the relationship between EL and EIB (Bagheri et al., 2020), our understanding of the mechanisms and processes through which entrepreneurial leaders can affect EIB requires a higher level of theoretical precision (Lee et al., 2020).

In addition, there is growing support for the idea that innovative employee behavior is what drives continuous innovation (Zhang & Yang, 2020). Consequently, research into employee innovative behavior has become mainstream over the past years (e.g., Akbari et al., 2021; Bagheri et al., 2020). Nevertheless, these studies have primarily been focused on transformational leadership (e.g., Amankwaa et al., 2019; Afsar & Masood, 2018). Other recent studies have also

* Corresponding author.

E-mail address: sbajaba@kau.edu.sa (S. Bajaba).

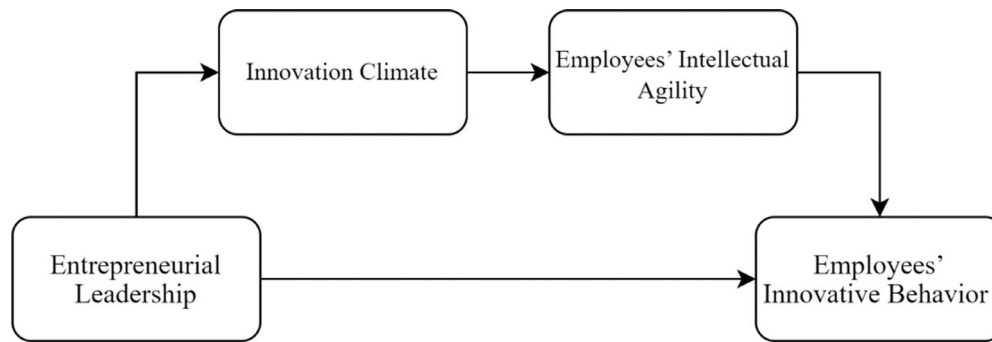


Fig. 1. The conceptual research model.

been conducted on the other newer genre of leadership styles, such as ethical, authentic, and servant leadership styles. For example, [Rego et al. \(2014\)](#) focused on authentic leadership, [Javed et al. \(2017\)](#) on ethical leadership, and [Wang et al. \(2019\)](#) on servant leadership. Throughout this study, we argue that in order to gain a competitive advantage and achieve organizational success through innovation within a dynamic and complex work environment, leaders must assist subordinates in identifying and seizing entrepreneurial opportunities.

Additionally, to our knowledge, no research has been published in the literature addressing the relationship between EL and employees' intellectual agility (EIA) when it comes to identifying entrepreneurial opportunities. Further, researchers have demonstrated that employees' innovative behavior is improved by creating a conducive innovation climate (IC) that encourages receptivity to new ideas and increases their willingness to pursue them ([Li et al., 2020](#); [Yu et al., 2013](#)). Despite the fact that it has been demonstrated in previous studies ([Akbari et al., 2021](#)) that there is a relationship between EL and EIB, more research is still needed in order to unravel the mechanism in which EL affects EIB.

On that basis, the aim of this study is to develop a conceptual model that sheds light on how EL can foster innovative behavior and examine the mediating roles that IC and EIA play in this relationship by analyzing a sample consisting of 241 full-time employees in the US. Our work addresses several gaps in the existing literature. Firstly, this study aims to fill a gap in the empirical evidence regarding EL's importance in encouraging employee innovation by thoroughly investigating the mediating mechanism of IC and EIA (see [Fig. 1](#)). Second, this study will also contribute to a more robust and nuanced understanding of the relationship between EL and EIB by incorporating social cognitive theory (SCT).

This research is organized into four sections. The following section provides an overview of the literature on the full spectrum of theories and concepts that support the proposed model. The next section discusses the study's methodology, sample, and measurement scales. The penultimate section introduces the quantitative results, including the fit of the model and hypotheses testing results. The final section discusses the implications, limitations, and directions for further research.

Theoretical background and hypotheses development

The social cognitive theory

In our attempt to address this research gap, we develop a research model through the lens of social cognitive theory ([Bandura, 1986](#)) to answer researchers' demands to explain how entrepreneurial leaders affect EIB by specifically investigating the mediating role of IC and EIA. The social cognitive theory provides a framework for understanding, predicting, and changing human behavior. In SCT, the interaction between the individual and behavior is influenced by the

individual's thoughts, actions, and interpretations. Furthermore, the interaction between an individual and the environment tends to involve the development and modification of cognitive abilities and human beliefs by societal factors and environmental structures. The final interaction is between the environment and behavior and is comprised of an individual's behavior influencing the characteristics of their environment, which in turn affects their behavior ([Bandura, 2005](#)). This enables us to examine the IC and intellectual agility of employees as motivational and affective mechanisms that have been recognized as crucial pathways connecting leadership to innovative behavior in the workplace ([Hughes et al., 2018](#)). Several studies have already explored the impact of EL on employees' outcomes through the use of the SCT by empirically examining a number of outcomes, such as innovative work behavior ([Bagheri, Akbari and Artang, 2022](#); [Bagheri et al., 2020](#); [Cai et al., 2019](#); [Li et al., 2020](#); [Newman et al., 2020](#)). This study has therefore extended previous literature in that it proposes that the EL has a functional role as an external determinant to support innovation in the workplace and that this relationship is mediated by the IC and EIA.

Entrepreneurial leadership and innovation climate

EL has arisen as a distinctive form of leadership for economic growth ([Park et al., 2014](#)). Innovative organizations often require entrepreneurial leaders who can effectively utilize resources and inspire followers' inventiveness through their vision. EL has been identified by [Renko et al. \(2015\)](#) as a style of leadership that comprises the attributes to motivate and lead the members of the group for the identification and exploitation of entrepreneurial initiatives to attain organizational objectives. Entrepreneurial leaders play a dual role, including encouraging their followers to be highly innovative and behaving as role models for their followers ([Gupta et al., 2004](#)). Therefore, the leaders of any business play a crucial role in developing and influencing the business environment that results in favorable behavioral patterns.

Additionally, the innovation climate supports employee creativity and innovative behavior, as well as the effort to explore and apply new ideas throughout the business ([Ali & Park, 2016](#); [Wang et al., 2013](#); [Park & Jo, 2017](#)). Climate for innovation can be described as a combination of employee perceptions around an organization's environment that supports risk-taking behavior, allots sufficient resources, and promotes a competitive environment that fosters innovation at work ([Scott & Bruce, 1994](#)). Moreover, [Kang et al. \(2015\)](#) argued that there is a positive relationship between EL behavior and a firm's innovative climate, which has a situational effect on employees' behavior in the workplace, endorses employees' innovative challenges, and prevents them from being responsive. Consequently, entrepreneurial leaders create a favorable climate for innovation, which not only empowers but also stimulates their subordinates to be innovative and discover innovative solutions to workplace challenges ([Mehmood et al., 2019](#)).

Drawing on social cognitive theory (Bandura, 1986, 2014), we examine IC as an effective and motivational mechanism that explains how EL promotes EIBs. To lead innovation, a leader must create an environment that encourages all employees to engage in innovative practices and generate and exploit new ideas. (Jaiswal & Dhar, 2015). A study by Li et al. (2020) found that entrepreneurial leadership is positively correlated with an organization's innovative environment. In their view, entrepreneurial leaders foster an environment that encourages their members to think differently, generate new ideas, and find innovative solutions to problems. According to this study, entrepreneurs may intentionally influence their employees' innovative behavior by creating a culture where they can develop new ideas and achieve them without feeling intimidated. Therefore, EL creates a conducive environment for employees to be innovative. Consequently, the leaders of any business play a crucial role in developing and influencing the business's climate, which stimulates favorable behaviors (Reise & Waller, 2009). Based on the above arguments, it is reasonable to hypothesize:

H1: Entrepreneurial leadership will be positively related to the innovation climate.

Innovation climate and employees' intellectual agility

Extensive research demonstrates the significance of the innovation climate in encouraging individuals to think differently, hence enhancing their innovative behaviors (Zhang et al., 2018; Waheed et al., 2019). In addition, intellectual agility is a relatively new aspect of human capital that contributes to the innovativeness of businesses. Intellectual agility relates to the capability of employees to adjust their patterns of thinking, seek out new knowledge, and generate unique solutions to current and future challenges (Tierney & Farmer, 2002). In addition, a climate that fosters innovation cultivates the innovative skills of employees, thus fostering innovation inside a business (Shanker et al., 2017; Zhang et al., 2018; Waheed et al., 2019). IC is a vital contextual component for innovative behavior throughout the innovation process, particularly during the idea execution phase (Ren & Zhang, 2015); shared perception between employees that their effort is valued by the business would increase their willingness to cooperate and establish a climate that promotes innovation (Chen et al., 2013). Innovation can be boosted by fostering an innovation-friendly environment throughout the organization and removing hurdles that inhibit innovation activities (Ren & Zhang, 2015).

In addition, one of the interactions in social cognitive theory proposes that individuals acquire and use knowledge from their business environment before deciding how to behave. As a result, a promising innovative climate produced by entrepreneurial leaders not just allows but also inspires their subordinates to be innovative and develop novel and innovative solutions to business challenges (Javed et al., 2019; Sethibe & Steyn, 2017). Entrepreneurial leaders not just challenge the current system and generate fresh creative ideas and innovative solutions, but they also inspire risk-taking behaviors and foster an environment conducive to innovation. While leaders are responsible for building an organizational climate conducive to innovation, individuals' knowledge, abilities, passion for innovation, and intellectual agility frequently support innovation behavior (Newman et al., 2020). It was found by Kang et al. (2016), for example, that team innovation climate enhanced an employee's passion for inventing and that as proactive (risk-taking) culture increased, the link between innovative climate and employee passion for inventing (employee innovation) strengthened. Magni et al. (2018) showed that team innovation climate enhanced proactive and risk-taking attitudes and, therefore, improvisation. In Shaw et al. (2012), two aspects of the team climate (participative safety and vision) were

found to be positively correlated with staff competency. The perception of organizational innovation climate has been strongly linked to employees' innovation behaviors, which we argue is due to their intellectual agility (Park & Jo, 2017; Ren & Zhang, 2015; Yu et al., 2013). Based on these arguments, we propose the following hypothesis:

H2: Innovation climate will be positively related to employees' intellectual agility.

Employees' intellectual agility and employees' innovative behavior

Success and survival in a progressively knowledge-driven society are reliant on the ability to participate in the exploration, experimentation, and creation of new inventions, product lines, manufacturing processes, knowledge transfer, and corporate structures (Dabić et al., 2018, Vlačić et al., 2019, Manesh et al., 2020). These capabilities, also known as innovativeness, are regarded as vital assets that connect businesses' embedded innovation capabilities with the outcomes of the innovation process (Santos-Rodrigues et al., 2010). Innovativeness exists as an intangible asset inside the expertise of human organizational capital. The development of employees' intellectual capabilities allows businesses to translate knowledge into new product lines, services, or procedures that the market demands (Demartini & Beretta, 2020). Agyapong et al. (2017) examined the associations between social capital, performance, and innovation in developing economies. This study discovered that social capital has a positive effect on performance, implying that having more social capital is likely to increase corporate performance.

Furthermore, the early literature on knowledge management acknowledged the significance of an environment that maximizes employee innovation and effort. For instance, Bontis et al. (2002) found that employees' perceptions of the value of their suggestions to management and the organization offer a significant motivator for employee initiatives in the areas of enhancing knowledge and skills, fostering self-confidence and skill, developing interest and motivation for tackling challenges, and moving potential barriers forward. In addition, numerous empirical studies have demonstrated that the capacity to convert and exploit information enhances innovative capabilities and organizational success (Caseiro & Coelho, 2019, Santos-Rodrigues et al., 2010). Therefore, increasing innovation agility has a favorable effect on organizational innovation.

From an SCT perspective, we suggest that, while managers are responsible for fostering an environment conducive to innovation, employees' intellectual agility and abilities typically contribute to innovation's success (Dabić et al., 2021; Santos-Rodrigues et al., 2010). Intellectual agility boils down to learning about the challenges companies face and then putting this knowledge into action within a business and adapting the skills and expertise of that business to meet the demands of a dynamic environment. For example, Choudhary et al. (2020) empirically investigate how human capital investments manifest at the individual level to determine when and how micro-social orders emerge when organizations invest in their employees. Consequently, employees feel grateful to their organizations for the resources they receive in the form of new knowledge, skills, abilities, and other characteristics (KSAOs). After acquiring the resources, employees are encouraged to share them with peers and colleagues, leading to knowledge management behaviors. As a result of participating in firm-specific knowledge management behaviors, employees are encouraged to develop, promote, and implement novel ideas and procedures, thus enhancing their innovation ability. We, therefore, propose the following hypothesis:

H3: Employees' intellectual agility will be positively related to employees' innovative behavior.

Entrepreneurial leadership and employees' innovative behavior

Literature asserts that EL is a significant factor in fostering and enhancing the innovative behavior of employees in a competitive corporate environment. Recently, Researchers in management have constantly acknowledged EL as a style of people-oriented leadership (Newman et al., 2018) as well as Gupta et al. (2004), Miao et al. (2018), and Renko et al. (2015) stressed its significance. Afsar & Masood (2018) believe that EIB is a motivational and cognitive procedure aimed at presenting, generating, and implementing innovative solutions (Scott & Bruce, 1994) to deliver original and beneficial solutions to complex and inadequately defined challenges (Zhang & Bartol, 2010). In addition, existing literature acknowledges the influence of leadership on individual actions and attitudes, particularly innovative employee behavior (De Jong & Den Hartog, 2007; Cai et al., 2019; Khaola & Coldwell, 2018).

In this sense, leaders serve as a source of authority and a crucial aspect that influences the innovative behavior of employees (Yukl, 2013). Accordingly, the nature of leader-employee relationships and engagements relates to the generation and implementation of innovative initiatives (De Jong & Den Hartog, 2007). Entrepreneurial leaders cultivate an attractive and encouraging in which all employees are motivated to recognize innovation as one of their core responsibilities and to be resilient in the face of the inherent challenges experienced by innovation activities (Karol, 2015). Bagheri (2017) found that EL has a strong effect on fostering innovative employee behavior. In the healthcare sector, Bagheri & Akbari (2018) confirmed that EL has a significant impact on developing the innovative behavior of nurses in hospitals. Newman et al. (2018) revealed that leaders who apply the EL approach to their task performance significantly foster innovative behavior within their subordinates. In sum, an entrepreneurial leader may effectively direct the innovation activities by promoting the generation and implementation of novel ideas by their employees.

Through the lens of social cognitive theory (Bandura, 1986, 1988), we suggest that entrepreneurial leaders encourage and empower their employees to recognize and utilize entrepreneurial opportunities in the workplace (i.e., innovate) and behave entrepreneurially. In the current study, we apply this notion to conceptualize EL as a technique in which leaders not only encourage and support entrepreneurial conduct in subordinates but also serve as role models by exhibiting entrepreneurial behavior personally. On the basis of these theoretical foundations, we propose the following hypothesis:

H4: Entrepreneurial leadership will be positively related to employees' innovative behavior.

The sequential mediation model of entrepreneurial leadership

Considering the previous discussions and hypotheses, we suggest a sequential mediation model linking EL and employees' innovative behavior. Specifically, we offer that EL relates to improving the IC, which, in turn, may produce greater EIA and, ultimately, promotes employees' innovative behavior. This mediation chain is in line with social cognitive theory (Bandura, 1988) as the innovative climate established by the entrepreneurial leaders can be used as a positive stimulation that enhances the willingness of employees to adopt innovative entrepreneurial activities and provide employees with resources by integrating a wide range of tools from various sources in order to develop systematic cognitions and innovative mindsets. Additionally, EIA can be effectively expressed in this positive IC, which helps produce more innovative behavior. Thus, we further assume that the contingent function of an innovative climate in the intellectual agility-building process of employees results in a sequential mediation model. In conclusion, leaders and employees who

understand an innovative firm's climate are shown to be highly empowered, leverage their intellectual capabilities to thrive in a complex and dynamic business climate, and behave innovatively (Bos-Nehles & Veenendaal, 2019; Mokhber et al., 2018). Taken together with all of the arguments, we propose the following hypotheses:

H5: The innovation climate will mediate the relationship between entrepreneurial leadership and employees' intellectual agility.

H6: Employees' intellectual agility will mediate the relationship between innovation climate and employees' innovative behavior.

H7: Innovation climate and employees' intellectual agility will sequentially mediate the relationship between entrepreneurial leadership and employees' innovative behavior.

Method

Sample and data collection procedure

Online questionnaires were used as the primary data collection tool. The online questionnaire gauges participants' perceptions based on different literature scales on how EL encourages EIB and the mediated association by EIA, which is a personal determinant, and how this mediated relation strength depends on the innovation climate.

Participants were full-time employees in a variety of industries (e.g., sales, finance, and technology) and occupations; they were recruited and paid through Pollfish, an online crowdsourcing platform that allows researchers to control who participates in a study and monitor dropout rates and completion times (Litman et al., 2017). Pollfish also makes it possible to include eligible participants from a broad range of jobs, people, and geographic locations.

Researchers have used Pollfish's platform for recruiting and delivering surveys and obtaining reliable and valid data (Akiba et al., 2021). Pollfish, workers tend to read survey instructions carefully, and the samples have diversity in terms of age, education, and work experience, providing high-quality data comparable to those from other data sources (Ukpabi et al., 2021; Ionescu, 2020). We also ensured that the survey was designed and formatted in an efficient manner in order to avoid receiving poor data when using the digital platform, as noted by Lovett et al. (2018). We required respondents to be full-time employed adults aged 18 and older working in the US and a minimum of 6 months of work experience with the current leader because we wanted to ensure that the employees have spent enough time with their current leader to evaluate their leadership style. In order to increase the data quality, we added one question to examine the data with insufficient-attention checks, which is, *please answer strongly disagree with this question*. By adding this attention check, Pollfish eliminated all participants who failed to choose that particular answer. However, we took the precaution of following several procedures to control the data quality (Cheung et al., 2017; DeSimone et al., 2015).

Because the sample was drawn from a high-reliability source (Pollfish), very few low-quality data were encountered to be eliminated. However, following the listwise deletion procedure outlined by Hair et al. (2018), a total of 241 usable questionnaires were used in the analysis due to the removal of data from participants answering too many consecutive questions with the same response, completing surveys four times faster than the average respondent, answering attention-check questions incorrectly, and/or did not meet the minimum condition of 6 months of work tenure. The sample size adheres to the recommended ratio of 15 observations per independent variable and the preferred sample size of 90 observations to run the analysis in this study, as suggested by Hair et al. (2018). The final sample consisted of 55% male and 45% female. The mean age group of the participants was 3, representing the age group between 35 and 44 years old. Among the participants, 46% had

Table 1
Sample characteristics.

Demographic Variables	Frequency (N = 241)	Percentage (%)
Gender		
Male	133	55
Female	108	45
Age		
18–24 years	16	7
25–34 years	60	25
35–44 years	96	40
45–54 years	47	19
54+ years	22	9
Education		
High School	51	21
College Degree	111	46
Graduate Degree	79	33

university degrees, and 33% had a graduate degree. Table 1 includes the demographic information of the sample.

Measures

All measures used in this study were derived from the literature and had high Cronbach’s α scores, as presented in Table 2. A five-point Likert-type scale was employed for participants to respond to. *Entrepreneurial leadership* was measured using an 8-item scale ($\alpha = 0.91$) developed by Renko et al. (2015). A sample item is “Comes up with radical improvement ideas for the products/services we are selling.” *Entrepreneurial leadership* was measured on a five-point Likert-type scale, ranging from 1 (Never) to 5 (Always). *Innovation climate* was measured using a 16-item scale ($\alpha = 0.80$) developed by Scott & Bruce (1994). A sample item is “Creativity is encouraged here.” *Innovation climate* was measured on a five-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). *Employees’ intellectual agility* was measured using a 15-item scale ($\alpha = 0.84$) developed by Alavi et al. (2014). A sample item is “I look for the opportunities to make improvements at work.” *Employees’ intellectual agility* was measured on a five-point Likert-type scale, ranging from 1 (Never) to 5 (Always). Finally, *employees’ innovative behavior* was measured using a 6-item scale ($\alpha = 0.88$) developed by Hu et al. (2009). A sample item is “At work, I come up with innovative and creative notions.” *Employees’ innovative behavior* was measured on a five-point Likert-type scale, ranging from 1 (Never) to 5 (Always). For more information about the constructs, see Appendix 1.

In terms of control variables, existing literature suggests that some individual and organizational characteristics may affect the relationship between independent and dependent variables and thus need to be controlled to achieve an adulteration-free relationship

between observed variables (Delery & Doty, 1996; Liu & Almor, 2016). Thus, in this research, we controlled for three demographic variables: gender, age, and education. Gender was dummy coded (0= “male” and 1= “female”). Age was measured using five categories (1= “18 - 24 years” to 5= “54+ years”). Finally, education was measured using three categories (1= “high school,” 2= “college degree,” 3= “graduate degree”).

Analysis

Hierarchical multiple regression analysis was used to assess the direct effect on entrepreneurial leadership, innovation climate, employees’ intellectual agility, and employees’ innovative behavior. To evaluate the mediation effect, a test was conducted via the PROCESS macro (v4.1) using SPSS 28 software with the bootstrap sampling method (sample size = 5000), as recommended by Hayes (2013) and used by several scholars (Bajaba et al., 2022b; Naqshbandi & Jasimuddin, 2022; Salam & Bajaba, 2021). The bootstrap sampling method generated asymmetric confidence intervals (CIs) for the mediating effect.

Results

Descriptive statistics and correlation analysis

The descriptive statistics, reliabilities, and zero-order correlations are presented in Table 2. All correlations related to the hypothesized paths were statistically significant at $p = .001$. *Entrepreneurial leadership* was found to be positively correlated with *innovation climate* ($r = 0.56, p < 0.01$), *employees’ intellectual agility* ($r = 0.43, p < 0.01$), and *employees’ innovative behavior* ($r = 0.57, p < 0.01$). Similarly, *innovation climate* was positively correlated with *employees’ intellectual agility* ($r = 0.52, p < 0.01$) and *employees’ innovative behavior* ($r = 0.53, p < 0.01$), respectively. Lastly, *employees’ intellectual agility* was positively correlated with *employees’ innovative behavior* ($r = 0.53, p < 0.01$). The reliability was evaluated by calculating the internal consistency coefficient (Cronbach’s alpha). All internal consistency reliabilities of the variables in the study were sufficient for research purposes (above 0.70; Hair et al., 2018). The Cronbach’s alpha coefficients of *entrepreneurial leadership*, *innovation climate*, *employees’ intellectual agility*, and *employees’ innovative behavior* were 0.91, 0.80, 0.84, and 0.88, respectively.

Common method bias analysis

As all indicators were self-reported, the impact of Common Method Bias (CMB) should be analyzed in order to deal with the

Table 2
Means, standard deviations, correlations, and reliabilities, (N = 241).

Variables	M	SD	1	2	3	4	5	6	7
1- EL	3.43	.90	(.91)	.43**	.56****	.58**	-.17	-.22**	.22**
2- EIA	3.96	.52	.44**	(.84)	.52**	.53**	-.14	-.02	.12
3- IC	3.46	.56	.57**	.53**	(.80)	.53**	-.23**	-.16	.21
4- EIB	3.54	.85	.58**	.53**	.53**	(.88)	-.30**	-.22**	.31**
5- Gender	.45	.49	-.17**	-.12	-.22**	-.29**	-	.10	-.14
6- Age	3	1.04	-.22**	-.02	-.15*	-.22**	.10	-	.11
7- Education	2.12	.73	.22**	.13*	.21**	.32**	-.13*	.12	-

Note. M = Mean; SD = Standard Deviation; Boldfaced diagonal elements are reliabilities (Cronbach’s Alpha); Gender: 0 = Male, 1 = Female; Age: 1= 18 - 24 years, 2= 25 - 34 years, 3= 35 - 44 years, 4= 45 - 54 years, 5= “54+ years”; Education: 1= high school, 2= college degree, 3= graduate degree; EL= *Entrepreneurial leadership*; IC = *Innovation climate*; EIA = *Employees’ intellectual agility*; EIB = *Employees’ innovative behavior*. Below the diagonal elements are the correlations between the constructs. Above the diagonal elements are the correlations between the constructs after controlling the marker variable.

** $p < .01$.
* $p < .05$.

potential presence of common method bias. To ensure that CMB is eliminated or minimized, established recommendations were followed (Podsakoff et al., 2003). This study employed the correlational marker technique by Lindell & Whitney (2001) for controlling method variance using a marker variable that is theoretically irrelevant to substantive variables in the research (Williams et al., 2010). The partial correlation measures the strength and direction of a linear relationship between two continuous variables and compares the variations while controlling for the marker variable chosen (Lindell & Whitney, 2001). This research used one of the most updated social science research marker variables: the attitude toward the Color Blue. This marker variable was measured using a 7-item scale ($\alpha = 0.94$) developed by Miller & Simmering (2022). A sample item is "Blue is a beautiful color." The marker variable was measured on a five-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Results indicated that partialling-out technique variance in this fashion did not affect the original correlation among substantive variables or change its statistical significance, as shown above, the diagonal in Table 2. The results of this method's test indicated that the homogeneity of variability in this study was not intense and, consequently, has no bearing on the dependability of the research's conclusions.

Furthermore, Harman's single factor test (Harman, 1967) was performed to confirm the existence of CMB. A substantial amount of CMB is present for this test if a single factor emerges from the factor analysis or if a single general factor accounts for the majority of the covariance among the variables (Podsakoff et al., 2012). The questionnaire items were subjected to principal component analysis with varimax rotation, which revealed the existence of nine distinct factors with eigenvalues greater than 1.0. These factors account for 64.45% of the total variance. Moreover, the first (and most significant) factor accounted for 26.11% of the total variance, which is significantly less than 50% (i.e., the minimum threshold to test for CMB based on Harman's single factor test (Podsakoff et al., 2012). Since more than one factor emerged and no single factor accounted for the majority of the total variance, CMB was less likely to have significantly confounded the interpretations of the results of the present study (Podsakoff et al., 2003).

Hypothesis testing

Table 3 provides a summary of the regression analysis outputs for hypotheses 1, 2, 3, and 4. As the models had tolerance values far above 0.2 and Variance Inflation Factors (VIF) far below 5, all models were not susceptible to multicollinearity (Bowerman & O'Connell, 1990). Hypothesis 1 was supported as entrepreneurial leadership

positively predicted innovation climate in Model 2 ($b = 0.32, p < 0.01$). Hypothesis 2 was also supported as innovation climate positively predicted employees' intellectual agility in Model 5 ($b = 0.49, p < 0.01$). Next, hypothesis 3 was supported as employees' intellectual agility positively predicted employees' innovative behavior in Model 10 ($b = 0.78, p < 0.01$). Lastly, hypothesis 4 was supported as entrepreneurial leadership positively predicted employees' innovative behavior in Model 8 ($b = 0.45, p < 0.01$; See Fig. 2).

Mediation analysis

To test hypotheses 5, 6, and 7, Hayes's (2013) PROCESS add-on was utilized. Hypothesis 5 assessed the mediating role of innovation climate on the relationship between entrepreneurial leadership and employees' intellectual agility. The results revealed a significant indirect effect of impact of entrepreneurial leadership on employee's intellectual agility ($b = 0.12, SE = 0.03, 95\% BCa CI [0.07, 0.18]$), supporting hypothesis 5. Furthermore, the direct effect of entrepreneurial leadership on employees' intellectual agility in the presence of the mediator was also significant ($b = 0.13, p < 0.001$). Hence, the innovation climate partially mediated the relationship between entrepreneurial leadership and employees' intellectual agility. Furthermore, the results show that the indirect effect of innovation climate on employees' innovative behavior through employees' intellectual agility was significant statistically ($b = 0.29, SE = 0.06, 95\% BCa CI [0.20, 0.39]$), supporting hypothesis 6. Lastly, the results show that the indirect effect of entrepreneurial leadership on employees' innovative behavior through innovation climate and employees' intellectual agility was significant statistically ($b = 0.18, SE = 0.06, 95\% BCa CI [0.04, 0.10]$), confirming the serial mediation as claimed in hypothesis 7. The mediation analysis summary is presented in Table 4.

Discussion

The current research explores the effect of entrepreneurial leadership in encouraging employees' innovative behavior by creating an innovation climate and increasing their intellectual agility. In terms of both direct and indirect effects, all of the proposed relationships were consistent with those described in the literature. In addition, the data revealed relatively large coefficients of determination, indicating that the model is sufficiently robust to explain employees' innovative behavior in the context of entrepreneurial leadership. These results suggest that the chain of serial mediation adequately explains these causal relationships and indicates that entrepreneurial leadership has a substantial indirect effect on the innovative behavior of employees. This proves that entrepreneurial leadership practices

TABLE 3
Summary of the hierarchical regression results (unstandardized coefficients) (N = 241).

Variables	Innovation Climate		Employees' Intellectual Agility				Employees' Innovative Behavior					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Intercept	3.47**	2.33**	3.85**	2.97**	2.16**	2.07**	3.49**	1.91**	1.28**	.50	.01	.025
Gender	-.20	-.13	-.11	-.05	-.01	.01	-.39**	-.29**	-.26**	-.30**	-.25	-.24
Age	-.09	-.02	-.01	.04	.03	.05	-.19**	-.10	-.13**	-.18**	-.15**	-.11
Education	.16	.07	.09	.01	.01	-.01	.37**	.24**	.28**	.30**	.26**	.22**
EL		.32**		.25**		.13**		.45**				.27**
IC					.49**	.39**			.64**		.35**	.18*
EIA										.78**	.59**	.49**
R ²	.11	.34	.03	.20	.28	.31	.23	.42	.38	.43	.47	.52
ΔR ²	-	.24	-	.17	.25	.11	-	.19	.15	.20	.09	.05
F	9.52**	30.84**	2.37	14.64**	23.32**	21.62**	21.90**	42.38**	35.61**	44.99**	41.35**	42.01**
df	237	236	237	236	236	235	237	236	236	236	235	234

Note. Gender: 0 = Male, 1 = Female; Age: 1= 18 - 24 years, 2= 25 - 34 years, 3= 35 - 44 years, 4= 45 - 54 years, 5= "54+ years; Education: 1= high school, 2= college degree, 3= graduate degree; EL= Entrepreneurial leadership, IC = Innovation climate, EIA = Employees' intellectual agility, EIB = Employees' innovative behavior.

** p < 0.01.

* p < 0.05.

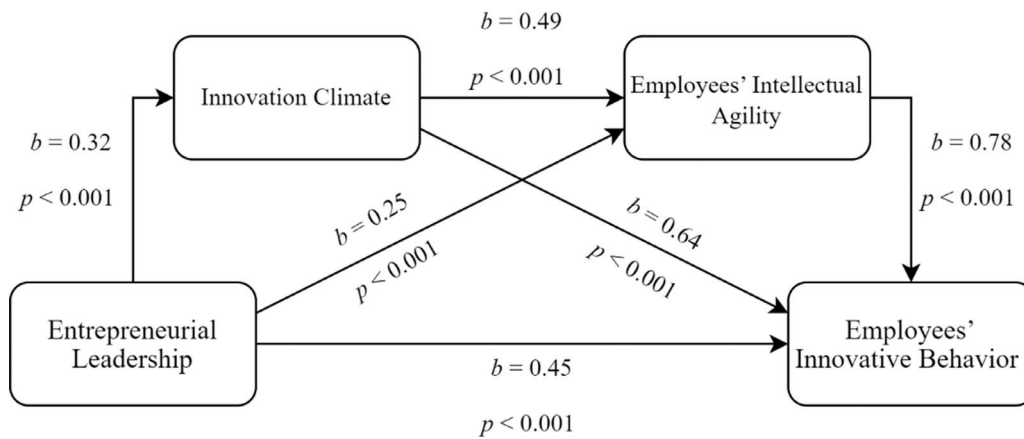


Fig. 2. The unstandardized coefficients for the hierarchical regression results (N = 241).

influence not only the innovation climate in the firm but also its employees' intellectual agility.

The findings suggest that when leaders enact their roles and tasks based on entrepreneurial leadership principles and not only create new ideas to solve problems and deal with difficulties but also value and support new ideas created by employees and develop strategies and approaches to facilitate innovation and opportunity recognition, employees are encouraged and empowered to challenge themselves and explore, generate and implement new ideas (Gupta et al., 2004; Kang et al., 2015; Karol, 2015). In addition, Kang et al. (2013) have also found in their study that the firm's innovative climate mediates the positive relationship between transactional and transformational leadership and followers' innovative behavior. Furthermore, the findings from Bagheri (2017) and Bagheri & Akbari (2018) claimed that EL is a critical factor that enables, encourages, and promotes the employees' innovative behavior. This study added value to these findings by examining the mediation role of the firm's innovative climate between EL and employees' innovative behavior. Finally, the positive impact of intellectual agility of employees on businesses' innovativeness corresponds with previous studies which show that human capital impacts innovativeness (Santos-Rodrigues et al., 2010).

Theoretical and practical implications

This study has multiple theoretical contributions based on the findings presented in the present study. First, this research adds to the literature on entrepreneurial leadership by developing and testing a new model through which entrepreneurial leadership promotes employees' innovation behavior. More specifically, we uncover the black box between entrepreneurial leadership and employees' innovative behavior where the climate for innovation and employees' intellectual agility play critical roles. We strengthen prior research by demonstrating that the innovation climate and intellectual agility of employees are effective mechanisms that influence the entrepreneurial leadership innovation process. Second, to our knowledge, the

innovation literature lacks studies assessing the influence of entrepreneurial leadership on the innovative behavior of employees. Further, we provide unique insight demonstrating that entrepreneurial leaders empower employees to establish a sense of intellectual agility, acknowledge business challenges, seek solutions, generate novel and valuable insights, and recommend innovative solutions by fostering an innovative climate. Leaders also constantly influence the work environment and set the vibe in the organization they work in, including the climate for innovation (Chen & Hou, 2016). As a result, this research extended the leadership styles that encourage innovative behavior among employees to include entrepreneurial leadership (e.g., Karol, 2015; De Jong & Den Hartog, 2010).

Moreover, the findings of this research have wide-ranging implications for business leaders and entrepreneurs, both existing and emerging, who ought to encourage innovation among their employees in order to maximize the growth and competitiveness of their organizations in the long term. First of all, the findings of this study are very helpful in identifying what role business leaders and entrepreneurs play in generating and guiding innovation within their organizations, as well as establishing the ideal environment for innovation within those organizations. In addition, leaders can use the findings of this study as a basis for encouraging entrepreneurial leadership to be used in creating innovative settings that encourage employees to feel confident about exchanging new ideas and concepts in a comfortable and safe environment. Furthermore, entrepreneurship academics can use the research's findings to help both present, and future business leaders understand their new responsibilities and assignments, as well as develop their entrepreneurial leadership skills and abilities to lead innovation in their businesses (Karol, 2015). Last but not least, employees should be aware that intellectual agility can have a significant impact on how innovative they are in their work, which is why they need to develop their abilities to recognize and analyze multiple perspectives and analyze the factors that are changing over time, and devise new solutions on a continuous basis.

Table 4
Summary of the mediation analysis results (N = 241).*

Relationship	Total effect	Direct effect	Indirect effect	Confidence interval		T statistics	Conclusion
				Lower bound	Upper bound		
EL → IC → EIA	0.25**	0.13**	0.12**	0.07	0.18	7.07	Partial Mediation
IC → EIA → EIB	0.64**	0.35**	0.29**	0.20	0.39	7.77	Partial Mediation
EL → IC → EIA → EIB	0.45**	0.27**	0.18**	0.04	0.10	9.03	Partial Mediation

Note. EL= Entrepreneurial leadership, IC = Innovation climate, EIA = Employees' intellectual agility, EIB = Employees' innovative behavior.

** $p < 0.01$.

* $p < 0.05$.

Limitations and future research

There are, however, certain limitations to the study that should be addressed. These are both limitations and opportunities for valuable future research. First, entrepreneurial leadership is the only antecedent that is considered in the framework. Future research may compare entrepreneurial leadership and other styles of leadership to determine whether they have distinct outcomes or mediation mechanisms. The sample is another potential drawback of the current study. The research sample was limited to the United States; therefore, this study should be reproduced in various cultural contexts to validate or refute its conclusions. Despite the fact that controlling for individual variations had no significant influence on the model based on the current data, future studies could examine the model for individuals of different ethnicities and those with less education to confirm its generalizability further. In addition, future research could expand our knowledge of the relationship between entrepreneurial leadership and innovative behavior by exploring vital personal attributes and team-level mechanisms. For instance, DeRue et al. (2011) found that employees who are more open to experience and have a greater cognitive entrepreneurial intention engage in innovative initiatives more actively while also demonstrating more significant levels of creative performance (e.g., Soyal et al., 2021). Finally, although we investigated emergent states such as innovation climate support, we also strongly encourage researchers to explore the moderating impact of team effectiveness (Chen et al., 2013) as well as team potency (Avolio et al., 1996), which may assist translate the positive impact of entrepreneurial leadership on employees' innovative behavior.

Conclusion

In this study, we utilized social cognitive theory to gain a deeper understanding of how entrepreneurial leadership can foster and reinforce innovative behavior. Our study explores how entrepreneurial leadership influences employees' innovative behavior, and we find that intellectual agility and innovation climate play essential roles. Study findings revealed that both innovative climate and employees' intellectual agility mediate the relationship between entrepreneurial leadership and innovative behavior.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with 1964 the Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

Informed consent was obtained from all individual participants included in the study.

Data availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- Afsar, B., & Masood, M. (2018). Transformational leadership, creative self-efficacy, trust in supervisor, uncertainty avoidance, and innovative work behavior of nurses. *The Journal of Applied Behavioral Science*, 54(1), 36–61. doi:10.1177/0021886317711891.
- Agyapong, F. O., Agyapong, A., & Poku, K. (2017). Nexus between social capital and performance of micro and small firms in an emerging economy: The mediating role of innovation. *Cogent Business & Management*, 4(1) 1309784. doi:10.1080/23311975.2017.1309784.
- Akbari, M., Bagheri, A., Imani, S., & Asadnezhad, M. (2021). Does entrepreneurial leadership encourage innovation work behavior? The mediating role of creative self-efficacy and support for innovation. *European Journal of Innovation Management*, 24(1), 1–22. doi:10.1108/EJIM-10-2019-0283.
- Akiba, D., Velazquez Lopez, A. S., & Hirano, M. (2021). The nature of Anti-Asian American xenophobia during the coronavirus pandemic: A preliminary exploration into envy as a key motivator of hate. *Behavioral Sciences*, 11(11), 158. doi:10.3390/bs11110158.
- Alavi, S., Abd. Wahab, D., Muhamad, N., & Arbab Shirani, B. (2014). Organic structure and organizational learning as the main antecedents of workforce agility. *International Journal of Production Research*, 52(21), 6273–6295. doi:10.1080/00207543.2014.919420.
- Ali, M., & Park, K. (2016). The mediating role of an innovative culture in the relationship between absorptive capacity and technical and non-technical innovation. *Journal of Business Research*, 69(5), 1669–1675. doi:10.1016/j.jbusres.2015.10.036.
- Althnayan, S., Alarifi, A., Bajaba, S., & Alsabban, A. (2022). Linking environmental transformational leadership, environmental organizational citizenship behavior, and organizational sustainability performance: A moderated mediation model. *Sustainability*, 14(14), 8779. doi:10.3390/su14148779.
- Amankwaa, A., Gyensare, M. A., & Susomrith, P. (2019). Transformational leadership with innovative behaviour: Examining multiple mediating paths with PLS-SEM. *Leadership & Organization Development Journal*, 40(4), 402–420. doi:10.1108/LODJ-10-2018-0358.
- Anderson, B. S., Eshima, Y., & Hornsby, J. S. (2019). Strategic entrepreneurial behaviors: Construct and scale development. *Strategic Entrepreneurship Journal*, 13(2), 199–220. doi:10.1002/sej.1306.
- Arshi, T., & Burns, P. (2018). Entrepreneurial architecture: A framework to promote innovation in large firms. *Journal of Entrepreneurship*, 27(2), 151–179. doi:10.1177/0971355718781245.
- Avolio, B. J., Jung, D. I., Murry, W., Sivasubramaniam, N., Beyerlein, M. M., Johnson, D. A., & Beyerlein, S. T. (1996). Building highly developed teams: Focusing on shared leadership process, efficacy, trust, and performance. (Eds.), *Advances in interdisciplinary studies of work teams: Team leadership*: (Eds.), 3 (pp. 173–209). Greenwich, CT: Elsevier Science/JAI Press.
- Bagheri, A. (2017). The impact of entrepreneurial leadership on innovation work behavior and opportunity recognition in high-technology SMEs. *Journal of High Technology Management Research*, 28(2), 159–166. doi:10.1016/j.hitech.2017.10.003.
- Bagheri, A., & Akbari, M. (2018). The impact of entrepreneurial leadership on nurses' innovation behavior. *Journal of Nursing Scholarship*, 50(1), 28–35. doi:10.1111/jnu.12354.
- Bagheri, A., Akbari, M., & Artang, A. (2022). How does entrepreneurial leadership affect innovation work behavior? The mediating role of individual and team creativity self-efficacy. *European Journal of Innovation Management*, 25(1), 1–18. doi:10.1108/EJIM-07-2020-0281.
- Bagheri, A., Newman, A., & Eva, N. (2020). Entrepreneurial leadership of CEOs and employees' innovative behavior in high-technology new ventures. *Journal of Small Business Management*, 60(2), 805–827. doi:10.1080/00472778.2020.1737094.
- Bajaba, S. M., Alajhar, N. A., & Bajaba, A. M. (2021). The bottom-up impact of proactive personality on employee job crafting: A serial mediation model. *Journal of Psychology*, 155(6), 523–547. doi:10.1080/00223980.2021.1921679.
- Bajaba, S., Bajaba, A., & Fuller, B. (2022a). Enduring exploitative leaders at work: The buffering role of proactive personality on employee job strain. *Organization Management Journal*, 19(2), 60–71. doi:10.1108/OMJ-11-2020-1090.
- Bajaba, S., Fuller, B., Simmering, M. J., Haynie, J., Ring, J. K., & Bajaba, A. (2022b). How tempered radicals pursue ideological change in organizations. *Current Psychology*, 1–18. doi:10.1007/s12144-022-02853-1.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall, Inc.
- Bandura, A. (1988). Organizational applications of social cognitive theory. *Australian Journal of Management*, 13(2), 275–302. doi:10.1177/031289628801300210.
- Bandura, A., Smith, K. G., & Hitt, M. A. (2005). The evolution of social cognitive theory. (Eds.), *Great minds in management* (Eds.). (pp. 9–35). New York: Oxford University Press.
- Bandura, A. (2014). *Social-cognitive theory. An introduction to theories of personality* (pp. 341–360). Psychology Press.

- Basahal, A., Jelli, A. A., Alsabban, A. S., Basahel, S., & Bajaba, S. (2022). Factors influencing employee productivity—A Saudi manager's perspective. *International Journal of Business and Management*, 17, 39–51. doi:10.5539/ijbm.v17n1p39.
- Bontis, N., Crossan, M. M., & Hulland, J. (2002). Managing an organizational learning system by aligning stocks and flows. *Journal of Management Studies*, 39(4), 437–469. doi:10.1111/1467-6486.t01-1-00299.
- Bos-Nehles, A. C., & Veenendaal, A. A. (2019). Perceptions of HR practices and innovative work behavior: The moderating effect of an innovative climate. *The International Journal of Human Resource Management*, 30(18), 2661–2683. doi:10.1080/09585192.2017.1380680.
- Bowerman, B. L., & O'Connell, R. T. (1990). *Linear statistical models: An applied approach*. Boston, MA: Brooks/Cole.
- Cai, W., Lysova, E. I., Khapova, S. N., & Bossink, B. A. (2019). Does entrepreneurial leadership foster creativity among employees and teams? The mediating role of creative efficacy beliefs. *Journal of Business and Psychology*, 34(2), 203–217. doi:10.1007/s10869-018-9536-y.
- Caseiro, N., & Coelho, A. (2019). The influence of business intelligence capacity, network learning and innovativeness on startups performance. *Journal of Innovation & Knowledge*, 4(3), 139–145. doi:10.1016/j.jik.2018.03.009.
- Chen, G., Farh, J. L., Campbell-Bush, E. M., Wu, Z., & Wu, X. (2013). Teams as innovative systems: Multi-level motivational antecedents of innovation in R&D teams. *Journal of Applied Psychology*, 98(6), 1018–1027. doi:10.1037/a0032663.
- Chen, A. S. Y., & Hou, Y. H. (2016). The effects of ethical leadership, voice behavior and climates for innovation on creativity: A moderated mediation examination. *The Leadership Quarterly*, 27(1), 1–13. doi:10.1016/j.leaqua.2015.10.007.
- Cheung, J. H., Burns, D. K., Sinclair, R. R., & Sliter, M. (2017). Amazon mechanical turk in organizational psychology: An evaluation and practical recommendations. *Journal of Business and Psychology*, 32(4), 347–361. doi:10.1007/s10869-016-9458-5.
- Choudhary, S., Memon, N. Z., & Mishra, K. (2020). Examining the influence of human capital on employees' innovative work behaviour: A moderated serial mediation model. *South Asian Journal of Human Resources Management*, 7(2), 189–213. doi:10.1177/2322093720942660.
- Dabić, M., Lažnjak, J., Smallbone, D., & Švarc, J. (2018). Intellectual capital, organizational climate, innovation culture, and SME performance: Evidence from Croatia. *Journal of Small Business and Enterprise Development*, 26(4), 522–544. doi:10.1108/JSEB-04-2018-0117.
- Dabić, M., Stojić, N., Simić, M., Potocan, V., Slavković, M., & Nedelko, Z. (2021). Intellectual agility and innovation in micro and small businesses: The mediating role of entrepreneurial leadership. *Journal of Business Research*, 123(1), 683–695. doi:10.1016/j.jbusres.2020.10.013.
- De Jong, J. P., & Den Hartog, D. N. (2007). How leaders influence employees' innovative behavior. *European Journal of Innovation Management*, 10(1), 41–64. doi:10.1108/14601060710720546.
- De Jong, J. P., & Den Hartog, D. (2010). Measuring innovative work behavior. *Creativity and Innovation Management*, 19(1), 23–36. doi:10.1111/j.1467-8691.2010.00547.x.
- Delery, J. E., & Doty, D. H. (1996). Modes of theorizing in strategic human resource management: Tests of universalistic, contingency, and configurational performance predictions. *Academy of Management Journal*, 39(4), 802–835. doi:10.2307/256713.
- Demartini, M. C., & Beretta, V. (2020). Intellectual capital and SMEs' performance: A structured literature review. *Journal of Small Business Management*, 58(2), 288–332. doi:10.1080/00472778.2019.1659680.
- Derue, D. S., Nahrgang, J. D., Wellman, N. E. D., & Humphrey, S. E. (2011). Trait and behavioral theories of leadership: An integration and meta-analytic test of their relative validity. *Personnel Psychology*, 64(1), 7–52. doi:10.1111/j.1744-6570.2010.01201.x.
- DeSimone, J. A., Harms, P. D., & DeSimone, A. J. (2015). Best practice recommendations for data screening. *Journal of Organizational Behavior*, 36(2), 171–181. doi:10.1002/job.1962.
- Fuller, B., Bajaba, A., & Bajaba, S. (2022). Enhancing and extending the meta-analytic comparison of newer genre leadership forms. *Frontiers in Psychology*, 13, 872568. doi:10.3389/fpsyg.2022.872568.
- García-Vidal, G., Sánchez-Rodríguez, A., Pérez-Campdesuñer, R., & Martínez-Vivar, R. (2019). The impact of self-confidence, creativity and vision on leadership performance: Perceptions at Ecuadorian SMEs owner/managers. *Serbian Journal of Management*, 14(2), 315–325. doi:10.5937/sjml14-17569.
- Gupta, V., MacMillan, I. C., & Surie, G. (2004). Entrepreneurial leadership: Developing and measuring a cross-cultural construct. *Journal of Business Venturing*, 19(2), 241–260. doi:10.1016/S0883-9026(03)00040-5.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). *Multivariate data analysis*. Upper Saddle River: Prentice-Hall.
- Harman, H. (1967). *Modern factor analysis*. Chicago, IL: University of Chicago Press Chicago, Ill.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: The Guilford Press.
- Hu, M. L. M., Horng, J. S., & Sun, Y. H. C. (2009). Hospitality teams: Knowledge sharing and service innovation performance. *Tourism Management*, 30(1), 41–50. doi:10.1016/j.tourman.2008.04.009.
- Hughes, D. J., Lee, A., Tian, A. W., Newman, A., & Legood, A. (2018). Leadership, creativity, and innovation: A critical review and practical recommendations. *The Leadership Quarterly*, 29(5), 549–569. doi:10.1016/j.leaqua.2018.03.001.
- Ionescu, L. (2020). Digital data aggregation, analysis, and infrastructures in FinTech operations. *Review of Contemporary Philosophy*, 19, 92–98. doi:10.22381/RCP19202010.
- Jaiswal, N. K., & Dhar, R. L. (2015). Transformational leadership, innovation climate, creative self-efficacy and employee creativity: A multi-level study. *International Journal of Hospitality Management*, 51, 30–41. doi:10.1016/j.ijhm.2015.07.002.
- Javed, B., Abdullah, I., Zaffar, M. A., Ul Haque, A., & Rubab, U. (2019). Inclusive leadership and innovative work behavior: The role of psychological empowerment. *Journal of Management & Organization*, 25(4), 554–571. doi:10.1017/jmo.2018.50.
- Javed, B., Khan, A. A., Bashir, S., & Arjoon, S. (2017). Impact of ethical leadership on creativity: The role of psychological empowerment. *Current Issues in Tourism*, 20(8), 839–851. doi:10.1080/13683500.2016.1188894.
- Kang, J. H., Matusik, J. G., Kim, T. Y., & Phillips, J. M. (2016). Interactive effects of multiple organizational climates on employee innovative behavior in entrepreneurial firms: A cross-level investigation. *Journal of Business Venturing*, 31(6), 628–642. doi:10.1016/j.jbusvent.2016.08.002.
- Kang, J. H., Solomon, G. T., & Choi, D. Y. (2013). Leadership and innovative behavior: Intervening effects in an entrepreneurial context. In *Proceedings of the Academy of Management* (p. 16406) Academy of Management.
- Kang, J. H., Solomon, G. T., & Choi, D. Y. (2015). CEOs' leadership styles and managers' innovative behaviour: Investigation of intervening effects in an entrepreneurial context. *Journal of Management Studies*, 52(4), 531–554. doi:10.1111/joms.12125.
- Karol, R. A. (2015). Leadership in the context of corporate entrepreneurship. *Journal of Leadership Studies*, 8(4), 30–34. doi:10.1002/jls.21350.
- Khaola, P., & Coldwell, D. (2018). Explaining how leadership and justice influence employee innovative behaviors. *European Journal of Innovation Management*, 22(1), 193–212. doi:10.1108/ejim-08-2017-0103.
- Lee, A., Legood, A., Hughes, D., Tian, A. W., Newman, A., & Knight, C. (2020). Leadership, creativity and innovation: A meta-analytic review. *European Journal of Work and Organizational Psychology*, 29(1), 1–35. doi:10.1080/1359432X.2019.1661837.
- Li, C., Makhdoom, H. U. R., & Asim, S. (2020). Impact of entrepreneurial leadership on innovative work behavior: Examining mediation and moderation mechanisms. *Psychology Research and Behavior Management*, 13, 105–118. doi:10.2147/PRBM.S236876.
- Lindell, M. K., & Whitney, D. J. (2001). Accounting for common method variance in cross-sectional research designs. *Journal of Applied Psychology*, 86(1), 114–121. doi:10.1037/0021-9010.86.1.114.
- Litman, L., Robinson, J., & Abberbock, T. (2017). TurkPrime.com: A versatile crowd-sourcing data acquisition platform for the behavioral sciences. *Behavior Research Methods*, 49(2), 433–442. doi:10.3758/s13428-016-0727-z.
- Liu, Y., & Almor, T. (2016). How culture influences the way entrepreneurs deal with uncertainty in inter-organizational relationships: The case of returnee versus local entrepreneurs in China. *International Business Review*, 25(1), 4–14. doi:10.1016/j.ibusrev.2014.11.002.
- Lovett, M., Bajaba, S., Lovett, M., & Simmering, M. J. (2018). Data quality from crowd-sourced surveys: A mixed method inquiry into perceptions of Amazon's mechanical turk masters. *Applied Psychology*, 67(2), 339–366. doi:10.1111/apps.12124.
- Magni, M., Palmi, P., & Salvemini, S. (2018). Under pressure! Team innovative climate and individual attitudes in shaping individual improvisation. *European Management Journal*, 36(4), 474–484. doi:10.1016/j.emj.2017.07.009.
- Manesh, M. F., Pellegrini, M. M., Marzi, G., & Dabic, M. (2020). Knowledge management in the fourth industrial revolution: Mapping the literature and scoping future avenues. *IEEE Transactions on Engineering Management*, 68(1), 289–300. doi:10.1109/TEM.2019.2963489.
- Mehmood, M. S., Jian, Z., & Waheed, A. (2019). The influence of entrepreneurial leadership on organizational innovation: Mediating role of innovation climate. *International Journal of Information Systems and Change Management*, 11(1), 70–89. doi:10.1145/3312662.3312701.
- Miao, Q., Newman, A., Schwarz, G., & Cooper, B. (2018). How leadership and public service motivation enhance innovative behavior. *Public Administration Review*, 78(1), 71–81. doi:10.1111/puar.12839.
- Miller, B. K., & Simmering, M. J. (2022). Attitude toward the color blue: An ideal marker variable. *Organizational Research Methods*. doi:10.1177/1094428122107536110944281221075361.
- Mokhber, M., Khairuzzaman, W., & Vakilbashi, A. (2018). Leadership and innovation: The moderator role of organization support for innovative behaviors. *Journal of Management & Organization*, 24(1), 108–128. doi:10.1017/jmo.2017.26.
- Naqshbandi, M. M., & Jasimuddin, S. M. (2022). The linkage between open innovation, absorptive capacity and managerial ties: A cross-country perspective. *Journal of Innovation & Knowledge*, 7(2) 100167. doi:10.1016/j.jik.2022.100167.
- Newman, A., Herman, H. M., Schwarz, G., & Nielsen, I. (2018). The effects of employees' creative self-efficacy on innovative behavior: The role of entrepreneurial leadership. *Journal of Business Research*, 89, 1–9. doi:10.1016/j.jbusres.2018.04.001.
- Newman, A., Round, H., Wang, S., & Mount, M. (2020). Innovation climate: A systematic review of the literature and agenda for future research. *Journal of Occupational and Organizational Psychology*, 93(1), 73–109. doi:10.1111/joop.12283.
- Park, J. H., Da Hu, L., Wu, C., & Hooke, A. (2014). Entrepreneurial leadership and innovativeness: The mediating role of team psychological safety. *The Korean Leadership Quarterly*, 5(3), 25–61. doi:10.5465/ambpp.2014.12470.
- Park, S., & Jo, S. J. (2017). The impact of proactivity, leader-member exchange, and climate for innovation on innovative behavior in the Korean government sector. *Leadership & Organization Development Journal*, 39(1), 130–149. doi:10.1108/LODJ-09-2016-0216.
- Pidduck, R. J., Clark, D. R., & Lumpkin, G. T. (2021). Entrepreneurial mindset: Dispositional beliefs, opportunity beliefs, and entrepreneurial behavior. *Journal of Small Business Management*, 1–35. doi:10.1080/00472778.2021.1907582.
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 63(1), 539–569. doi:10.1146/annurev-psych-120710-100452.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. doi:10.1037/0021-9010.88.5.879.

- Rego, A., Sousa, F., Marques, C., & e Cunha, M. P. (2014). Hope and positive affect mediating the authentic leadership and creativity relationship. *Journal of Business Research*, 67(2), 200–210. doi:10.1016/j.jbusres.2012.10.003.
- Reise, S. P., & Waller, N. G. (2009). Item response theory and clinical measurement. *Annual Review of Clinical Psychology*, 5(1), 27–48. doi:10.1146/annurev.clinpsy.032408.153553.
- Ren, F., & Zhang, J. (2015). Job stressors, organizational innovation climate, and employees' innovative behavior. *Creativity Research Journal*, 27(1), 16–23. doi:10.1080/10400419.2015.992659.
- Renko, M., El Tarabishy, A., Carsrud, A. L., & Brännback, M. (2015). Understanding and measuring entrepreneurial leadership style. *Journal of Small Business Management*, 53(1), 54–74. doi:10.1111/jsbm.12086.
- Salam, M. A., & Bajaba, S. (2021). Corporate social responsibility during the COVID-19 pandemic: A sequential mediation analysis. *Social Responsibility Journal*, 18(6), 1188–1208. doi:10.1108/SRJ-03-2021-0118.
- Santos-Rodriguez, H., Dorrego, P. F., & Jardon, C. F. (2010). The influence of human capital on the innovativeness of firms. *International Business & Economics Research Journal (IBER)*, (9), 9. doi:10.19030/iber.v9i9.625.
- Scott, S. G., & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*, 37(3), 580–607. doi:10.2307/256701.
- Sethibe, T., & Steyn, R. (2017). The impact of leadership styles and the components of leadership styles on innovative behavior. *International Journal of Innovation Management*, 21,(02) 1750015. doi:10.1142/S1363919617500153.
- Shanker, R., Bhanugopan, R., Van der Heijden, B. I., & Farrell, M. (2017). Organizational climate for innovation and organizational performance: The mediating effect of innovative work behavior. *Journal of Vocational Behavior*, 100, 67–77. doi:10.1016/j.jvb.2017.02.004.
- Shaw, J., Minoudis, P., Hamilton, V., & Craissati, J. (2012). An investigation into competency for working with personality disorder and team climate in the probation service. *Probation Journal*, 59(1), 39–48. doi:10.1177/0264550511429843.
- Siyal, S., Xin, C., Umrani, W. A., Fatima, S., & Pal, D. (2021). How do leaders influence innovation and creativity in employees? The mediating role of intrinsic motivation. *Administration & Society*, 53(9), 1337–1361. doi:10.1177/0095399721997427.
- Subramaniam, R., & Shankar, R. K. (2020). Three mindsets of entrepreneurial leaders. *The Journal of Entrepreneurship*, 29(1), 7–37. doi:10.1177/0971355719893498.
- Tierney, P., & Farmer, S. M. (2002). Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of Management Journal*, 45(6), 1137–1148. doi:10.2307/3069429.
- Ukpabi, D., Olaleye, S., & Karjaluo, H. (2021). Factors influencing tourists' intention to use COVID-19 contact tracing app. *Information and communication technologies in tourism 2021* (pp. 504–516). Cham: Springer.
- Vlajčić, D., Caputo, A., Marzi, G., & Dabić, M. (2019). Expatriates managers' cultural intelligence as promoter of knowledge transfer in multinational companies. *Journal of Business Research*, 94, 367–377. doi:10.1016/j.jbusres.2018.01.033.
- Waheed, A., Miao, X., Waheed, S., Ahmad, N., & Majeed, A. (2019). How new HRM practices, organizational innovation, and innovative climate affect the innovation performance in the IT industry: A moderated-mediation analysis. *Sustainability*, 11(3), 621. doi:10.3390/su11030621.
- Wang, P., Rode, J. C., Shi, K., Luo, Z., & Chen, W. (2013). A workgroup climate perspective on the relationships among transformational leadership, workgroup diversity, and employee creativity. *Group & Organization Management*, 38(3), 334–360. doi:10.1177/1059601113488163.
- Wang, Y. X., Yang, Y. J., Wang, Y., Su, D., Li, S. W., Zhang, T., & Li, H. P. (2019). The mediating role of inclusive leadership: Work engagement and innovative behaviour among Chinese head nurses. *Journal of Nursing Management*, 27(4), 688–696. doi:10.1111/jonm.12754.
- Williams, L. J., Hartman, N., & Cavazotte, F. (2010). Method variance and marker variables: A review and comprehensive CFA marker technique. *Organizational Research Methods*, 13(3), 477–514. doi:10.1177/1094428110366036.
- Yu, C., Yu, T. F., & Yu, C. C. (2013). Knowledge sharing, organizational climate, and innovative behavior: A cross-level analysis of effects. *Social Behavior and Personality: An International Journal*, 41(1), 143–156. doi:10.2224/sbp.2013.41.1.143.
- Yukl, G. (2013). *Leadership in organizations* (8th ed.). Boston, MA: Pearson.
- 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(1), 107–128. doi:10.5465/AMJ.2010.48037118.
- Zhang, Y., & Yang, F. (2020). How and when spiritual leadership enhances employee innovative behavior. *Personnel Review*, 50(2), 596–609. doi:10.1108/PR-07-2019-0346.
- Zhang, Y., Zheng, J., & Darko, A. (2018). How does transformational leadership promote innovation in construction? The mediating role of innovation climate and the multi-level moderation role of project requirements. *Sustainability*, 10(5), 1506. doi:10.3390/su10051506.