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Entrepreneurial Leadership and Innovative Work Behavior: the role of Entrepreneurial Passion

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Abstract: Innovation is a gateway to survival, growth, and success for modern organizations. Employees' fundamental contribution to organizational innovation is well documented. Stimulating the creativity and innovativeness of employees is thus an essential objective of many leaders. However, not all leaders would be effective in this endeavor, and not under all circumstances. We investigate the relationship between perceived entrepreneurial leadership and innovative work behavior of IT employees.

We draw on social cognitive theory l to explain this relationship. Our model theorizes that perceived entrepreneurial leadership would enhance employees' innovative behavior directly and indirectly through their entrepreneurial passion. We empirically test our theory using structural equation modeling based on data collected from 446 employees using an online survey. The results validate our model. Our findings offer new, important theoretical insights and useful managerial implications.

Keywords: Entrepreneurial leadership; Innovative work behavior; Employee entrepreneurial Passion; IT employees; Social cognitive theory.

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Introduction:

The business world, in current times, grapples with myriad challenges including unprecedented technological advancements, growing ethical and environmental concerns, and major market dynamics (Mahmood, Uddin, & Fan, 2019; Saeed et al., 2019; Uddin et al., 2019). Responding effectively to these challenges requires companies to be nimble and maintain an innovative orientation (Bagheri, Newman & Eva 2022; Elhelaly & Ray 2024).

Practical evidence reveals the power of continuous innovation in achieving sustainability and economic growth for companies. In their 2023 report, Boston Consulting Group (BCG) demonstrates that the most innovative companies in the world generate an annual return to their shareholders that exceeds the average world return by 3.3%. Given the unquestionable advantages of innovation, the BCG's report also highlights that about 80% of the companies are considering innovation as one of their three top business priorities, with 66% planning to increase their investments in both incremental and radical innovations. These companies have adopted several strategies to reinforce their innovation capabilities and outcomes, ranging from establishing technological partnerships to hiring innovative leaders and recruiting talented employees with demonstrated innovation abilities[1].

This practical significance of leadership and employee innovativeness to a company's innovation has inspired a growing body of management literature to scrutinize these relationships to help managers identify the best trajectories for enhancing innovation in their organizations. In the literature, one research stream (e.g., Afsar, Cheema & Saeed, 2018; Shafique Ahmad & Kalyar, 2020; Zhang et al., 2021) identifies employees' innovativeness as a catalyst for continuous organizational innovation. In the same vein, researchers (e.g., Fischer, Dietz & Antonakis 2017; Hughes et al. 2018; Lee et al. 2020) recognize leadership as a crucial factor in stimulating employees' creativity and provoking their innovation.

[1] https://web-assets.bcg.com/ce/fd/d7fa78e547a09d2eef5086fbbf79/bcg-most-innovative-companies-2023-reaching-new-heights-in-uncertain-times-may-2023.pdf (last access on 16 August 2024).

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Therefore, many scholars attempted to explain the relationship between different leadership styles and *innovative work behavior* (IWB) which refers to the process of advocating and implementing new ideas by employees to enhance organizational effectiveness (Scott & Bruce 1994; Zhang & Batrol 2010). Much focus was on the transformational, servant, and authentic leadership styles (Afsar & Masood 2018; Amankwaa et al. 2019; Javed et al. 2017; Rego et al. 2014; Wang, Meng & Cai 2019).

The emerging style of *entrepreneurial leadership* (EL) received less attention despite its distinctive attributes that directly relate to stimulating subordinates' innovation as it focuses on encouraging the identification and exploitation of new opportunities and supporting risk-taking behaviors (Bagheri, Newman & Eva 2020; Miao et al. 2018; Newman et al. 2018; Renko et al. 2015). As the relationship between EL and IWB is understudied, the mechanisms through which EL would enhance the innovative behavior of employees have not been fully disclosed yet.

This study posits that, based on SCT, employee entrepreneurial passion serves as an affective mechanism elucidating the impact of entrepreneurial leadership on employee innovative behaviors. This suggests that by motivating employees to generate and execute new ideas and serving as an entrepreneurial role model, the entrepreneurial leader can improve employees' innovative behavior by increasing their enthusiasm for invention and development. Previous empirical research indicates that employee entrepreneurial passion serves as a motivator for individuals to generate and execute new ideas within the workplace (Cardon et al., 2013; Kang et al., 2016). Cardon et al. (2013) identified a significant correlation between entrepreneurs' passion for invention and their creativity. Kang et al. (2016) identified a significant correlation between employees' passion for invention and their innovative behavior.

We empirically tested our model based on data collected, using the survey method, from a sample of 446 employees working in the IT sector in Egypt. Our results provide strong support for our theory, allowing us to draw several important conclusions and managerial implications. By doing so, our paper contributes to the extant literature on innovation and leadership in the following ways.

First, we explicitly study and measure the subordinates' perceived, not a leader's intended, entrepreneurial leadership. Our study is among the few studies that do so. Focusing on the perceived EL is important; Jacobsen & Andersen (2015) demonstrate that "employee-perceived leadership practices" are associated with more significant organizational performance than "leader-intended leadership." Subordinates' attitudes and behaviors are influenced by their leaders' actions only when they can observe and understand them. Also, the leaders' intended leadership may not align with their actual behaviors due to practical implementation difficulties such as time constraints and resource limitations, which hinder them from fully realizing their plans.

Second, our study is one of the first studies to explain the relationship between perceived EL and IWB through the creative process engagement of employees in the IT sector in a developing country.

Third, this study is the first, to the best of our knowledge, to investigate the mediating effects of employee entrepreneurial passion as an internal personal trait within an entrepreneurial leadership context.

Fourth, building on the social cognitive theory, our study is the first study – as far as we know – to examine the interactions among EL, and entrepreneurial passion to explain employee innovative behavior. By doing so, our study provides a more holistic view of the process through which EL might enhance IWB.

In the following sections, we review the extant literature, develop our model and hypotheses, elaborate on the research method and data collection efforts, conduct empirical analyses, discuss our results, offer managerial implications, and acknowledge limitations and set future research agenda.

Literature Review:

Many companies acknowledge continuous innovation as vital for their survival, economic growth, and prosperity (Bagheri, Newman & Eva 2022; Jason & Geetha 2021). Executives of such companies thus are constantly searching for effective ways to maintain their innovativeness. To help executives in their endeavors, scholars from various disciplines exert remarkable efforts to investigate firm innovation from different perspectives.

Previous studies identified several factors that would trigger IWB among employees. One of the frequently studied drivers is leadership (Peerzadah, Mufti, & Majeed, 2024). Leadership plays a crucial role in motivating employee innovative behavior as it (a) has the authority to create a supportive environment that stimulates creativity and encourages innovation, and (b) controls resources needed to experiment with and implement new ideas (Fischer et al., 2017; Lee et al., 2020). However, the extant literature concentrated on the transformational, authentic, and servant leadership styles (Afsar & Masood 2018; Amankwaa, Gyensare & Susomrith 2019; Javed et al. 2017; Rego et al. 2014; Wang, Meng & Cai 2019), leaving other relevant leadership styles such as entrepreneurial leadership (EL) understudied and thus failing to effectively guide leaders who implement these styles. We aim to address this lacuna by investigating the relationship between EL and IWB.

EL has distinguishing features that directly relate to stimulating employee creativity and innovative behavior. For instance, entrepreneurial leaders not only focus on encouraging the identification and exploitation of new opportunities and supporting risk-taking behaviors among their subordinates, but they also serve as successful role models in these regards for the subordinates (Bilal et al. 2021, Huang, Ding, & Chen 2014; Renko et al. 2015). Table (1) summarizes a sample of previous studies on EL.

Table (1): Selective Studies on Entrepreneurial Leadership:

Study	Dependent Variable	Mediator(s)	Moderator(s)	Theoretical lens	Empirical Context	Relevant Findings
Akbari et al. (2019)	Innovative work behavior.	Creative self-efficacy. Support for innovation.	NA	Social cognitive theory.	High-tech information and communications technology SMEs in Iran.	Entrepreneurial leadership has a positive effect on employees' innovative work behavior.
Bagheri & Akbari (2018)	Innovation work behavior	NA	NA	Extant studies on leadership and innovation.	Nurses at public and private hospitals in Iran.	Entrepreneurial leadership has a positive impact on nurses' innovation behavior.
Bagheri et al. (2020a)	Innovative behavior.	Passion for inventing. Creative self-efficacy.	NA	Social cognitive theory	High-tech new ventures.	Entrepreneurial leadership enhances employees' innovative behavior through passion and creative self-efficacy.
Bagheri et al. (2020b)	Innovation work behavior.	Individual creativity self-efficacy. Team creativity self-efficacy.	NA	Social cognition and resource-based theories.	Knowledge-based firms in Iran.	CEOs' entrepreneurial leadership boosts their employees' innovative work behavior through individual and team creativity self-efficacy.
Iqbal et al. (2020)	Employee innovative behavior.	Affective commitment. Creative self-efficacy. Psychological safety.	NA	Social exchange, social cognitive, and social information processing theories.	IT employees in Pakistan.	Entrepreneurial leadership is strongly and positively associated with employee innovative behavior.
Latif et al. (2020)	Project success.	Knowledge management processes.	NA	The knowledge-based view.	Software project workers.	Entrepreneurial leadership is positively related to knowledge management processes and project success.
Li et al. (2020)	Innovative work behavior.	Firm's innovative environment.	Entrepreneurial self-efficacy.	Social cognitive and specific continuum of self-efficacy theories.	Entrepreneurial-based high-tech SMEs.	There is a significant, positive effect of entrepreneurial leadership on innovative work behavior.
Nguyen et al. (2021)	Business performance.	Entrepreneurial orientation. Team creativity. Dynamic capabilities. Competitive advantage.	Technological innovation capabilities.	Literature on leadership and firm performance.	Small and medium IT enterprises.	There is an indirect link between entrepreneurial leadership and business performance through team creativity, dynamic capabilities, and competitive advantage.
Nor-Aishah et al. (2020)	Sustainable performance.	NA	Entrepreneurial bricolage.	Upper echelons and effectuation theories.	Malaysian manufacturing SMEs.	Entrepreneurial leadership has a significant, positive impact on sustainable performance.
Paudel (2019)	Business performance.	Organizational innovation.	Environmental dynamism.	Literature on leadership.	SME's owners in Nepal.	Entrepreneurial leadership positively impacts business performance.
Purwati et al. (2021)	SME's Performance.	Innovation capability.	NA	The resource advantage theory of competition.	Small and Medium Enterprises (SMEs).	Entrepreneurial leadership significantly influences the performance of SMEs.
Sawaean a and Ali (2020)	Organizational performance.	Innovation capacity.	NA	Previous studies on entrepreneurship.	Kuwaiti's SMEs.	There is a positive relationship between entrepreneurial leadership and organizational performance.

Study	Dependent Variable	Mediator(s)	Moderator(s)	Theoretical lens	Empirical Context	Relevant Findings
Utoyo et al. (2019)	Innovation performance.	Capability-driven strategy. Configuring core innovation capabilities.		Entrepreneurship and innovation theory.	Telecommunication and banking industries in Indonesia.	Entrepreneurial Leadership positively affects innovation performance through configuring core innovation capabilities.
Yang et al. (2019)	Employees' turnover intentions.	Job embeddedness. Job satisfaction. Affective commitment.	NA	Entrepreneurial leadership theory.	New ventures.	Entrepreneurial leadership reduces employee turnover intentions through job embeddedness, job satisfaction, and affective commitment.
This study	Innovative work behavior.	Creative process engagement.	Entrepreneurial passion. Structural empowerment.	Social cognitive theory.	IT employees in Egypt.	Perceived entrepreneurial leadership is positively associated with innovative work behavior directly and through creative process engagement. This link is stronger for employees with higher passion and more empowerment.

As Table (1) demonstrates, few studies examine the relationship between EL and IWB. For example, Bagheri & Akbari (2018) investigate the relationship between EL and IWB of nurses in Iranian hospitals and reveal a positive, direct relationship. Similarly, Akbari et al. (2021) find a positive relationship between EL and IWB of employees of SMEs. In addition, they draw on social cognitive theory to demonstrate that this relationship is mediated by employee creative self-efficacy and leader support for innovation. Likewise, grounding on social cognitive theory and resource-based view, Bagheri, Newman, & Eva (2022) show that EL enhances IWB both directly and indirectly through the creative self-efficacy of individual employees and work teams.

Also, Li, Makhdoom, & Asim (2020) build on social cognitive theory to explain that EL improves IWB both directly and indirectly through an organizational innovative environment and that entrepreneurial self-efficacy enhances the positive association between EL and IWB. Likewise, Iqbal, Nazir, & Ahmad (2022) draw on social exchange, social cognitive, and social information processing theories to illustrate that EL and IWB are positively related both directly and indirectly through creative self-efficacy, affective commitment, and psychological safety.

The review of extant studies reveals that the relationship between EL and IWB is understudied, and thus the mechanisms through which EL would enhance the innovative behavior of employees have not been fully disclosed yet. We attempt to contribute to existing literature with a more holistic model, explaining the process through which EL would enhance IWB as follows.

First, most studies overlook the process in which employees engage to identify problems and/or opportunities, collect information, and generate alternatives and new ideas (Henker, Sonnentag, & Unger, 2015). This creative process engagement (CPE) is considered a fundamental first step to IWB (Henker, Sonnentag, & Unger 2015; Shalley 1991). Failing to explicitly incorporate this crucial step in studying the relationship between EL and IWB offers an incomplete explanation of this relationship. Therefore, our model aims to overcome this gap in the literature by studying the mediating role of CPE in the relationship between EL and IWB.

Second, in explaining the relationship between EL and IWB, most studies (e.g., Akbari et al. 2019; Iqbal et al., 2020; Li et al. 2020) focused on internal drivers of innovative behavior and particularly on creative self-efficacy, leaving other potential internal factors unstudied as well as understudying important external factors. In our model, we explicitly incorporate novel internal and external drivers.

We build on the social cognitive theory to examine the interactions among EL and entrepreneurial passion to explain the innovative behavior of employees. By doing so, our study provides a more holistic view of the mechanisms through which EL would enhance IWB.

Theory & Hypotheses:

The social cognitive theory (SCT) explains how individuals learn and maintain new behaviors through dynamic interactions among internal factors and external social determinants. The SCT emphasizes the significant role of internal personal traits and prior experiences in acquiring, and successfully conducting and maintaining a particular behavior. It also posits that an external social context as well as a demonstration of behavior by influential individuals are as equally important for human learning (Biraglia & Kadile, 2016, p. 3; Bandura, 2012).

In the present study, it is proposed that entrepreneurial leadership fosters employee entrepreneurial passion through the affective pathway outlined in social cognitive theory (Bandura, 1997). Specifically, entrepreneurial leaders act as role models who exhibit passion in the process of creating new products and services, thereby influencing followers' affective states. This aligns with Cardon's (2008) proposition that passion is contagious and can be transmitted from entrepreneurs to employees within the organization. Empirical support is provided by recent research demonstrating that the passion of entrepreneurial leaders enhances employee creativity by stimulating employees' own entrepreneurial

passion (Hubner & Baum, 2018). Although the direct relationship between entrepreneurial leadership and employee entrepreneurial passion remains underexplored, broader leadership studies suggest that leadership behaviors can cultivate employee passion. For instance, empowering leadership has been shown to improve employee performance through the mediating role of work passion (Hao et al., 2018).

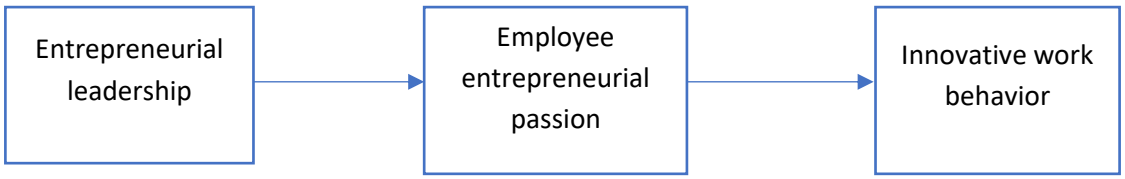

Figure (1): Hypothesized Relationships among Research Variables

Perceived entrepreneurial leadership (EL) and innovative work behavior (IWB):

Operating in a turbulent business environment means no organization would survive and remain competitive without innovating new products, changing its processes, altering its problem-solving approaches, and/or devising new work techniques (Bagheri, Newman, & Eva 2022; Chatzoglou & Chatzoudes 2018; Khaola & Coldwell 2019). Most of these work innovative endeavors are usually bottom-up activities, originating and being implemented by employees (Hoang et al. 2022). Thus, employee innovative work behavior (IWB) is a crucial source of continuous innovation and sustainable competitive advantage for organizations (Afsar et al. 2018; Shafique et al. 2020; Zhang et al. 2020).

Building on the social cognitive theory, several scholars pointed out the important role of effective leadership in enhancing IWB among employees (Iqbal et al. 2020; Li et al. 2020). Previous studies examined the relationships among IWB and different leadership styles. In this regard, an emerging thread of research is investigating the effectiveness of the entrepreneurial leadership (EL) style in inspiring and enhancing innovation among employees (Bagheri, Newman, & Eva 2022). EL is defined as a leadership style that "entails influencing and directing the performance of group members toward the achievement of organizational goals that involve recognizing and exploiting entrepreneurial opportunities" (Renko et al. 2015, p. 55). Entrepreneurial leaders can influence their subordinates to strategically utilize resources in order to effectively recognize and exploit opportunities (Ireland, Hitt, & Sirmon 2003), directly spurring their innovativeness (Hoang et al. 2022).

Entrepreneurial leaders have several distinct traits that when perceived by their subordinates might foster those subordinates' innovative behaviors (Iqbal et al. 2020; Renko et al. 2015). First, entrepreneurial leaders are adept at stimulating the identification and exploitation of new business opportunities, inspiring creative thinking, and supporting risk-taking behaviors among their subordinates (Iqbal, Nazir, & Ahmed 2022; Hoang et al. 2022). Second, entrepreneurial leaders serve as effective role models for their subordinates because they embody entrepreneurial attitudes and regularly participate in entrepreneurial pursuits (Malibari & Bajaba 2022; Hoang et al. 2022). Third, entrepreneurial leaders are also known for their role as "uncertainty absorbers". They would carry the responsibility for any negative results of their subordinates venturing into new activities while being uncertain about the future outcomes (Gupta, MacMillan, & Surie, 2004). Realizing that they will not be blamed for the negative consequences of their innovative behaviors, the subordinates are encouraged to innovate more. Hence, we posit that:

H1: perceived entrepreneurial leadership is positively associated with innovative work behavior.

Perceived entrepreneurial leadership (EL) and employee entrepreneurial passion (EEP):

Employee work passion is a new concept in organizational psychology. Besides the definition provide by Vallerand et al. (2003), some researchers also give their definitions. For instance, Zigarmi et al. (2009) propose that employee work passion constitutes an individual's enduring, emotionally positive, meaning-oriented state of well-being, derived from repeated cognitive and affective evaluations of diverse job and organizational contexts, leading to stable, constructive work intentions and behaviors. Perrewé et al. (2014) contend that work passion may be a higher order construct composed of other closely related constructs such as engagement, affect, desire, and thriving. In sum, most of the studies accept that work passion contains the affective and cognitive components, love to work and identification to work. The majority of work passion research devotes significant attention to the issues of what and how individuals' work passion affects their own feelings and behaviors. In contrast, there is a lack of concern regarding the specific factors that promote an individual's work passion.

Research on the source of work passion is mainly composed of the following aspects: the internalization of the representation of work in an individual's identity (Vallerand et al., 2003); cognitive and affective evaluation of work and organization (Zigarmi et al., 2011); and engagement in special work activities (i.e., entrepreneurship) (Cardon et al., 2009). In summary, a leader's emotion, cognition, and behavior may represent organizational context factors that impact employees' work passion. For example, Zigarmi et al. (2011) have indicated that a leader's self-concern orientation results in employees' negative affect experience, which reduces employees' passion for work; a leader's other-orientation exhibits a significant direct correlation with employees' positive job-specific affect, thus increasing employees' passion (Zigarmi & Roberts, 2012). Furthermore, cognitive perception research suggests that leaders who act in an ethical manner (Permarupan et al., 2013), provide employees recognition (Permarupan et al., 2013), and maintain connectedness with their employees may promote an employee's work passion (Luo et al., 2014). As work passion is a concept with cognition, affect and motivation components (Perttula & Cardon, 2011), an exploration of the

antecedent variables of employees' work passion from their leaders' work passion may provide more worthy outcomes.

In this study, we contend that consistent with the affective states' pathway delineated in social cognitive theory (Bandura, 1997), the demonstration of entrepreneurial leadership by the leader will cultivate employees' entrepreneurial passion, as the leader serves as an entrepreneurial role model who displays passion in the creation of new products and services. This aligns with Cardon's (2008) claim that enthusiasm is infectious and can be transmitted from the entrepreneur to other employees inside the organization. To put it another way, the entrepreneurial leader will make employees more excited about coming up with and putting into execution new ideas at work by encouraging them to do so and being an entrepreneurial role model. Furthermore, the social cognitive perspective holds that knowledge is created by actively participating in tasks, receiving feedback, and interacting with people in a variety of ways in public and social contexts. According to Norena-Chavez & Torres (2024), cognition and learning are not seen as isolated processes, but rather as products of the kinds of interactions people have with one another and the environments in which those interactions occur. Leaders must instill their enthusiasm in their followers if they want to improve company outcomes (Renko et al., 2015). The conviction that having passion is essential to achieving organizational goals is something that leaders impart to their followers (Raby et al., 2023; Sari & Ahmad, 2022). This emphasizes how important entrepreneurial leadership is in enhancing enthusiasm toward entrepreneurial activities among employees.

In the field of entrepreneurial passion, a branch of passion research, it has been reported that entrepreneurial passion can enhance employees' passion for work (Cardon, 2008). This study also notes that entrepreneurs are not always the transmitters of passion because they may have bound emotionality or emotional suppression (Norena-Chavez & Torres, 2024). Thus, it is necessary to identify the "emotional leader" of the organization (Cardon, 2008). Positive psychology highlights leaders' behavior as the main source for employees' positive emotional experience and psychological state (Dasborough & Ashkanasy, 2002; Bono & Ilies, 2006). Furthermore, there is a trickle-down effect between leaders and employees, which indicates that a leader's emotional state may elicit the same state of his/her employees. Combined with passion theory, a passionate leader prefers to display his or her passion positively and frequently and share his or her identification with work. Over time, employees begin to internalize this emotion, and they are also likely to experience work passion (Cardon, 2008). In summary, we propose that leaders exhibiting entrepreneurial leadership significantly impact employee entrepreneurial passion. This leads us to the following hypothesis:

H2: *Entrepreneurial leadership is positively associated with employees' entrepreneurial passion.*

Employee entrepreneurial passion (EEP) and innovative work behavior (IWB):

Employee entrepreneurial passion is a crucial asset for the firm (Cardon, 2008; Cardon et al., 2017). Numerous researchers have employed the theory of passion to elucidate entrepreneurial behavior. Entrepreneurial passion is a fundamental characteristic that entrepreneurs should possess, as it can motivate them to engage in entrepreneurial activities (Feng & Chen, 2020). Entrepreneurial passion serves as a significant resource for entrepreneurs facing challenges (Montiel-Campos, 2018). Entrepreneurial passion encompasses activities such as exploring innovative market ideas, developing and expanding new products, and sourcing establishing assets (Cardon et al., 2009), which ultimately motivates individuals to become entrepreneurs (Biraglia & Kadile, 2017).

Passion significantly influences individual motivation, behavior, and cognition (Perrewé et al., 2014). Vallerand et al. (2003) categorize passion into two types: obsessive passion and harmonious passion. A harmonious passion involves individuals choosing their preferred activities autonomously, resulting in positive emotions and a more enriching experience. Secondly, obsessive passion refers to the adverse emotions induced by external pressures when individuals engage in their preferred activities. The contrasts between the two are as follows. Moreover, harmonious passion demonstrates greater adaptability compared to obsessive passion and is associated with more favorable emotional outcomes. Furthermore, harmonious passion exerts a greater influence than obsessive passion in promoting individuals' commitment to an activity. When individuals realize they can benefit from an activity, they are likely to persist in it. Conversely, individuals may reduce or cease the activity if they frequently experience negative emotions (Feng & Chen, 2020).

Entrepreneurial passion consists of the positive emotions generated through engagement in entrepreneurial activities. Entrepreneurs will persist in pursuing their objectives by investing significant energy, time, and intellectual effort to attain success when aligned with the values of the established targets (Feng & Chen, 2020). Bao et al. (2017) found that entrepreneurs with high passion were more likely than others to seize opportunities and initiate new businesses. Entrepreneurs exhibit significant passion in various facets of their lives, characterized by intense positive emotions that propel business success (Shook et al., 2003). Entrepreneurial passion is recognized as a vital cognitive and behavioral characteristic of entrepreneurs, influencing their enthusiasm for innovation, persistence, survival, growth, and overall business success (Kiani et al., 2022; Luu & Nguyen, 2021). Noreña-Chavez & Guevara (2020) demonstrate that entrepreneurial passion positively correlates with innovative behavior. Employees exhibiting strong entrepreneurial passion demonstrate increased innovative behavior in the workplace.

The SCT suggests that an employee's behavior is influenced by their individual traits as well as the social context in which they operate (Bandura, 1986). This theory posits a multifaceted relationship among the individual, their environment, and behavior (Zhang et al., 2024). This research seeks to examine the influence of cultural contexts on the relationship between EP and the innovative behavior of IT employees. This research considers the cultural environment, as prior studies have shown that national culture can impact an individual's attitudes and behaviors related to entrepreneurship and innovation (Alabduljader et al., 2023). According to Hofstede et al. (2010) Culture embodies the collective cognitive frameworks that distinguish members of a specific group from those in alternative groups. While several significant studies exist (Alabduljader et al., 2023; Porfírio et al., 2023), the influence of culture on EP and IWB relationship remains ambiguous. We contend that a more profound understanding of the national context's impact on the relationship between EP and IWB can elucidate the differences in entrepreneurial inclination among individuals across different countries. So, we suggest this hypothesis:

H4: *Employee entrepreneurial passion is positively associated with innovative work behavior.*

The mediating role of employee entrepreneurial passion:

We suggest that the association between innovative work behavior and entrepreneurial leadership practices is mediated by an employee entrepreneurial passion. Entrepreneurial passion, as previously mentioned, is defined as consciously accessible, intensely positive emotions that arise from engaging in entrepreneurial activities, such as creating and developing new and beneficial products and services linked to roles that are significant and prominent to the entrepreneur's self-identity (Cardon et al., 2009). Nevertheless, previous empirical studies have predominantly concentrated on entrepreneurs' passion for invention as one of the three principal characteristics of entrepreneurial passion, rather than exploring the other dimensions (Cardon & Kirk, 2015). Not until very recently have researchers begun to investigate the role that employee entrepreneurial passion plays as a mediator between entrepreneurial leadership and creativity. In addition, they have begun to study the factors that drive employee entrepreneurial passion and how such employee entrepreneurial passion influences their work behaviors (Kang et al., 2016). The relationship between employee entrepreneurial passion and entrepreneurial leadership is covered first in the next section, followed by the association between entrepreneurial passion and innovative behavior.

In the present study, it is proposed that entrepreneurial leadership fosters employee entrepreneurial passion through the affective pathway outlined in social cognitive theory (Bandura, 1997). Specifically, entrepreneurial leaders act as role models who exhibit passion in the process of creating new products and services, thereby influencing followers' affective states. This aligns with Cardon's (2008) proposition that passion is contagious and can be transmitted from entrepreneurs to employees within the organization. Empirical support is provided by recent research demonstrating that the passion of entrepreneurial leaders enhances employee creativity by stimulating employees' own entrepreneurial passion (Hubner & Baum, 2018). Although the direct relationship between entrepreneurial leadership and employee entrepreneurial passion remains underexplored, broader leadership studies suggest that leadership behaviors can cultivate employee passion. For instance, empowering leadership has been shown to improve employee performance through the mediating role of work passion (Hao et al., 2018).

In addition to fostering employee entrepreneurial passion, this study contend that entrepreneurial leadership not only fosters employee entrepreneurial passion but also influences employees' innovative behaviors by enhancing this passion. According to social cognitive theory (Bandura, 1997), employee entrepreneurial passion serves as an affective mechanism that elucidates the impact of EL on IWB. Encouraging employees to generate and implement new ideas, along with acting as an entrepreneurial role model, enhances their innovative behavior by fostering greater passion for invention and development. Previous empirical studies indicate that employee entrepreneurial passion serves as a motivator for generating and implementing new ideas within the workplace (Cardon et al., 2013; Kang et al., 2016). For instance, Cardon et al. (2013) identified a significant connection between the passion entrepreneurs have for inventing and their levels of creativity. Kang et al. (2016) identified a significant link between employee enthusiasm for invention and their innovative actions. In conclusion, we suggest that when leaders exhibit entrepreneurial leadership, they impact employee entrepreneurial passion, which subsequently serves as a positive mediator in the relation between EL and IWB. This leads us to the following hypothesis:

H6: *Employee entrepreneurial passion mediates the relationship between entrepreneurial leadership and innovative work behavior.*

Empirical Analyses:

Data and Sample:

We used a survey method to empirically test our theory. We collected primary data using a self-administered online questionnaire from employees working in information technology companies in Egypt[2]. The information and communication technology (ICT) sector is the fastest-growing sector in Egypt with a growth rate of 16.3% in the last fiscal year.

Our data collection efforts resulted in 446 valid questionnaires. Our sample contains 222 (almost 50%) female employees and 147 (33%) with a university degree. About 29% (129 employees) of the respondents are relatively new employees with less than five years of work experience for the company, while the senior employees who served for more than fifteen years represent 21% of our sample. Also, most of the respondents (42%) have worked less than five years under their current leaders, while only 7% of our sample spent more than fifteen years working with their current leaders. Table (2) offers more details on the sample's characteristics.

[2] The respondents answered an Arabic-translated version of the questionnaire.

Table (2): Summary Statistics of the Sample Characteristics

Variable		Count (n)	%
Gender	Male	224	50.22
	Female	222	49.78
Age	30 years old or less	107	23.99
	From 31 to 40	108	24.22
	From 41 to 50	122	27.35
	50 or older	109	24.44
Education	Intermediate/high school	146	32.74
	College/university degree	147	32.96
	Graduate degree (Master's/PhD)	153	34.30
Years of work experience	Less than 5 years	118	26.46
	From 5 to less than 10	129	28.92
	From 10 to less than 15	106	23.77
	15 and more	93	20.85
Time working with the leader	Less than 5 years	188	42.15
	From 5 to less than 10	153	34.30
	From 10 to less than 15	73	16.37
	15 or more	32	7.17
Total Respondents (N)		**446**	

Variables and Measures:

In operationalizing our research variables, we depend on well-established, previously validated instruments borrowed from the extant literature to ensure their content validity. In addition to the scales of the main variables, our questionnaire also measured control variables, and a marker variable as follows.

a) Main variables:

Dependent variable – innovative work behavior was measured, based on two dimensions of idea championing and idea implementation, by a 5-item scale adopted from De Jong and Den Hartog (2010). In completing this part, the respondents answered a 5-point Likert scale, with "never =1" and "always = 5" as the endpoints.

Independent variable – entrepreneurial leadership was rated according to the employees' self-report perception of the leadership style of their leaders, depending on the twenty-item scale of Gupta et al. (2004). This instrument identified five different dimensions of EL namely: framing challenges, absorbing uncertainty, underwriting/ path clearing, building commitment, and defining gravity. This variable was measured on a 5-point Likert scale, where "strongly disagree =1" and "strongly agree = 5."

Mediating variable – employees' entrepreneurial passion was evaluated on the two dimensions of passion for inventing and passion for developing from the scale of Cardon et al. (2013)[3]. For this variable, the respondents rated nine items on a 5-point Likert scale, where "strongly disagree =1" and "strongly agree = 5."

b) Control variables: Prior studies argued that the IWB of an employee might be impacted by their gender, age, education level, and work experiences (Begum et al. 2021). We control for these variables in our study.

c)Marker variable: Since we depend on a single source (i.e., employees) to collect cross-sectional data on our dependent and independent variables, our results are prone to the common method bias [CMB] (Podsakoff et al. 2003). One approach to control the effect of CMB is a marker-based technique (Tehseen, Ramayah, & Sajilan 2017). Implementing this approach requires a variable that is theoretically unrelated to the main research variables and yet is measured using the same rating approach as the substantive variables in the model (Simmering et al. 2015). Thus, in designing our questionnaire we incorporated a measure of environmental consciousness, a three-item scale borrowed from Zheng et al. (2021). We believe that environmental consciousness has no theoretical foundations to be related to the other variables in our model. However, we measured it on a 5-point Likert scale like our main variables. We elaborate more on the CMB below.

Common Method Bias (CMB):

As mentioned earlier, we collect cross-sectional data on all research variables from a common source due to time and cost

[3] Our study pursues the entrepreneurial passion of employees, not business entrepreneurs. Therefore, we adapted the scale to our context by dropping passion for founding from our measurement.

constraints. Depending on a common rater for evaluating the independent and dependent variables is one of the main causes of CMB (Podsakoff et al. 2003). CMB is defined as "the systematic variance shared among the variables and is usually introduced to the measures by the method of measurement rather than the theoretical constructs represented by the measures" (Tehseen et al. 2017, p.146). This systematic error variance may artificially inflate relationships among variables (Simmering et al. 2015), potentially leading researchers to draw misleading conclusions (Podsakoff et al. 2003). Not detecting and controlling CMB is a serious research problem that might lead to invalid results. Thus, several scholars proposed different techniques to test for and remedy CMB (Simmering et al. 2015; Tehseen et al. 2017).

We followed the recommendations of previous studies (e.g., Podsakoff et al. 2003; Simmering et al. 2015; Tehseen et al. 2017; Willims et al. 2010) to control CMB in our study. We started by implementing procedural remedies while designing our instrument (Podsakoff et al. 2003). We added a marker variable that is theoretically unrelated to the substantive research variables to make it harder for the respondents to guess the relationship between the main variables. We also included a cover letter in our questionnaire that emphasized the anonymity of the respondents and assured the confidentiality of their answers. Respondents were also instructed to express their opinions honestly since there are no "right" answers to the questionnaire's items.

In addition to these primary procedures, we also employed statistical techniques. First, previous studies argued that if the correlation between a marker variable, that should not be theoretically related to the substantive variables, and those variables is not 0.00, then the amount of the CMB in the data is reflected in the observed correlation value (Simmering et al. 2015). We tested the correlation between the marker variable and the main variables to detect if there is CMB in our data. Our correlation matrix in Table (3) reveals that the correlation between the marker variable and each of the substantive variables is almost zero and insignificant. Thus, we conclude that the CMB in our data is highly unlikely. Second, we utilized the widely used Harman's single factor test to further investigate the CMB in our data. The unrotated principal-component factor analysis in Table (4) generated multiple factors, with the first factor accounting only for 27.072% of the total variance. This result indicates that CMB is not a serious problem in our data (Podsakoff et al. 2003).

Table (3): Correlation between the Main Variables and the Marker Variable

	EL	**IWB**	**CPE**	**EP**	**SE**	**Marker**
EL	1.00					
IWB	.332*	1.00				
CPE	.388*	.339*	1.00			
EP	-.122*	.403*	.337*	1.00		
SE	.209*	.666**	.286*	.645*	1.00	
Marker	**-.009**	**-.042**	**-.003**	**.015**	**.006**	1.00

* Significant at 99% (2-tailed).

Table (4): Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	20.107	27.927	27.927	19.492	27.072	27.072
2	10.810	15.014	42.941			
3	4.796	6.661	49.602			
4	3.345	4.646	54.248			
5	2.280	3.167	57.414			
6	1.183	1.642	59.057			
7	1.119	1.554	60.611			
8	1.104	1.533	62.144			
9	.864	1.199	63.343			
10	.842	1.170	64.513			
11	.825	1.146	65.659			
12	.784	1.089	66.748			
13	.767	1.065	67.813			

14	.738	1.025	68.837				
15	.721	1.002	69.839				
16	.697	.968	70.807				
17	.678	.942	71.750				
18	.664	.922	72.672				
19	.659	.915	73.587				
20	.630	.875	74.462				
21	.610	.848	75.310				
22	.602	.837	76.146				
23	.587	.816	76.962				
24	.572	.794	77.756				
25	.565	.784	78.540				
26	.547	.759	79.299				
27	.539	.749	80.048				
28	.524	.728	80.776				
29	.513	.713	81.489				
30	.508	.706	82.195				
31	.497	.690	82.884				
32	.490	.681	83.566				
33	.480	.666	84.232				
34	.474	.659	84.890				
35	.466	.647	85.537				
36	.450	.625	86.162				
37	.440	.611	86.773				
38	.428	.594	87.367				
39	.424	.589	87.955				
40	.408	.567	88.522				
41	.398	.553	89.076				
42	.380	.528	89.604				
43	.371	.516	90.120				
44	.368	.512	90.631				
45	.358	.498	91.129				
46	.344	.478	91.607				
47	.341	.473	92.080				
48	.327	.454	92.535				
49	.325	.451	92.985				
50	.321	.446	93.431				
51	.300	.417	93.848				
52	.294	.408	94.256				
53	.285	.395	94.651				
54	.278	.386	95.037				

55	.267	.370	95.407			
56	.260	.361	95.768			
57	.256	.355	96.124			
58	.245	.341	96.465			
59	.235	.326	96.791			
60	.223	.310	97.101			
61	.219	.304	97.405			
62	.211	.293	97.698			
63	.206	.286	97.984			
64	.201	.279	98.263			
65	.181	.251	98.514			
66	.175	.244	98.758			
67	.174	.242	99.000			
68	.162	.224	99.224			
69	.158	.220	99.444			
70	.140	.194	99.638			
71	.135	.187	99.826			
72	.126	.174	100.000			

Extraction method: Principal Axis Factoring。

Structural Equation Modeling:

To validate our instrument and test the hypothesized relationships in our model, we analyzed our data using the partial least squares (PLS) approach of structural equation modeling (SEM) with WarpPls software. As discussed in the measurements section, our model comprises several higher-order constructs. Although higher-order constructs are useful in making complex models parsimonious, their analysis requires special considerations (Duarte & Amaro 2018; Sarstedt et al. 2019).

Scholars proposed two main approaches to analyze these models: the repeated indicators and the two-stage approaches (Sarstedt et al. 2019). For the repeated indicators technique to give unbiased results, the lower-order constructs should have an equal number of indicators (Becker, Klein, & Wetels 2012; Duarte & Amaro 2018). Our data do not satisfy this requirement, so we opt for *the disjoint two-stage approach*.

In the first stage, we estimated the model with the first-order constructs and their indicators, excluding all second-order constructs. All the estimated scores of the first-order constructs are saved to our dataset. In the second stage, we used the first-stage construct scores as indicators for their associated second-order constructs. We assessed the measurement's validity and reliability in the two stages before testing the proposed relationships in the second stage as follows.

Measurement Model (First and Second Stages):

The measurement model is concerned with assessing the quality of the relationship between a construct (i.e., latent variable) and its underlying observed indicators (Hair Jr et al. 2022, p.110). It focuses on evaluating the reliability and validity of the measurements before testing the relationships between the constructs in the structural model. Following previous studies (e.g., Becker, Klein, & Wetels 2012; Duarte & Amaro 2018; Sarstedt et al. 2019), we evaluated the reliability and validity of our measures in the first- and second-order models.

We used several statistics to assess the reliability of our measures. We estimated the outer loadings of the indicators to evaluate the *indicator reliability*. As shown in Table (5), all factor loadings for the first- and second-order constructs' indicators are well above the cutoff point of 0.7 (Hair Jr et al. 2022, p.117). On the construct level, we assessed the *internal consistency reliability* based on Cronbach's alpha and composite reliability. Table (5) demonstrates that all latent variables in the first-order and second-order models show good construct reliability. Both Cronbach's alpha (α) and composite reliability (CR) values for all (except for opportunity with $\alpha = 0.626$[4]) latent constructs are above the satisfactory value of 0.7 (Fornell and Larcker 1981; Hair Jr et al. 2022, p.119).

[4] Cronbach's alpha above 0.60 is considered an acceptable value (Hair Jr et al. 2022, p.119).

Table (5): Reliability and Convergent Validity Evaluations:

Second-order construct	First-order construct	Outer loading – 2nd stage	Indicators of 1st order construct	Outer loading – 1st stage	Cronbach's alpha (α)	Composite reliability (CR)	Average variance extracted (AVE)
Entrepreneurial leadership					***0.945***	***0.958***	***0.819***
	Framing challenges	0.927	FCH1	0.756	0.822	0.875	0.583
			FCH2	0.765			
			FCH3	0.779			
			FCH4	0.804			
			FCH5	0.711			
	Absorbing uncertainty	0.886	AUN1	0.813	0.734	0.849	0.652
			AUN2	0.778			
			AUN3	0.831			
	Underwriting/path clearing	0.910	U1	0.799	0.802	0.87	0.627
			U2	0.76			
			U3	0.754			
			U4	0.850			
	Building commitment	0.900	BC1	0.771	0.778	0.855	0.597
			BC2	0.732			
			BC3	0.756			
			BC4	0.828			
	Defining gravity	0.900	DG1	0.771	0.797	0.868	0.622
			DG2	0.765			
			DG3	0.815			
			DG4	0.802			
Innovative work behavior					***0.907***	***0.942***	***0.844***
	Idea exploration	0.921	IE1	0.844	0.726	0.845	0.646
			IE2	0.752			
	Idea generation	0.917	IG1	0.816	0.733	0.849	0.652

Second-order construct	First-order construct	Outer loading – 2nd stage	Indicators of 1st order construct	Outer loading – 1st stage	Cronbach's alpha (α)	Composite reliability (CR)	Average variance extracted (AVE)
			IG2	0.806			
			IG3	0.799			
	Idea championing	0.965	IC1	0.905	0.799	0.908	0.832
			IC2	0.919			
	Idea implementation	0.964	IIM1	0.889			
			IIM2	0.919	0.873	0.921	0.795
			IIM3	0.867			
Entrepreneurial passion					***0.909***	***0.953***	***0.910***
	Passion for inventing	0.928	IP1	0.882			
			IP2	0.893			
			IP3	0.872	0.939	0.952	0.766
			IP4	0.858			
			IP5	0.870			
			IP6	0.875			
	Passion for developing	0.979	DP1	0.937			
			DP2	0.930	0.924	0.952	0.868
			DP3	0.928			
Structural empowerment					***0.952***	***0.961***	***0.805***
	Opportunity	0.870	OPP1	0.722			
			OPP2	0.783	0.626	0.800	0.571
			OPP3	0.761			
	Information	0.909	INF1	0.854			
			INF2	0.853	0.803	0.883	0.716
			INF3	0.830			
	Support	0.892	SUP1	0.868			
			SUP2	0.825	0.791	0.877	0.705
			SUP3	0.825			

Second-order construct	First-order construct	Outer loading – 2nd stage	Indicators of 1st order construct	Outer loading – 1st stage	Cronbach's alpha (α)	Composite reliability (CR)	Average variance extracted (AVE)
	Resources	0.907	RES1	0.867	0.807	0.886	0.721
			RES2	0.850			
			RES3	0.830			
	Formal power	0.892	FP1	0.826	0.783	0.874	0.698
			FP2	0.849			
			FP3	0.830			
	Informal power	0.911	INFP1	0.817	0.822	0.882	0.651
			INFP2	0.802			
			INFP3	0.833			
			INFP4	0.774			

In addition, we evaluated convergent validity using the average variance extracted (AVE). Table (5) shows that the AVE for each construct is well above 0.5 (Hair Jr et al. 2022, p.120). Further, we used the cross-loadings for the first- and second-order models to assess discriminant validity. As shown in Tables (6 and 7), each indicator's loading on its associated construct is higher than any of its cross-loadings on the other constructs. These results lead us to conclude that our instrument demonstrates satisfactory reliability and validity.

Table (6): Cross-loadings of the First-Stage Model

	Absor. Uncert.	Build. commit.	Defin. gravity	Passion develop.	Fram. challeng.	Form. power	Idea gener.	Idea champ.	Idea impl.	Info.	Infor. Power	Passion invent.	Info. Sear.	Opport.	Prob. Ident.	Res.	Supp.	Under-writing
AUN1	**0.81**	0.61	0.59	-0.01	0.62	0.08	0.25	0.22	0.20	0.07	0.10	-0.03	0.23	0.09	0.23	0.04	0.05	0.59
AUN2	**0.78**	0.57	0.65	0.04	0.61	0.10	0.23	0.25	0.27	0.13	0.13	0.02	0.23	0.14	0.20	0.08	0.10	0.60
AUN3	**0.83**	0.61	0.59	0.03	0.64	0.05	0.30	0.26	0.22	0.11	0.05	0.02	0.29	0.09	0.29	0.04	0.02	0.63
BC1	0.62	**0.77**	0.58	0.07	0.64	0.12	0.27	0.25	0.23	0.16	0.14	0.00	0.24	0.18	0.24	0.09	0.14	0.62
BC2	0.54	**0.73**	0.56	-0.03	0.59	0.05	0.21	0.20	0.17	0.07	0.04	-0.04	0.21	0.09	0.20	0.04	0.04	0.60
BC3	0.52	**0.76**	0.54	-0.02	0.58	0.04	0.24	0.19	0.17	0.07	0.05	-0.04	0.22	0.08	0.21	0.01	-0.01	0.58
BC4	0.60	**0.83**	0.63	0.04	0.64	0.07	0.35	0.27	0.26	0.15	0.10	-0.01	0.33	0.11	0.34	0.07	0.06	0.64
DG1	0.58	0.59	**0.77**	-0.01	0.63	0.05	0.29	0.22	0.21	0.07	0.05	-0.04	0.26	0.07	0.27	0.04	0.05	0.56
DG2	0.58	0.55	**0.77**	0.01	0.62	0.03	0.25	0.24	0.23	0.07	0.10	0.00	0.25	0.09	0.21	0.03	0.01	0.61
DG3	0.59	0.57	**0.82**	-0.03	0.63	0.05	0.29	0.25	0.24	0.05	0.08	-0.02	0.26	0.08	0.24	0.02	0.01	0.61

	Absor. Uncert.	Build. commit.	Defin. gravity	Passion develop.	Fram. challeng.	Form. power	Idea gener.	Idea champ.	Idea impl.	Info.	Infor. Power	Passion invent.	Info. Sear.	Opport.	Prob. Ident.	Res.	Supp.	Under-writing
DG4	0.63	0.64	**0.80**	0.00	0.64	0.04	0.29	0.23	0.23	0.10	0.06	-0.01	0.27	0.11	0.28	0.03	0.05	0.65
DP1	0.02	-0.01	-0.02	**0.94**	0.04	0.65	0.31	0.43	0.42	0.67	0.64	0.77	0.34	0.60	0.29	0.68	0.64	-0.02
DP2	0.04	0.04	0.00	**0.93**	0.07	0.65	0.26	0.44	0.46	0.70	0.66	0.77	0.36	0.61	0.30	0.70	0.64	0.00
DP3	0.03	0.04	-0.01	**0.93**	0.06	0.63	0.28	0.43	0.45	0.67	0.64	0.79	0.33	0.59	0.29	0.67	0.65	0.01
FCH1	0.56	0.55	0.59	0.06	**0.76**	0.12	0.24	0.31	0.30	0.13	0.14	-0.02	0.27	0.14	0.27	0.13	0.13	0.62
FCH2	0.60	0.63	0.59	0.02	**0.77**	0.04	0.22	0.26	0.21	0.12	0.10	-0.02	0.24	0.11	0.23	0.06	0.04	0.64
FCH3	0.61	0.64	0.66	0.00	**0.78**	0.07	0.25	0.26	0.26	0.08	0.09	-0.03	0.25	0.13	0.27	0.02	0.05	0.63
FCH4	0.63	0.62	0.64	0.12	**0.80**	0.16	0.36	0.28	0.30	0.18	0.18	0.07	0.31	0.18	0.31	0.12	0.15	0.64
FCH5	0.54	0.61	0.56	0.01	**0.71**	0.03	0.25	0.23	0.18	0.06	0.02	0.01	0.19	0.06	0.20	-0.01	0.04	0.59
FP1	0.12	0.11	0.05	0.59	0.10	**0.83**	0.32	0.50	0.49	0.67	0.64	0.41	0.31	0.57	0.29	0.65	0.62	0.03
FP2	0.08	0.05	0.07	0.58	0.08	**0.85**	0.27	0.47	0.47	0.66	0.67	0.43	0.35	0.63	0.31	0.66	0.66	0.04
FP3	0.03	0.07	0.03	0.55	0.11	**0.83**	0.27	0.48	0.49	0.63	0.61	0.40	0.29	0.59	0.30	0.66	0.64	0.04
IAG1	0.27	0.28	0.31	0.29	0.29	0.26	**0.77**	0.26	0.27	0.34	0.32	0.19	0.58	0.37	0.58	0.29	0.26	0.26
IAG2	0.29	0.28	0.27	0.19	0.27	0.24	**0.76**	0.23	0.21	0.29	0.26	0.10	0.58	0.30	0.61	0.21	0.22	0.24
IAG3	0.20	0.29	0.24	0.23	0.27	0.28	**0.78**	0.23	0.20	0.29	0.25	0.11	0.59	0.28	0.60	0.27	0.20	0.21
IAG4	0.26	0.30	0.31	0.23	0.28	0.26	**0.78**	0.23	0.22	0.27	0.25	0.11	0.56	0.30	0.60	0.24	0.19	0.26
IAG5	0.21	0.22	0.22	0.20	0.24	0.26	**0.71**	0.22	0.19	0.29	0.26	0.11	0.55	0.26	0.61	0.21	0.22	0.23
IC1	0.26	0.25	0.28	0.42	0.30	0.53	0.28	**0.91**	0.79	0.56	0.54	0.37	0.28	0.34	0.25	0.53	0.53	0.24
IC2	0.29	0.29	0.27	0.42	0.34	0.52	0.28	**0.92**	0.79	0.55	0.57	0.37	0.31	0.38	0.28	0.54	0.54	0.26
IIM1	0.24	0.24	0.23	0.41	0.28	0.51	0.23	0.75	**0.89**	0.51	0.55	0.36	0.26	0.35	0.22	0.52	0.50	0.24
IIM2	0.30	0.29	0.31	0.44	0.35	0.52	0.31	0.80	**0.92**	0.56	0.58	0.40	0.34	0.40	0.30	0.57	0.55	0.32
IIM3	0.20	0.19	0.21	0.42	0.25	0.52	0.22	0.76	**0.87**	0.52	0.52	0.38	0.25	0.33	0.21	0.51	0.50	0.20
INF1	0.07	0.08	0.01	0.64	0.07	0.69	0.30	0.48	0.47	**0.85**	0.69	0.47	0.33	0.64	0.30	0.69	0.63	0.02
INF2	0.13	0.17	0.12	0.61	0.17	0.67	0.37	0.52	0.51	**0.85**	0.68	0.46	0.40	0.61	0.38	0.67	0.65	0.12
INF3	0.12	0.14	0.09	0.60	0.15	0.63	0.31	0.54	0.52	**0.83**	0.66	0.47	0.38	0.61	0.31	0.68	0.67	0.09
INFP1	0.11	0.15	0.11	0.54	0.17	0.66	0.32	0.52	0.50	0.67	**0.82**	0.37	0.33	0.63	0.31	0.66	0.67	0.10
INFP2	0.04	0.01	0.02	0.58	0.06	0.58	0.27	0.46	0.46	0.63	**0.80**	0.44	0.32	0.61	0.26	0.67	0.65	0.00
INFP3	0.09	0.09	0.05	0.56	0.10	0.63	0.29	0.47	0.51	0.63	**0.83**	0.40	0.36	0.58	0.32	0.61	0.62	0.11

	Absor. Uncert.	Build. commit.	Defin. gravity	Passion develop.	Fram. challeng.	Form. power	Idea gener.	Idea champ.	Idea impl.	Info.	Infor. Power	Passion invent.	Info. Sear.	Opport.	Prob. Ident.	Res.	Supp.	Under-writing
INFP4	0.12	0.10	0.12	0.58	0.15	0.62	0.25	0.53	0.54	0.65	**0.77**	0.43	0.29	0.57	0.24	0.66	0.66	0.09
IP1	0.00	-0.03	-0.02	0.74	0.00	0.43	0.12	0.35	0.37	0.47	0.45	**0.88**	0.20	0.35	0.11	0.51	0.43	-0.08
IP2	0.04	0.02	-0.01	0.71	0.04	0.42	0.16	0.37	0.37	0.48	0.45	**0.89**	0.21	0.37	0.15	0.48	0.42	0.00
IP3	0.02	-0.04	0.00	0.72	0.02	0.43	0.14	0.34	0.38	0.48	0.45	**0.87**	0.19	0.36	0.14	0.50	0.43	-0.02
IP4	0.00	-0.01	-0.04	0.73	-0.01	0.46	0.14	0.34	0.35	0.48	0.43	**0.86**	0.17	0.37	0.13	0.46	0.41	-0.03
IP5	-0.04	-0.07	-0.04	0.75	-0.03	0.41	0.12	0.33	0.37	0.50	0.44	**0.87**	0.17	0.34	0.10	0.48	0.41	-0.08
IP6	0.03	-0.02	-0.02	0.73	0.01	0.45	0.16	0.39	0.39	0.49	0.43	**0.88**	0.20	0.37	0.16	0.49	0.43	-0.05
ISE1	0.26	0.27	0.26	0.33	0.27	0.32	0.60	0.27	0.25	0.35	0.32	0.21	**0.82**	0.37	0.60	0.31	0.29	0.25
ISE2	0.24	0.27	0.30	0.26	0.27	0.29	0.64	0.24	0.24	0.34	0.36	0.12	**0.81**	0.35	0.64	0.30	0.24	0.25
ISE3	0.25	0.26	0.24	0.31	0.27	0.31	0.57	0.28	0.29	0.38	0.31	0.19	**0.80**	0.37	0.61	0.30	0.29	0.24
OPP1	0.07	0.09	0.05	0.35	0.10	0.33	0.32	-0.02	-0.03	0.37	0.38	0.14	0.35	**0.72**	0.36	0.37	0.38	0.05
OPP2	0.11	0.12	0.10	0.56	0.13	0.68	0.29	0.49	0.51	0.67	0.66	0.41	0.34	**0.78**	0.32	0.65	0.65	0.09
OPP3	0.13	0.13	0.10	0.57	0.16	0.64	0.29	0.48	0.49	0.63	0.66	0.42	0.33	**0.76**	0.29	0.68	0.65	0.11
PI1	0.27	0.28	0.27	0.24	0.29	0.31	0.65	0.25	0.21	0.31	0.31	0.12	0.65	0.34	**0.84**	0.29	0.26	0.26
PI2	0.21	0.27	0.23	0.23	0.22	0.25	0.58	0.20	0.22	0.29	0.26	0.10	0.58	0.30	**0.75**	0.22	0.21	0.23
PI3	0.24	0.24	0.27	0.29	0.31	0.30	0.66	0.24	0.24	0.34	0.29	0.15	0.61	0.40	**0.81**	0.27	0.27	0.27
RES1	0.06	0.09	0.06	0.63	0.10	0.67	0.29	0.53	0.53	0.69	0.71	0.50	0.34	0.63	0.29	**0.87**	0.70	0.06
RES2	0.04	0.05	0.01	0.61	0.07	0.68	0.27	0.45	0.47	0.68	0.66	0.44	0.33	0.62	0.28	**0.85**	0.62	-0.01
RES3	0.07	0.05	0.01	0.62	0.06	0.65	0.26	0.50	0.53	0.68	0.67	0.47	0.29	0.63	0.25	**0.83**	0.67	0.03
SUP1	0.05	0.08	0.04	0.57	0.10	0.66	0.26	0.47	0.49	0.65	0.67	0.40	0.30	0.63	0.29	0.63	**0.87**	0.06
SUP2	0.05	0.06	0.00	0.60	0.09	0.61	0.23	0.48	0.49	0.64	0.69	0.41	0.27	0.61	0.24	0.68	**0.83**	0.06
SUP3	0.07	0.07	0.04	0.58	0.10	0.66	0.22	0.54	0.48	0.65	0.67	0.41	0.29	0.58	0.24	0.66	**0.83**	0.05
U1	0.58	0.65	0.61	-0.01	0.64	0.04	0.27	0.20	0.21	0.05	0.07	-0.04	0.26	0.12	0.27	0.03	0.04	**0.80**
U2	0.55	0.57	0.58	0.00	0.61	0.00	0.19	0.20	0.23	0.07	0.07	-0.01	0.20	0.08	0.21	0.04	0.07	**0.76**
U3	0.56	0.59	0.59	-0.08	0.63	-0.02	0.24	0.17	0.18	0.04	0.03	-0.07	0.23	0.03	0.24	-0.03	-0.02	**0.75**
U4	0.68	0.68	0.65	0.05	0.70	0.10	0.28	0.29	0.29	0.12	0.13	-0.03	0.27	0.11	0.27	0.05	0.10	**0.85**

Table (7): Cross-loadings of Second-Stage Model

	Entrepreneurial Leadership	Creative Process Engagement	Innovative Work Behavior	Passion	Empowerment
Absorbing Uncertainty	**0.856**	0.337	0.207	0.022	0.114
Building Commitment	**0.911**	0.368	0.147	0.007	0.126
Defining Gravity	**0.984**	0.364	0.320	-0.016	0.082
Framing Challenges	**0.969**	0.373	0.251	0.043	0.149
Underwriting	**0.917**	0.339	0.369	-0.021	0.084
Problem Identification	0.254	**0.900**	0.123	0.268	0.356
Information Searching	0.356	**0.977**	0.369	0.328	0.371
Idea alternative Generation	0.371	**0.923**	0.125	0.264	0.378
Idea Championing	0.378	0.211	**0.923**	0.46	0.219
Idea Implementation	0.316	0.300	**0.955**	0.475	0.238
Passion for Inventing	-0.127	0.358	0.389	**0.928**	0.035
Passion for Developing	0.322	0.284	0.177	**0.979**	0.049
Opportunity	0.749	0.156	0.258	0.583	**0.870**
Information	0.238	0.211	0.115	0.693	**0.909**
Resources	0.035	0.147	0.265	0.694	**0.907**
Support	0.049	0.369	0.445	0.643	**0.892**
Formal Power	0.085	0.422	0.362	0.644	**0.892**
Informal Power	0.187	0.507	0.305	0.654	**0.911**

Structural Model (Second Stage):

Before estimating our structural model, we examined the model for potential multicollinearity between our constructs that might bias our estimates. Table (8) demonstrates that the variance inflation factor (VIF) for all constructs is below the more conservative value of 5 (Hair Jr et al. 2022). This indicates that multicollinearity is not a problem in our model.

Table (8): Collinearity Statistics

	VIF Value
Absorbing Uncertainty	3.011
Building Commitment	3.124
Defining Gravity	3.362
Passion for Developing	3.877
Formal Power	3.177
Framing Challenges	4.961
Idea Championing	3.005
Idea Generation	3.027
Idea Implementation	3.813
Info Searching	2.789
Information	3.911
Informal Power	4.211
Passion for Inventing	3.201
Opportunity	2.235
Problem Identification	3.112
Resources	3.222
Support	2.888
Underwriting	3.125

We followed a stepwise approach to test our hypotheses in four models. First, we tested the simple relationship between the dependent and independent variables suggested in H1. Second, we added the mediator to test the mediation hypotheses H2-H4. We controlled for age, gender, education level, and work experience in all the estimations of innovative work behavior. Also, in all our estimations, we ran bootstrapping of 10,000 samples (one-tailed) to test the significance of the path coefficients. Overall, the results summarized in Table (9) reveal that all our proposed relationships are verified, offering support to our four hypotheses. We elaborate more on the results below.

Table (9): Summary of Hypotheses Results

Hypothesis	**Path Coefficient (β)**	**P-value**	**Result**
H1 (+): EL→ IWB	0.313	0.000	Supported
H2 (+): EL→ EEP	0.355	0.000	Supported
H3 (+): EEP → IWB	0.212	0.000	Supported
H4 (+): EL→ EEP → IWB	0.087	0.000	Supported

Table (10) exhibits the estimations of the structural models. Our simple effect model's estimation in panel (a) shows that EL is positively and significantly associated with IWB, supporting H1. In particular, the results reveal that a one percent increase in the employees' perception of entrepreneurial leadership is associated with a 18% increase in their innovative behavior. The significant positive relationship between EL and IWB is consistent in the mediating and moderation models as well.

Table (10): Results of Structural Models

	(a) Simple Effect Model	(b) Mediating Effect Model	
	Endogenous Variable	**Endogenous Variables**	
	Innovative work behavior (IWB)	***EEP***	***IWB***
Exogenous Variables:			
Entrepreneurial leadership (EL)	0.313***	0.355***	
Entrepreneurial passion (EP)			0.212***
Control Variables:			
Gender	-0.042		-0.025
Age	0.017		-0.003
Education Level	0.018		0.022
Work Experience	-0.045		-0.05*
R-square	0.118	0.123	0.151
N	446	446	446

***p < .01. **p < .05. *p < .1.

Consistent with H2 and H3, the results in panel (b) of Table (10) reveal that EL is positively and significantly related to EEP which is in turn positively and significantly associated with IWB. For instance, a one percent increase in perceived EL would increase EEP by about 23%. Similarly, an increase of one percent in EEP would result in a 51% increase in IWB. In addition to these direct relationships, our estimation of the mediating effect model also offers *support* for H4, indicating an indirect relationship between EL and IWB. Particularly, we find that EL is significantly and positively related indirectly to IWB through EEP. Our subsequent moderation models confirm the positive mediation role of EEP between EL and IWB. Overall, the results validated our hypothesized relationships.

Discussion:

No organization can survive and sustain a competitive advantage in a dynamic environment without innovation. Organizational innovation can stem from different sources, but employee innovativeness is a fundamental source (Li et al. 2010). Successful innovation is rewarding, but the innovation process is very risky and challenging (Elhelaly & Ray 2024). Thus, inspiring and motivating employees to engage in this process is not an easy task; it requires effective leadership. In this study, we sought to investigate the relationship between entrepreneurial leadership and innovative work behavior of IT employees.

Entrepreneurial leadership, as an emerging leadership style, has been commended for its effectiveness in seeing problems through new lenses, finding novel solutions to old issues, exploring new frontiers, and spotting and exploiting new opportunities (Iqbal et al. 2022; Hoang et al. 2022). Entrepreneurial leaders would not just conduct these activities themselves, but they will also encourage and empower their subordinates to practice them. Those leaders would not blame the subordinates for taking risks or punish them for making mistakes when experimenting with new things. Thus, perceiving their leaders as entrepreneurial leaders, the subordinates will be motivated to explore new activities and innovate novel products and work techniques.

Our study provides strong support for the positive, direct relationship between perceived EL and IWB. We find that a one percent increase in perceived EL would increase IWB by about 34%. Hence, we (a) add new strong evidence to the few studies (e.g., Bagheri & Akbari 2018; Iqbal et al. 2022; Li et al. 2020) that examined the relationship between EL and IWB, and (b) contribute to the extant literature by explicitly evaluating employees' perception of EL. Underestimating the perception of employees in leadership studies is problematic. It is the employee's perception of their leader's orientation and actions that would influence their own behavior, not the intended leadership style of the leader (Jacobsen & Andersen 2015).

Moreover, we aimed to examine the mechanism through which perceived EL would boost IWB. We proposed a mediating role of EEP in this relationship. Our empirical results show that perceived EL is positively and significantly related to IWB through EEP. Our findings thus reveal that employees' perception of EL would motivate their enthusiasm toward creative activities and generate new ideas, this entrepreneurial passion would in turn motivate them to realize their novel ideas to reap the rewards of their creative initiatives. Our study is thus one of the first studies to introduce EEP as a mediator between perceived EL and IWB. In fact, most of the extant studies examined work passion and creative self-efficacy as a mediator between EL and IWB. Thus, one main contribution of our study is providing an additional path (i.e., creative process engagement) for EL to enhance IWB.

In the process of investigating the mediating effect, we also examined the direct relationships between EEP and both EL and IWB. We find a positive relationship between perceived EL

and CPE, offering new insight to the literature. Similarly, the results indicate a positive association between EEP and IWB, confirming previous findings (Saeed et al., 2019).

Overall, we offer a new process for enhancing IWB through EL. Employees' perception of EL is one key starting point of this process. Perceived EL would encourage and motivate employees to engage in creative activities and generate new ideas. As our study explains, the more an employee have entrepreneurial passion the more likely they would conduct innovative behaviors.

Managerial Implications:

We offer four key guidelines for leaders, organizational development (OD) managers, and human resources (HR) practitioners concerned with fostering employee innovation in their organizations. *First*, our findings point out that entrepreneurial leadership style when perceived by employees would inspire and motivate them to participate in creative processes and innovative activities. So, leaders need to adopt an entrepreneurial leadership style that not only stimulates idea generation, experimentation, and opportunity exploration and exploitation, but also encourages risk-taking and tolerates mistakes.

However, the effectiveness of entrepreneurial leadership's implementation depends also on employees' understandings and interpretations of their leader's actions. Employees' perceptions should be consistent with their leader's intentions for entrepreneurial leadership to inspire and motivate their creativity and innovativeness. Hence, it is the responsibility of entrepreneurial leaders to clearly communicate their leadership style including their vision, values, work techniques, and reward systems to their employees and be open to the subordinates' opinions and concerns.

Second, our study reveals that perceived entrepreneurial leadership can boost innovative work behavior through creative process engagement. Building on this finding we recommend entrepreneurial leaders to promote a work environment that encourages employees to question existing work approaches, challenge old ways of conducting tasks, and search for new solutions to existing issues. In doing so, leaders need to reward employees for their engagement in creative processes, regardless of the outcomes of their efforts. Needless to say, entrepreneurial leaders should refrain from criticizing or reprimanding employees for failed attempts.

Third, one important finding of our study demonstrates the crucial role of employee entrepreneurial passion in boosting their engagement in creative processes and innovative activities. A direct implication of this result might help HR managers in qualifying competent employees for innovative tasks. HR practitioners might consider evaluating the level of entrepreneurial passion of job applicants.

Limitations and Further Research:

One significant limitation of our study is that it depended on single-sourced data. Although common method bias is not an issue in our study, it adopts the perspective of employees, overlooking the viewpoint and evaluation of leaders. We call for future studies to collect data from diverse sources to enrich our literature with distinct views. Relatedly, we depended on employees' self-rating evaluations of their innovative behavior. We emphasized the anonymity of the respondents and assured the confidentiality of their answers during the data collection process. However, we have no means to verify the reported scores. Future studies may collect secondary data on the innovation outcomes of employees or depend on their direct supervisors' evaluations.

Another main data limitation in our study is that we collected cross-sectional survey data. This prevented us from establishing causal relationships for the hypothesized links in our model. While we find support for all the proposed relationships, we are short of attributing cause-effect relationships to them. We call for future studies to collect longitudinal or experimental data to establish causality among our variables.

A last substantive limitation of our study is that it does not consider creative self-efficacy as a mediator like most of the extant studies. We aimed to examine novel paths for enhancing employee innovative behavior and proposed a rich model. We refrained from adding creative self-efficacy to achieve model parsimony. Yet, we hope further studies will incorporate additional mediators, both old and new, into our model and compare their roles.

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