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The Link between Ambidextrous Leadership and Innovative Work Behavior in a Military Organization: The Moderating Role of Climate for Innovation

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Abstract: Innovative work behavior is a vital necessity that enables sustainable public sector organizations, particularly the highly centralized military ones, to successfully adapt to complex and rising challenges. This empirical study, drawing on the social exchange theory, investigates the separate and combined effects of ambidextrous leadership dimensions (i.e., opening and closing leader behaviors) on innovative work behavior and the moderating role of climate for innovation on these relationships. The data were collected from 425 participants working at Allied Command Transformation (ACT), the North Atlantic Treaty Organization's (NATO) Warfare Development Command, and analyzed using AMOS and SPSS Process Macro. We found that while opening leader behavior of ambidextrous leadership was positively related to innovative work behavior, closing leader behavior had no significant effect on it. Findings also confirmed that the interaction of both (i.e., the combined effect of ambidextrous leadership) was positively related to innovative work behavior, and climate for innovation moderated the relations of both closing leader behavior and ambidextrous leadership to innovative work behavior. Based on these results, we discuss the managerial and theoretical implications.

Keywords: ambidextrous leadership; innovative work behavior; climate for innovation



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1. Introduction

Innovative work behavior, as the development and implementation of new and useful ideas for work methods and outcomes to benefit the organization and society, has received great research attention in the domain of organizational innovativeness [1–3]. Several individual and contextual drivers of it have recently been studied [4–7]. Among other drivers of innovativeness, the present literature recognizes the critical role played by different leadership styles on innovative work behavior, such as transformational [8,9], servant [10], authentic [11], inclusive [12], and ethical [13]. Depending on the contextual factors, different leadership styles may have a broad range of impacts on innovation as well [11,14,15]. Emphasizing the necessity of studying newer leadership styles and behaviors to improve innovativeness, some scholars [16] have defined ambidextrous leadership as the ability to foster both explorative and exploitative behaviors in followers by separate and combined effects of opening and closing leader behaviors. This relatively new leadership style is suggested to promote innovation at the individual, team, and organizational levels [17]. Moreover, both past and recent studies on innovativeness have already mentioned the contingency effect of the working environment and/or organizational climate on leader–follower relations in general [18]. Therefore, the climate for innovation and its interaction with leadership have always been a particular question of interest [19–21].

Innovation plays a vital role in continuous improvement and efficiency, not only in the private sector but also in the public [22–24]. For instance, innovation-related goals and performance indicators constitute an important part of the corporate strategy in public-owned organizations all over the World [25,26]. Although little is known about innovative work behavior in the public sector [27], the need to empirically investigate its nature and drivers have begun to receive attention in recent studies [28,29]. However, to our knowledge, and compared to other types of public organizations, empirical studies are still very rare on military organizations that are essentially characterized by hierarchical structure and management based on directive leadership [1]. Innovation has always been also important in military settings. The total military expenditure surpassed USD 2 trillion for the first time in 2021, which was the seventh consecutive year that spending went up. The United States, as a striking example and one of the five largest spenders, allocated USD 801 billion for military research and development by focusing more on state-of-the-art technologies [30]. The North Atlantic Treaty Organization (NATO), a prominent defense organization consisting of 30 member countries, has also recognized innovation since disruptive technologies are the most effective tools to deal with security challenges and uncertainties [31]. Considering that innovations such as radar, computers, penicillin, and flu vaccines were based on the research made during World Wars I and II [32], innovation and creativity have always been critical for militaries. Contrary to the general belief that scientists have been central characters of those innovations, military personnel have also played a key role in eliciting the requirements for capabilities, introducing the problems in the field, and coming up with new ideas to solve them. All this indicates that despite the hierarchical structure, personnel who display innovativeness are vital for the military.

Given the paucity of research on innovative climate within military organizations that are generally presumed as relatively rigid in structure and directive in leadership, this study examines the moderating role of climate for innovation in the relations between ambidextrous leadership and innovative work behavior among the staff working in a multinational military setting of NATO. Most military organizations operate under the directives given by high-level leadership. However, some are responsible for research and development. In our case, NATO Allied Command Transformation, which is not an operational command, was chosen to investigate innovative work behavior as its mission is to explore and implement different ideas, methods, or solutions to the challenges faced by NATO. Thus, this study intends to fill the gap in the literature by examining the nature of individual innovativeness and its potential critical drivers in a unique multinational, military, and public environment. The present study has two main research questions: (a) how does ambidextrous leadership affect innovative work behavior? And (b) How does climate for innovation moderate the relationship between them? As for the structure of the paper, this introduction section precedes the theoretical framework and hypothesis development section. Next, the research methodology is explained, and findings are presented. Finally, concluding remarks and limitations are discussed.

2. Theoretical Framework and Hypothesis Development

There is a large volume of published studies examining the role of leadership in innovative work behavior [33,34]. However, all those leadership styles are not particularly suited to promote innovation as they have a wide range of different leadership behaviors. Therefore, the findings of past research are quite varied [16]. In this regard, the mechanisms that underpin the link between ambidextrous leadership, a specific leadership style that includes certain behaviors particularly related to innovation, and innovative work behavior are still lacking in the literature and are required to be investigated.

According to the social exchange theory [35], social interaction is mainly based on reciprocity, in such a way that, if employees perceive that certain kinds of positive behaviors are supported and rewarded by the organization and/or manager(s), they become more inclined to display those behaviors. On the other hand, if negative outcomes are likely to happen, they avoid behaving in that manner even if those behaviors will be for the benefit

of their organization [36]. Drawing on the social exchange theory, this empirical study aims to uncover the complex relationships among employees' perceptions about both leadership and climate in the organization and their innovative behaviors in return, particularly in a multinational military setting. The proposed conceptual model of relations depicted in Figure 1 is intended to provide a more comprehensive understanding of innovative work behavior in public organizations.

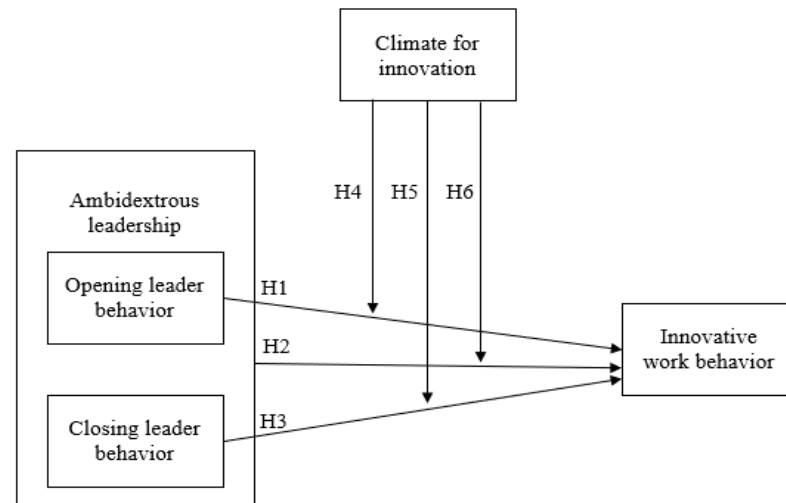


Figure 1. The hypothesized conceptual model.

2.1. Innovative Work Behavior

Both private and public organizations need employees with innovative behaviors that exhibit original, creative, and innovative ideas and practices to deal with new challenges emerging constantly in today's dynamic work environment [22,37–39]. Innovative work behavior, defined as the development, adoption, and implementation of new ideas, includes three main components: namely, idea generation (developing new solutions to the problems detected); idea promotion (gaining support in the organization to execute the suggested ideas); and idea implementation (transforming new ideas into practical solutions, then executing them) [40,41]. Previous research has established that this critical type of behavior improves performance at both individual and team levels [42]. Thus, the drivers that trigger this precious behavior became a hot research topic in the last decades. Previous studies have investigated not only individual traits such as proactiveness [4,43], creative self-efficacy [44], locus of control [45], and extraversion [46], but also organizational drivers such as leadership [47], empowerment [4,48], autonomy [14], organizational support [4], etc., as the antecedents of innovative work behavior. However, the role of ambidextrous leadership in innovative work behavior remains largely unexamined. Although some scholars have conducted research in the private sector and provided important implications [17,49], much uncertainty still exists about its nature in a military organization.

2.2. Ambidextrous Leadership

Ambidexterity as the combination of any compatible duality (e.g., exploration vs. exploitation, alignment vs. adaptability, radical vs. incremental, flexibility vs. efficiency, etc.) represents a reconciling approach expected to combine the benefits of both possibilities [50–53]. As a managerial term, it is generally referred to as a managerial or organizational ability to conduct in a combined way the activities of both exploration, i.e., experimentation, risk-taking, discovery, etc., and exploitation, i.e., implementation, efficiency, execution, etc., simultaneously [54–56]. This balanced duality in any aspect of managerial functions, in terms of goal setting, organizing, leading, appraising, etc., is essential for innovative performance and sustainable improvement of the organizations [57]. In this sense, the necessity of competent ambidextrous leaders to implement organizational ambidexterity,

by handling tensions that arise between competing goals and efforts, has already been highly emphasized in the recent literature [58,59]. Similarly, according to the ambidextrous leadership theory proposed by Rosing et al. [16], the two complementary leadership behaviors, namely opening leadership behaviors (encouraging followers to do things differently) and closing leadership behaviors (goal setting, monitoring, corrective actions, etc.) should be applied by the leaders simultaneously to collect the fruits of both in terms of experimentation and efficiency.

2.3. *The Relation between Innovative Work Behavior and Ambidextrous Leadership*

Scholars have already investigated the factors that promote the processes of idea generation, promotion, and implementation which are embedded in innovative behaviors, and suggested that different leadership styles in general (e.g., transformational, servant, authentic, etc.) have a tremendous influence on encouraging these behaviors [8,12,60,61]. In this concern, Usman et al. [62] argue that among various leadership styles and behaviors already studied, ambidextrous leadership as a balanced combination of exploitative and explorative approaches seems to be one of the most effective antecedents of innovativeness. Accordingly, in their study on the telecom sector in Pakistan, they also confirm that ambidextrous leadership sparks innovative work behaviors among employees [62].

Rosing et al. [16] argue that by combining the two distinct but complementary leadership behaviors, i.e., opening and closing behaviors, leaders can successfully stimulate both explorative and exploitative efforts in their followers. The first one, opening leader behavior, supports followers to break up the routines, challenge the status quo and come up with new ideas at work. This type of behavior is critical, as coming up with new ideas and expressing them freely in an organization without any concerns underpins innovative work behavior [63]. It can be suggested that opening leader behavior encourages employees to think outside the box and challenge the status quo, thereby displaying innovative work behavior [64]. In accordance, we posit that:

H1. *Opening leader behavior is positively related to employees' innovative work behavior.*

Although creating new ideas is essential for innovative work behavior, integrating those ideas by checking their feasibility and providing procedures or corrections to refine the quality of implementations might be another path to innovative behaviors [65]. In other words, creative thinking and experimentation alone do not guarantee innovative performance; to complement them it is necessary to establish formal procedures to plan, implement and learn from mistakes [66]. Accordingly, in comparison to opening leader behavior, closing leader behavior incorporates taking corrective action, establishing routines, sanctioning errors, and so forth [16]. This type of behavior can also contribute to individual innovation since close coordination and efficient execution are also indispensable to this process. Providing clear incentives and a contingent reward system can encourage employees to innovate as well [67]. In addition, feedback given by a leader might promote employees' motivation to come up with new ideas [68]. Based on the above discussion, we suggest that:

H2. *Closing leader behavior is positively related to employees' innovative work behavior.*

Both leadership behaviors of opening and closing seem to be positive drivers of innovativeness. Moreover, their simultaneous application, i.e., ambidextrous leadership, can combine the benefits of both—if successfully reconciled—since one is not at the expense of the other. To balance seemingly opposing behaviors, the leader should discover the complementarity within duality [53], and behave in a balanced way accordingly. In public organizations, both sides of ambidexterity are highly needed, namely exploring possibilities to adapt to the rapidly changing environment to improve and renovate public services for the society, while aligning with the existing rules, regulations, hierarchy, power politics, etc. In this concern, ambidextrous leaders are needed to manage this tension. By successfully combining these seemingly opposing behaviors of opening and closing leadership, both

of which are very critical in public organizations, ambidextrous leaders may trigger their followers' innovative behaviors. Therefore, we suggest the following hypothesis:

H3. *Ambidextrous leadership (the interaction between opening and closing leadership behaviors) is positively related to employees' innovative work behavior.*

2.4. The Moderating Role of Climate for Innovation

As for the contextual factors that may affect the relationship between leadership and innovative work behavior [63,69], types of culture, demographic variability, mode of governance, organizational health, degree of centralization, etc., are among those factors examined by researchers [70]. Since leaders cannot influence their followers regardless of working environments, employees' perceptions of leadership style are contingent on recurring practices, policies, and processes in an organization (Schneider, 1990). In this context, the perceived organizational climate, as the accumulation of meanings employees attach to interrelated experiences they have at work mainly about the nature of interpersonal relationships, hierarchy, the level of participative decision making, and the focus of support and rewards [71], has a very important role in affecting followers' behaviors.

More specifically, an organizational atmosphere fostering new ideas and improvements together with the supply of required resources in terms of money, time, personnel, etc., may constitute a suitable climate for innovation displaying the organization's commitment to continuously support innovativeness [20,41]. The existence of such a climate of support, autonomy, learning, tolerance for risks and mistakes, etc., facilitates employees' innovative efforts leading to further organizational innovative performance [4,13]. By means of such a convenient milieu, perceived opening leadership behaviors would enhance employees' innovative work behaviors more. Hence, it can be suggested that the more employees perceive a climate supporting innovation, the stronger the effect of opening leader behavior will be on innovative work behavior.

Coming up with novel ideas to solve problems might not be always enough for continuous improvement in organizations. To put them into practice, detailed plans should be prepared and monitored by leaders on time [72]. The leaders should use incentives and sanctions to ensure that corrective actions are taken and the employees performing well are rewarded [73]. Likewise, closing leader behavior contributes to establishing routines and controlling organizational attainment. Still, this tendency for alignment with the existing conditions and exploitation of existing opportunities may provide innovativeness, especially if combined with a climate supporting innovation. Such a convenient climate for innovation and the discipline of goal setting, monitoring, corrective actions, etc., embedded within closing leadership, can complement each other for stimulating the innovativeness of the followers. In other words, employees may need a climate for innovation to behave more innovatively when they perceive that their leader exhibits closing behaviors.

Ambidextrous leadership, the interplay of opening and closing leadership behaviors at the same time, promotes both exploration and exploitation, thereby inspiring innovation in an organization [17]. In line with the social exchange theory, employees assess the potential benefits and risks of being innovative, then, if the rewards outweigh the risks, they can be more inclined to display innovative work behavior [74]. Moreover, contextual factors might amplify this relationship. The relationship between ambidextrous leadership and innovative work behavior can be stronger in an organization supporting a climate for innovation, as this environment can influence not only the leaders but also the employees. In other words, the joint interaction of keeping and challenging the status quo at the same time while coming up with new ideas is encouraged. In light of the arguments above, we suggest:

H4. *Climate for innovation moderates the positive relationship between (a) opening leader behavior and innovative work behavior, (b) closing leader behavior and innovative work behavior, and (c) ambidextrous leadership and innovative work behavior.*

3. Methods

3.1. Data Collection

The data were collected from one of the strategic commands of the North Atlantic Treaty Organization (NATO), Allied Command Transformation (ACT) Headquarters, which is located in Norfolk, Virginia, USA. Through the headquarters' web portal, a general introduction to the research was provided and the personnel were encouraged to fill out the survey. Participants were assured that the information they provide would be strictly confidential. Using an e-mail addresses directory, 700 questionnaires were sent to the randomly selected participants by stressing that the questionnaire would be administered anonymously. In total, 432 employees completed the survey (response rate of 61.7%). We examined the differences between the means of all the variables for the early (the first 61%) and late (the final 39%) responders of completed questionnaires in order to test for non-response bias [75]. Between the two groups of surveys, there are no significant differences. After calculating Mahalanobis distance [76], 7 questionnaires were determined to be outliers and excluded from the study. G*Power (3.1.9.7) software was used to test sample adequacy; the G*Power score was 99 indicating that the sample size of the study was adequate [77]. All items were measured using a 5-point Likert Scale ranging from 1 = strongly disagree to 5 = strongly agree.

3.2. Measures

3.2.1. Innovative Work Behavior

This scale has three dimensions, which are idea generation, idea promotion, and idea implementation, and nine items. It was developed by Janssen [40]. A sample item of the scale is 'I create new ideas for improvement'. Most studies use one dimension rather than three as the concept's multidimensionality has yet to be accepted widely in the literature [78]. Based on the confirmatory factor analysis, we choose to examine this concept as one dimension. Cronbach's alpha for the scale was 0.88.

3.2.2. Ambidextrous Leadership

This scale includes two dimensions, namely, opening leader behavior and closing leader behavior. Each dimension has seven items. It was developed by Rosing et al. [16]. A sample item for opening leader behavior is 'My leader allows different ways of accomplishing a task'. A sample one for closing leader behavior is 'My leader controls and monitors goal attainment'. Cronbach's alpha values were 0.91 and 0.84, respectively.

3.2.3. Climate for Innovation

This scale consists of two dimensions: support for innovation and resource supply. These dimensions have 16 and 6 items, respectively. It was developed by Scott and Bruce [41]. A sample item for support for innovation is 'Creativity is encouraged here' and a sample one for resource supply is 'There are adequate resources devoted to innovation in this organization'. A confirmatory factor analysis suggests that a unidimensional conceptualization of climate for innovation fits the data well. Cronbach's alpha is 0.90, which indicates good internal consistency.

4. Results

4.1. Exploratory Factor Analysis

To assess the individual item reliability and construct validity, exploratory factor analysis (EFA) was conducted. The extraction was based on a principal component analysis using the Varimax rotation method with Kaiser normalization. The Kaiser–Meyer–Olkin measure verified the sampling adequacy for the analysis, $KMO = 0.91$ [79]. An initial analysis was run to obtain eigenvalues for each factor in the data. Four factors (i.e., opening leader behavior, closing leader behavior, climate for innovation, innovative work behavior) had eigenvalues over Kaiser's criterion of 1 and in combination explained 59.52% of the variance (30.86% of opening leader behavior, 12.94% of closing leader behavior, 8.18% of

climate for innovation, 7.54% of innovative work behavior). Items with low factor loadings (<0.50) were removed [80]. Despite the differences in the sub-factors, results indicated that factor loadings overlap with the main constructs of the previous studies, which shows construct validity of the scale was confirmed. Standardized loadings of the measurement model are presented in the Appendix A.

4.2. Test of Common Method Bias

To check common method bias (CMB) that may cause estimation or measurement error [81], Harman's single-factor method was employed by extracting all the factors into one factor. The single factor variance of the study was 29.33%, which is less than the threshold of 50%. This analysis indicated that the potential effects of common source bias are negligible in this study.

4.3. Descriptive Statistics, Reliability, and Validity Tests

Means, standard deviations, reliability coefficients (presented in parentheses), and zero-order correlations for all constructs are presented in Table 1. The scales used in this study exceed the recommended reliability level [82] and all variables, except innovative work behavior and closing leader behavior, are significantly and positively related to each other. We controlled for demographic variables including age, tenure, and educational status. The results indicated that they are not significantly related to the variables in the conceptual model.

Table 1. Means, standard deviations and correlations of variables in the study.

Variables	M	SD	1	2	3	4	5	6	7
1. Age	-	-	-						
2. Tenure	-	-	0.68 **						
3. Educational status	-	-	0.041	0.047					
4. Opening leader behavior	3.96	0.81	-0.030	0.010	0.064	(0.91)			
5. Closing leader behavior	3.81	0.74	-0.036	-0.071	-0.010	0.418 **	(0.86)		
6. Climate for innovation	3.38	0.76	-0.086	-0.083	-0.035	0.552 **	0.463 **	(0.90)	
7. Innovative work behavior	3.74	0.58	-0.014	-0.049	-0.009	0.186 **	0.083	0.114 *	(0.88)

Notes: * $p < 0.05$, ** $p < 0.01$; Cronbach's alpha reliability coefficients are presented in the parentheses.

To assess the discriminant and convergent validity, composite reliability (CR), average variance extracted (AVE), maximum squared variance (MSV), and average shared variance (ASV) were calculated and presented in Table 2. For convergent validity, it is suggested that $AVE > 0.5$; $CR > 0.7$ and $CR > AVE$ [80]. To confirm discriminant validity, it is proposed that $MSV < AVE$, $ASV < AVE$, and the square root of each construct's AVE values should be greater than its correlation with another construct [80,83]. As seen in Table 2, those values in this study meet the above-mentioned suggestions, thereby confirming the discriminant and convergent validity.

Table 2. Convergent and discriminant validity of the model.

Variables	CR	AVE	MSV	ASV	1	2	3	4
Closing leader behavior	0.86	0.51	0.28	0.16	(0.72)			
Opening leader behavior	0.91	0.60	0.44	0.23	0.45	(0.77)		
Climate for innovation	0.89	0.52	0.44	0.25	0.54	0.66	(0.72)	
Innovative work behavior	0.88	0.51	0.05	0.02	0.09	0.21	0.15	(0.71)

Notes: The values in parentheses represent the square root of the variance extracted. CR: Composite/construct reliability, AVE: Average variance extracted, MSV: Maximum squared variance, ASV: Average shared square variance.

Confirmatory factor analysis was conducted to test the measurement model in the study by using AMOS 28 software. As seen in Table 3, the four-factor model tested on the overall sample showed a superior fit to the data when compared to the three-factor model

where opening leader behavior and closing leader behavior were loaded on a single factor, and two-factor model where opening leader behavior, closing leader behavior and climate for innovation and the one-factor model where all items were loaded on a single factor ($X^2(423) = 1146,3; p < 0.001; X^2/df = 2.71; CFI = 0.91; SRMR = 0.06; RMSEA = 0.06$). Those results also confirm the discriminant validity of the measures used in this study.

Table 3. Comparison of measurement models.

Model	X^2	df	X^2/df	CFI	SRMR	RMSEA	Model Comparison	
							ΔX^2	Δdf
Four-factor model ^a	1146.3 *	423	2.71	0.91	0.06	0.06	-	-
Three-factor model ^b	1977.7 *	428	4.62	0.79	0.08	0.09	2 vs. 1	831.4 *
Two-factor model ^c	2946.9 *	433	6.86	0.66	0.09	0.12	3 vs. 1	1800.6 *
One-factor model ^d	4117.7 *	434	9.49	0.5	0.14	0.14	4 vs. 1	2971.4 *

Note: * $p < 0.001$. CFI = Comparative fit index; SRMR = Standardized root mean square residual; RMSEA = Root mean square error of approximation. ^a = Baseline model, ^b = OLB and CLB combined, ^c = OLB, CLB and CI combined, ^d = OLB, CLB, CI and IWB combined.

4.4. Hypothesis Testing

In this study, the bootstrapping method was used to conduct regression analysis by using SPSS Process macro v3.5, as it provides more reliable results compared to the classic approaches [84]. The number of bootstrap samples selected in the analysis was 5000. In the bootstrapping method, the confidence intervals are calculated by using the resampling technique, and if those confidence intervals do not include zero the result is suggested to be statistically significant [84,85].

The relationships between opening leader behavior, closing leader behavior, ambidextrous leadership (the interaction term) and innovative work behavior were first analyzed (see Table 4). The effect of opening leader behavior on innovative work behavior is statistically significant and positive ($\beta = 0.12, p < 0.001$). Thus, the first hypothesis was supported. On the other hand, the second hypothesis was not supported as the relationship between closing leader behavior and innovative work behavior was not statistically significant. The positive effect of ambidextrous leadership, namely the interaction of opening and closing leader behavior on innovative work behavior, was statistically significant ($\beta = 0.04, p < 0.05$), providing evidence for the third hypothesis. The plot in Figure 2 shows that innovative work behavior is highest when both opening and closing leader behavior are high.

Table 4. Moderating effect of closing leader behavior (CLB) on the relationship between opening leader behavior (OLB) and innovative work behavior (IWB).

Regression Results for the Conditional Effect of Closing Leader Behavior				
Predictor	β	SE	t	p
Innovative work behavior				
Constant	3.72	0.02	126.53	0.00 **
Opening leader behavior	0.12	0.03	3.84	0.00 **
Closing leader behavior	0.005	0.03	0.16	0.87 ns.
Opening leader behavior \times Closing leader behavior	0.04	0.02	1.97	0.04 *
Closing leader behavior	Interactional Effect	SE	t	p
The conditional indirect effect at Closing leader behavior = $M \pm 1$ SD				
M - 1 SD (-0.74) Low	0.07	0.03	2.06	0.03 *
M (0.00) Medium	0.12	0.03	3.86	0.00 **
M + 1 SD (+0.74) High	0.16	0.04	3.85	0.00 **
Model Summary	R	R-sq	F	p
	0.20	0.43	6.40	0.00 **

Table 4. Cont.

Regression Results for the Conditional Effect of Closing Leader Behavior				
R-sq increase due to interaction	R-sq change	F	df	p
	0.009	3.90	421	0.04 *

Notes: * $p < 0.05$, ** $p < 0.001$, ns.: not significant.

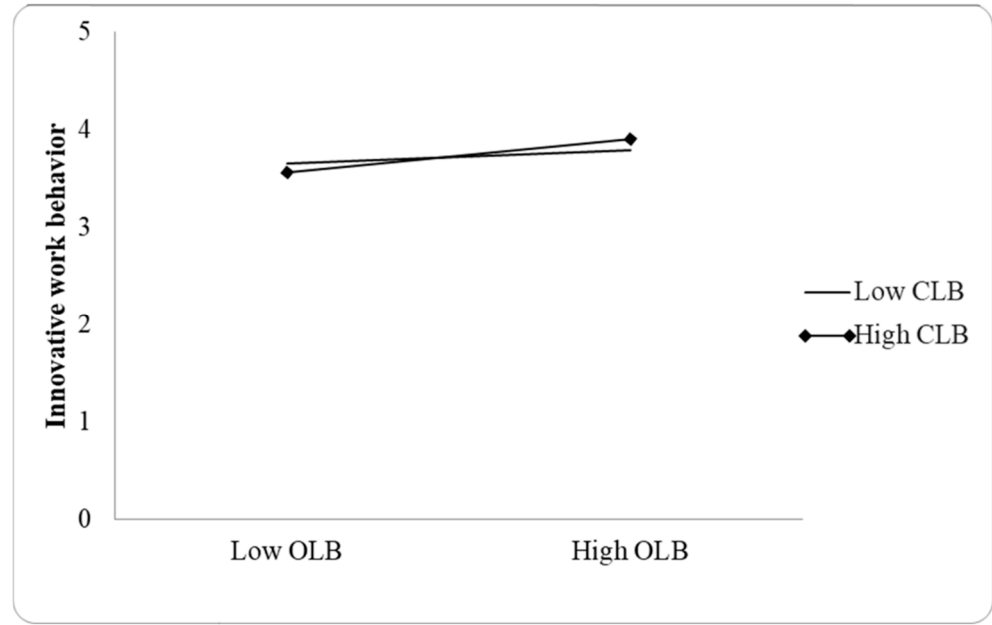


Figure 2. Moderating effect of closing leader behavior (CLB) on the relationship between opening leader behavior (OLB) and innovative work behavior (IWB).

The results also showed that the moderating role of climate for innovation on the relationship between opening leader behavior and innovative work behavior was not statistically significant. Thus, the hypothesis 4a was not supported (see Table 5).

Table 5. Moderating effect of climate for innovation (CI) on the relationship between opening leader behavior (OLB) and innovative work behavior (IWB).

Regression Results for the Conditional Effect of Climate for Innovation				
Predictor	β	SE	t	p
Innovative work behavior				
Constant	3.72	0.03	121.49	0.00 **
Opening leader behavior	0.12	0.03	3.43	0.00 **
Climate for innovation	0.01	0.03	0.32	0.74 ns.
Opening leader behavior \times Climate for innovation	0.03	0.02	1.47	0.14 ns.
Climate for innovation	Interactional Effect	SE	t	p
The conditional indirect effect at Climate for innovation = $M \pm 1$ SD				
M - 1 SD (-0.76) Low	0.09	0.03	2.59	0.00 **
M (0.00) Medium	0.12	0.03	3.43	0.00 **
M + 1 SD (+0.76) High	0.16	0.05	3.14	0.00 **
Model Summary				
	R	R-sq	F	p
	0.19	0.04	5.83	0.00 **
R-sq increase due to interaction	R-sq change	F	df	p
	0.005	2.18	421	0.14 ns.

Notes: ** $p < 0.001$, ns.: not significant.

The moderating effect of climate for innovation on the relationship between closing leader behavior and innovative work behavior was examined. The interaction term (CLB \times IC) had a positive and significant effect ($\beta = 0.04$, $p < 0.05$) on innovative work behavior, providing evidence for hypothesis 4b (see Table 6). The plot in Figure 3 indicates that when the climate for innovation is high, the relationship between closing leader behavior and innovative work behavior is statistically significant.

Table 6. Moderating effect of climate for innovation (CI) on the relationship between closing leader behavior (CLB) and innovative work behavior (IWB).

Regression Results for the Conditional Effect of Climate for Innovation				
Predictor	β	SE	t	p
Innovative work behavior				
Constant	3.72	0.03	122.94	0.00 **
Closing leader behavior	0.02	0.03	0.80	0.42 ns.
Climate for innovation	0.06	0.03	1.90	0.06 ns.
Closing leader behavior \times Climate for innovation	0.04	0.02	1.97	0.04 *
Climate for innovation	Interactional Effect	SE	t	p
The conditional indirect effect at Climate for innovation = $M \pm 1$ SD				
M $- 1$ SD (-0.76) Low	-0.02	0.03	-0.6	0.54 ns.
M (0.00) Medium	0.02	0.03	0.83	0.4 ns.
M $+ 1$ SD ($+0.76$) High	0.07	0.04	1.97	0.04 **
Model Summary	R	R-sq	F	p
	0.15	0.02	3.31	0.01 *
R-sq increase due to interaction	R-sq change	F	df	p
	0.009	3.88	421	0.04 *

Notes: * $p < 0.05$, ** $p < 0.001$, ns.: not significant.

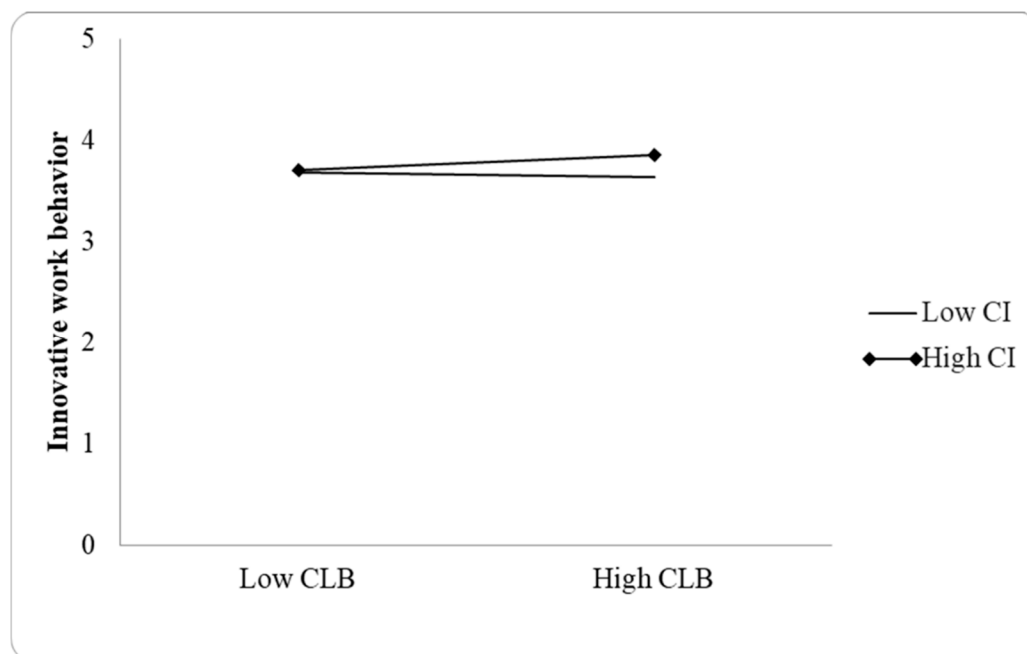


Figure 3. Moderating effect of climate for innovation (CI) on the relationship between closing leader behavior (CLB) and innovative work behavior (IWB).

Lastly, the interaction effect of ambidextrous leadership and climate for innovation was examined. The results showed that the moderating effect of climate for innovation on the relationship between ambidextrous leadership and innovative work behavior is

positive and statistically significant (see Table 7). Simple slope analysis was also utilized for this model and presented in Figure 4. This analysis was also consistent with the statistical results. Thus, the hypothesis 4c was supported.

Table 7. Moderating effect of climate for innovation (CI) on the relationship between ambidextrous leadership (ALB—interaction of OLB and CLB) and innovative work behavior (IWB).

Regression Results for the Conditional Effect of Climate for Innovation				
Predictor	β	SE	t	p
Innovative work behavior				
Constant	3.72	0.02	124.8	0.00 **
Ambidextrous leadership (OLB \times CLB)	0.07	0.03	2.49	0.01 *
Climate for innovation	0.03	0.03	1.03	0.30 ns.
Ambidextrous leadership \times Climate for innovation	0.04	0.01	2.45	0.01 *
Climate for innovation	Interactional Effect	SE	t	p
The conditional indirect effect at Climate for innovation = $M \pm 1$ SD				
M $-$ 1 SD (-0.76) Low	0.03	0.02	1.2	0.22 ns.
M (0.00) Medium	0.07	0.03	2.51	0.01 *
M + 1 SD ($+0.76$) High	0.12	0.04	2.77	0.00 **
Model Summary				
	R	R-sq	F	p
	0.15	0.02	3.31	0.01 *
R-sq increase due to interaction				
	R-sq change	F	df	p
	0.02	6.01	421	0.01 *

Notes: * $p < 0.05$, ** $p < 0.001$, ns.: not significant.

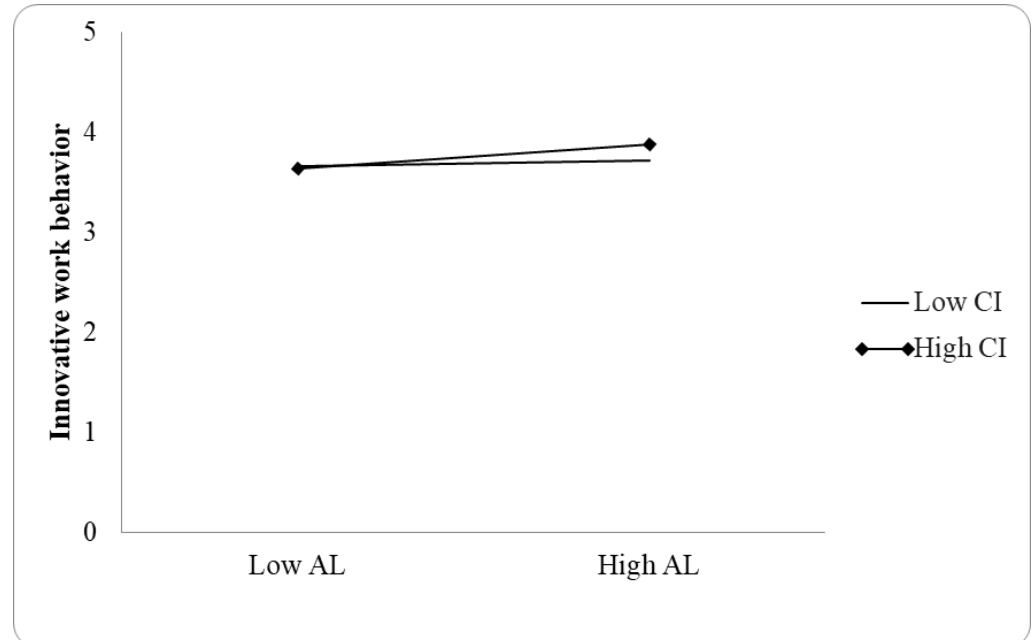


Figure 4. Moderating effect of climate for innovation (IC) on the relationship between ambidextrous leadership (AL) and innovative work behavior (IWB).

A summary of the hypotheses, proposed relationships, and hypothesis testing results are presented in Table 8.

Table 8. Summary of hypothesis testing results.

Hypothesis	Relationship	Result
H1	Opening leader behavior is positively related to employees' innovative work behavior.	Supported
H2	Closing leader behavior is positively related to employees' innovative work behavior.	Not supported
H3	Ambidextrous leadership (the interaction between opening and closing leadership behaviors) is positively related to employees' innovative work behavior.	Supported
H4a	Climate for innovation moderates the positive relationship between opening leader behavior and innovative work behavior.	Not supported
H4b	Climate for innovation moderates the positive relationship between closing leader behavior and innovative work behavior.	Supported
H4c	Climate for innovation moderates the positive relationship between ambidextrous leadership and innovative work behavior.	Supported

5. Discussion

This study aimed to investigate the effects of ambidextrous leadership on innovative work behavior, and the moderating role of climate for innovation in this relationship in a multinational military organization. Based on the propositions of the social exchange theory, our results indicate that opening leader behavior, as the first dimension of ambidextrous leadership, promotes innovative work behavior, confirming earlier research [17]. Moreover, the combination or interplay of both opening and closing behaviors, as the two seemingly opposing dimensions of ambidextrous leadership, promotes again innovative work behavior. These are in line with the ambidextrous leadership theory [16]; our research confirms that leaders displaying both opening and closing behaviors at the same time in a balanced way can ignite innovative work behavior in their followers. However, the direct individual relationship of closing leadership, as the second dimension of ambidextrous leadership, to innovative behavior has been found non-significant. There are a few studies in the recent literature providing contradictory findings on this specific relation; while Gerlach et al. [86] confirmed a positive relation of closing leader behavior, Zacher and Rosing [17] did not. A plausible explanation for why our study has not produced support for this relationship may be also related to the nature of work in a military setting where directive leadership concentrates more on alignment, efficiency, and obedience-related performance indicators than innovative ideas and actions. In other words, in a military setting, solely closing leadership isolated from, or not supported by, opening behaviors cannot lead to innovative employee behaviors. For this reason, it should be taken into consideration that the impacts of closing leader behavior on the employees working in a typical business environment can be different from the ones in a military organization.

The current study also examined the moderating role of climate for innovation between ambidextrous leadership and innovativeness, since it is a crucial condition for certain positive behaviors [87]. The moderating effect of climate for innovation between opening leadership and innovative work behavior was found to be non-significant. This result may imply that as opening leader behavior has a huge impact on innovative work behavior, the climate for innovation in an organization is not necessarily needed. In other words, if the perceived leadership can sufficiently support innovativeness, an extra supporting climate as a contextual factor is not a prerequisite or facilitator for it. On the contrary, the moderating effect of climate for innovation between closing leader behavior (i.e., the other side of ambidexterity) and innovative work behavior was found significant. This implies that closing leadership that was found ineffective in the followers' innovative behaviors in the direct relationship calls for a supportive climate as an undeniable necessity if innovativeness is desired. In other words, by virtue of a supportive climate for innovation, even closing leader behaviors can now enhance innovative work behavior. Similarly, the same applies to the combination of all three factors, namely, opening and closing leadership and climate for innovation. Therefore, in parallel with the ambidextrous leadership theory, the moderating effect of climate for innovation in the relationship of ambidextrous leadership (both closing and opening behaviors together at the same time) to innovative work behavior has been

confirmed in our study. Likewise, we can conclude that even closing leadership may be positively related to innovative work behaviors, provided that it is supported either by opening leadership or a climate for innovation; but the best combination is the existence of ambidextrous leadership and a suitable climate at the same time.

5.1. Theoretical Implications

Our study reveals and emphasizes the moderating role of climate for innovation in the ambidextrous leadership theory. Indeed, the opening leadership dimension alone has a direct positive effect which our study also confirms. However, the effect of closing leadership dimension, especially in more hierarchical or directive organizations, may not be so efficacious. Displaying innovative work behavior in hierarchical organizations can be somewhat risky, as it essentially tries to change the well-founded processes and practices [38]. Especially in these situations, the climate for innovation or change may balance or assist leadership to trigger followers' innovativeness. Employees may consider both perceived leadership behaviors and climatic factors all together, then they reciprocate accordingly. As a result of their perceptions and evaluations, they can display innovative work behavior or not. Drawing on these assumptions of both social exchange theory and ambidextrous leadership theory mostly confirmed the relationships in our resulting model proposed; when there is a supportive climate for innovation, perceived ambidextrous leadership and specifically its opening leadership dimension increase employees' innovative work behaviors.

5.2. Managerial Implications

In recent years innovative work behavior has gained considerable attention, not only in private, but also in public sector organizations that need to react to changes and achieve continuous improvement under highly dynamic technological and socio-economical conditions. In comparison to private sector organizations, public sector organizations have some structural disadvantages since they are less competitive, more hierarchical, and have limited financial incentives and benefits for attracting, motivating, and retaining innovative human capital. In this regard, the employees' innovativeness becomes crucial in public organizations. However, employees' individual inclination is not sufficient for innovation as other vital factors also play a significant role. In this sense, leadership and organizational climate are worth to be assessed as they affect employees' motivation towards innovativeness in terms of putting efforts into new ideas and actions. At this point, we are faced with the question of which leadership style is suitable for promoting these innovative work behaviors. As for the managerial implications of our findings, ambidextrous leadership, with its specific task of balancing seemingly opposing behaviors of opening and closing, seems to be significantly effective in the followers' innovative work behavior. For instance, a recent study by Oluwafemi et al. [88] demonstrated that ambidextrous leadership predicted employee innovation behaviors in small and medium-sized enterprises (SMEs) in the UK. Another study that collected multisource survey data from the employees working for Taiwanese public museums also provided evidence that ambidextrous leadership has a significant effect on employees' innovative behaviors [89]. Accordingly, we may suggest that leaders, especially in public organizations, need to develop a leadership style that combines both directive and participative approaches in relation to their followers, and keeps dynamic capabilities while challenging the shortcomings and rigidities of the status quo at the same time as much as possible. In addition to their role at the individual level, ambidextrous leaders also have an impact on exploratory and exploitative learning in teams and team innovation [90]. They also encourage newcomers to pursue innovation and ease their distressing transition process [91]. However, if the current leadership is not ready to manage this combined and balanced style, the organization can have only one-legged leadership of either opening or closing dimensions. When closing leadership alone may not trigger enough innovativeness, in such a case which may be common in some public organizations, a supportive climate for innovation may constitute a safe haven

that might automatically balance the directive behaviors of the closing leaders. On the other hand, especially in the military settings, even if opening leaders exist for the moment, it is difficult to continue it for the long term since leaders may change rapidly. In order to sustain employees' innovative work behaviors, an already established climate for innovation, where both newer leaders and employees grow together, might be much more instrumental. Therefore, organizations, in either case, need to develop a climate for innovation and should take advantage of this climate to motivate both leaders and employees. In addition, all organizations needing to survive the digital age, but specifically the public ones, should select and develop potential ambidextrous leaders that can manage the balanced way between exploration and exploitation, and display alignment and adaptability to also motivate their employees to be innovative and productive at the same time.

5.3. Limitations and Further Research Implications

Notwithstanding the novel contributions of this study, some limitations need to be considered. First, the data were collected from a multinational military organization. Therefore, the generalization of the results is limited. Although many features of this organization are shared with other public organizations, there might be some differences considering that it is firstly military and secondly multinational. Hence, future research may try to compare these results with those from different public organizations.

Second, to develop a parsimonious conceptual model, we only focused in this study on innovative work behavior and its relationship with ambidextrous leadership along with the moderating effect of climate for innovation. Considering that other important aspects might contribute to investigating this complex concept, other potential factors can be examined as direct drivers or moderators in future studies. Among other factors, organizational size [92], environmental dynamism [68], and structural distance [93] might be moderators that can enhance our knowledge of individual innovativeness and its relationship with ambidextrous leadership.

Third, since all variables were measured by collecting data from single respondents and they rated those variables by themselves, the common method variance might be a concern in our study [81]. To reduce common method bias, we have already taken some precautions such as using established scales to avoid ambiguous items and protecting the anonymity of the respondents [94]. Additionally, we conducted Harman's single-factor test as a statistical remedy. Nevertheless, causal conclusions cannot be drawn based on the current study [95]. Hence, researchers might use longitudinal designs to further understand the nature of innovative work behavior in the future.

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Appendix A. Factor Analysis Results

Items	Factor Loadings			
	OLB	CLB	CI	IWB
OLB1—My leader allows different ways of accomplishing a task	0.819			
OLB2—My leader encourages experimentation with different ideas	0.803			
OLB3—My leader motivates to take risks	0.727			
OLB4—My leader gives possibilities for independent thinking and acting	0.826			
OLB5—My leader gives room for own ideas	0.819			
OLB6—My leader allows errors	0.702			
OLB7—My leader encourages error learning	0.704			
CLB1—My leader monitors and controls goal attainment		0.585		
CLB2—My leader establishes routines		0.739		
CLB3—My leader takes corrective action		0.692		
CLB4—My leader controls adherence to rules		0.810		
CLB5—My leader pays attention to uniform task accomplishment		0.810		
CLB7—My leader sticks to plans		0.705		
CI2—Our ability to function creatively is respected by the leadership			0.596	
CI3—Around here, people are allowed to try to solve the same problems in different ways			0.575	
CI6—This organization can be described as flexible and continually adapting to change			0.645	
CI10—This organization is open and responsive to change			0.733	
CI14—The reward system here encourages innovation			0.749	
CI15—This organization publicly recognizes those who are innovative.			0.720	
CI16—The reward system here benefits mainly those who do not rock the boat			0.548	
CI17—Assistance in developing new ideas is readily available			0.704	
CI18—There are adequate resources devoted to innovation in this organization			0.619	
CI19—There is adequate time available to pursue creative ideas here			0.718	
CI22—This organization gives me free time to pursue creative ideas during the workday			0.619	
IWB1—I create new ideas for improvements				0.798
IWB2—I search out new working methods, techniques, or instruments				0.779
IWB3—I generate original solutions for problems				0.751
IWB4—I mobilize support for innovative ideas				0.767
IWB6—I make important organizational members enthusiastic for innovative ideas				0.725
IWB7—I transform innovative ideas into useful applications				0.801
IWB9—I evaluate the utility of innovative ideas				0.605
Cronbach's Alpha	$\alpha = 0.91$	$\alpha = 0.86$	$\alpha = 0.90$	$\alpha = 0.88$
Eigenvalues	9.567	4.011	2.538	2.337
% of variance explained	30.86	12.94	8.18	7.54
% of total variance explained	59.52			

KMO = 0.91, Barlett's Test of Sphericity = 7655.433 (465) $p < 0.001$ Rotation converged in 5 iterations. Note: Opening leader behavior: OLB; Closing leader behavior: CLB; Climate for innovation: CI; Innovative work behavior: IWB.

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