Trickle-down effect of CEO transformational leadership on employee's innovative work behaviors: Examining the role of managerial innovation behaviors and organizational innovation culture

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ABSTRACT

Despite the theoretical foundation that links Transformational leadership (TFL) with innovation behavior, previous studies have overlooked on Transformational leadership and innovation behavior at the individual level relationship but paid less attention to how transformational leadership qualities of top leaders would advance innovative work behavior within the organizational setting. To date, the impact of Transformational leadership at a top executive level on employee's innovative work behavior (IWB) within an organizational setting has not been dealt with in-depth. However, using transformational leadership theory, this study uncovers the pivotal role of innovation culture (IC) and managerial innovation (MI) in the relationship between CEO transformational leadership and employee's innovation behavior in SMEs. A cross-sectional design with a total of 434 employees from 24 SMEs operating from Rwanda was analyzed using structural equation modelling to evaluate the relationship between the variables developed in the study. The findings of this study support our hypothesized model.

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Introduction

This paper examines the role of supervisory leadership style to subordinate's innovativeness. Employees innovative work behavior have long recognized as an engine for organizational innovativeness. To keep competitiveness and sustainability in today's quick-paced changing business conditions, Khalili, (2016) argued that organizations need to put more efforts into innovativeness. In the same view, Jaiswal & Dhar, (2015), asserted that organizational managers need to address complex problems with innovative solutions to meet the current fast-changing customer demands. However, as innovation is widely considered to be the most important in organizational success, the mechanism by which organizations strengthen innovative work behavior within a corporate setting has not yet been established and not widely understood in the literature. Innovative work behavior within an organizational setting which would be crucial knowledge in managing SMEs of today's highly changing business condition (De Jong & Den Hartog, 2010), still need deeper analysis. In this review, in line with Volberda, Van Den Bosch, & Heij, (2013), managerial innovation should be an internal change agent to make organizational innovations more effective. In the same vein, Dobni mentioned innovation culture as organizational engagement in behaviors that value creativity, risk-taking, freedom, teamwork within the organization. Damanpour, (2014), added that managerial innovations lead to the overall need for organizational change. In the same view, Sattayaraksa & Boon-

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itt, (2016), suggested that organizations should set in an active culture that arouses innovative behavior within the organization. In this regard, this study focused on how organizations promote innovative work behavior within its organizational setting, especially in SMEs, as suggested by Aksoy, (2017), SMEs require more studies and more in-depth analysis due to its importance in national economies and its role on economic growth in many countries and also, how SMEs which mostly suffers from limited resources (Olmos-Peñuela, García-Granero, Castro-Martínez, & D'Este, 2017), cope with the fast-ever-changing market demands. However, this study employed organizational innovation culture and managerial innovation behavior as the possible mediators between CEO TFL and employees innovative work behavior based on TFL theory that links TFL with different innovation outcomes such as innovation culture (Sattayaraksa & Boon-itt, 2016), organizational innovation (Jung, Chow, & Wu, 2003), innovative work behavior (Afsar, Badir, Saeed, & Hafeez, 2016), management innovation (Chang, 2016; Vaccaro, Jansen, Van den Bosch, & Volberda, 2012), and innovation climate (Zuraik & Kelly, 2018).

The new mechanism developed in this study is consistent with several studies that emphasized on the role of both managerial innovation and innovation culture on innovation performance, for examples, an Organizational culture that promotes innovation has been identified as one of a crucial source of innovative behavior. (S. Park & Jo, 2018); Chen & Hou, 2016) Organizations need Innovation culture as multi-dimensional conditions which combine infrastructure, environment, markets orientation, operational level behavior and other supports for organizational innovativeness, (Ali Taha, Sirkova, & Ferencova, 2016). Management needs to be more innovative when defining and implementing the practice, process, structure, and techniques used to achieve overall organizational goals (Birkinshaw, Hamel, & Mol, 2008). Zhongfeng, Chen, & Wang, (2018) argued that managerial innovation optimizes managerial practices that promote technological innovation within an organizational setting and taking advantage of environmental changes.

In another hand, it is well known that CEOs or General managers have the ultimate authority of setting the strategic direction of their organizations (Makri & Scandura, 2010). In line with the TFL theory, the quality of TFL has been strongly linked to different innovation outcomes (Bass, 2000). For examples, Kang, Solomon, & Choi, (2015), suggested that the CEO leadership style upwardly shapes the firm innovative climate. In the same vein, Using the TFL theory, (Chang, 2016), explained how the CEO with TFL behavior could use his/her position to shape managerial innovation within the organization. Henk Wijnze Volberda, Van Den Bosch, & Mihalache, (2014), added that the CEO develops new managerial practices that respond to an environmental change. In line with Wang, Ma, Wang, & Ma, (2013), the influence of innovation culture on employee's innovative work behavior would flourish as employees are likely to engage in more innovative activities when organizational practices and norms encourage them to take the initiative and explore and develop new ideas. In this regard, we believe that a CEO with TFL qualities would create tactics and strategic direction toward innovation culture within an organizational setting. In the same vein, due to the fact that, followers (Managers) consider CEO with TFL qualities as their role model in which they can imitate, (Bass, 2000; Bass, Avolio, Jung, & Berson, 2003), it stands to the reason that, CEO TFL would influence managerial innovation behavior by inspiring innovation behavior among followers (Managers). In line with Aksoy, (2017), innovation culture allows new methods, new approaches, and strategies in the workplace. In the same vein, Birkinshaw et al., (2008); Mol & Birkinshaw, (2014), found a positive relationship between management innovation and organizational novelty. Although, we hope that both innovation culture and managerial innovation behavior would foster employee's IWB within an organizational setting.

Despite the theoretical foundation that links TFL with innovation behavior (Bass et al., 2003; Bass, 2000; Khalili, 2016). Previous works have mainly focused on individual-level relationship outcomes; the role of TFL at the organizational level is not well grounded and still need deeper analysis. In this regard, the current study addresses this issue by advancing the theoretical explanation of the relationship between CEO TFL, organizational innovation culture, managerial innovation behavior and employee's innovative work behavior innovation behavior within a corporate setting. As mentioned in Appendix I, organizational innovation culture and managerial innovation behavior introduced in the model were not used in the previous literature while these two variables are theoretically related with innovative work behavior (Aksoy, 2017; Volberda et al., 2013). However, this study which broadens current knowledge on leadership behavior at the top level and its ability to build an environment that stimulates innovativeness within an organizational setting make three surmountable contributions to existing literature.

First, most of the previous research has overlooked the impact of TFL on different innovation outcomes at individual-level perspectives. The influence of CEO TFL on innovation behavior which would flow from top executive to the lowest level in the organization setting has been neglected. However, this study sheds new light on how CEO TFL behavior creates a strong innovation culture within an organizational setting and stimulate managerial innovation behavior among followers (managers) which in turn foster employees' innovative work behavior within an organizational system. Second, based on TFL theory, extant literature link innovation culture with different innovation behavior within an organization, for examples, positive perception of innovation culture encourages employees to perform creatively (Kang et al., 2015; Panuwatwanich, Stewart, & Mohamed, 2008). According to Jolles, McBeath, Carnochan, & Austin, (2016), an environment that supports innovation provide adequate approaches to cherish new ideas in the workplace, like innovation-based teams, brainstorming, and work time. Damanpour, (2014), suggested that management innovation would flourish if the organization facilitate an abandonment from traditional managerial principles, processes, and practices and create a new managerial way that foster performance. Therefore, previous studies paid less attention to the influence of innovation culture to managerial innovation behavior within the organization. However, this model unveils the role of an organizational innovation culture to managerial innovation behavior which in turn diffuse innovative work behavior within an

organizational system. Third, this study is responding to some calls for further investigations, for examples, Zhongfeng et al., (2018), suggested further research on managerial innovation with other variables, (Afsar et al., 2014), recommended further study on transformational leadership on multiple levels of the organization. Khalili, (2016), proposed more studies on the leadership-innovation relationship.

Literature review

Theoretical background

CEO Transformational leadership

The theoretical foundation of this study is based on the Transformational leadership theory (Bass, 2000). The concept of transformational leadership was first introduced by James MacGregor Burns in 1978. According to Burns, TFL is a process where

"leaders and followers help each other to advance to a higher level of morale and motivation, creating a vision to guide the change through inspiration, and executing the change in tandem with committed members of a group" (Bass, 2000).

In 1985, this concept was extended by Bernard M. Bass by underlying the psychological mechanism that describes and justify transformational and transactional leadership (Bass & Avolio, 1990). This widely studied theory has been linked to different follower outcomes. Based on TFL theory, in recent years there have been significant studies that link TFL and different follower outcomes, using some examples, transformational leaders express high expectations and resoluteness in followers' capabilities (Jung, Bass, & Sosik, 1995). Afsar, Badir, & Khan, (2015), added that Transformational leaders encourage people to initiate more innovative behavior. In the same view, TFL with its essential qualities such as inspirational, intellectual stimulation and the challenging process has been linked to innovation behavior of the followers (Bass & Avolio, 1990; De Jong & Den Hartog, 2007). However, within this framework, it is evidenced that, CEO with TFL behavior value innovation and influence innovation behavior in the workplace (Jung et al., 1995). This study is consistent with several studies that linked organizational level TFL with different outcomes for examples, Makri & Scandura, (2010), examined two dimensions of CEO leadership with innovation, Sattayaraksa & Boon-itt, (2016), found relationship between CEO TFL and product innovation performance, Kang et al., (2015), examined the relationship between CEO transformational vs. transactional leadership and innovation behavior of managers. Peterson, Walumbwa, Byron, & Myrowitz, (2009), examined CEO TFL and firm performance Waldman, Siegel, & Javidan, (2006) found a relationship between CEO TFL and CSR.

Organizational innovation culture

Innovation culture is the work environment that leaders cultivate in order to nurture nonconformist thinking and its application which embrace a multi-faceted approach to innovation (Stempfle, 2011; Martins, Martins, & Terblanche, 2004). Workplaces that foster a culture of innovation generally subscribe to the belief that innovation is not the province of top leadership but can come from anyone in the organization (Harbi, Anderson, & Amamou, 2014; Dobni, 2008). Aksoy, (2017), defined innovation culture as a strategic mechanism to enhance performance and promote organizational innovativeness. Ali Taha et al., (2016), added that innovation culture is a kind of socializing process consisting structures, politics, practices, procedures and day-to-day activities that facilitate creativity and innovation within the organization. Linke & Zeffass, (2011), explained innovation culture as managerial practices of introducing and communication innovation into a business philosophy and trace each step from philosophy to action. In this line, innovation as a dynamic social process does not take place in a vacuum; it needs a good working environment that favors innovative activities (Chen & Hou, 2016). Dobni, (2008), mentioned innovation culture as organizational engagement in behaviors that value creativity, risk-taking, freedom, teamwork within the organization. Several studies linked innovation culture with different organizational outcomes for examples, the culture of innovation contributes to firm performance, (Harbi et al., 2014). Sattayaraksa & Boon-itt, (2016), suggested that organizations should set in a strong culture that arouses innovative behavior within the organization.

Managerial innovation behavior

Management innovation refers to the invention and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals (Birkinshaw et al., 2008). Volberda et al., (2014), defined managerial innovation as an introduction to the new administrative system, processes, and practices to uplift overall organizational goals. Hamel, (2006), identified some fundamental tasks of managers that can foster organizational innovation, such as developing and nurturing relationships among employees, bringing in and applying knowledge, Coordinating and controlling activities and allocating resources. Managers as decision-makers, they can change managerial principles, process and practices to enhance organizational performance (Damanpour, 2014). Management innovation involves the introduction of novelty in the organisation, and as such it represents a particular form of organizational change (Mol & Birkinshaw, 2014; Birkinshaw et al., 2008; Gashema & Gao, 2018). In this view, Zhongfeng et al., (2018) argued that managerial innovation optimizes managerial practices that promote technological innovation within an organizational setting and taking advantage of environmental changes. Managerial innovation is about how managers make changes regarding the decision-making process, coordination of activities and employee motivation in the workplace (Vaccaro et al., 2012). Zhongfeng et al., (2018), mentioned that, among two important types of innovation in an organization, namely; managerial innovation and technological innovation, previous studies focused widely on technological innovation and pay less attention to managerial innovation while it has a surmountable impact on overall changes in the organization. The construct of Management innovation has widely investigated in previous studies in relation with organizational outcomes, for

examples, Birkinshaw et al., (2008); Mol & Birkinshaw, (2014), found a positive relationship between management innovation and organizational novelty. Managerial innovation plays a pivotal role in organizational competitive advantage (Volberda, Van Den Bosch, & Mihalache, 2014b). Hollen, Van Den Bosch, & Volberda, (2013), found a relationship between management innovation and technological innovation process. According to Damanpour & Aravind, (2012), to attain organizational goals, managers with managerial innovation behaviors need to promote new administrative systems, processes, structures, practices, and techniques. In the same view, Nieves, (2016), argued that managerial innovation creates an environment to stimulate innovative activities within the organization.

Innovative work behavior

The concept of 'Innovative Work Behavior' was first introduced by Scott & Bruce, (1994). Since that time, much work on the potential of IWB has been carried out. Several studies have been published on this concept. This has led authors such as Janssen, (2000) to investigate the relationship between IWB, HR fair practices and performance. In his study, IWB is fully explained as the intentional creation, introduction, and application of new ideas within a work role, group or organization (Janssen, 2004). Several authors have defined IWB in different perspectives. For examples, Innovative work behavior refers to all employee behavior aimed at the generation, introduction and /or application of ideas, processes, products or procedures, new and intended to benefit the relevant unit of adoption " (Wojtczuk & Dariusz Turek, 2015; Khalili, 2016; Afsar et al., 2015; Agarwal, 2014b). De Jong & Den Hartog, (2010) defined innovative work behavior as an intentional introduction of new and useful ideas, processes, products or procedures within a workplace. Contreras, Espinosa, Dornberger, Angel, & Acosta, (2017), added that IWB is an employee's enthusiasm toward the generation and implementation of the new idea, product development process, and methods. Agarwal, 2014), explained IWB as an intentional introduction and implementation of a new idea within a work role in the organization for the benefit of role performance. Wojtczuk & Dariusz, (2015) added that IWB shows the employee's individual qualities of attempting new methods and new approaches aimed at generation and advancement of new ideas within a work role. According to Khodakarami & Zakaria, (2015), innovative work behavior starts when an individual identifies and handle the issue at hand in the new and improved ways. Scott & Bruce, (1994) added that individual with innovative work behaviors is expected to be involved in any sequential multi-stage process of organizational innovation. In the same view, employees with innovative work behaviors identify the work-based problem and develop new idea and solutions for that particular problem (Taştan & Davoudi, 2015). Park, Song, Yoon, & Kim, (2014), listed intrinsic motivation, psychological resilience and self-fulfillment behaviors as main components of innovative work behavior. In the table below; we tried to identify the previous studies in the area of transformational leadership and employees innovation behavior (studies that link TFL and EWB only) and the mechanisms used to measure the relationship of these two variables. Although , organisational level mechanisms that link transformational leadership and innovation behavior of employees are still missing in the literature.

Table 1: Existing literature on transformational leadership and innovative work behavior

Selected studies	Independent variable	Dependent variable	Mediator (s)	Moderator	Journal
Paulsen et al.,2013	Transformational leadership	Innovation	Identification with team/ Support for creativity	-	Journal of Organizational Change Management
Voice et al.,2016	Effects of Transformational Leadership on	Individual and Team Innovation	Task interdependence	-	Group& Organization Management
Masood et al.,2013	Transformational Leadership	Organizational Innovation	Organizational Learning and self-efficacy	-	World Applied Sciences Journal
Bouke Kroes.,2015	Transformational leadership	Innovative work behavior		Perceived Organizational Support	Master thesis/Tilburg university
Bilal et al., 2014	Transformational leadership	Innovative work behavior	psychological empowerment	self-construal	Industrial Management & Data Systems
Suk et al.,2016	transformational leadership	Innovative work behavior	Knowledge sharing positively	Organizational support	Personnel Review
Ashkan Khalili,2016	Transformational leadership	employees' creativity and innovation	-	supportive climate for innovation/supportive climate	Management Decision
Hyeung et al.,2015	CEO transformational/transactional leadership	Manager's innovative work behavior	Innovative climate	-	Journal of Management Studies
Contreras et al., 2017	transformational/ transactional leadership	Innovative Work Behavior	organizational Climate/ Organizational Absorptive Capacity	Employee Work Engagement	Asian Social Science

Source: Authors (2018)

Hypothesis development

CEO transformational leadership and organizational innovation culture

Based on TFL theory, several studies found a link between CEO TFL and organizational innovation culture, for examples, CEO's TFL enhances innovation competence by building a climate that favors innovation behavior (Zuraik & Kelly, 2018). In this context, we believe that CEO TFL is more impactful for innovation, (Peterson et al., 2009; Waldman et al., 2006). In line with Kang et al., (2015), an effective CEO can create a situational a context that motivates their followers to engage in the innovative behavior. In the same view, Sattayaraksa & Boon-itt, (2016), assert that CEOs can influence social interaction within organizations which promotes a culture of innovation. CEO as the highest-ranking executive in the organization would create opportunities for new knowledge, knowledge sharing, and innovations within an organizational setting. Thus, the study states the hypothesis as follows:

H1: *CEO transformational leadership influence organizational innovation culture.*

CEO transformational leadership and managerial innovation behavior

According to Bass & Avolio, (1990), TFL makes followers handle issues using their ways. TFL intellectually stimulate followers to reframe challenges and approach old circumstances in entirely new ways (Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008). In the same vein, TFL creates self-confidence for employees, (Zuraik & Kelly, 2018). However, with such extensive theoretical evidence, TFL always attempts to raise followers needs and promote dramatic changes, and support for risk-taking behavior (Bass et al., 2003). Thus, the study states the hypothesis as follows:

H2: *CEO transformational leadership influence managerial innovation behavior*

Organizational innovation culture and managerial innovation

Based on TFL theory, extant literature link innovation culture with different innovation behavior within an organization, for examples, positive perception of innovation culture encourages employees to perform creatively (Kang et al., 2015; Panuwatwanich et al., 2008). In line with TFL theory, we believe that CEO with TFL qualities would build an environment that supports innovation within the organization which in turn promote managerial innovation behavior within an organizational setting. According to Jolles et al., (2016), an environment that supports innovation provide adequate strategies that nurture and encourage new ideas within organizational practices, such as building a team for innovation, favoring brainstorming culture and flexible work time. Damanpour, (2014), suggested that management innovation would flourish if the organization facilitate an exit from old managerial principles, processes, and methods and create a new managerial way that foster performance. In the same view, Aksoy, (2017), indicated that innovation culture allows new methods, new approaches, and strategies in the workplace. However, as commonly discussed, it stands to the reason that, when innovation culture is established, managers will develop new management practices, processes, and structures within the organization (Volberda et al., 2014b). In line with Dobni, (2008); we suggest that innovation culture create an appropriate environment to stimulate innovative activities in the workplace which in another hand trigger managerial innovation behavior such as new managerial processes, practices, or structures within an organizational setting. We thus state the following hypothesis:

H3: *Organizational innovation culture positively influences managerial innovation behavior*

Organizational innovation culture and employee's innovative work behavior

As indicated by Linke & Zeffass, (2011), innovation culture facilitates internal communication and knowledge sharing within the organization. In line with this view, we hope that organizational innovation culture would favor innovation behavior among employees. While individuals display more innovation behavior in an environment that has freedom at work (Shanker, Bhanugopan, van der Heijden, & Farrell, 2017), organizational culture for innovation set to become a vital factor in shaping a corporate environment that supports employee's innovation behavior. According to Hartmann, (2006), organizational culture facilitates interaction and learning behavior among individuals within the organization; in this regard, interaction and knowledge sharing would lead to innovative work behavior. Under organizational innovation culture, efforts and creativities are encouraged and rewarded (Panuwatwanich et al., 2008); thus, within such an atmosphere, employees are likely to display more innovative work behavior. In line with several studies in the literature, for examples, innovation culture leads to organizational performance (Padilha & Gomes, 2016), innovation culture fosters organizational innovativeness (Harbi et al., 2014), innovation culture facilitates product development (Sattayaraksa & Boon-itt, 2016), innovation culture break resistance to change (Terziovski, 2010), we thus state the following hypothesis:

H4: *Organizational innovation culture positively influences innovative work behavior among employees*

Managerial innovation behavior and employee's innovative work behavior

Managerial innovation which refer to the introduction of new managerial process and practices to achieve overall organizational goals (Volberda et al., 2013), Damanpour & Aravind, (2012) stated that managerial innovation develops a strategic renewal and organizational change, in this regard, innovative work behavior among employees would be supported in facilitating such needed organizational change. In the same view, when managerial innovation is reinforced, it can change the nature of organizational work (Vaccaro et al., 2012). Under the climate of managerial innovation behavior, real capital and material goods are supplied to facilitate

technological process innovation (Damanpour & Aravind, 2012). As an internal agent of change, management can shape organizations to be more innovative, (Volberda et al., 2013). According to Volberda et al., (2014b), management innovation promotes the generation, diffusion, and adaptation of new ideas. However, managers as day-to-day decisions makers within the organization (Hollen et al., 2013), it stands to the reasons that, employees under managerial innovation behavior would display more innovative work behavior since such behavior is encouraged and supported. We thus state the following hypothesis:

H5: *Managerial innovation behavior positively influence employee's innovative work behavior*

Figure 1: *Conceptual model*

Research and Methodology

This section presents the specific procedures and techniques used to process and analyze the information under investigation which allows the authors to evaluate the validity and reliability of this study. This research methodology is also employed to test the hypotheses developed in this study.

Sample and procedure of data collection

To test the hypotheses proposed in this study, we used a cross-sectional design with a total of 434 employees from 24 SMEs randomly selected from Rwanda development board (RDB). After being permitted by the general managers of sampled SMEs, the HR office of each company provided a list of managers who were fully available during the study. Due to the small size of the organizational structure in SMEs, most of them frequently work directly with general managers in the companies. To minimize potential common method bias, we distributed a survey questionnaire to the respondents in two phases. In the first phase, 464 copies of survey questionnaire were distributed, rating CEO TFL and organizational innovation culture within their organizations. In 60 days later, we distributed 464 copies of the survey questionnaire to the same respondents, rating their managerial innovation behavior and innovative work behavior of their followers (employees). After matching the time-lag of data collection, we found that a total of 446 questionnaires for both phases was completed and returned. (96% of response rate). After data screening, we found some copies of the survey were looking untrustworthy, such as providing the same answer for all items and also some copies were missing complete information. In this regard, 12 survey questionnaires dropped which resulted in 434 fully completed questionnaires about 93% of the total response rate.

Measurement

All hypothesis was tested using multi-item scales adopted from prior studies in the literature. Apart from the identification of firm age and firm size, all other items were measured on a seven-point Likert-type scale where (1) never to (7) all the time for innovative work behavior and (1) strongly disagree to (7) strongly agree for remaining variables. *CEO transformational leadership*: We used Global transformational leadership scale (GTL) developed by Carless, Wearing, & Mann, (2000), which has shown a high degree of convergent validity in relation to other scales (Ghadi, Fernando, & Caputi, 2012) and its quick and easy to administer (Şahin, Sait Gürbüz, 2017 ;Carless et al., 2000). A sample item was “My supervisor/manager gives encouragement and recognition to staff.” *Managerial innovation*. We used six items adopted by Zhongfeng et al., (2018), measuring capabilities of integrating logistics system, human resource management, financial management, cost control, marketing, and forecasting accuracies on returns and profits (Birkinshaw et al., 2008; Hamel, 2006). A sample item was “We regularly make changes to our employees’ tasks and functions.” *Organizational Innovation culture*: We used a short measure of 6 items adopted by Terziovski, (2010); Sattayaraksa & Boon-it, 2016). A sample item was “Our culture encourages employees to share knowledge.” *Innovative work behavior*: This study used five-items from the scale of six items originally developed by Scott & Bruce, (1994). A sample item was “Employee generates creative ideas.”

Control variables: As our study focused on multiple analysis, Jung et al., (2003), suggested controlling firm age (years of its establishment) and firm size (number of full-time employees). In this regard, to rule out the alternative effects of these variables, we controlled firm age as it may affect its innovation culture due to the fact that at early-stage company may face challenges of limited

resources and firm size because it may influence innovation due to the fact that innovation behavior might be more and easily observed in bigger firms than small firms (Kang et al., 2015). *Common Method Variance*: As the data used in this study was collected using the same sample, common method bias was tested using two widely adopted approaches namely; Harman's one-factor suggested by Organ & Kovovsky, (1989) and variance inflation factor (VIF) indicated by Kock & Lynn, (2012). The results from the two tests revealed that there was no common method bias in this study. Harman's one-factor results indicated that the first factor explained 35.7% which is below the cut-off of 50% recommended. Variance inflation factor (VIF) results suggested that all variables in the study were below 3.3 recommend

Findings

Procedures for Data Analysis

As suggested by Anderson & Gerbing, (1988), a confirmatory factor analysis (CFA) and a reliability analysis were conducted in a two-step modeling approach using AMOS a version 23. In step one, we conducted the Confirmatory Factor Analysis (CFA) for the constructs to examine the measurement validity of the constructs. In step two, we conducted CFA to test the relationship among all variables in the model (i.e., Structural modeling). To test the hypothesis in the study, we used a bootstrapping technique developed by Hayes, (2009) using both Amos 23 and SPSS 24. This is an emerging approach evidenced to be a more valid and impressive method which does not require the assumption of normality (Fairchild & MacKinnon, 2009; Hayes, 2009).

First step: Assessment of measurement model: In this step, we used Amos 23 to conduct Confirmatory factor analysis (CFA) for each construct in the model. We adopted two types of indices which include; absolute fit indices and incremental fit indices suggested by Hu & Bentler, (1998). Among the fit indices, we used widely adopted fit indices namely; χ^2/df , instead of χ^2 Since it is susceptible to sample size, (Shah & Goldstein, 2006), the value should be less than 3.00 (Hair, Black, Babin, & Anderson, 2010). Root Mean Square Error of Approximation (RMSEA), Standardized Root-Mean-Square Residual (SRMR), with value at least equal or below 0.08 (Hu & Bentler, 1998). We also used the Tucker-Lewis Index (TLI) and comparative-fit index (CFI), which recommended cut-off is equal to or above 0.90 (Hu & Bentler, 1998; Hair et al., 2010). As recommended by Fornell & Larcker, (1981), to assess the convergent validity of the measures, we used confirmatory factor analysis (CFA), to examine composite reliability (CR) and average variance extracted (AVE) (Fornell & Larcker, 1981). In this study, we have also computed Cronbach alpha, (Cronbach, 1951), using SPSS a version 24. As provided in Table I, the CFA results indicate that all constructs fit well in the data according to fit indices considered (see table I). this results also presented inTable I, show that AVE, CR and Cronbach alpha are within recommended ranges. (i.e. AVE>0.50, CR>0.70 & α >0.60). (Cronbach, 1951;Fornell & Larcker, 1981).

Table 2: Validity and reliability of the constructs

Constructs	Items	Loadings	α	CR	AVE	χ^2/df	TLI	CFI	SRMR	RMSEA
CEO TFL	TFL1	0.68	0.87	0.85	0.50	0.296	0.97	0.99	0.02	0.06
	TFL2	0.72								
	TFL3	0.66								
	TFL4	0.65								
	TFL5	0.77								
	TFL6	0.80								
	TFL7	0.63								
MI	MI1	0.69	0.88	0.56	0.51	1.86	0.99	0.99	<0.01	0.04
	MI2	0.75								
	MI3	0.71								
	MI4	0.78								
	MI5	0.78								
	MI6	0.78								
IC	IC1	0.77	0.88	0.55	0.50	2.91	0.99	0.99	0.02	0.06
	IC2	0.71								
	IC3	0.70								
	IC4	0.80								
	IC5	0.64								
	IC6	0.83								
IWB	IWB1	0.71	0.89	0.63	0.69	1.91	1.000	1.000	<0.05	<0.01
	IWB2	0.74								
	IWB3	0.74								
	IWB4	0.90								
	IWB5	0.85								

CEO TFL= CEO transformational leadership, MI= managerial innovation

IC= Innovation culture, IWB= Innovative work behavior, α = Cronbach alfa

Second step: Structural model assessment: In this step, we tested our baseline model of four constructs namely; CEO transformational leadership, managerial innovation, innovation culture and innovative work behavior in comparison with other two alternative models to find out which model has adequate fit, (Peterson et al., 2009). As indicated in Table II, the CFA results suggested that our hypothesized (baseline) model show adequate to fit in data comparing with alternative models.

Table 3: CFA results, Comparison of the alternative models

Models	χ^2	$\Delta \chi^2$	x2/df	TLI	CFI	SRMR	RMSEA
Baseline (****)	686.567	-	2.934	0.92	0.94	0.05	0.06
3 constructs model (***)	733.985	47.418	4.926	0.85	0.87	0.06	0.09
1 construct model (*)	1836.945	1,102.96	7.952	0.69	0.74	0.11	0.12

****= Transformational leadership, Innovation culture, managerial innovation, and innovative work behavior were merged

***= Transformational leadership, managerial innovation, and innovation culture were combined

*= all factors were merged

Hypotheses testing

Beside the CFA results suggested the adequate fit of our baseline model, (see, table II, $\chi^2=686.5$, $df=234$, $x^2/df=2.934$, $TLI=0.92$, $CFI=0.94$, $SRMR=0.05$ & $RMSEA=0.06$), descriptive and inferential statistical tools were used to analyze the correlations among variables (i.e., mean and standard deviations), in order to test the hypotheses of this study. The results suggest that the relationship between all four hypotheses in the study were adequately supported. (see, Table III.). Using examples, CEO TFL positively and significantly related to innovation culture ($r=0.36$; $p < 0.01$). Thus, Hypothesis one is supported. In the same results, CEO transformational leadership showed a positive relationship with managerial innovation ($r=0.43$; $p < 0.01$). This means that Hypothesis two is supported. The same results also showed that innovation culture is significantly and positively related to managerial innovation ($r=0.60$; $p < 0.01$). in this regard, Hypothesis three is supported. These results also suggest that innovation culture positively and significantly related to innovative work behavior ($r=0.44$; $p < 0.01$). Thus, Hypothesis four is supported. Finally, these results indicated that managerial innovation positively and significantly correlates with innovative work behavior ($r=0.44$; $p < 0.01$). Thus, Hypothesis five is supported.

Table 4: Descriptive statistics and inter-correlations

	M	SD	1	2	3	4	5	6
1 Firm age	2.36	0.572	1.00					
2 Firm size	1.39	0.48	.57**	1.00				
3 CEO TFL	27.4	13.2	.47**	.50**	1.00			
4 MI	26.1	12.5	.34**	.26**	.43**	1.00		
5 IC	28.6	12.2	.34**	.19**	.36**	.60**	1.00	
6 IWB	23.2	10.8	.11*	0.04	.17**	.44**	.44**	1.00

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

N=434

Mediation analysis

As indicated in the study, innovation culture and managerial innovation are hypothesized to mediate the relationship between CEO TFL and employee's innovative work behavior within an organizational setting. It is however in this regard that we adopted bootstrapping techniques using Haye's Process Macro developed by Hayes, (2009), to deeply measure the potential effect of mediation proposed in the model. We adopted this emerging approach due to its efficacy as evidenced in the literature. According to (Hayes, 2009; Fairchild & MacKinnon, 2009), this approach can provide all necessary information for analysis. Using Haye's Process Macro in SPSS 24, we conducted a bootstrapping procedure with 5000 resample. As recommended by Hayes, (2009), we tested three main paths in the structural model to confirm whether there is mediation or non-mediation in the hypothesized model.

As indicated in the Hayes bootstrapping matrix (see table IV), the results show that the relationship between CEO TFL and managerial innovation (path-a, $X \rightarrow M$, β_{mx}) is positively significant (i.e., $\beta = .41$, $t(432) = 9.9$, $p < 0.01$). In the same view, the relationship between CEO TFL and innovation culture (path-a, $X \rightarrow M$, β_{mx}) is also positive and significant (i.e. $\beta = .33$, $t(432) = 8$, $p < 0.01$). The same data also revealed that the relationship between managerial innovation and IWB (path-b, $M \rightarrow Y$, β_{ym}) is significant (= .26, $t(430) = 5.4$, $p < 0.01$) and the relationship between innovation culture and IWB (path-b, $M \rightarrow Y$, β_{ym}) also positive and significant (i.e. $b = .25$, $t(430) = 5.4$, $p < 0.01$). The direct effect of CEO TFL and IWB (path-c, $X \rightarrow Y$, β_{yx}) is very week (i.e. $\beta = .14.2$, $t(432) =$

16.2, $p < 0.05$). In the same data, the effect of CEO TFL to IWB through mediation (path-c', $X \rightarrow M \rightarrow Y$.) was not significant when mediators were included in the model ($\beta = -.04$, $t(430) = -1.2$, $p = .20$). Thus, in line with Mathieu & Taylor, (2006); Cheung & Lau, (2008), since path a and b are both significant and based on the no significance of path c & c' , the relationship between IV and DV is only significant with the introduction of mediating variables. In this regard, the full mediation of organizational innovation culture and managerial innovation behavior in this model is confirmed and supported.

Table 5: Path analysis CEO TFL and Managerial innovation

Paths	Predictions
CEO TFL $\rightarrow$ MI (path-a)	a. $F(1,432) = 99.5$, $p = p < 0.01$, $R^2 = .1873$ b. $b = .41$, $t(432) = 9.9$, $p = p < 0.01$
CEO TFL $\rightarrow$ MI $\rightarrow$ IWB (path-b-c')	a. $F(3,430) = 47.7$, $p = p < 0.01$, $R^2 = .25$ i. $b = .26$, $t(430) = 5.4$, $p < 0.01$ ($M \rightarrow Y$, path-b) ii. $b = -.04$, $t(430) = -1.2$, $p = .20$ ($X \rightarrow Y$, path-c')
CEO TFL $\rightarrow$ IWB (path-c)	a. $F = (432) = 13.3$, $p = p < 0.05$, $R^2 = .03$ b. $b = .14.2$, $t(432) = 16.2$, $p < 0.05$

CEO TFL: CEO transformational leadership

MI= Managerial innovation

IWB= Innovative work behavior

Table 6: Path analysis CEO TFL and Innovation culture

Paths	Predictions
CEO TFL $\rightarrow$ IC (path-a)	a. $F(1,432) = 64$, $p = p < 0.01$, $R^2 = .1291$ b. $b = .33$, $t(432) = 8$, $p = p < 0.01$
CEO TFL $\rightarrow$ IC $\rightarrow$ IWB (path-b-c')	a. $F(3,430) = 47.7$, $p = p < 0.01$, $R^2 = .25$ i. $b = .25$, $t(430) = 5.4$, $p < 0.01$ ($M \rightarrow Y$, path-b) ii. $b = -.04$, $t(430) = -1.2$, $p = .20$ ($X \rightarrow Y$, path-c')
CEO TFL $\rightarrow$ IWB (path-c)	a. $F = (432) = 13.3$, $p = p < 0.05$, $R^2 = .03$ b. $b = .14.2$, $t(432) = 16.2$, $p < 0.05$

IC= Innovation culture

Furthermore, the fact that zero does not lie in between 95% confidence intervals (table VI, VII), the mediating role of an innovation culture and managerial innovation in the model is also supported.

Table 7: Outcome variable of Innovative work behavior (Predictions of DV)

Constructs	Coeff.	SE	t	LLCI/95%	ULCI/95%
TFL	-.0486 (ns)	.0386	-1.2598	-.1244	.0272
MI	.2578 (***)	.0472	5.4607	.1650	.3506
IC	.2543 (***)	.0467	5.4479	.1625	.3460

***= $p < 0.001$, ns= not significant

Table 8: Indirect effect of CEO TFL on IWB

Effect	BootSE	BootLLCI	BootULCI
Total	.1914	.0247	.2419
MI	.1063	.0223	.1537
IC	.0851	.0199	.1262

Discussion

The primary objective of this study was to extend the current knowledge about the role of the top-level organizational leadership in strengthening innovative work behavior within an organizational setting. To introduce the new mechanism that underlies the relationship between CEO TFL and employee's innovative behavior, we employed the mediation effect of an organizational innovation culture and managerial innovation behavior in this relationship. As hypothesized in the study, the findings revealed that CEO TFL was positively associated with both organizational culture ($r = 0.36$; $p < 0.01$) and managerial innovation behavior ($r = 0.43$;

$p < 0.01$). Hence, H1 & 2 were supported. This supported relationship is also consistent with the TFL theory; for example, Bass used the TFL theory to explain the relationship between transformational leaders and organizational effectiveness and commitment. Leaders with TFL behavior stimulate follower's efforts to be innovative (Bass et al., 2003). According to Vaccaro et al., (2012), top leaders in the organization can influence managerial innovation. The findings also supported the relationship between managerial innovation and organizational innovation culture ($r=0.60$; $p < 0.01$). Thus, H3 was supported.

Organizational innovation culture and different innovation outcomes have received much attention in the literature, for examples, Aksoy, (2017), found the relationship between innovation culture and product innovation in SMEs. According to Dobni, (2008), organizational innovation culture lead to performance outcomes. However, managers under an organizational culture that support innovation would display more innovative behavior since they feel supported by their organizations. In the same view, the findings revealed that both organizational innovation culture and managerial innovation behaviors positively related to employee's innovative work behavior ($r=0.44$; $p < 0.01$, both results), thus H4 & 5 are both supported. However, in line with (Hamel, 2006; Damanpour & Aravind, 2012), we hope that managerial innovation would be a vital factor for organizational change. Jolles et al., (2016), also added that managerial innovation plays a pivotal role in promoting innovative work. In this regard, it stands to the reason that CEO with FFL qualities influence innovative work behavior within an organizational setting in two ways, creating a strong culture that supports innovation (Sattayaraksa & Boon-itt, 2016) and stimulates followers (managers) to be innovative (Jung et al., 1995) which foster employee's innovative work behavior in the organization.

Implications

The foundation of this study is based on TFL theory that firstly introduced by James MacGregor Burns in 1978 (Bass et al., 2003) and later extended by Bernard M. Bass in 1985 (Bass & Avolio, 1990). TFL behavior has been well-documented in relation with different organizational outcomes, such as creativity, innovation behavior, product development and performance (Peterson et al., 2009; Waldman et al., 2006; Sattayaraksa & Boon-itt, 2016; De Jong & Den Hartog, 2007; Afsar et al., 2014). However, despite extant literature on TFL, the role of TFL at the top executive level of the organization in lighting innovative work behavior within an organizational setting is not yet known. Previous studies have overlooked TFL and innovation behavior at the individual level relationship but paid less attention to how TFL qualities of top leaders would advance innovative work behavior within the whole organizational system. In this regard, given the fact that transformational leaders fuel innovation behavior (Afsar et al., 2014; Kang et al., 2015; Choi, Kim, Ullah, & Kang, 2016), we believe that TFL at top management level is set to become a vital factor in engaging organization to innovation culture and influencing innovation behavior of managers (followers) which further builds innovative work behavior within an organizational setting. This relationship which has not yet been established in the literature, is consistent with the study by Jung et al., (1995), that link this leadership style with culture, (Jung et al., 2003) that link TFL with organizational innovation, (Khalili, 2016) that link TFL with the climate for innovation. Therefore, within this framework, this study extends the current knowledge by employing innovation culture and managerial innovation behavior in the mechanism in which TFL at the top managerial level build innovative work behavior within an organizational setting. Our model which introduce innovation culture and managerial innovation behavior in the relationship between CEO TFL and employee's innovative work behavior, add more understanding in managerial perspective in different ways.

Knowledge is cumulative; every piece of study adds another part to it. However, within the framework of the theoretical and conceptual relationship between leadership and organizational outcomes, this study makes a valuable contribution by broadening the current understanding of leadership and its strength in shaping organizational behavior, such that TFL at top organizational level increase innovation outcomes within an organizational setting. Another implication of this study is that previous studies have mostly focused on innovation within large organizations; innovation in SMEs is not well-grounded in the literature and need more studies (Aksoy, 2017). However, this paper sheds new light on the role and practices of TFL at the top level of SMEs in advancing innovative work behavior which would be a vital factor of SMEs survival in current rapidly changing customer tastes. Since SMEs mostly suffer from limited resources (Olmos-Peñuela et al., 2017; Aksoy, 2017), differentiation would be an alternative way for SMEs to penetrate in today's competitive market. In this regard, this study brings a new look at how leaders in SMEs would overcome the competition challenges by undertaking and strengthen innovative work behavior within their organizational setting.

Conclusions

The objective of this study was to examine the relationship between CEO TFL and innovative work behavior, using mediation effect of an organizational innovation culture and managerial innovation behavior in this relationship. The overall findings of this study support our hypothesized model. However, with this new mechanism in the literature, we believe that this study extends the current understanding of the potential influence of top leaders on organizational innovation outcomes. In responding to call for a further study by Aksoy, (2017), suggesting research on the role of managers in building an innovation culture that supports marketing and product development in SMEs, this study provides more in-depth analysis on the role managers in developing a strong culture of innovation which in turn lead to innovative work behavior among employees in SMEs. In the same vein, studying more on managerial innovation especially in SMEs which has a high impact on national and global economies, would extend the current knowledge about innovation at management level, especially the extent of managerial innovation practices in SMEs with limited resources (Olmos-Peñuela et al., 2017).

Despite its contribution to the current literature, this study has several limitations. First, this study collected data from SMEs operating in Rwanda. However, we can propose replication of similar studies in other countries to avoid possible generalizability of the findings. Second, most studies in the literature overlooked in large organizations; however, we do suggest more studies examining leadership and other related organizational outcomes in SMEs. Third, our study focused on managerial innovation behavior in relation with innovative work behavior, while research on managerial innovation is still in its early stage (Damanpour & Aravind, 2012), managerial innovation may have several outcomes in organizations. However, we do suggest further studies to extend managerial innovations and their potential outcomes within the organization.

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