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Alisher Tohirovich Dedahanov, Changjoon Rhee, Junghyun Yoon,

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Organizational structure and innovation performance

Is employee innovative behavior a missing link?

Alisher Tohirovich Dedahanov

School of Business, Yeungnam University, Gyeongsan, Korea

Changjoon Rhee

Independent Researcher, Daegu, Korea, and

Junghyun Yoon

College of Management, Dongguk University, Gyeongju, Korea

Abstract

Purpose – The purpose of this paper is to investigate the mediating role of innovative behavior on the relationships between organizational structure, such as centralization, formalization, integration, and organizational innovation performance.

Design/methodology/approach – The authors collected data from 140 functional managers of manufacturing organizations in the Republic of Korea. The authors used structural equation modeling procedure to evaluate the validity of proposed hypotheses.

Findings – The results suggest that innovative behavior mediates the links among centralization, formalization, and organizational innovation performance. However, the findings indicate that innovative behavior does not mediate the relationship between integration and organizational innovation performance.

Originality/value – This work is the first to examine the mediating role of innovative behavior on the associations among centralization, integration, and organizational innovation performance.

Keywords Integration, Innovative behaviour, Innovation performance, Formalization, Centralization

Paper type Research paper

Introduction

Organizational innovation is an underlying factor that assists companies to survive in a rapidly changing world (Pundt *et al.*, 2010) and it is perceived to be one of the means of achieving organizational success and competitiveness (Jafri, 2010) because it helps organizations outperform competitors, excite customers, and build new product portfolios (Cingoz and Akdogan, 2011). Thus, today's organizations require more creative and novel ideas from employees who can contribute to innovation performance. We believe that it is not just organizations that benefit from employees' innovative behavior but employees also benefit from their own innovativeness. Individuals engaging in creative activities have the chance to develop their competencies and task mastery (Amabile, 1996). What is more, individuals who display innovative behavior are more likely to receive rewards for their innovativeness and to be promoted (Kim *et al.*, 2009). Moreover, the innovativeness of employees influences their social networking and social status (Greenberger and Strasser, 1986). Because there is a high demand for innovative individuals by organizations and every organization tries to retain innovative people, innovative individuals have a better chance to maintain their positions in the face of downsizing and find new jobs (Noe *et al.*, 2011). Therefore, the significance of innovativeness at both the individual (Jansen *et al.*, 2006;



Nayir, 2014; Tang *et al.*, 2013) and organizational levels has been widely acknowledged by previous studies (Woodman *et al.*, 1993; Janssen *et al.*, 2004; Van de Ven, 1986).

Many previous studies on innovation indicated the critical role of organizational structure such as centralization (Polansky and Hughes, 1986), formalization (Pierce and Delbecq, 1977) and integration (Tang *et al.*, 2013) in influencing organizational innovation performance.

According to Van de Ven (1986), the basis for organizational innovation is found in the individuals who introduce, modify, and implement ideas. Therefore, organizations rely on employee creativity and innovativeness to increase organizational innovation performance (Cingoz and Akdogan, 2011). Hence, organizational innovation performance is not directly influenced by organizational structure; instead, employee innovative behavior can be a missing link between these two factors. Thus, we assume that employee innovative behavior mediates the associations amongst structural factors such as centralization, formalization, integration, and organizational innovation performance. In other words, when all decisions are made by superiors (Damanpour, 1991), individuals follow written work rules for their jobs (Chen *et al.*, 2010) and there is a low level of integration amongst unit members (Sethi, 2000), employees are less likely to seek new technologies, processes, techniques, and/or product ideas. Consequently, this lower level of innovative behavior in organizations reduces organizational innovation performance (Nayir, 2014). Hence, employee innovative behavior can be a critical underlying mechanism that explains the relationships between structural factors and organizational innovation performance.

Despite the significant role that innovative behavior plays in explaining the associations between structural factors and organizational innovation performance, much of this dynamic remains unknown. For example, Jansen *et al.* (2006) examined the link between centralization, formalization, and innovative behavior. Despite the fact that these authors investigated the link between structural factors and innovative behavior, they did not include organizational innovation performance in their model. Tang *et al.* (2013) studied the roles of cross-functional integration and innovative behavior in the fostering of organizational innovation performance; however, these scholars did not examine the relationships between structural factors and innovative behavior. Although Nayir (2014) measured the mediating role of innovative behavior in the link between formalization and organizational innovation performance, the work ignored centralization and integration in the research model.

We believe that examining the mediating role of innovative behavior on the relationship between structural factors and organizational innovation performance is critical because the results from this investigation can help the managements of organizations to understand better what forms of structural factors should be managed to enhance the levels of employee innovative behavior, which in turn fosters organizational innovation performance. In other words, understanding this dynamic enables managers to foster organizational innovation performance by managing structural factors that influence organizational innovation performance via innovative behavior. Therefore, our study aims to address the existing gaps in the literature by examining the mediating role of innovative behavior in the links between structural factors (such as centralization, formalization, and integration) and organizational innovation performance.

Literature review

Employee innovative behavior

Innovative behavior refers to the intentional generation, introduction, and application of novel ideas regarding products, processes, and procedures within a work role, group, or organization, to benefit role performance, the group, or the organization (West and Farr, 1989).

Individual creativity is a starting point for innovation (Kim and Lee, 2013). Therefore, the terms “creativity” and “innovation” are used interchangeably (West and Farr, 1990). However, scholars have agreed on the definitions of these terms: “creativity” is related to the

generation of new ideas regarding products, services, and organizational procedures and processes (Mumford and Gustafson, 1988), and “innovation” is associated with the generation, adoption, and implementation of novel ideas (Kanter, 1988; Van de Ven, 1986). Similarly, Woodman *et al.* (1993) indicated that creative behavior is only related to generating new ideas, while innovative behavior is related not only to generating new ideas but also to adopting the ideas of others that are novel for the work unit or company. Hence, innovative behavior is a multistage process (Scott and Bruce, 1994). In the first stage, this behavior begins with the introduction of useful and novel ideas. The next phase of individual innovation is idea promotion in which individuals engage in social activities to seek sponsors, supporters, and backers who can help to realize novel ideas. The final phase of the innovation process is idea realization in which ideas are applied within a work role, a group, or an organization (Scott and Bruce, 1994).

Several factors have been examined as the determinants of innovative behavior, such as job characteristics (Oldham and Cummings, 1996), organizational climate and culture (Scott and Bruce, 1994), relationships with superiors (Janssen and Van Yperen, 2004), individual differences (Bunce and West, 1995), and social/group contexts (Munton and West, 1995).

Centralization and innovative behavior

Organizational structures are described as having various elements, three of which are centralization, formalization, and integration (Germain, 1996; Andrews and Kacmar, 2001). Centralization is described as “the extent to which decision making power is concentrated at the top levels of the organization” (Caruana *et al.*, 1998, p. 18). Hence, centralization encourages hierarchical organizational structures by concentrating decision making at the top rather than sharing the responsibility with lower-level individuals (Auh and Menguc, 2007). Several researchers (Ouchi, 2006; Pertusa-Ortega *et al.*, 2010) have indicated that the more members of an organization become involved in organizational decision-making processes, the greater will be the variety of ideas and opinions that emerge. Moreover, in centralized structures, management tends to overlook the diverse cognitive resources of human capital, and consequently, diverse and creative ideas are more likely to be excluded from decision-making processes (Auh and Menguc, 2007). Furthermore, lower-level employees have limited autonomy in highly centralized organizations (Chen *et al.*, 2010). Decentralized structures provide more autonomy and allow more exchanges of ideas within organizations (Calantone *et al.*, 2010). According to Andrews and Kacmar (2001), individuals who have more discretion tend to come up with new ideas and be more innovative. Similarly, Pertusa-Ortega *et al.* (2010) indicated that autonomy encouraged employees to engage in idea creation and application of new knowledge. Hence, we believe that employees who are excluded from decision-making processes and who have lower levels of autonomy might feel that they are unable to influence their work environments and, consequently, become reluctant to come up with creative ideas and suggestions. Furthermore, centralization mitigates the quantity and quality of knowledge and ideas retrieved for problem-solving (Nord and Tucker, 1987) by tightening communication channels (Cardinal, 2001). According to Donaldson (2001) communication is a prerequisite for innovation.

A number of researchers have also documented the negative associations between higher levels of centralization and innovative behavior. For example, Kamaruddeen *et al.* (2012) stated that the centralization of power was perceived to be a major obstacle to the adoption of innovation, whereas decentralized organizational structures fostered creativity. Prajogo and McDermott (2014) stated that centralization inhibits the free flow of opinions and ideas and can limit innovative solutions. Kesting and Ulhoi (2010) noted that when members of organizations do not have necessary information, they are less likely to have competencies to make decisions about innovations. Parzefall *et al.* (2008)

indicated that organic structures encourage employees' innovativeness by allowing individuals to express their opinions during the innovation process. Therefore, we proposed the following hypothesis:

H1. Centralization is negatively related to innovative behavior.

Formalization and innovative behavior

Formalization refers to "the degree to which rules define roles, authority relations, communications, norms, sanctions, and procedures" (Jaworski and Kohli, 1993, p. 56).

Organizations with low levels of formalization are characterized as organic organizational structures, whereas those with high levels of formalization are categorized as mechanistic organizational structures (Alexander and Randolph, 1985). According to Duncan (1976), an organization with an organic structure tends to increase innovation initiation. Hence, a lower level of formalization facilitates innovative behavior, whereas a higher level of formalization hinders it.

Innovative behavior includes suggesting new means to achieve objectives, investigating and securing resources to implement new ideas and seeking new technologies (Yuan and Woodman, 2010). During this stage, employees engage in individual-level creativity (Wang and Rafiq, 2009). In organizations with a formalized structure, managements specify work routines rather than permitting individuals to decide how things are done (Agarwal, 1993). Rules restrict the opportunities for employees of organizations to interact and communicate with one another; therefore, the lack of communication among employees limits the exchange of ideas among individuals and thus, limits the generation of knowledge. (Pertusa-Ortega *et al.*, 2010). According to Chen *et al.* (2010), obeying procedures and rules may restrain individuals from developing and suggesting ideas regarding new services and products. Similarly, Prajogo and McDermott (2014) have indicated that the existence of routines and systems impedes the development of creative behavior and experimentation. Several scholars have also reported negative associations between dependencies on work procedures and innovative behavior. For example, Hartline *et al.* (2000) indicated that formalization leads employees to conform with work rules and consequently makes their activities rigid and hampers creativity. Pertusa-Ortega *et al.* (2010) noted that a variety of new ideas are constrained when organizations have strict formal rules. Jansen *et al.* (2006) noted that formalization impedes deviations from structured behaviors and the variation-seeking behavior of a unit. According to Van der Panne *et al.* (2003), formalization conflicts with the trial-and-error character of the innovation process. Conversely, a less formalized structure encourages individuals to seek other sources of information, to think creatively and to engage in more sense-making approaches to their jobs rather than following prearranged courses of action (Gilson and Shalley, 2004). Moreover, a low focus on work rules can foster openness and stimulate creative behaviors and idea generation (Gilson and Shalley, 2004; Damanpour, 1991). According to Donaldson (2001), a lower level of formalization encourages innovativeness. Thus, we have proposed the following hypothesis:

H2. Formalization is negatively related to innovative behavior.

Integration and innovative behavior

Integration is described as the extent to which different units and employees of a company communicate and work interrelatedly (Germain, 1996). Integration fosters interaction, horizontal communication (Moenaert and Souder, 1990; Gatignon and Xuereb, 1997), information-sharing, collaboration, and coordination between units (Song and Montoya-Weiss, 1997). According to Shu *et al.* (2012), interaction between employees increases the dissemination of tacit and explicit knowledge. When there is a higher level of

knowledge exchange, individuals in organizations will have more chances to access and attain knowledge that is dissimilar from their own; consequently, this triggers new ideas (Nonaka, 1991). Similarly, several researchers have noted that integration enhances the dissemination (Rulke and Galaskiewicz, 2000) and transformation (Madhavan and Grover, 1998; Griffith *et al.*, 2003) of knowledge, which stimulates innovation (Sherman *et al.*, 2005; Madhavan and Grover, 1998; Kogut and Zander, 1992; Song *et al.*, 2005; Leiponen, 2006).

Moreover, integration facilitates innovation by creating a platform for combining diverse skills, expertise, and process experiences (Tang *et al.*, 2013). These skills, expertise, and process experiences are crucial for both process and product innovation (Tang *et al.*, 2013). Furthermore, an integrated structure facilitates the dispersion of diverse mindsets across units and helps employees to consider different perspectives (Brown and Eisenhardt, 1995). Many researchers have indicated that a variety of perspectives are prerequisites for innovating new products (Olson *et al.*, 2001; Dougherty, 1992). Thus, we believe that when there is a higher level of integration in organizations, individuals are more likely to seek new technologies, processes, techniques, and/or product ideas; therefore, we have proposed the following hypothesis:

H3. Integration is positively related to innovative behavior.

Innovative behavior and organizational innovation performance

The bases of organizational innovation are ideas, and it is individuals who introduce, modify, and implement ideas (Van de Ven, 1986). Hence, organizations depend on their employees for innovation because employees are a critical source of new ideas (Redmond *et al.*, 1993) and provide the groundwork for organizational innovation (Shalley and Gilson, 2004). Similarly, Gumusluoglu and Ilsev (2009) indicated that employee innovativeness contributes to organizational innovation performance because individuals are the source of novel ideas. Hence, the introduction and application of ideas at the employee level are more likely to result in innovative products/services at the organizational level (Gumusluoglu and Ilsev, 2009). In other words, when the members of organizations seek new technologies, processes, techniques, and/or product ideas and develop adequate plans and schedules for the implementation of new ideas, organizations are more likely to have new products or services. Previous empirical studies have also reported a positive association between employee innovative behavior and organizational innovation performance. For example, Kuczmarski (1996) reported that innovative behavior and the mindsets of individuals enhance the innovation of firms. Tang *et al.* (2013) indicated that innovative behavior fosters organizational innovation performance. Nayir (2014) documented how innovative behavior stimulates product and process innovativeness. Thus, we believe that employee innovative behavior is positively linked with organizational innovation performance and so have proposed the following hypothesis:

H4. Employee innovative behavior is positively related to organizational innovation performance.

The mediating role of innovative behavior

A number of scholars (Subramanian and Nilakanta, 1996; Tang *et al.*, 2013; Damanpour, 1991; Hage and Dewar, 1973; Pierce and Delbecq, 1977) have indicated that organizational structure influences organizational innovation performance. We believe that employee innovative behavior has a mediating role in the links between structural factors such as centralization, formalization, integration, and organizational innovation performance. In other words, when most decisions are made by top management and employees need to ask their supervisor before they can do almost anything (Damanpour, 1991), rules and procedures occupy a central place in an organization (Chen *et al.*, 2010), units in the

organization do not cooperate to generate and screen new ideas for new products (Sethi, 2000), employees in such organization become reluctant to seek and implement new technologies, processes, techniques, and product ideas. Since companies become innovative by utilizing the capabilities of employees to innovate (De Jong and Den Hartog, 2007), the reluctance of individuals to generate and implement new ideas inhibits organizational innovation performance. Thus, organizational structures influence organizational innovation performance via employee innovative behavior. Therefore, we proposed the following hypotheses:

- H5.* Innovative behavior mediates the link between centralization and organizational innovation performance.
- H6.* Innovative behavior mediates the link between formalization and organizational innovation performance.
- H7.* Innovative behavior mediates the link between integration and organizational innovation performance.

Methods

Data and sample

The data were collected from the functional managers of organizations in the manufacturing industry in the Republic of Korea. We believed that functional managers could represent organizations to measure organizational innovation performance because they have knowledge about the innovation capabilities and performance of their organizations. Moreover, functional managers could also be a good source for evaluating employee innovative behavior because they have more opportunities to deal with employees and more knowledge about employees' innovative behavior than the top managements of firms. Therefore, we identified the functional managers at 140 selected companies and sent survey questionnaires to them. In accordance with Dillman (1978), we used the total design model for the data collection process. A mailing packet included the following: a cover letter addressed to the functional managers of the companies approached; a questionnaire; and a postage-paid return envelope. In the cover letter for the questionnaire, we indicated the purpose of the study and explained that responses would be kept confidential. After 14 days, "thank you" calls were made to those who had returned the questionnaire, and reminder calls were placed to those who had not responded. The average age of firms was 17, and the average staff size was 156.

Measures

The questionnaire items were originally developed in the English language; therefore, we asked professional translators to translate them into Korean. To ensure the accuracy of the translation, bilingual experts back-translated the scale items into English (Brislin, 1993). For this study, all scale items were rated on a five-point Likert scale ranging from "1 = strongly disagree" to "5 = strongly agree."

Centralization. We measured centralization using three items (e.g. "in our firm, employees need to ask their supervisor before they do almost anything," and "most decisions people make here must have their supervisor's approval") taken from Hage and Aiken (1967). The Cronbach's α coefficient for this scale was 0.897.

Formalization. Formalization was evaluated using the four-item scale devised by Jansen *et al.* (2006) (e.g. "whatever situation arises, written procedures are available for dealing with it," and "rules and procedures occupy a central place in our firm"). The scale's Cronbach's reliability was 0.926.

Integration. We measured integration using three items developed by Li and Calantone (1998). Example items included the following: “in this organization, different departments cooperate fully in generating and screening new ideas for new products,” and “in this organization, different departments fully cooperate in establishing goals and priorities for our strategies.” The Cronbach’s α coefficient for this scale was 0.858.

Innovative behavior. To measure innovative behavior, six items were adapted from the study by Scott and Bruce (1994). Example items from this scale included: “generally, employees in our company search out new technologies, processes, techniques, and/or product ideas,” and “generally, employees in our company develop adequate plans and schedules for the implementation of new ideas.” The Cronbach’s α coefficient for this scale was 0.943.

Organizational innovation performance. Innovation performance was measured using five items from the study by Tang *et al.* (2013). Example items from this scale included: “my company has better new product/service quality than others,” and “my company has better effectiveness of process innovation performance than others.” The scale’s Cronbach’s α reliability in this study was 0.928.

Control variables. We controlled the firm age (Chen *et al.*, 2010; Jung *et al.*, 2003) and size (Jung *et al.*, 2003) because prior studies indicated that there were positive associations between firm age, size, and organizational innovation performance. Firm age was evaluated using the number of years a firm had been in operation since its founding date, and company size was measured by the number of employees.

According to Podsakoff *et al.* (2003), the relationships between constructs can be inflated or deflated by common method bias when data are collected from a single informant. Thus, to minimize the common method bias, we followed the suggestions of Podsakoff *et al.* (2003). First, to overcome any potential evaluation apprehension by participants, we assured the participants of the confidentiality and anonymity of their responses in the cover letter sent with the questionnaire. Second, to reduce the participants’ perceptions of any direct connection between the variables, we used psychological separation by interspersing all the study variables. Third, we applied a time lag (Time 1: July 2016; Time 2: October 2016) between the measures. Centralization, formalization, integration, and innovative behavior measures were collected at Time 1, and organizational innovation performance measures were collected at Time 2.

To evaluate the common method bias effect, we conducted both Harman’s one-factor (Podsakoff *et al.*, 2003; Dedahanov and Rhee, 2015) test and a confirmatory factor analysis. According to the principles of Harman’s one-factor test, either a single factor will represent the majority of the covariance or a general factor will represent the majority of the covariance when a substantial amount of common method bias exists. An unrotated factor analysis extracted five distinct factors, and the largest factor explained 31.227 percent of the variance. Hence, the results suggested that common method bias was not a significant problem in this study because no single factor emerged in the results, and there was no general factor that represented the majority of the variance. In conducting the confirmatory factor analysis, we combined all the items into a single factor. The results indicated a poor model fit for a single factor: comparative fit index (CFI) = 0.438; the Tucker Lewis index (TLI) = 0.376; the goodness-of-fit index (GFI) = 0.488; and the root mean square error of approximation (RMSEA) = 0.214. These findings also implied that there was no common method bias effect.

As we mentioned earlier, we conducted the survey at 140 organizations. In order to check whether there were significant differences in the innovative behaviors of employees at the different organizations, we conducted an ANOVA test. The results revealed that there were no significant differences ($F = 0.924$; $p > 0.05$) between the organizations. Thus, we decided to use the data in our analysis.

Results

We used the confirmatory factor analysis to evaluate the measurement model using IBM SPSS Amos 21. The overall model fit was assessed by χ^2 , CFI, GFI, TLI, and RMSEA. According to Byrne (1991) a χ^2/df ratio larger than 2 indicates that there is an inadequate fit, whereas a χ^2/df ratio value of less than 2 represents a nominally plausible model. Moreover, a good model fit is demonstrated when the RMSEA value is below 0.06 (Hu and Bentler, 1999) and when the CFI and TLI values exceed 0.90 (Hair *et al.*, 2011). All these model fit indices indicated that the measurement model had adequate fit ($\chi^2 = 230.585$; $\chi^2/df = 1.159$; $p < 0.05$; CFI = 0.987; GFI = 0.874; TLI = 0.985; RMSEA = 0.034) with the collected data.

To assess the validity of the measurement model, we evaluated the convergent and discriminant validities. The results indicated that all standardized factor loadings were statistically significant ($p < 0.01$), ranging from 0.775 to 0.918. Moreover, the values of average variance extracted (AVE) and the composite reliabilities exceeded the acceptable levels of 0.50 and 0.70 (Fornell and Larcker, 1981), respectively. Hence, the model of the study met the criteria of convergent validity. We assessed discriminant validity by using Fornell's and Larcker's (1981) approach. According to this method, the AVE for each variable should exceed the squared correlation between the construct and any of the other constructs (Fornell and Larcker, 1981). In our study, the AVE values of all the constructs exceeded the squared correlations between the construct and the other constructs (Table I). Hence, the measures demonstrated discriminant validity.

Structural equation modeling analysis

The structural equation modeling procedure was utilized to evaluate the validity of the suggested hypotheses. The structural model analysis demonstrated adequate fit, as judged by the goodness-of-fit indices ($\chi^2 = 277.791$; $\chi^2/df = 1.157$; $p < 0.05$; CFI = 0.984; GFI = 0.866; TLI = 0.981; RMSEA = 0.034).

The results suggested that centralization ($\beta = -0.506$, $p < 0.01$) and formalization ($\beta = -0.286$, $p < 0.01$) were negatively and significantly associated with employee innovative behavior. Hence, *H1* and *H2* were supported. In *H3* we proposed that integration is positively related to innovative behavior. The findings indicated that there was no significant relationship between integration ($\beta = 0.094$, $p > 0.05$) and innovative behavior. Thus, *H3* was not supported. Moreover, structural equation modeling analysis revealed that innovative behavior ($\beta = 0.235$, $p < 0.05$) was positively and significantly associated with organizational innovation performance. Therefore, *H4* was supported. To assess the mediation, we used a bootstrapping procedure (Preacher and Hayes, 2008) with maximum likelihood estimation in Amos 21. "Bootstrapping is a computationally intensive method that involves repeatedly sampling from the data set and estimating the indirect effect in each resampled data set" (Preacher and Hayes, 2008, p.880). By extracting 1,000 bootstrapped samples from the data set based on random sampling with replacement, 95 percent bias-corrected confidence intervals (CI) were calculated. If the CI of an indirect effect did not include 0, the mediation was assumed (Lichtenthaler *et al.*, 2016).

Variables	Mean	SD	AVE	1	2	3	4	5
1. Centralization	3.03	1.266	0.720	1				
2. Formalization	3.16	1.278	0.757	0.208*	1			
3. Integration	2.73	1.140	0.610	-0.130	-0.010	1		
4. Innovative behavior	2.98	1.253	0.740	-0.452**	-0.328**	0.116	1	
5. Organizational innovative performance	3.04	1.263	0.721	-0.242**	0.007	-0.019	0.306**	1

Notes: * $p < 0.05$; ** $p < 0.01$

Table I.
Descriptive statistics,
AVE and correlations

The bootstrapping analysis demonstrated that innovative behavior mediates the links between centralization ($\beta = -0.119$, $p < 0.05$; $CI_{0.95} = -0.254, -0.017$), formalization ($\beta = -0.067$, $p < 0.05$; $CI_{0.95} = -0.171, -0.005$) and organizational innovation performance. However, the findings indicated that innovative behavior did not mediate the link between integration ($\beta = 0.022$, $p > 0.05$; $CI_{0.95} = -0.015, 0.116$) and organizational innovation performance (Figure 1). Hence, *H5* and *H6* were supported, but *H7* was not supported. Furthermore, the results demonstrated that control variables, such as firm age and size, did not influence the innovation performance of organizations (Figure 1).

Discussion

This study has examined the links between centralization, formalization, integration, and innovative behavior, the relationships between innovative behavior and organizational innovation performance, and the mediating role of innovative behavior on the associations between centralization, formalization, integration, and organizational innovation performance. The model was tested on a data set comprising 140 functional managers from 140 organizations. The empirical findings revealed the following.

First, the results demonstrated that centralization was associated with less innovative behavior among employees. In other words, when superiors did not involve individuals in decision-making processes, and most decisions employees made had to have a superior’s approval, employees became reluctant to generate creative ideas. Hence, the higher the centralization in an organization, the lower would be employees’ innovative behavior. This finding led to the conclusion that organizations’ reluctance to involve employees in decision making process could give employees the perception that their opinions were not valued and that information-sharing within the organization was futile. Consequently, for employees this perception could serve as an obstacle to the generation of novel ideas. These results were in accordance with the findings of Polansky and Hughes (1986), who discovered a negative link between centralization and employee innovativeness.

Second, the findings suggested that formalization also reduced employees’ Innovative behavior. That is, when rules and procedures occupied a central place in organizations, members of those organizations were less likely to seek out new technologies, processes, techniques, and/or product ideas. Hence, adhering to rules and procedures could hamper employees’ development and sharing of creative ideas. Based on this finding, we could confirm that when employees were not permitted to decide how things were done and when managers specified work routines, employees had fewer opportunities to experiment and, given the trial-and-error character of the innovation process, this eventually inhibited innovative behavior. This finding supported previous research (Gilson and Shalley, 2004;

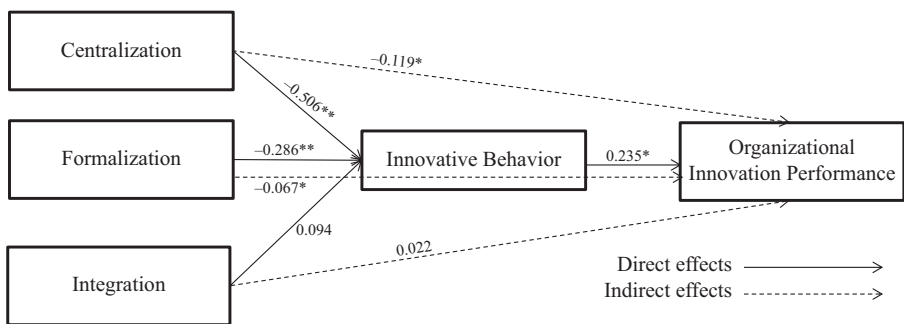


Figure 1.
Results for the structural model

Notes: $*p < 0.05$; $**p < 0.01$

Damanpour, 1991), which posited that lower levels of formalization facilitate openness and foster new ideas and creative behavior, whereas higher levels of formalization inhibit creativity in organizations.

Third, we found that integration had no significant association with innovative behavior. More specifically, the absence of integration, information-sharing, coordination, and collaboration between units did not influence employees' innovative behavior. The potential reason for this insignificant association was that employees might have believed that the absence of centralization and formal procedures and rules could eliminate the borders between units and thus, foster integration, information exchange, and communication between departments; therefore, they might not have considered that integration played a special role in facilitating innovative behavior. In other words, employees might have perceived that with decentralized structures and less formal procedures and rules, different units and employees of a company could communicate and work interrelatedly, and thus, employees might not have seen integration as a critical obstacle to their innovative behavior.

Fourth, empirical analyses revealed that the innovative behavior of employees was positively related to organizational innovation performance. This meant that when members of an organization generated creative ideas and developed adequate plans and schedules to implement new ideas, the organization tended to have better new products and services than other companies. Hence, organizations relied on their employees' innovative behavior to enhance their organization's innovation performance because the members of organization were suggesting novel ideas. This finding was consistent with the findings of previous studies (Tang *et al.*, 2013; Nayir, 2014).

Moreover, the findings indicated that innovative behavior mediated the relationships between centralization, formalization, and organizational innovation performance. In other words, when top managements made most decisions and rules occupied a central place in an organization, individuals in such organizations became reluctant to generate creative ideas or to seek out new processes, technologies, techniques, and/or product ideas, which in turn, mitigated the abilities of organizations to provide new products and services. Hence, higher levels of centralization and formalization did not directly impede organizational innovation performance. Rather these structural factors influenced the innovative behavior of employees and, via employees' innovation behavior, hindered the innovation performance of organizations. Thus, employees' innovative behavior was a crucial underlining mechanism that explained the associations between centralization, formalization, and organizational innovation performance.

Theoretical implications

In dynamic marketplaces, innovativeness is necessary to create and sustain superior performance (Nijssen and Frambach, 2000) and to achieve organizational success (Jafri, 2010). Thus, a number of studies (Subramanian and Nilakanta, 1996; Damanpour, 1991; Woodman *et al.*, 1993; Janssen *et al.*, 2004; Van de Ven, 1986) have investigated the antecedents of organizational innovation in business organizations.

Amongst the antecedents of organizational innovation, organizational structure plays a crucial role in influencing organizational innovation performance (Polansky and Hughes, 1986). Specifically, organizational structure determines the degree of employees' autonomy in organizational decision-making processes, including those related to innovative projects (Damanpour, 1991) and it affects the level of organizational creativity that drives innovation processes (Klotz *et al.*, 2012). Thus, the direct relationship between organizational structure and organizational innovation performance has been widely studied redundant. Because organizations rely on their employees' innovativeness to foster organizational innovation performance (Cingoz and Akdogan, 2011), our study proposed that employee innovative

behavior can explain the link between structural factors and organizational innovation performance. Despite the number of studies on innovativeness, very little has been known about the role of innovative behavior in explaining the links between structural factors and organizational innovation performance. In other words, there has been a lack of knowledge about what forms of structural factors foster organizational innovation performance by way of employees' innovative behavior. For example, several previous researchers (Subramanian and Nilakanta, 1996; Tang *et al.*, 2013; Damanpour, 1991; Hage and Dewar, 1973; Pierce and Delbecq, 1977) have investigated the direct relationships between structural factors and organizational innovation performance. Hence, the role of innovative behavior in explaining the links between organizational structure and organizational innovation performance has been overlooked by those previous studies. Although Jansen *et al.* (2006) examined the relationship between centralization, formalization, and innovative behavior, they did not study organizational innovation performance as the outcome of innovative behavior. Therefore, these authors did not measure innovative behavior as the mediator between organizational structure and organizational innovation performance. Tang *et al.* (2013) investigated the associations between innovative behavior and organizational innovation performance; nevertheless, they overlooked studying structural factors as the antecedents of innovative behavior. Hence, those scholars also did not measure the role of innovative behavior in explaining the link between structural factors and organizational innovation performance. Despite the fact that Nayir (2014) discovered the mediating role of innovation behavior in the link between formalization and organizational innovation performance, centralization and integration were not included in that work's research model.

Therefore, our study has addressed these gaps in the field and extended the literature by examining the mediating role of innovative behavior in the link between organizational structures (such as centralization, formalization, and integration) and organizational innovation performance. More specifically, our study has contributed to the literature by providing empirical evidence about the mediating role of innovative behavior in the links between centralization, formalization, and organizational innovation performance. Moreover, our study has revealed that innovative behavior does not mediate the associations between integration and organizational innovation performance. Hence, we believe that the results of our study have deepened the knowledge concerning organizational management with regard to the forms of structural factors that should be managed to foster employees' innovative behavior which in turn, can enhance organizational innovation performance.

Practical implications

The results of our study have demonstrated that organizations with centralized structures decrease the innovative behavior of their employees. Therefore, we recommend that organizations use self-managed teams that have the autonomy to make decisions (Rhee *et al.*, 2014). When employees have autonomy in certain decision-making processes they are more likely to generate and implement new ideas (Holsapple and Joshi, 2001) because autonomy gives employees a chance to carry out proposals and motivates them to experiment in ways that lead to the generation of new knowledge and ideas (Pertusa-Ortega *et al.*, 2010).

In addition, we have suggested that companies' managements should solicit individual ideas and opinions as part of their decision-making processes. We believe that when individuals are involved in decision-making processes or have the autonomy to make decisions concerning their jobs, they are more likely to feel that they can influence their organizations. When they are given this perception, individuals are more likely to propose novel ideas and suggestions. Moreover, our study has indicated that formalization also mitigates employee innovative behavior. When organizations are more flexible, the creation

of new ideas will increase. Thus, we have pointed out the importance of using less formalized organizational structures to facilitate innovative behavior amongst the employees of organizations by encouraging employees to generate and suggest new ideas without there being an overbearing concern about adhering to regulations and norms (Im *et al.*, 2013). Furthermore, our findings have revealed that innovative behavior explains the relationship between centralization, formalization, and organizational innovation performance. Hence, we would suggest that organizations manage centralized and formalized structures to encourage the innovative behavior of their employees, which will subsequently foster organizational innovation performance. In addition, we have recommended that organizations should establish supportive atmospheres to increase employees' innovativeness by making employees feel honored to contribute and participate in innovative work (Chen *et al.*, 2010).

At the individual level, we would recommend that employees actively participate in employee development programs which develop their learning orientations because learning fosters the generation of new ideas (Hirst *et al.*, 2009). Moreover, to become more innovative, employees should avoid systematic problem-solving that adheres to disciplinary boundaries and rules, or follows set routines because systematic problem-solving styles negatively influence innovative behavior (Scott and Bruce, 1994). In addition, to be more innovative, individuals should develop self-leadership characteristics that are defined as processes by which individuals may navigate and motivate themselves to achieve desired behaviors and ends (Carmeli *et al.*, 2006).

Limitations and future research directions

Although our study extends the literature, it has several limitations and so we have made suggestions for future research. First, our study examined the mediating role of innovative behavior between three elements of organizational structures (i.e. centralization, formalization, and integration) and organizational innovation performance. Thus, we would suggest that future studies might investigate the impact of other elements of organizational structures, such as work specialization and departmentalization on employee innovative behavior, and whether this subsequently influences organizational innovation performance. Moreover, in our study, we focused on the general form of organizational innovation performance rather than various types of firms' innovativeness, such as market, product and process innovation. Hence, we would recommend that future research should examine the mediating role of employee innovative behavior on the links between centralization, integration, and various types of organizational innovation performance such as market, product, and process innovation. Third, we only collected data from manufacturing companies, and thus our findings might not be transferable to organizations operating in other environments and industries. Therefore, we would recommend that future studies investigate the applicability of this model in the service industry.

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Further reading

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About the authors

Alisher Tohirovich Dedahanov (PhD, Yeungnam University, Republic of Korea) is an Assistant Professor of the School of Business, Yeungnam University, Republic of Korea. His articles were published in *Management Decision*, *Managerial Psychology*, *Personnel Review*, *Asian Journal of Technology Innovation*, *European Planning Studies*, *Social Behavior and Personality* and others. His research interests are employee silence, voice, innovation and leadership.

Changjoon Rhee (MPhil, University of Cambridge, UK) is an Independent Researcher. His research interests are innovation in teams, creativity, ambidexterity, leadership and teamwork.

Junghyun Yoon (PhD, Newcastle University, UK) is an Assistant Professor of the College of Management, Dongguk University-Gyeongju Campus. His articles were published in *Transportation Research Part A: Policy and Practice*, *Sustainability*, *Science Technology and Society*, *Management Decision*, *European Planning Studies*, and others. His research interests are strategic human resource management, international and corporate entrepreneurship, technology innovation and management, and organizational behavior and cluster. Junghyun Yoon is the corresponding author and can be contacted at: jyoon071121@naver.com