

Tired of innovations? Learned helplessness and fatigue in the context of continuous streams of innovation implementation[†]

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Summary

The business environment faced by contemporary organizations is highly uncertain and constantly changing. Thus, organizations have adopted and implemented a continuous stream of innovations to achieve sustainable growth and survival. Considering the demand for additional resources to implement innovations, the present study explores organizational conditions that may lead to innovation-targeted burnout and fatigue among employees, which impede their active participation in a subsequent innovation. To this end, we propose a theoretical framework that elucidates the effects of previous innovations on the subsequent implementation behavior of employees. We identify two dimensions of the cognitive appraisal of previous innovations (i.e., intensity and failure) that shape employees' beliefs regarding innovations, such as innovation-targeted helplessness, which ultimately results in innovation fatigue. Data collected from 84 managers and 397 employees of Chinese and Korean organizations prove the significant role of employee perceptions of previous innovations in shaping the innovation-targeted helplessness and fatigue of employees, which ultimately affect employee behavior toward a subsequent innovation. The present conceptual and empirical analyses suggest that given continuous streams of innovation implementation, managers should carefully consider employee's perceptions of previous innovations (i.e., intensity and failure) for successful implementation of a subsequent innovation. Copyright © 2017 John Wiley & Sons, Ltd.

Keywords: innovation implementation; learned helplessness; innovation fatigue; innovation intensity; innovation failure

Constant adaptation and innovation are necessary for organizational success and survival in the contemporary business environment, which is characterized by intense competition as well as ever-changing technology and market demands (Damanpour & Schneider, 2006; Tushman & O'Reilly, 2002). Empirical studies demonstrate that innovations offer various performance benefits, such as customer satisfaction, efficient internal operations, increased market share, and improved financial outcomes to organizations (Birkinshaw, Hamel, & Mol, 2008). However, organizations often encounter difficulty in attaining innovation-related outcomes, such as implementation effectiveness (i.e., frequent and committed use of an innovation by employees) and innovation effectiveness (i.e., benefits accrued from an innovation; Klein & Sorra, 1996). For instance, 44 and 24 percent of attempts to introduce new information systems partially and completely fail, respectively, resulting in an overall failure rate of 68 percent (Altuwaijria & Khorsheed, 2012). Considering this high rate of implementation failure, aside from appreciating the value and positive implications of successful innovations, one must understand the manner by which successful and unsuccessful innovations can help organizations engage in additional innovation processes in the future.

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Innovation comprises two activities: (i) creativity, which refers to the generation of novel and useful ideas, and (ii) implementation, which denotes the transformation of ideas into new products, services, and processes, thereby putting such ideas into practice (Anderson, De Dreu, & Nijstad, 2004; Baer, 2012; Miron, Erez, & Naveh, 2004). The current study only focuses on implementation. To explain the outcome of innovation implementation efforts, previous studies have examined various factors surrounding an innovation, such as innovation properties, user characteristics, and organizational context (Klein & Knight, 2005; Oreg, 2003; Venkatesh, Morris, Davis, & Davis, 2003). These studies have mostly identified innovation implementation as a single, independent process, thereby overlooking the fact that any innovation implemented in a contemporary organization is typically embedded in a continuous stream of innovation processes (Bordia, Restubog, Jimmieson, & Irmer, 2011). Although some studies have considered the role of innovation frequency in employee attitudes and social relationships (Carter, Armenakis, Feild, & Mossholder, 2013; Rafferty & Griffin, 2006), they have failed to examine the effect of past innovations on employee behavior toward subsequent innovation implementation efforts.

In practice, innovation implementation forms a cyclic process, in which the management tends to introduce another innovation immediately after adopting a previous one (Eisenhardt, 1989; McKendrick & Wade, 2005). Similarly, we must view innovation implementation efforts as streams of processes that involve the introduction and implementation of multiple innovations in organizations instead of a single process involving the current innovation (Bordia et al., 2011; Smith & Tushman, 2005). Furthermore, researchers must highlight the negative innovation implementation processes by demonstrating the effects of the unfavorable cognitive appraisals of previous innovations and the resulting negative beliefs about innovation on employee reactions to a subsequent innovation. Given the high failure rates of innovation implementation (Altuwajjria & Khorsheed, 2012; Andrew, 2009), one must consider the positive and negative processes related to innovation implementation. In this respect, the present study highlights the previously unrevealed and overlooked “dark side” of innovation implementation (Anderson, Potonik, & Zhou, 2014, p. 1322) and emphasizes the need to adopt a balanced view of innovation processes particularly as a stream of continuous innovation efforts.

In this study, the effects of the experiences and judgments of employees toward past innovations on the implementation of another innovation are investigated. Past experiences shape the cognitive schema of a person, which affects his or her sense-making of upcoming events (Fiske & Taylor, 1991), because schemas represent “cognitive structures of organized prior knowledge, abstracted from experience with specific instances; schemas guide the processing of new information and the retrieval of stored information” (Fiske & Linville, 1980, p. 543). Thus, the cognitive appraisal of previous innovations is likely to guide the evaluation and willingness of an employee to implement a subsequent innovation (Choi, 2004; King & He, 2006).

To theorize the effects of previous innovations, we draw on cognitive schema theory (Bordia et al., 2011) and identify “intensity” and “failure” as the two critical dimensions of the cognitive evaluation of past experiences. Intensity and failure reflect the quantity- and quality-based appraisal of previous innovations, respectively. By referring to the learned helplessness literature (Harvey & Martinko, 2009; Overmier & Seligman, 1967; Seligman & Maier, 1967), we posit that employees experience an increased innovation-targeted helplessness when they believe that their organizations frequently introduce innovations (high innovation intensity) but fail to benefit from them (high innovation failure). A prolonged sense of helplessness among employees may induce innovation fatigue, which may discourage employees from participating in a subsequent innovation (Eglinton & Chung, 2011). Thus, the present study explores the effects of the cumulative history of innovation implementation within the organization on the psychological and behavioral reactions of employees toward subsequent innovations. The current theoretical propositions are tested through the data collected from Chinese and Korean organizations.

Conceptual Framework

Organizations introduce an innovation through four stages: awareness, adoption, implementation, and routinization (Klein, Conn, & Sorra, 2001; Rogers, 2003). On the basis of an organization’s awareness of potential innovations,

it adopts the most desirable or feasible innovation and then implements/applies the selected innovation continuously until the innovation becomes a routine (Damanpour & Shcneider, 2006). In competitive and dynamic business environments, organizations tend to initiate a new innovation cycle even though their previously adopted innovations are still under the early phase of implementation. In this context, employees must implement a ceaseless stream of multiple innovations (Smith & Tushman, 2005). Therefore, aside from examining innovation as an isolated process, the reactions of employees toward an innovation as part of a stream of continuous innovation processes need to be evaluated in order to create a more valid and realistic representation of the innovation phenomenon.

Figure 1 shows our theoretical framework. We begin by postulating that employees cognitively appraise the previously implemented innovations according to two dimensions: (i) *intensity* of innovation implementation based on innovation frequency (i.e., quantity-based appraisal) and (ii) *effectiveness* of implementation attempts in producing the expected outcomes (i.e., quality-based appraisal).

Cognitive appraisal of previous innovations: intensity and failure

The consumer behavior literature shows that consumers make decisions on the basis of the quantity- and quality-based attributes of their prior experiences with similar products and brands (Keller & Staelin, 1987). Thus, we propose that employees similarly evaluate the previously implemented innovations in their organizations in terms of their quantity and quality. Quantity-based assessment represents the extent to which employees perceive that they have intense experiences of innovation implementation. Therefore, employee perceptions of the *intensity of previous innovations* may be driven by the frequency of innovations, which refers to the interval between the instances of introducing innovations in an organization. Employees may perceive past innovations as being frequent when two innovations are implemented in a short interval (Rafferty & Griffin, 2006).

A quality-based appraisal of previous innovations assesses the extent to which previous implementation efforts have been successful and instrumental in achieving desired outcomes such as increased efficiency, reduced defects, and enhanced financial performance (King & He, 2006). We consider the frequent dysfunctional consequences of past innovations and identify the perceptions of employees on the *failure of previous innovations* as a core dimension of their quality-based assessment of previous innovation experiences.

Lost sense of control from previous innovations: innovation-targeted helplessness

The cognitive appraisal of the intensity and failure of past innovations generates a cognitive schema or an abstraction of prior experiences that affects the reaction of a person to a new or similar event (Fiske & Taylor, 1991). On the basis of the cognitive schema perspective, several studies demonstrated that the negative experiences of employees

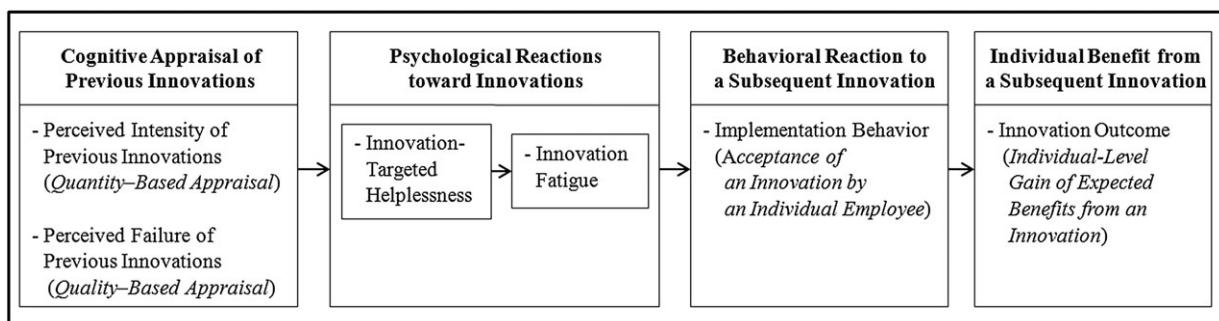


Figure 1. Theoretical framework of innovation implementation based on the stream of continuous innovation processes

with past organizational changes may engender their pessimism toward the competence of change agents, thereby promoting their cynicism toward subsequent changes (Bordia et al., 2011; Dean, Brandes, & Dharwadkar, 1998). Therefore, we consider perceived intensity and failure of previous innovations as the bases of the employees' schema for a subsequent innovation. To explain individual psychological reactions to chronic, intense, and negative events, we borrow two constructs from the literature, namely, "helplessness" and "fatigue" (Minor & Hunter, 2002). Henceforth, we identify innovation-targeted helplessness and innovation fatigue as key intermediate mechanisms that explain the effects of the perceptions of employees of past innovations on their reactions toward a subsequent innovation.

Learned helplessness theory was initially developed to offer a behavioral explanation for animals exposed to inescapable external shocks (Overmier & Seligman, 1967). Experiments show that the sufficient intensity of previous shocks and the ineffective attempts to cope with such situations result in learned helplessness (Overmier, 2002). Therefore, learned helplessness refers to a phenomenon wherein "after repeated punishment or failure, [actors] become passive and remain so even after environmental changes that make success possible" (Martinko & Gardner, 1982, p. 196). By reformulating the original theory, Carlson and Kacmar (1994) applied the learned helplessness construct to human behavior and articulated that employees experiencing repeated failures tend to develop learned helplessness. Martinko and Gardner (1982) proposed a model of organizationally induced helplessness, which posited that employees experience learned helplessness when the changes in their organization (e.g., technological change and increased task difficulty) are coupled with negative experiences (e.g., failure).

Most of the decisions on innovation adoption are made by top management, and innovations are often imposed on employees for implementation as part of their tasks (Damanpour & Schneider, 2006). Repeating such enforced or obligatory implementation over time deprives the employees of their sense of control. Therefore, we presume that employees develop innovation-targeted learned helplessness when they must implement innovations at high intensity and if they believe that the previously implemented innovations are mostly ineffective. *Innovation-targeted helplessness* indicates that after a series of failed innovations are implemented, an employee becomes and remains passive even after a subsequent innovation is considered successful (Martinko & Gardner, 1982). Therefore, we propose the following hypotheses:

Hypothesis 1: The perceived intensity of previous innovations is positively related to the innovation-targeted helplessness of employees.

Hypothesis 2: The perceived failure of previous innovations is positively related to the innovation-targeted helplessness of employees.

Exhaustion following helplessness: innovation fatigue

Employees may experience personal exhaustion when dealing with innovation if they must implement numerous innovations over a prolonged period of time. We define *innovation fatigue* as the exhaustion of emotional and cognitive resources of an employee that disrupts his or her further engagement in subsequent innovations (Chandrasekar & Ng, 2007; Huhtala & Parzefall, 2007). Innovation fatigue conceptually differs from innovation-targeted helplessness. When employees experience innovation-targeted helplessness, they become aware of the innovation goals but lack a sufficient amount of energy or ability to control the situation or implement the innovation. However, employees with innovation fatigue simply avoid (often unconsciously) anything related to innovation because they are exhausted and are deprived of emotional and cognitive resources to deal with such innovation (Taris, 2006). Therefore, innovation-targeted helplessness represents a lowered self-efficacy for innovation, whereas innovation fatigue represents the (unconditional) avoidance of innovation.

The intensity and failure of previous innovations can increase innovation fatigue. The high intensity of innovations forces employees to perform additional task demands and adapt to new work arrangements with substantial uncertainty (Janssen, 2000; Rafferty & Griffin, 2006). This situation induces task-related tension and

overload, that in turn, drain the emotional and cognitive resources of employees, ultimately resulting in burnout or fatigue (cf. job demands–resources model; Schaufeli, Bakker, & Rhenen, 2009). Similarly, the perceived failure of previous innovations generates exhaustion or mental fatigue because the failure of past efforts is strongly linked to stress and burnout (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002). Thus, the failure of past organizational innovations can result in stress, alienation, and fatigue among employees (Martinko & Gardner, 1982).

Although the intensity and failure of previous innovations can affect innovation fatigue, such relationship may be mediated by innovation-targeted helplessness, which forms an immediate psychological reaction to past innovation experiences. We expect that the cognitive appraisals of employees of previous innovations indirectly affect their innovation fatigue by shaping their innovation-targeted helplessness. Over time, learned helplessness may reduce the enthusiasm and motivation of employees toward a given task and gradually exhaust their emotional and cognitive resources; in turn, these can trigger burnout and mental fatigue (Lee & Ashforth, 1990; Rafferty & Griffin, 2006). Empirical studies have demonstrated that the learned helplessness of an individual is directly responsible for his or her emotional exhaustion or fatigue in the future (Segal et al., 2008). Thus, innovation-targeted helplessness induces innovation fatigue, thereby debilitating and impairing employee readiness for subsequent innovations. Therefore, we posit the following hypothesis:

Hypothesis 3: Innovation-targeted helplessness mediates the effects of perceived intensity and failure of previous innovations on innovation fatigue.

Effects of previous innovations on a subsequent innovation: implementation outcomes

The negative psychological reactions toward innovation (e.g., helplessness and fatigue), which is driven by intense but ineffective previous innovations, may discourage employees from participating in subsequent innovations, thereby preventing potential performance gains to be obtained from the innovation. Drawing on the innovation literature, we determine the intermediate implementation behavior and the ultimate outcome of an innovation at the individual level (Choi & Chang, 2009; Klein et al., 2001). *Implementation behavior* refers to the frequent, consistent, and committed use of the innovation by the employee, whereas *innovation outcome* reflects the performance-related consequence or the gain of expected benefits from the innovation (Klein & Sorra, 1996).

Empirical studies have also demonstrated that negative cognitive and affective states (e.g., fatigue and burnout) hinder desirable behavioral outcomes. In particular, fatigue leads to behavioral impairment, because the inefficient use of human, physical, and technical resources results in passive maladaptive behaviors and decreased efforts in future task engagements (George & Jones, 2001; Martinko & Gardner, 1982; Minor & Hunter, 2002). Similarly, burnout reduces productivity and effectiveness at work (Maslach, Schaufeli, & Leiter, 2001). Therefore, we posit that innovation fatigue discourages employees from consistently applying subsequent innovations. Hence, we propose the following hypothesis:

Hypothesis 4: Innovation fatigue is negatively related to implementation behavior toward a subsequent innovation.

Although implementation behavior is important for innovation success, it is merely a necessary condition for innovation success and not a sufficient condition (Klein et al., 2001). For instance, the fact that employees consistently use a new IT system does not imply that all of them can gain the benefits (e.g., increases in productivity) from using the system. Nonetheless, the ultimate outcome of innovation implementation can be achieved only when the employees actually apply the innovation to their tasks (Choi & Chang, 2009). Studies showed that performance expectations can be met only when the task requirements are fulfilled by incumbents (Borman & Motowidlo, 1993). Similarly, by meeting the innovation requirements and consistently using the innovation, employees can gain the expected benefits of the innovation such as skill acquisition and improved productivity (Klein et al., 2001). Employees who comply with an innovation are apt to accomplish what is intended by the organization (Meyer,

Srinivas, Lal, & Topolnysky, 2007). Thus, we hypothesize a positive association between the implementation behavior of employees and their gain of expected benefits from the innovation.

Hypothesis 5: The implementation behavior toward a subsequent innovation is positively related to the innovation outcome gained by an individual.

Method

Sample and data collection procedure

We collected field data from China and Korea to test the present theoretical propositions. These two countries have intensely pursued technological and industrial advancements by exploring and exploiting numerous innovations to maintain their rapid economic growth (Dahlman, 2009). Therefore, the employees of Chinese and Korean organizations tend to implement innovations in a continuous manner. We contacted 127 managers enrolled in part-time Executive MBA and MBA programs in China and Korea. After the non-participants and those responses with missing data are excluded, our final sample included 84 managers (response rate = 63.8 percent) and their 397 subordinates. The sample from China included 51 managers and 244 employees, whereas that from Korea included 33 managers and 153 employees. We combined the samples for our analysis because of two reasons: (i) the samples from China and Korea reflect the demographic characteristics of the typical workforce in the two countries, and (ii) they represent highly similar sets of industries.

The current sample of 84 managers and their teams represent the following industries: 24 from technology and manufacturing (e.g., computers and automobiles), 22 from consumer services (e.g., retail), 17 from financial services (e.g., banking and insurance), 17 from industrials (e.g., energy and construction), and 4 from telecommunications (e.g., fixed line and mobile communications). The sample of managers included 16 women and 68 men with an average age of 38.8 years ($SD = 6.3$). Eight managers (9.5 percent) obtained their degrees from two- or three-year colleges or high schools, 51 (60.7 percent) held bachelor's degrees, and 25 (29.8 percent) held graduate degrees. Meanwhile, the sample of employees included 139 women and 258 men with an average age of 31.6 years ($SD = 5.9$) and an average organizational tenure of 4.9 years ($SD = 4.9$). Eighty employees (20.2 percent) obtained their degrees from 2- or 3-year colleges or high schools, 280 (70.5 percent) held bachelor's degrees, and 37 (9.3 percent) held post-graduate degrees.

During the data collection, we asked the managers to identify an innovation that had been adopted and implemented recently within their departments. We asked them to report the name of the innovation and the reason or goal related to its implementation. The managers identified 76 administrative innovations (e.g., new human resources practices and team-based work arrangements) and eight technological innovations (e.g., new information technologies and quality assessment tools). Thereafter, they were asked to rate the implementation behavior and innovation outcome of their subordinates on the recent innovation that they designated. Each manager rated an average of 4.7 employees. The employees were asked about their perceptions toward the innovations that were adopted and implemented in their organizations over the past 3 years. They also reported their own levels of innovation-targeted helplessness and innovation fatigue. The employees reported that they experienced an average of 3.8 innovations ($SD = 2.7$) per year.

Measures

All of the constructs were measured with multi-item scales with acceptable reliability coefficients. The managers and employees rated the scale items by using a 5-point Likert scale (1 = "strongly disagree" and 5 = "strongly agree").

Perceived intensity of previous innovations

Consistent with the conceptualization of the intensity of innovations, it is operationalized as the perceptions of employees toward previous innovations instead of the actual number of previous innovations. This operationalization is employed because employees may experience highly different levels of innovation intensity and develop different cognitive appraisals regarding the quantity of innovations implemented in their organizations.¹ Given the lack of existing measures, we constructed a three-item measure ($\alpha = .85$) of the intensity of previous innovations. The employees rated three items, namely, “With regard to the innovations that were adopted and implemented in my organization over the past three years, I believe that (i) my organization implemented innovations quite frequently, (ii) my organization adopted highly radical innovations very frequently, and (iii) my organization introduced too many innovations.”

Perceived failure of previous innovations

We adopted an existing measure of innovation effectiveness (Klein et al., 2001) and used a four-item index ($\alpha = .90$) to assess the perceptions of innovation failure that employees experienced in their organizations. The employees rated the following four items: “I believe that the previous innovations that were adopted and implemented in my organization over the past three years have failed to improve (i) the quality of products and services that we offer, (ii) the information exchange and communication in the organization, (iii) the morale of employees, and (iv) the overall productivity.”

Innovation-targeted helplessness

By modifying the items of learned helplessness from Quinless and Nelson (1988), we used a four-item index ($\alpha = .80$) to measure the innovation-targeted helplessness of employees. This scale included the following items: (i) “No matter how much energy I put into innovation implementation, I feel that I have no control over the outcome,” (ii) “I am unable to solve most problems that are related to innovations,” (iii) “I do not try any new tasks related to an innovation if I have failed in similar tasks in the past innovations,” and (iv) “My behavior toward innovations does not influence their success.”

Innovation fatigue

We employed items from the Maslach Burnout Inventory (Maslach & Jackson, 1981) and measured innovation fatigue with the resulting five-item index ($\alpha = .93$). This scale included the following items: (i) “I feel emotionally drained from my work related to innovations,” (ii) “Working with other people in accomplishing innovation-related tasks is a real strain for me,” (iii) “I feel burned out from my innovation-related work,” (iv) “I feel that I am working too hard on my innovation-related tasks,” and (v) “I feel that I am at the end of my tether while using or implementing innovations.”

¹We performed several analyses to verify whether the current measure of the perceived intensity of previous innovations reflects the reality of previous implementations within the organization. First, we examined the correlation between the perceived innovation intensity measure and the number of innovations that was implemented per year over the past 3 years. Such correlation was moderate but significant ($r = .26$, $p < .001$), indicating that the current measure of innovation intensity reflected the abstracted reality in the mind of employees. Second, we checked whether the employees from the same work unit context reported a similar level of perceived innovation intensity by performing an analysis of variance, which was highly significant ($F = 2.89$, $p < .001$). This result was similar to that of another analysis of variance based on the number of innovations implemented per year as reported by the employees ($F = 3.51$, $p < .001$). This pattern demonstrated the consistency in the innovation intensity perceptions reported by employees from the same work unit. This significant sharedness or group-level variance of perceived innovation intensity supports the validity of the perceived innovation intensity measure. Finally, we examined the correlation between the employee and manager ratings of perceived innovation intensity, which was significant ($r = .31$, $p < .01$). The correlation between employee and manager ratings of perceived innovation failure exhibited a comparable magnitude and significance ($r = .34$, $p < .01$). Overall, these patterns demonstrated the validity of the perceived intensity of previous innovations with respect to the actual condition within an organization.

Implementation behavior

We adopted the implementation effectiveness measure of Klein et al. (2001) and used three items ($\alpha = .87$) to measure the employees' acceptance and use of an innovation that was recently adopted and implemented in their organizations as identified by the managers. The managers rated the following reverse-coded items: (i) "When this employee can accomplish a task by either using or not using this innovation, he/she usually chooses not to use this innovation," (ii) "Even when this employee can do a task using this innovation, he/she still uses the old system and work processes most of the time," and (iii) "I think that this employee believes that this innovation wastes his/her time and efforts."

Innovation outcome

By adopting items from the innovation effectiveness scale (Klein et al., 2001), we used three items ($\alpha = .92$) to measure the extent to which the employees benefited from their use of a recently adopted innovation identified by the participating managers. The managers rated the following items: (i) "The quality of products and services that this employee provides has been improved by implementing this innovation," (ii) "The morale of this employee has been improved because of this innovation," and (iii) "The productivity of this employee has been improved because of this innovation."

Control variables

We controlled the demographic characteristics of the employees in the analyses, including their age, gender, and organizational tenure. We also controlled the type of the recently adopted innovation that the managers identified and used to rate the implementation behavior and innovation outcome of their employees. Specifically, we categorized the focal innovations into administrative and technological innovations. In addition, we included a country dummy (0 = *Korea*, 1 = *China*) to control for potential country effects.

Results

Table 1 presents the descriptive statistics and correlations among all variables. Although all correlations among study variables were moderate and below .50, we verified the empirical distinctiveness among them, using exploratory and confirmatory factor analyses (EFA and CFA, respectively). First, we conducted three sets of EFAs with an oblique rotation for the following variables that could be confounded and indistinguishable because of their conceptual proximity: (i) perceived intensity and failure of previous innovations, (ii) innovation-targeted helplessness and innovation fatigue, and (iii) implementation behavior and innovation outcome. All three EFAs produced two factors in accordance with the expected factor structure. Although some cross-loadings were moderate, the loadings on the corresponding factors were considerably greater than the cross-loadings.

Second, drawing on the analytic CFA procedure (Price, Choi, & Vinokur, 2002), we conducted three nested CFAs to verify the empirical distinctiveness of four employee-rated variables. Specifically, we tested (i) a four-factor model as we hypothesized ($\chi^2 (df = 98) = 231.5, p < .001, CFI = 0.96, RMSEA = 0.06$); (ii) a three-factor model wherein innovation-targeted helplessness and innovation fatigue were combined into a single factor ($\chi^2 (df = 101) = 458.9, p < .001, CFI = 0.91, RMSEA = 0.09$); (iii) a two-factor model wherein innovation-targeted helplessness and fatigue items were combined as a single factor, and the perceived intensity and failure of previous innovations items were also loaded onto one factor ($\chi^2 (df = 103) = 1416.4, p < .001, CFI = 0.66, RMSEA = 0.18$); and (iv) a one-factor model wherein all of the items were loaded onto one factor ($\chi^2 (df = 104) = 1803.9, p < .001, CFI = 0.56, RMSEA = 0.20$). The results confirm the hypothesized four-factor structure, indicating that each scale should be treated as a distinct latent factor.

On the bases of these empirical confirmations from EFA and CFA, we proceeded to test the structural relations among the constructs. To test our framework in Figure 1, we performed multilevel structural equation modeling

Table 1. Means, standard deviations, and intercorrelations among the study variables.

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Country (0 = Korea, 1 = China)	0.61	0.49	—										
2. Innovation type (0 = administration/service, 1 = technology)	0.09	0.29	-.08	—									
3. Age	31.55	5.91	-.35**	-.05	—								
4. Gender (0 = female, 1 = male)	0.65	0.48	-.23**	.09	.27**	—							
5. Organizational tenure	4.92	4.93	-.16**	-.01	.67**	.11	—						
6. Perceived intensity of previous innovations	2.91	0.83	.27**	-.04	-.07	-.05	-.01	—					
7. Perceived failure of previous innovations	1.48	0.70	-.29**	.14**	.01	.03	-.05	.13*	—				
8. Innovation-targeted helplessness	2.74	0.73	.28**	-.07	-.18**	-.09	-.09	.38**	.31**	—			
9. Innovation fatigue	2.82	0.85	.18**	.01	-.05	-.04	.06	.46**	.25**	.58**	—		
10. Implementation behavior	2.62	1.01	-.26**	.18**	.18**	.17**	.06	-.26**	-.10*	-.30**	-.28**	—	
11. Innovation outcome	3.47	0.85	.20**	.05	-.03	-.03	-.01	-.11*	-.25**	-.09	-.03	.43**	—

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

(SEM) by using MPLUS 6.0 (Muthén & Muthén, 1998–2010). Given that the current sample included 84 teams, in which a manager rated multiple employees, we employed multilevel SEM to consider the interdependence of observations within the same team (Cook & Kenny, 2005). These SEMs also included demographic factors (age, gender, and tenure), innovation type, and country as control variables.

Hypothesized model and alternative models

By creating a multilevel structural model according to the framework depicted in Figure 1, we confirmed that our hypothesized model showed a favorable fit to the data ($\chi^2 (df = 294) = 572.4, p < .001, CFI = 0.95, RMSEA = 0.05, Akaike information criterion = 19,176.2, Bayesian information criterion (BIC) = 19,562.7, adjusted BIC (ABIC) = 19,254.9$). Although our hypothesized model exhibited acceptable model fit indices, we compared this model with alternative or competing models that also offered theoretically plausible explanations to maximize the benefits of SEM (Aziz, 2008). To achieve this purpose, we tested three alternative models and compared their model fit with that of the hypothesized model using chi-square, CFI, RMSEA, and three types of information criteria, namely, Akaike information criterion, BIC, and ABIC. For these criteria, a model with a smaller value has a better fit with the observed pattern in the data (Wang & Wang, 2012).

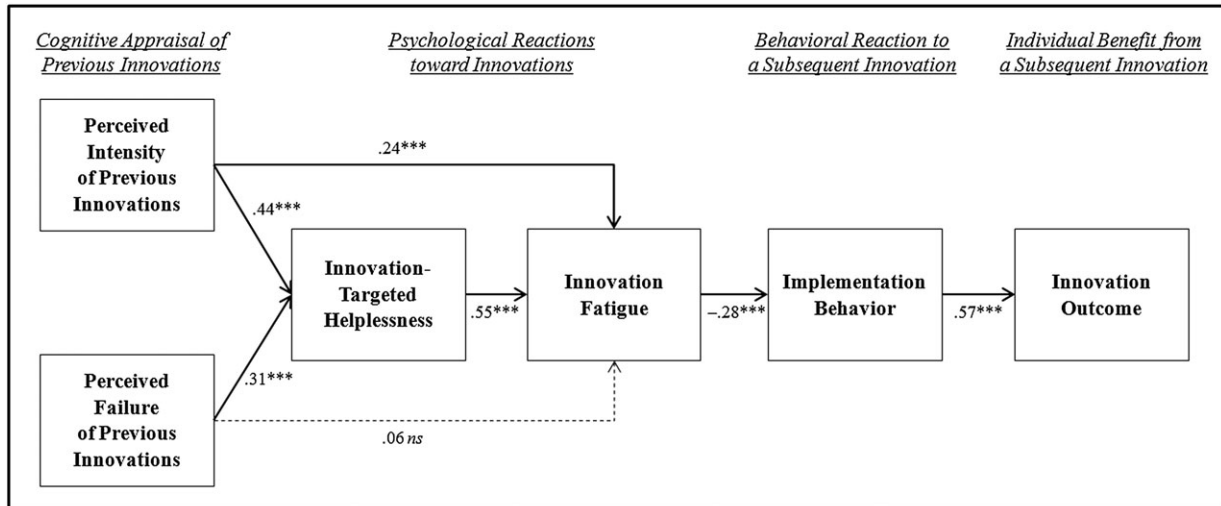
First, we tested the possibility of innovation fatigue predicting innovation-targeted helplessness instead of vice versa as we hypothesized. Second, we tested the possibility of innovation-targeted helplessness and fatigue simultaneously mediating the relationship between perceptions of previous innovations and implementation behavior. Third, we tested a structural model, in which innovation intensity leads to fatigue and innovation failure leads to innovation-targeted helplessness only. Hence, fatigue mediates the effect of innovation intensity on innovation implementation, whereas helplessness mediates the effect of innovation failure on innovation implementation. Table 2 shows that these alternative models exhibited a worse fit than the hypothesized model.

Finally, although we hypothesized that innovation-targeted helplessness fully mediates the relationship between perceptions of previous innovations and innovation fatigue, we find that such mediating role could be partial. We tested such possibility by adding two direct paths from two innovation perceptions to innovation fatigue. The results of model comparison in Table 2 indicate that this partial mediation model has a significantly better fit than the hypothesized model ($\Delta\chi^2 (df = 2) = 15.0, p < .001$). Therefore, we adopt this partial mediation model, which offers the best fit, and still a plausible explanation for the observed patterns in the data.

Table 2. Model fit comparisons among the hypothesized model and the alternative models.

Models	χ^2	df	p-value	CFI	RMSEA	AIC	BIC	ABIC
Hypothesized model (full mediation of innovation-targeted helplessness)	572.4	294	<.001	0.95	0.05	19,176.2	19,562.7	19,254.9
Alternative Model 1 (reverse causality model)	580.5	294	<.001	0.95	0.05	19,184.3	19,570.7	19,262.9
Alternative Model 2 (parallel mediations by both helplessness and fatigue)	609.4	292	<.001	0.94	0.05	19,217.3	19,611.7	19,297.6
Alternative Model 3 (separate mediations: intensity-fatigue-implementation behavior and failure-helplessness-implementation behavior)	712.5	294	<.001	0.93	0.06	19,316.3	19,702.7	19,395.0
Alternative Model 4 (partial mediation of innovation-targeted helplessness)	557.4	292	<.001	0.95	0.05	19,165.2	19,559.6	19,245.5

Note: AIC, Akaike information criterion; BIC, Bayesian information criterion; ABIC, sample-size adjusted BIC.



*** $p < .001$

Figure 2. Individual-level structural model

Hypothesis testing

As shown in Figure 2, all hypothesized relationships were confirmed by the SEM results obtained from the best-fitting partial mediation model. In particular, the perceived intensity and failure of previous innovations were meaningful predictors of innovation-targeted helplessness ($\beta = .44$ and $.31$, respectively, both $p < .001$), thereby supporting Hypotheses 1 and 2.

Consistent with Hypothesis 3, innovation-targeted helplessness significantly affected innovation fatigue ($\beta = .55$, $p < .001$). The indirect effects of the perceived intensity and failure of previous innovations on innovation fatigue through innovation-targeted helplessness were also statistically significant ($\beta = .24$ and $.17$, respectively, both $p < .001$), indicating the significant mediating role of innovation-targeted helplessness. After controlling for the indirect effect, the perceived intensity of previous innovations still exerted a significant direct effect on innovation fatigue ($\beta = .24$, $p < .001$), indicating that innovation-targeted helplessness *partially* mediated the relationship between the intensity of previous innovations and innovation fatigue as well as *fully* mediated the relationship between the failure of previous innovations and innovation fatigue.

The SEM results also confirmed the negative effect of innovation fatigue on implementation behavior ($\beta = -.28$, $p < .001$) and the positive relationship between implementation behavior and innovation outcome ($\beta = .57$, $p < .001$). Therefore, Hypotheses 4 and 5 are supported.

Post hoc analysis

We performed three *post hoc* analyses to further verify the validity of these findings and to identify potential boundary conditions.² First, the samples collected from Korean and Chinese organizations could exhibit different empirical patterns. We checked this possibility by conducting multi-group SEM analysis. We compared the unconstrained model with the constrained model that assumed the invariance of structural parameters across two samples. Although the constrained model produced acceptable fit indices (χ^2 ($df = 417$) = 683.1, $p < .001$,

²We thank the anonymous reviewers for their insightful suggestions in pursuing these possibilities in the present data.

CFI = 0.94, RMSEA = 0.06), the unconstrained model significantly outperformed the constrained model ($\Delta\chi^2$ ($df = 38$) = 145.2, $p < .001$). In particular, two path coefficients were significantly different across the two samples. First, the coefficient from the perceived intensity of previous innovations to innovation-targeted helplessness was significant in the Chinese sample ($\beta = .37$, $p < .001$) but was insignificant in the Korean sample ($\beta = .13$, ns). Second, the coefficient from the perceived failure of previous innovations to innovation-targeted helplessness was significantly greater in the Korean sample ($\beta = .63$, $p < .001$) than in the Chinese sample ($\beta = .34$, $p < .001$). These contrasting patterns indicate that innovation-targeted helplessness is affected by different aspects of previous innovations in Chinese and Korean organizations.

Second, although the present theoretical model proposes that the perceived intensity and failure of previous innovations have independent effects on innovation-targeted helplessness, these two innovation perceptions may interact to predict innovation-targeted helplessness. We checked such possibility by testing an interaction term, which turned out to be a significant predictor of helplessness ($\beta = -.25$, $p < .01$). As shown in Figure 3, a simple slope analysis of this significant interaction (Aiken & West, 1991) showed that the effect of perceived intensity on helplessness is stronger when employees consider previous innovations as successful (when the perceived failure is low; $b = 0.52$, $p < .001$) than when they consider them to be ineffective (when the perceived failure is high; $b = 0.17$, ns). These patterns suggest that the role of innovation intensity toward helplessness becomes stronger when innovation failure is lower, thus having a *complementary rather than synergistic or simple additive relationship* with innovation failure.

This complementary interaction between the intensity and failure of previous innovations was somewhat different from the typical expectation of additive effects of these factors in predicting learned helplessness (Overmier & Seligman, 1967; Martinko & Gardner, 1982). Thus, we further explored this interaction effect by dividing the items used to assess the failure of previous innovations, as follows: (i) a single-item measure that assesses the failure in improving the quality of products and services (i.e., product innovations) and (ii) a three-item measure that assesses the failure in improving the work processes such as communication, morale, and productivity (i.e., process innovations). The results showed that the interaction between the first failure measure involving product innovations and the intensity of previous innovations was not significant ($\beta = -.08$, ns). By contrast, the interaction between the second failure measure involving process innovations and the intensity of previous innovations was statistically significant ($\beta = -.19$, $p < .05$). In addition, the interaction pattern from the second failure measure was almost identical to that depicted in Figure 3 (low perceived failure, $b = 0.52$, $p < .001$; high perceived failure, $b = 0.12$, ns). These contrasting patterns indicate that the complementary interaction effect of perceived intensity may be observed when previous innovations are related to process improvements but not when previous innovations are

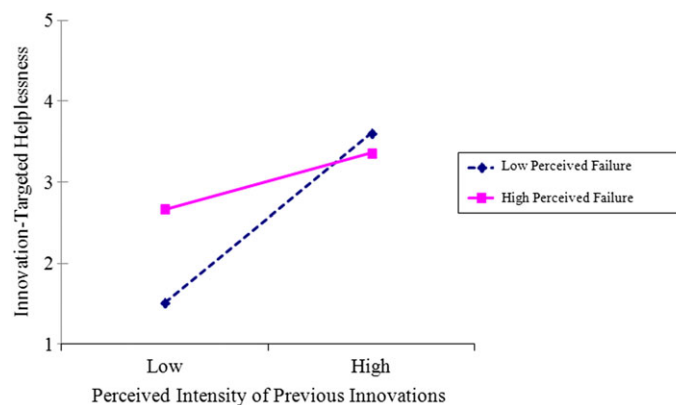


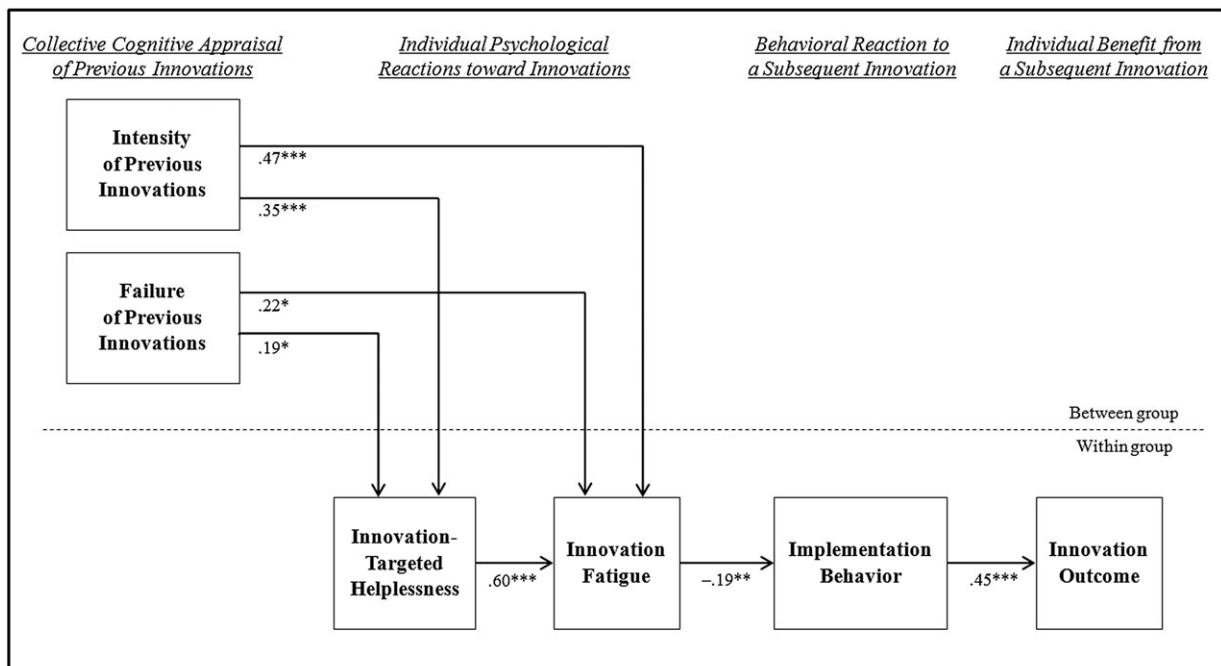
Figure 3. Interaction between perceived intensity and failure of previous innovations in predicting innovation-targeted helplessness. [Colour figure can be viewed at wileyonlinelibrary.com]

targeted at improving product quality. This interaction pattern suggests a new direction for theoretical developments, as discussed later.

Third, to further attenuate the concerns of common method bias, we aggregated the intensity and failure of previous innovations at the group level and tested the current framework by adopting a multilevel structural model. This multilevel approach also addresses the theoretical plausibility that employees in the same work unit share the experiences involving previous innovation implementation at the workplace so that the perceptions of previous innovations have cross-level (from group to individual) effects on individual employees' innovation-targeted cognitions (Anderson et al., 2014; Choi, Sung, Lee, & Cho, 2011). Both perceptions of intensity and failure of previous innovations exhibited acceptable aggregation statistics, although ICC(1) values were somewhat low [ICC(1) = 0.02, ICC(2) = 0.65, $r_{wg} = 0.65$, and ICC(1) = 0.03, ICC(2) = 0.69, $r_{wg} = 0.76$, respectively]. As depicted in Figure 4, two collective cognitive appraisals (i.e., collective perceptions of intensity and failure of previous innovations) are significantly related to innovation-targeted helplessness and fatigue. The results confirm that the current theoretical propositions can be expanded as a contextual and collective process that accounts for individual psychological and behavioral reactions to innovations.

Discussion

By responding to the recent call for the “dark side of innovation predictors, processes, and outcomes” (Anderson et al., 2014, p. 1322), we investigated a vicious spiral of innovation implementation. In this negative stream of innovation, employees with negative experiences of previous innovations are less likely to willingly implement another innovation in a subsequent period. The present empirical analysis confirmed our theoretical propositions that



* $p < .05$; ** $p < .01$; *** $p < .001$

Figure 4. Multilevel structural model

employees' perceptions of the intensity and failure of past innovations shape their psychological reactions toward innovations. Such negative schematic reactions could also negatively affect the implementation behavior of employees toward a subsequent innovation, thereby hindering the achievement of intended innovation outcomes. The following subsections highlight the theoretical and practical implications of the findings, the limitations of this study, and the promising directions for future research.

Theoretical implications

The present research makes several important contributions to the innovation literature. First, the present conceptual and empirical developments highlight and conceptualize the individual-level innovation implementation in organizations as a stream of continuous innovation processes. As noted earlier, most existing studies on innovation focus on predictors, processes, and consequences of the implementation of a single innovation (e.g., Choi & Chang, 2009; Klein et al., 2001). However, in practice, contemporary organizations continuously adopt and implement one innovation after another. The current study theoretically advances the innovation literature by raising and theorizing the practical possibility that employees' experience with past innovations may affect their perceptions, attitudes, and behaviors toward a subsequent innovation. By doing so, as physicists can deeply understand the movement of light by embracing the fact that light has particle and wave properties (i.e., wave-particle duality; Giancoli, 2004), innovation scholars who typically consider innovation as a single isolated event (i.e., particle theory) can gain deeper insights into the mechanism of innovation implementation by also conceptualizing it as a series of interconnected events (i.e., wave theory).

Second, we enrich the innovation literature by introducing new theoretical perspectives that provide more realistic and sophisticated explanations of the micro-processes of implementation than available in the existing literature. Specifically, (i) on the basis of cognitive schema theory in the sense-making literature (Fiske & Linville, 1980; Fiske & Taylor, 1991), the current theoretical framework specifies the individual-level cognitive processes of appraising previous innovations and the formation of overall schematic orientations toward innovations in general, which determine the behavioral choices in a subsequent innovation. (ii) Referring to a model of information quantity and quality in the consumer behavior literature (Keller & Staelin, 1987), we identify two critical cognitive appraisal dimensions (intensity and failure of previous innovations) to provide a new systematic framework for employee behavior toward innovations. (iii) To advance the theoretical accounts of negative innovation experiences, we first introduce theory of learned helplessness (Overmier & Seligman, 1967; Seligman & Maier, 1967) to the innovation implementation literature. The current analysis validates the perceived intensity and failure of previous innovations as independent, critical factors for forming schematic reactions such as innovation-targeted helplessness and fatigue.

The *post hoc* analysis indicates that the negative effect of perceived intensity of previous innovations on innovation-targeted helplessness is stronger when employees consider previous innovations as successful than when they consider them as ineffective (Figure 3). A follow-up analysis further revealed that such pattern can be observed only for failure perceptions related to work process innovations (i.e., communication, morale, and productivity) but not for product innovations (i.e., quality of products and services). Product and process innovations are considerably different from each other in that "product innovations have a market focus and are primarily customer driven, while process innovations have an internal focus and are primarily efficiency driven" (Damanpour & Gopalakrishnan, 2001, p. 48). Within this perspective, employees may accept product and service innovations as the target for *ongoing, continuous improvements* needed for organizational survival (Anderson et al., 2014; Utterback & Abernathy, 1975), which may separate the effect of the intensity of previous innovations from that of their success or failure. On the contrary, employees may consider work process innovations as more *instrumental and tentative* improvement efforts. Once employees view these types of innovations as successful (low perceived failure), they may recognize that the process improvement efforts have achieved their goal and completed, thereby removing the need for further process innovations given that the problems are resolved and there is nothing to be fixed.

This theoretical speculation suggests that when employees regard previous process innovations as successful, the continuous, intense innovation implementation may be regarded as never-ending demands for increased work performance that cannot be fulfilled after all, which generates helplessness among them. This theoretical possibility is somewhat different from typical expectations for additive functions of intensity and failure in leading to learned helplessness (Overmier & Seligman, 1967; Martinko & Gardner, 1982). Nonetheless, this unexpected interactive pattern presents an intriguing possibility for theorizing the formative processes of innovation reactions based on learned helplessness theory in organizations.

Finally, this study complements the existing focus on favorable social, organizational, and individual characteristics that promote a successful innovation implementation (Choi & Chang, 2009; Klein & Sorra, 1996; Rogers, 2003). Considering a high rate of innovation failure (Altuwaijria & Khorsheed, 2012; Andrew, 2009), scholars must adopt a balanced view of the positive and negative innovation processes, which produce either innovation success or failure, respectively, as well as negative employee outcomes such as burnout, fatigue, and helplessness in the context of innovation implementation. This balanced view should further enrich the research on innovation when it is combined with the consideration of the streams of innovations as a continuous and interconnected organizational phenomenon, which exerts broad contextual influences on employees' sense-making of past innovations. An elaborate consideration of innovation activities, with the expanded temporal scope and various contextual factors that explain the positive and negative unfolding spirals of organizational innovations, presents an intriguing direction to further enhance the understanding of organizational innovations.

Practical implications

The findings of the current study offer several managerial implications. First, top management must set a sufficient time lag or interval among innovations. Given that employee attitudes and behaviors toward future innovations are influenced by the intensity of previous innovations, top management must carefully schedule the implementation of a subsequent innovation. Managers must also combine radical and incremental innovations to provide a break to employees in between intensive innovation challenges. Under extreme cases, in which top management adopts one radical innovation after another, top managers must provide sufficient resources and foster a climate in support of innovation, which refers to employees' shared perception of the importance of innovation (Scott & Bruce, 1994). To this end, managers should inform the employees about the rationale, intended benefits, and legitimate reasons for the intensive innovation implementation in support of the current core identity and the ideal identity of the organization (Talib & Rahman, 2010). Otherwise, their employees experience innovation-targeted helplessness and fatigue and become unwilling to implement subsequent innovations.

Second, managers must use positive reinforcements, such as optimistic feedback, when implementing a series of innovations. Specifically, they must encourage their employees to attribute innovation success to internal, controllable factors and innovation failure to external, uncontrollable factors because unsuccessful experiences with previous innovations can induce innovation-targeted helplessness, as shown in this study. In this respect, organizations can offer attribution training to their employees so that employees can attribute their innovation successes to internal, general, and stable causes and their innovation failures to external, specific, and unstable factors. In this manner, employees avoid developing helpless and apathetic attitudes toward the implementation of new innovations (Martinko & Gardner, 1982).

Third, managers must cautiously disseminate lessons from the past experiences of innovation failure or disasters. Many companies analyze their past failures and the reasons for such failures. Although such retrospective analysis of failure can elicit valuable lessons, an excessive emphasis on learning from past failures drives employees to recall the failure of previous innovations, thereby triggering innovation-targeted helplessness and fatigue. Managers can avoid such negative cycle by frequently sharing success stories to nurture the commitment and confidence of employees toward future innovations. Furthermore, a balanced consideration and narration of failure and success stories must be practiced.

Finally, our *post hoc* analysis indicates that employees may feel exhausted and experience helplessness when they are demanded to continually implement new work-related process innovations even after they believe that they have been successful in improving their work processes (e.g., communication, morale, and productivity). This never-ending, continuous pressure to incessantly improve work processes following successful improvement through previous innovations may urge employees to feel stronger helplessness than when their attempts were not fruitful, and they could agree with the need for process improvements in their work. Thus, managers should carefully evaluate the achievement from past process innovations and employees' sentiments toward the need for further process improvements to promote the acceptance and actual implementation of new work process improvement efforts.

Limitations and future research directions

Despite the significant theoretical contributions and practical implications of this study, it has several limitations. First, although the current research design involves multiple sources, all variables are measured simultaneously. Future studies may thus explore the dynamic unfolding of processes over time and clearly establish causal directions by using longitudinal design or qualitative research methods. Second, although we tested and compared several alternative structural models, the differences in model fit indices among them were relatively small despite their statistical significance. Future research may theoretically confirm the distinctiveness among the variables by refining and validating the current scales (e.g., intensity and failure) and then replicating the present theoretical model using samples from various organizational contexts.

Third, the scale items that assess the perceived intensity of previous innovations may trigger biased responses because of the use of a strong expression such as “too many innovations.” To examine the possibility that the negatively framed item could bias the empirical analysis results, we tested the same structural model as that reported in Figure 2 by using a two-item scale of intensity by excluding the negative item (i.e., “My organization introduced too many innovations”). Nevertheless, the results were basically the same. Although the perceived innovation intensity scale still offers a valid operationalization of the construct in question (cf. footnote 1), future studies may improve this scale or employ alternative approaches to assess the intensity of previous innovations.

Finally, although we aim to examine the negative processes of innovation implementation, our theoretical propositions must be examined further by considering the positive innovation implementation processes. Future studies may theorize and empirically examine positive cognitive appraisals (e.g., previous successes in innovations, adequacy of innovation frequency, and organizational capacity and employee morale in previous innovations). They may also identify favorable cognitions toward innovation in general (e.g., commitment to innovation implementation, implementation efficacy, and collective readiness for implementation). Failure to elaborate on the innovation histories and experiences of employees may prevent researchers from developing a comprehensive understanding of the organizational innovation—regardless of whether they focus on the positive or negative aspects of such phenomenon.

Given that innovation is mandatory and imperative, contemporary organizations tend to implement one innovation after another. Nevertheless, studies on innovation have chiefly focused on innovation as a single process; such studies have largely ignored the fact that an innovation is part of a stream of continuous innovation processes. To address this gap, we propose a conceptual framework that specifies the mechanism through which the pattern and history of previous innovations affect the success of a subsequent innovation. Our analysis reveals that the cognitive appraisal of the two dimensions of previous innovations can trigger the innovation-targeted helplessness and fatigue of employees, which subsequently diminish the chances for future innovation efforts to succeed. Further conceptual and empirical efforts must elaborate the comprehensive dynamics of innovation as a stream of processes instead of a single incident by exploring additional individual and situational contingencies to achieve an ecologically valid representation of organizational innovation.

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