


## ORIGINAL ARTICLE

# Effects of training and development on employee outcomes and firm innovative performance: Moderating roles of voluntary participation and evaluation

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This study investigates the effect of training and development (T&D) on firm innovation. Given the inconsistent findings on the performance implications of T&D and the lack of studies on the T&D–innovation relationship, we elaborate the multiple dimensions of T&D, intermediate employee outcomes, and boundary conditions to elucidate the pathways of T&D toward firm innovation. We specifically identify two distinct T&D dimensions, namely, firm investment and employees' positive perceptions. The former and the latter, respectively, reflect top-down and bottom-up approaches. We suggest that these two dimensions indirectly affect firm innovative performance by enhancing employees' competence and commitment. We further hypothesize that T&D-related contingencies (i.e., employees' voluntary participation and T&D evaluation) moderate the indirect effects of T&D on firm innovative performance. We examine the current framework by using multisource data collected at three time points over a 5-year period from 325 Korean organizations. Our analysis confirms that the positive indirect effect of T&D on firm innovative performance through employees' competence and commitment becomes stronger (a) when employees voluntarily participate in T&D and (b) when firms do not implement T&D evaluation. This study provides useful and valid theoretical explanations and practical insights into the design and implementation of T&D in firms.

## KEYWORDS

commitment, employee participation, human capital, innovation, training and development

## 1 | INTRODUCTION

In a contemporary business environment, developing idiosyncratic, inimitable, and nonsubstitutable human capital is a major strategic tool and necessary condition to improve organizational performance (Shaw, Park, & Kim, 2013). For this reason, organizations bear enormous capital spending on training and development (T&D) programs and activities (Association for Talent Development, 2017). Nonetheless, meta-analytic reviews on empirical findings raise considerable doubt on the actual contribution of T&D to firm performance (Nguyen, Truong, & Buyens, 2010; Tharenou, Saks, & Moore, 2007). For example, several empirical studies have demonstrated that training contributes to employees' motivation and competence and firm performance (Castellanos & Martin, 2011; Kim & Ployhart, 2014). By contrast, other studies have reported that training is not a meaningful predictor of employees' knowledge, skills, and abilities (KSAs) and firm performance because T&D frequently irritates employees, resulting in unintended dysfunctional outcomes that cancel out potential

benefits (Glaveli & Karassavidou, 2011). Ployhart, Call, and McFarland (2017) noted that T&D investment often helps improve employee performance but simultaneously leads to negative consequences, such as increased job mobility, bargaining power, and turnover. Aragón-Sánchez, Barba-Aragón, and Sanz-Valle (2003) revealed that training can even hinder employees' task involvement and firm profitability. These findings present a critical theoretical challenge in understanding why some studies have revealed positive effects of T&D on performance, whereas other studies have obtained nonsignificant or even negative effects.

To address the gap between the prevailing assumption and mixed empirical evidence on the value of T&D, the present study investigates the distinct functions associated with different dimensions of T&D, their intermediate employee outcomes, and critical boundary conditions to explain firm performance. In so doing, we focus on firm innovation as a critical performance domain. Unfortunately, innovative performance has been largely neglected in T&D-related literature despite its importance in organizations to continually adapt to

changing market and technological demands (see Nguyen et al., 2010; Tharenou et al., 2007, for review).

Inconsistent findings on the T&D–performance link may be partly due to the lack of consensus on conceptualization and resulting inconsistent dimensions of T&D examined across empirical investigations (Nguyen et al., 2010). Studies employing various T&D operationalizations may have led to disparate findings. To address this conceptual and operational ambiguity of the T&D construct, we explicitly differentiate two contrasting dimensions, namely, (a) firm investment in T&D and (b) employee positive perceptions of T&D. Firm investment in T&D represents a prevailing resource-based view concerning an organization's resource input to T&D that also reflects a top-down approach driven by the managerial intention to develop human capital (Aragón-Sánchez et al., 2003; Castellanos & Martín, 2011). By contrast, employees' positive perceptions of T&D reflect a target-centered perspective on how employees favorably experience and appraise the T&D activities offered to them (Bartlett, 2001; Tabassi, Ramli, & Bakar, 2012). Given the multifaceted nature of T&D, we deliberately specify the top-down resource-based view and bottom-up employee-based perspectives of T&D to investigate their distinct implications toward firm innovation.

Inconsistent findings on T&D may also be attributable to the tendency to create a direct connection between T&D and firm performance without considering potential intermediate processes. Studies on strategic human resource management (SHRM) have acknowledged the critical role of employee ability and motivation as plausible underlying mechanisms explaining the effects of various high-performance work practices on organizational outcomes (Combs, Liu, Hall, & Kitchen, 2006). Likewise, Brown and Sitzmann (2011) concluded that “the positive effects of training are believed to occur through at least two mechanisms ... training improves employees' job-related knowledge and skills ... employees who received such benefits may reciprocate with increased effort and commitment” (p. 470). Therefore, we propose that T&D enhances firm innovation to the extent that T&D positively affects employees in terms of improving motivation and developing KSAs (Collier, Green, Kim, & Peirson, 2011; Sitzmann & Weinhardt, 2017).

Finally, this study explores boundary conditions to account for the inconsistent effects of T&D (Tabassi et al., 2012). Although T&D is regarded as a beneficial tool to increase employee motivation and KSAs, it may not necessarily produce desirable outcomes. T&D-relevant situations that may shape employee interpretations, reactions, and motivation toward T&D should be identified to understand the actual effect of T&D on firm innovation (Grossman & Burke-Smalley, 2017; Sitzmann & Weinhardt, 2017). On the basis of the learner motivation viewpoint that emphasizes the active T&D engagement of employees (Bell & Kozlowski, 2008; Noe, Tews, & Dachner, 2010), we determine voluntary T&D participation and evaluations following T&D as critical contingencies that form employee outcomes. The voluntary participation of employees in T&D may strengthen the T&D–employee outcome–firm innovation link because proactive and learning-goal-oriented behaviors are promoted by self-determination and internal attribution of specific activities (Hurtz & Williams, 2009). By contrast, such proactive learning activities and positive employee outcomes may be hindered when

employees are subject to evaluation following T&D participation, which may be interpreted as a managerial control mechanism and thus demotivate and place employees in a passive position during learning (Bouskila-Yam & Kluger, 2011).

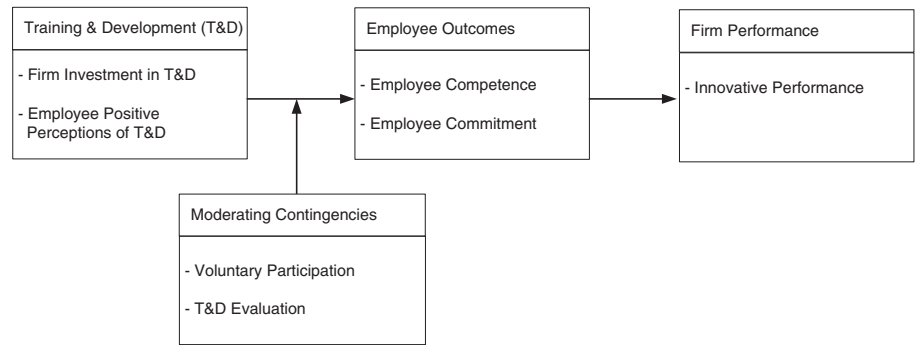
In summary, this study explicates the reasons for the inconsistent performance implications of T&D by theoretically specifying its distinct dimensions, intermediate mechanisms, and boundary conditions. We propose a moderated mediation model wherein voluntary participation and T&D evaluation moderate the indirect effects of the two dimensions of T&D on firm innovative performance through employee outcomes. The research framework is empirically validated using multisource time-lagged data collected from 325 Korean companies at three time points over a 5-year period.

## 2 | THEORETICAL FRAMEWORK AND HYPOTHESES

T&D is based on human resource development (HRD), which refers to “a series of organized activities conducted within a specified time and designed to produce behavioral change” (Nadler & Nadler, 1970, p. 3). Connecting T&D to SHRM, Sung and Choi (In Press) further defined T&D as “a firm's strategic option to build inimitable and nonsubstitutable human capital by developing task-related skills and knowledge through firm-specific training and education.” T&D also constitutes a core feature of corporate HRD efforts (Dhamodharan, Daniel, & Ambuli, 2010; Gubbins, Garavan, Hogan, & Woodlock, 2006).

In the learning and education literature, researchers employed two main theoretical frameworks to understand training: traditional instructional design (ISD) model (Kraiger, 2008) and learning design framework (Bell & Kozlowski, 2008; Noe et al., 2010). The instructor-centric ISD model focuses on the design and delivery of training activities by highlighting top-down, organization-driven approaches, such as resource allocation to T&D (Sung & Choi, 2014a). By contrast, the target-centric learning design framework emphasizes the conditions of learning and the active role of learners, thereby endorsing bottom-up employee-based approaches, such as T&D experiences and employee satisfaction with T&D (Bartlett, 2001; Gubbins et al., 2006; Tabassi et al., 2012). However, research on employee-centric bottom-up approaches has remained relatively limited despite prevailing arguments that the intended benefits of T&D for organizational outcomes are achieved only when such practices are aligned with the interests and needs of target learners (Glaveli & Karassavidou, 2011; Nijhof, 2004).

Considering the ISD model and the recently emerging learning design framework, we focus on the two main dimensions of T&D: (a) Firm investment in T&D refers to the quantitative resource input to T&D characterizing a top-down managerial action, and (b) employee positive perceptions of T&D reflect the qualitative employee experience of T&D in terms of its task relevance and benefit. This study elucidates the processes by which the two dimensions of T&D promote employee competence and commitment and ultimately improve firm innovative performance. We also propose that this T&D-to-innovation process is contingent on several moderating conditions, including employees' voluntary participation and T&D



**FIGURE 1** Theoretical framework of T&D and firm performance

evaluation (Figure 1). This systematic comparison of the distinct dimensions of T&D toward firm innovation in consideration of critical contingencies may provide practical directions for business leaders to make optimal strategic choices regarding T&D implementation.

## 2.1 | T&D and firm innovative performance

Firm innovation depends on the utilization of the broad and diverse reservoir of knowledge and information, which facilitates different combinations and reconfigurations of existing knowledge (Ahuja, 2000; Sung & Choi, 2014a). T&D may enhance firm innovation because it engenders continuous and exploratory learning that provides new knowledge to employees and encourages experimentation at work (Shipton, West, Dawson, Birdi, & Patterson, 2006). Organizational members' task-related KSAs are elements necessary to identify problems and generate useful and innovative ideas (Castellanos & Martín, 2011; Nguyen et al., 2010).

T&D is an effective strategy that helps employees gain appropriate KSAs for their adaptive performance (Gubbins et al., 2006; Kim & Ployhart, 2014; Sitzmann & Weinhardt, 2017). However, T&D exhibits high resource dependence and requires intensive asset investment, thereby necessitating sufficient resource allocation to succeed (Grossman & Burke-Smalley, 2017; Ployhart et al., 2017; Sung & Choi, 2014a). Firm investment in T&D promotes the capacity of organizations to initiate product and service innovations. Employees also tend to be motivated to develop KSAs essential for innovations when they perceive T&D as valuable and relevant to their tasks (Clardy, 2008; Glaveli & Karassavidou, 2011). Such positive T&D perceptions should stimulate their learning motivation and lead to considerable improvements in KSAs among participants. Thus, both the top-down and bottom-up dimensions of T&D are expected to enhance firm innovation.

**Hypothesis 1:** *Firm investment in T&D is positively related to firm innovative performance.*

**Hypothesis 2:** *Employee positive perceptions of T&D are positively related to firm innovative performance.*

## 2.2 | Mediating roles of employee competence and commitment

Studies suggest that T&D enhances firm performance by improving the KSAs and motivation of employees (Collier et al., 2011; Hutchings, Zhu, Cooper, Zhang, & Shao, 2009). However, the empirical

validation of such a mediated relationship remains lacking, particularly in explaining firm innovation. This study identifies employee competence and commitment as intermediate outcomes that link T&D to firm innovation. Following previous studies on T&D (Sung & Choi, 2014b; Tabassi et al., 2012), we define *employee competence* as the task-relevant KSAs and expertise possessed by organizational members, and *employee commitment* as employees' sense of emotional attachment to a given organization.

### 2.2.1 | Employee competence

Improving employees' KSAs is the principal benefit of T&D (Sitzmann & Weinhardt, 2017; Swanson & Holton, 2001). A firm invests in T&D primarily to leverage employee competence to meet performance expectations (Clardy, 2008; Noe et al., 2010; Sung & Choi, 2014b). Thus, a firm's resource allocation to T&D activities indicates managerial expectations regarding human capital development (Bartlett, 2001; Gubbins et al., 2006). Firm investment in T&D may increase employee competence by providing a wide array of opportunities to leverage task-related KSAs and inculcate a sense of obligation to enhance KSAs among employees. In addition, the positive experiences and appraisal among employees regarding T&D offered by a firm, such as effectiveness, usefulness, and benefits, motivate them to actively engage in learning and skill building and thus acquire new knowledge and competence (Bell & Kozlowski, 2008; Tabassi et al., 2012).

Enhanced employee competence helps increase adaptability to changing environments and openness to innovative ideas because rich cognitive resources and KSAs gained through T&D are critical raw materials for innovation (Aragón-Sánchez et al., 2003; Choi & Chang, 2009). Therefore, we propose that increased employee competence translates the effect of T&D into enhanced innovative performance of firms, which informs the following mediation hypothesis:

**Hypothesis 3:** *Employee competence mediates the relationship between the two dimensions of T&D and firm innovative performance.*

### 2.2.2 | Employee commitment

One core mechanism explaining the beneficial effects of T&D on employees is its symbolic value. An organization's investment in employee T&D conveys a clear signal that the organization cares about the welfare and personal growth of employees. Firm investment in T&D reinforces the employees' sense of attachment to their organization by eliciting a strong belief on the genuine support from

their organization (cf. social exchange theory; Eisenberger, Huntington, Hutchison, & Sowa, 1986; Masterson & Stamper, 2003). In addition, employees who perceive that T&D is relevant and beneficial to performing their tasks likely possess positive and appreciative feelings toward their organization, thereby developing a trusting relationship with and attachment toward their employers (cf. perceived organizational support; Rhoades & Eisenberger, 2002).

Employees' membership perception and commitment to an organization tend to motivate them to contribute beyond the minimum task requirement and thus help achieve organizational goals (P. M. Wright, Gardner, Moynihan, & Allen, 2005). Such motivation should be conducive to the proactive search for new opportunities, performance improvements, and innovative products and services. Therefore, we propose an indirect effect of T&D on firm innovation through employee commitment and identify such commitment as a critical intermediate process underlying the T&D–innovation relationship.

**Hypothesis 4:** *Employee commitment mediates the relationship between the two dimensions of T&D and the firm innovative performance.*

## 2.3 | T&D-related moderating contingencies: Voluntary participation and T&D evaluation

Despite considerable resource expenditure on T&D and its strategic value, mixed empirical findings cause scholars and practitioners to be skeptical about the benefits of this mechanism (Bartlett, 2001; Tabassi et al., 2012). We suggest that situational contingencies surrounding T&D may explain the inconsistent findings on its effects. In particular, we identify two T&D-related contingencies, namely, voluntary participation and evaluation following T&D participation, which may modify the effects of T&D on employee outcomes and firm innovation.

### 2.3.1 | Voluntary participation

Employees' motivation to learn is identified as a crucial determinant of T&D outcomes because highly motivated employees tend to apply KSAs that they developed in T&D back on the task (Bartlett, 2001; Haiva, Hofmans, & Pepermans, 2013). The voluntary participation of employees represents an apparent self-determined behavior positively related to intrinsic motivation and proactive task engagement (Deci & Ryan, 2002). Self-determination theory (SDT) states that autonomous motivation is necessary to achieve spontaneous and persistent work behavior and enhance employee performance (Gagné & Deci, 2005; Vandercammen, Hofmans, & Theuns, 2014). People behaving willingly, making their own choices, and taking initiatives tend to experience increased positive affect and motivation toward a given behavior (Bidee et al., 2013).

Employees voluntarily participating in T&D may perceive T&D activities as an opportunity that they have chosen for growth and skill development. In line with SDT arguments (Bidee et al., 2013; Deci & Ryan, 2002), the sense of personal choice and self-control with regard to T&D may increase the engagement and persistence in T&D activities among employees. Such an attitude toward T&D also

promotes their trust toward their employers, who provide valuable opportunities for self-growth. The goal of training programs can be realized when target learners develop interest and motivation to learn, thereby stipulating proactive, self-initiated learning processes (Hurtz & Williams, 2009; Nijhof, 2004).

By contrast, employees forced to attend T&D programs may perceive T&D as a source of unwanted extra workload and an unpleasant burden imposed by organizations (Glaveli & Karassavidou, 2011; Tabassi et al., 2012). Involuntary or often obligatory participation in T&D can significantly decrease satisfaction and affection toward organizations and weaken employees' motivation to develop KSAs through T&D programs. Accordingly, the intervening role of employee competence and commitment between T&D and firm innovative performance is likely more accentuated in firms that allow voluntary participation than in firms that block their employees from choices related to T&D. Therefore, we propose the following moderated mediation hypothesis:

**Hypothesis 5:** *Voluntary participation moderates the relationship between T&D and firm innovative performance, which is mediated by employee outcomes, such that the positive relationship is stronger when voluntary participation is allowed than when it is not.*

### 2.3.2 | T&D evaluation

Evaluation is a crucial and widely adopted component of HR practices by which managers assess and deliver feedback to employees (Spence & Keeping, 2011). Evaluation practices provide various benefits, such as accumulating behavioral data, monitoring, and managing employee behavior and performance, which create opportunities for supervisor–subordinate communication and improved overall performance (P. Wright, Dunford, & Snell, 2001). Nevertheless, studies have also demonstrated the negligible, even destructive, effects of evaluation despite its constructive intentions (for a review, see Smither, London, & Reilly, 2005). Apparently, employees may despise evaluation practices, which can be regarded as the application of *Theory X* based on a managerial belief that employees should be coerced and manipulated because they dislike work (Bouskila-Yam & Kluger, 2011). This view is congruent with the SDT perspective wherein the imposition of external pressure tends to deteriorate task motivation (Gagné & Deci, 2005; Haiva et al., 2013; Vandercammen et al., 2014). In addition, evaluation triggers cold cognitive processes that instigate socially painful interactions between managers and subordinates during performance reviews (Spence & Keeping, 2011).

We argue that the drawbacks of evaluation of employees can be exaggerated when such a practice is applied to T&D and learning-oriented activities. By implementing T&D evaluation, organizations evaluate employees' attitudes, skill improvement, and performance following their participation in T&D programs. The information from the evaluation is used in subsequent personnel decisions (e.g., promotion and incentive allocation) and in the improvement and refinement of T&D programs. Although T&D evaluation can be deployed as an efficient tool to ensure employee participation and effort toward T&D activities, it can provoke unexpected detriments.

With an upcoming evaluation following T&D, employees likely feel a psychological burden or threat and experience antipathy toward a given T&D activity, which diminishes their commitment to the organization and effort toward developing KSAs.

Employees excessively concerned with or distracted by evaluation cannot freely experiment with different possibilities and engage in learning through trial and error (El-Alayli & Baumgardner, 2010). Thus, the expectation of evaluation following T&D limits the cognitive scope and flexibility necessary for employees to acquire new KSAs (cf. entity theory; Dweck & Elliott, 1983). However, without the impending evaluation following T&D, employees liberate themselves from the pressure and managerial control that cause their anxiety over mistakes when practicing new means of doing things. Thus, without expecting T&D evaluation, employees regard T&D as a positive challenge for personal growth that freely leverages new task-related KSAs and appreciate the opportunities for learning offered by their organization. Therefore, we propose that the indirect effects of T&D on firm innovative performance via employee competence and commitment should be positive in the absence of T&D evaluation.

**Hypothesis 6:** *T&D evaluation moderates the relationship between T&D and firm innovative performance, which is mediated by employee outcomes, such that the positive relationship is weaker when T&D evaluation is implemented than when it is not.*

### 3 | METHOD

#### 3.1 | Research setting and data structure

This study aims to examine the effects of T&D in terms of analyzing employee outcomes and firm innovative performance while considering T&D-related situational contingencies. This research goal presents considerable challenges for adequate research design, which requires a sufficiently large sample at the firm level and multisource time-lagged data that allow robust causal inferences from empirical observations (Takeuchi, Lepak, Wang, & Takeuchi, 2007). To address these challenges and to validate the current hypotheses empirically, we used the Human Capital Corporate Panel data archived by the Korea Research Institute of Vocational Education and Training (KRIVET). As a research institute that supports the national training and educational policy on human resource practices in Korean organizations, KRIVET conducted a large-scale corporate survey in cooperation with the Ministry of Labor of the Korean government. A stratified, random sample was derived from the companies listed in the database of the Korea Investors Service. KRIVET created a 4 × 2 matrix based on organization size (i.e., 100 to 299, 300 to 999, 1,000 to 2,999, and over 3,000) and ownership type (i.e., publicly versus privately owned). Approximately 25% of the organizations were randomly selected from each cell of the matrix to avoid potential over- or undersampling problems in specific cells.

The effects of HR practices, particularly those directed to build human capital and employee KSAs, may affect employee and organizational outcomes after a considerable time, often years (Rhoades &

Eisenberger, 2002). Similarly, innovation in organizations unfolds over a long period and takes a minimum of 1 year before positive organizational practices or employee outcomes lead to organizational innovation (Sung & Choi, 2014a). Following the recommendation proposed in research on SHRM and organizational innovation for adopting time-lagged design (Ahuja, 2000; Hagedoorn & Cloudt, 2003), we used the data collected at three time points over a 5-year period: 2011 (T1,  $N = 500$  organizations), 2013 (T2,  $N = 482$ ), and 2015 (T3,  $N = 367$ ). A total of 325 organizations from the initial sample participated in all three waves of data collection and provided longitudinal data for the present analysis. These organizations in our analysis sample represented three large business categories, including 16 specific industries: (a) manufacturing ( $N = 241$ , 10 industries: electronics, computer, chemical, machinery, and plastic), (b) service ( $N = 65$ , 5 industries: telecommunication, software/system/online DB, and entertainment), and (c) financial sector ( $N = 19$ , 1 industry: banking/insurance). This time-lagged research design corresponded to the following conceptual model summarized in Figure 1: (a) Two T&D dimensions were reported by HRM directors and employees in 2011 (T1), (b) employee competence and commitment were rated by employees and department managers in 2013 (T2), and (c) firm innovative performance was rated by strategy directors and department managers in 2015 (T3).

In each organization, different constituents, such as HRM directors, strategy directors, department managers, and employees, participated in the corporate survey over a period of 5 years. The T1 sample was composed of HRM directors of each organization and 6,255 employees, which included engineers, office workers, and factory workers. Approximately 5% of the employees were randomly selected from each of the participating organizations to avoid the potential over- or undersampling problems. Each company included an average of 34.34 ( $SD = 20.58$ ) participants, in which 78.3% were males with a mean age of 41.7 years ( $SD = 8.16$ ) and an average organizational tenure of 13.5 years ( $SD = 7.49$ ). The T2 sample was composed of 1,410 department managers and 6,879 employees. Each company in the sample was represented by an average of 5.2 managers ( $SD = 2.56$ ) and 32.13 employees ( $SD = 11.89$ ). The T2 manager sample included 93.9% males, with an average age of 45.7 years ( $SD = 5.65$ ) and an average tenure of 15.6 years ( $SD = 7.20$ ). The employee sample was composed of 79.9% males, with a mean age of 40.2 years ( $SD = 8.24$ ) and an average organizational tenure of 12.1 years ( $SD = 7.73$ ). The T3 sample comprised strategy directors and 1,317 department managers from each company. An average of 4.67 managers ( $SD = 2.67$ ) per company participated in the current corporate survey. The T3 manager sample included 93.4% males, with an average age and tenure of 44.4 ( $SD = 5.93$ ) and 14.1 years ( $SD = 7.35$ ), respectively.

#### 3.2 | Measures

All of the variables were assessed using multi-item measures with a 5-point Likert scale that ranges from 1 (*strongly disagree*) to 5 (*strongly agree*). The individual responses of department managers and employees were aggregated to the organizational level for analysis by utilizing the direct consensus and referent-shift consensus

composition models of aggregation, which have been used to operationalize collective constructs (Chan, 1998). All of the scales exhibited acceptable within-organization agreement [ $r_{wg(j)}$ ] and intraclass correlations [ICC(1), ICC(2)]. These patterns demonstrate that departmental managers have shared perceptions regarding employee competence and firm innovative performance, and employees have shared perceptions regarding T&D and commitment. These indices verified the validity of our organizational-level aggregation of the ratings offered by department managers and employees (Chen, Mathieu, & Bliese, 2004).

### 3.2.1 | Firm investment in T&D (HRM director, T1)

The present study employed a resource-based approach and assessed the actual amount of the firm's monetary investment in T&D. We adopted the measure of Sung and Choi (2014a) and operationalized firm investment in T&D as the total financial cost spent by the company for T&D as reported by HRM directors. The total cost included the monetary expenditure an organization incurred in training its employees based on the archived financial records. The total amount of expenses for these T&D efforts was divided by the size of the organization to obtain the per-capita spending on T&D.

### 3.2.2 | Employee positive perceptions of T&D (Employees, T1)

On the basis of existing measures (Bartlett, 2001; Sung & Choi, 2014b), we constructed the following three-item scale ( $\alpha = .86$ ,  $r_{wg(3)} = .83$ , ICC(1) = .07, ICC(2) = .72,  $F = 3.56$ ,  $p < .001$ ) to measure employee positive perceptions of T&D: "T&D activities for employees in our company (a) are highly task related, (b) can be directly applied to the workplace, and (c) are beneficial to the improvement of our task abilities and skills."

### 3.2.3 | Moderating contingencies (HRM director, T1)

Voluntary participation and T&D evaluation were reported by the HRM directors. The HRM directors reported on two conditions: (a) "In most T&D programs in our company, employees are allowed to choose to either participate or not in a given program"; and (b) "when employees participate in T&D programs in our company, their attitude and performance after T&D are evaluated and reflected on subsequent personnel decisions (e.g., promotion and pay raise)." A dummy code (0 = nonvoluntary, 1 = voluntary) was created for the voluntary participation of employees (Hurtz & Williams, 2009). Voluntary participation constituted 42.2% of the sampled organizations. We also created a dummy code (0 = no evaluation, 1 = evaluation) for the T&D evaluation variable (Gubbins et al., 2006). The presence of T&D evaluation comprised 42.5% of the sample.

### 3.2.4 | Employee competence (Department managers, T2)

The department managers reported the level of the overall competence of employees by rating the following eight items ( $\alpha = .87$ ,  $r_{wg(8)} = .95$ , ICC(1) = .18, ICC(2) = .57,  $F = 2.31$ ,  $p < .001$ ): "Employees of our company have higher levels of overall ability than those of our competitors in the following areas: (a) research and development (R&D), (b) sales and service, (c) manufacturing, (d) managerial support

and staff, (e) engineering technology, (f) product development, (g) operation, and (h) core professionals" (Sung & Choi, 2014b; P. M. Wright, McCormick, Sherman, & McMahan, 1999).

### 3.2.5 | Employee commitment (Employees, T2)

Drawing on prior research on commitment (Allen & Meyer, 1990), we used the following four items to assess employee commitment ( $\alpha = .73$ ,  $r_{wg(4)} = .88$ , ICC(1) = .11, ICC(2) = .80,  $F = 4.85$ ,  $p < .001$ ): (a) "If I decided to leave this company, I would lose too much in my life"; (b) "I feel as if our company's problems are my own"; (c) "our company is worthy of my loyalty"; and (d) "too much of my life would be disrupted if I decided to leave our company."

### 3.2.6 | Firm innovative performance (Strategy director and department managers, T3)

We evaluated the multiple dimensions of innovative performance, such as new product development (NPD), NPD capability, and product and service differentiation. The strategy directors reported the NPD level of the company by rating the item "To what extent did your company introduce new products or services in the last 2 years?" (1 = *not at all*, 5 = *a great deal*). The department managers reported the innovative performance of their respective companies by responding to the following two items ( $\alpha = .70$ ,  $r_{wg(2)} = .85$ , ICC(1) = .26, ICC(2) = .66,  $F = 2.96$ ,  $p < .001$ ): "Our company has competitive advantage over other companies in (a) developing and introducing new products or services and (b) introducing differentiation in the products or services offered" (1 = *not at all*, 5 = *a great deal*) (Shipton et al., 2006). The innovative performance score of each company was computed by averaging the ratings of the strategy directors (i.e., NPD) and those of the department managers (i.e., NPD capability and product/service differentiation).

### 3.2.7 | Control variables (Strategy director, T3)

We identified numerous factors probably affecting firm innovative performance by reviewing the relevant literature. Consequently, we carried out the present analysis after the effects of the following factors were controlled: (a) industry type, (b) market demand, and (c) technology change. Industry type is a critical determinant of employee outcomes and firm innovation (Swanson & Holton, 2001). Thus, we controlled the effect of industry type by using two dummies created for three industrial sectors (i.e., manufacturing, service, and finance). We also controlled the extent of market demand and technology change, given the critical role of environment-specific factors in promoting firm innovation (Sung & Choi, 2014a). Market demand was measured by utilizing the item rated by strategy directors: "In the past 2 years, how was the market trend in the demand for the main products of your company?" (1 = *rapidly decreasing*, 5 = *rapidly increasing*). Technology change was assessed using the item "To what extent did your company experience technological changes in the past 2 years?" (1 = *not at all*, 5 = *a great deal*).

## 3.3 | Analytic strategy

The current research framework proposes that the indirect effects of the two distinct dimensions of T&D on firm innovative performance

**TABLE 1** Means, standard deviations, and correlations among study variables

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Manufacturing industry	.74	.44	—										
2. Service industry	.20	.40	-.84**	—									
3. Market change	.90	.01	-.05	-.01	—								
4. Technology change	.38	.82	.01	-.01	.31**	—							
5. Firm investment in T&D	.22	.31	-.27**	.19**	.13*	.17*	—						
6. Employee positive perceptions of T&D	.75	.36	-.05	.01	.17*	.08	.25**	—					
7. Voluntary participation	.41	.49	-.11	.09	.11	.06	.05	.09	—				
8. T&D evaluation	.43	.50	-.03	.01	.01	-.01	-.04	-.04	.26**	—			
9. Employee competence	.50	.40	-.01	.01	.08	.16*	.19**	.28**	.03	.07	—		
10. Employee commitment	.32	.30	-.13*	.09	.06	.16*	.32**	.21**	.09	-.02	.27**	—	
11. Firm innovative performance	.99	.58	.09	-.09	.26**	.51**	.21*	.20**	.13*	.02	.22**	.32**	—

**Note.** Unit of analysis is organization ( $N = 325$ ).

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

through employee outcomes are moderated by voluntary participation of employees and T&D evaluation. We tested these moderated mediation hypotheses by employing the procedure proposed by Edwards and Lambert (2007). This approach examines moderated mediation through the following three steps. First, we estimated the effects of the independent (i.e., firm investment in and employee positive perceptions of T&D) and mediating (i.e., employee commitment and competence) variables on the dependent variable (i.e., firm innovative performance). This step is equivalent to the tests of the first four hypotheses in the present study. Second, we determined if the moderators (i.e., voluntary participation of employees and T&D evaluation) affected the relationship between independent and mediating variables. Third, we verified whether the indirect effects of the independent variables on the dependent variable through the two mediators varied, depending on the presence and absence of the moderators.

Hierarchical multiple regression analyses were performed for the first- and second-step estimates. We mean-centered all of the predictor variables before the cross-product terms were calculated to minimize any potential problems of multicollinearity among the main effect variables and their interaction terms (Aiken & West, 1991; Katrichis, 1993). The variance inflation factors were less than 2 for all of the variables in the current analysis, indicating that multicollinearity is not a serious threat. For the third step, we assessed the significance of the conditional indirect effects of the two T&D dimensions on the innovative performance of firms through employee outcomes with the presence and absence of moderating contingencies by bootstrapping 1,000 samples to obtain bias-corrected confidence intervals (CIs) (Preacher, Rucker, & Hayes, 2007).

## 4 | RESULTS

The empirical distinctiveness of the scales was examined through confirmatory factor analysis (CFA). We performed a CFA of the 18 items comprising five constructs (i.e., firm investment in T&D, employee positive perceptions of T&D, employee competence, employee commitment, and firm innovative performance) to confirm

the discriminant validity of the current measures. The estimated five-factor model showed good fit to the data ( $\chi^2 [df = 115] = 185.89$ ,  $p < .001$ , comparative fit index [CFI] = .97, root mean square error of approximation [RMSEA] = .043) and performed better than any alternative four- or three-factor models did (all  $p < .001$ ). The CFA results supported the empirical distinctiveness of the measures. Table 1 reports the descriptive statistics and correlations between the study variables.

### 4.1 | Hypothesis testing

Among the variables controlled in our analysis, manufacturing industry was a positive predictor, whereas service industry was a negative predictor of firm innovative performance ( $\beta = .10$ ,  $p < .10$ ; and  $\beta = -.13$ ,  $p < .05$ , respectively), probably reflecting greater emphasis and faster cycle involving innovation in manufacturing industries compared with service industries. Market demand and technology change were significantly and positively related to firm innovative performance ( $\beta = .09$ ,  $p < .10$ ; and  $\beta = .45$ ,  $p < .001$ , respectively).

#### 4.1.1 | Main effects of the two dimensions of T&D

Hypotheses 1 and 2 posited that firm innovative performance is predicted by the two T&D dimensions. Firm investment in T&D was a significant, positive predictor of firm innovative performance ( $\beta = .15$ ,  $p < .05$ ) (Model 2, Table 3), thereby supporting Hypothesis 1. Employee positive perceptions of T&D were not significantly related to firm innovative performance, thereby rejecting Hypothesis 2.

#### 4.1.2 | Mediating effects

Hypotheses 3 and 4 proposed that employee competence and commitment mediate the effects of T&D on firm innovative performance. Firm investment and employee positive perceptions of T&D were significant predictors of employee competence ( $\beta = .16$ ,  $p < .05$ ; and  $\beta = .21$ ,  $p < .01$ , respectively) and employee commitment ( $\beta = .22$ ,  $p < .01$ ; and  $\beta = .16$ ,  $p < .05$ , respectively) (Models 1 and 4, Table 2). Employee competence and commitment measured at T2 significantly predicted firm innovative performance at T3 ( $\beta = .20$ ,  $p < .001$ ; and  $\beta$

**TABLE 2** Results of hierarchical regression analyses predicting employee outcomes

Predictors	Employee competence			Employee commitment		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Manufacturing industry	-.03	-.02	-.09	-.09	-.07	-.15
Service industry	-.06	-.05	-.05	-.06	-.05	-.07
Firm investment in T&D (FirmInv)	.16*	.16*	.04	.22**	.22**	.12
Employee positive perceptions of T&D (EmpPosiPercep)	.21**	.22**	.26***	.16*	.16*	.16*
Voluntary participation (VoluntParti)		.01	.01		.04	.02
T&D evaluation (T&DEval)		.05	.02		.01	-.01
FirmInv * VoluntParti			.12			.14*
FirmInv * T&DEval			-.15*			-.22**
EmpPosiPercep * VoluntParti			.18*			-.03
EmpPosiPercep * T&DEval			-.09			.17*
<i>F</i>	4.89***	3.34**	3.87***	6.03***	4.05***	3.84***
<i>R</i> <sup>2</sup>	.09	.09	.16	.10	.11	.16
$\Delta R^2$		.00	.07**		.01	.05*

Note. Unit of analysis is organization ( $N = 325$ ).

<sup>a</sup> Unit is 1 million Korean won.

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

= .09,  $p < .10$ , respectively) (Model 1, Table 3). These empirical patterns are congruent with the hypothesized mediated relationships.

We formally tested the mediation hypotheses via the product-of-coefficient approach, specifically by testing the statistical significance of the indirect effects by using a bootstrapping procedure. Increasing recommendations for this approach have emerged because it avoids problems caused by asymmetric and nonnormal sampling distributions that typically characterize mediated relationships (MacKinnon, Fairchild, & Fritz, 2007). Table 4 shows that the

effects of firm investment and employee positive perceptions of T&D on firm innovative performance are mediated by employee competence ( $b = .11$ , 95% CI, .04 and .22;  $b = .13$ , 95% CI, .06 and .23, respectively). The results also confirmed the significant mediation by employee commitment ( $b = .10$ , 95% CI, .01 and .21;  $b = .08$ , 95% CI, .02 and .17, respectively). Consistent with Hypotheses 3 and 4, the overall pattern indicated that T&D dimensions affect firm innovative performance by shaping desirable employee outcomes.

**TABLE 3** Results of hierarchical regression analyses predicting firm innovative performance

Predictors	Firm innovative performance			
	Model 1	Model 2	Model 3	Model 4
Manufacturing industry	.12*	.11*	.15*	.16*
Service industry	-.13*	-.15*	-.16*	-.17**
Market demand	.09+	.08	.08	.08
Technology change	.45***	.45***	.45***	.42***
Firm investment in T&D (FirmInv)		.15*	.15*	.12+
Employee positive perceptions of T&D (EmpPosiPercep)		.05	.04	-.01
Voluntary participation (VoluntParti)			.07	.07
T&D evaluation (T&DEval)			.03	.03
FirmInv * VoluntParti				.09
FirmInv * T&DEval				.05
EmpPosiPercep * VoluntParti				-.01
EmpPosiPercep * T&DEval				.03
Employee competence	.20***			.18**
Employee commitment	.09+			.05
<i>F</i>	27.57***	18.97***	13.84***	8.90***
<i>R</i> <sup>2</sup>	.35	.32	.33	.38
$\Delta R^2$			.01	.05*

Notes.  $N = 325$ . Standardized beta coefficients are shown. + $p < .10$ ;

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



**TABLE 4** Indirect effects

Independent variable	Mediator	Outcome	Product coefficients			Bootstrapping bias-corrected 95% CI	
			Point estimate	SE	<i>p</i>	Lower	Upper
Firm investment in T&D	Employee competence	Firm innovative performance	.11	.05	.01	.04	.22
	Employee commitment		.10	.04	.03	.01	.21
Employee positive perceptions of T&D	Employee competence		.13	.04	.01	.06	.23
	Employee commitment		.08	.03	.02	.02	.17

Note. Bootstrap sample size = 1000. CI = confidence interval.

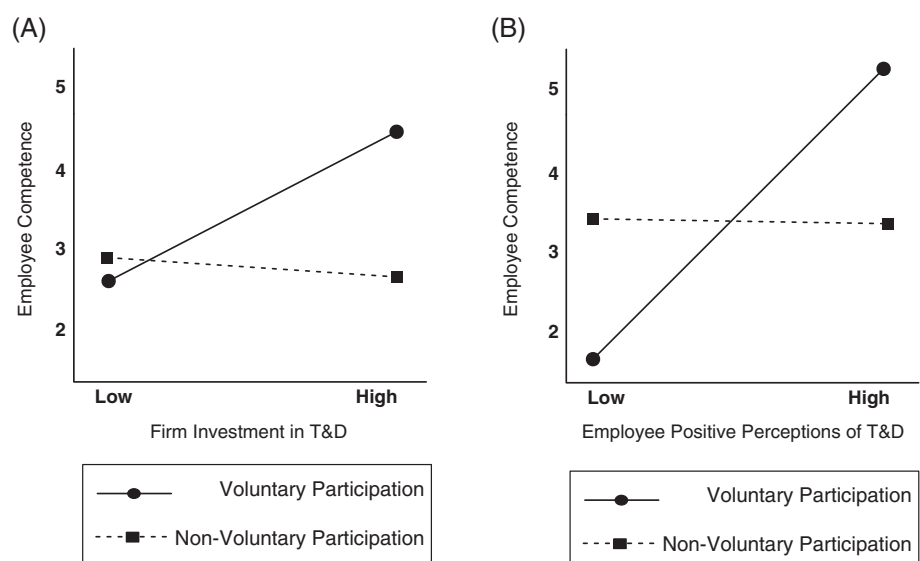
#### 4.1.3 | Moderated mediation effects

Hypotheses 5 and 6 propose that T&D-related contingencies (i.e., voluntary participation of employees and T&D evaluation) moderate the indirect effects of T&D on firm innovative performance through employee outcomes. Drawing on Edwards and Lambert (2007), we first tested if these contingencies moderate the relationships between T&D and employee outcomes. Models 3 and 6 in Table 2 report that the voluntary participation of employees exhibits significant interactions with firm investment in T&D in predicting employee commitment and with employee positive perceptions of T&D in predicting employee competence ( $\beta = .14$  and  $.18$ , respectively, both  $p < .05$ ). We conducted simple slope analyses to clarify these significant interactions (Aiken & West, 1991). Both plots displayed in Figure 2 suggest that the effects of firm financial investment on commitment and employee positive perceptions of T&D on competence are positive and significant when employees voluntarily participate in T&D ( $b = .59$ ,  $p < .05$ ;  $b = .90$ ,  $p < .001$ , respectively). However, the same relationships become nonsignificant when employees do not have a choice ( $b = -.22$  and  $-.17$ , both *ns*).

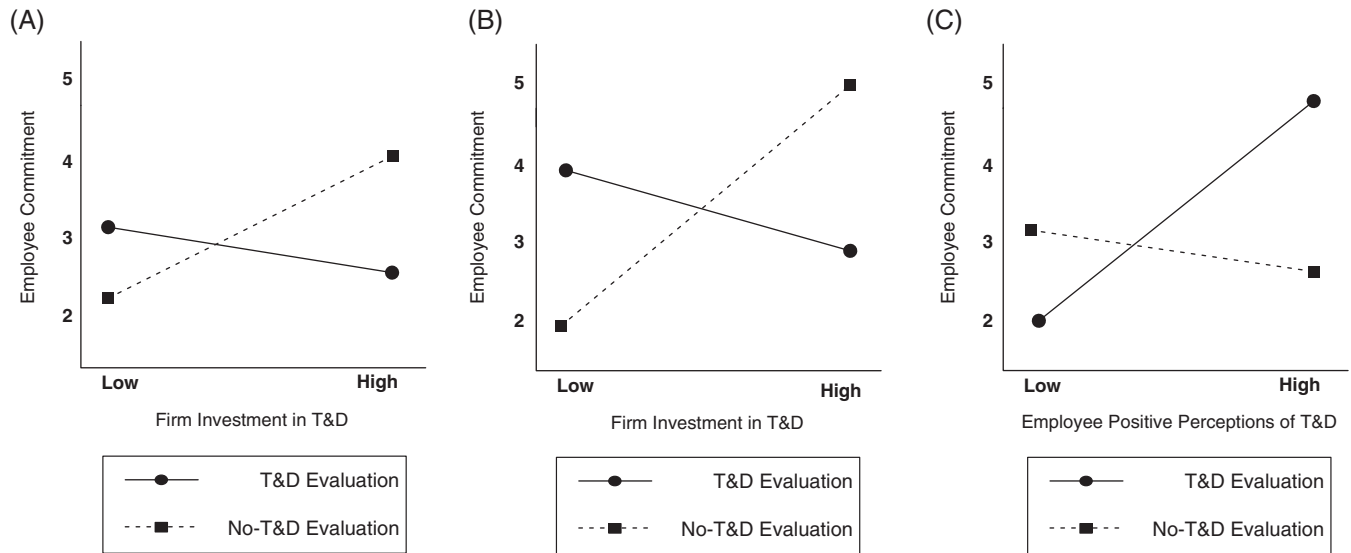
The results of T&D evaluation demonstrated that firm investment in T&D and T&D evaluation had significant negative interactions in predicting employee competence and commitment ( $\beta = -.15$ ,  $p < .05$ ;  $\beta = -.22$ ,  $p < .01$ , respectively) (Models 3 and 6, Table 2). Plots A and B in Figure 3 show that the effects of firm investment in T&D on employee competence and commitment were positive for

firms without T&D evaluation ( $b = .51$ ,  $p < .05$ ;  $b = .80$ ,  $p < .001$ ) but negative for firms with T&D evaluation ( $b = -.39$ ,  $p < .10$ ;  $b = -.46$ ,  $p < .05$ ). Unexpectedly, the interaction between employee positive perceptions of T&D and T&D evaluation was significant and positive (instead of negative) in predicting employee commitment ( $\beta = .17$ ,  $p < .05$ ). Plot C in Figure 3 illustrates that the effect of employee positive perceptions of T&D on employee commitment was significant and positive for firms that implement T&D evaluation ( $b = .72$ ,  $p < .01$ ) but not for firms without such an evaluation practice ( $b = -.25$ , *ns*). This counterintuitive pattern is discussed later.<sup>1</sup>

We further verified if the indirect effects of T&D change with the presence or absence of employees' voluntary T&D participation and evaluation by using the bootstrapping-based analytic approach (Edwards & Lambert, 2007; Preacher et al., 2007). Table 5 summarizes the complete results of the conditional indirect effects indicated in our model, which includes all control variables as covariates. First, the conditional indirect effects of firm investment on firm innovative performance via employee competence and commitment are statistically significant and positive when employees voluntarily participate in T&D ( $b = .18$ , 95% CI, .09 and .33;  $b = .13$ , 95% CI, .02 and .31, respectively). However, these conditional indirect effects become nonsignificant when employee participation in T&D is involuntary (Table 5). Similarly, employee positive perceptions of T&D elicit significant conditional indirect effects on firm innovative performance via employee competence and commitment when employee



**FIGURE 2** Interaction between T&D dimensions and voluntary participation in predicting employee outcomes



**FIGURE 3** Interaction between T&D dimensions and T&D evaluation in predicting employee outcomes

participation in T&D is voluntary ( $b = .25$ , 95% CI, .11; .43;  $b = .10$ , 95% CI, .02 and .27, respectively) but not when employee participation is involuntary, thus confirming Hypothesis 5.

Second, our bootstrapping analysis demonstrated that the conditional indirect effects of firm investment in T&D on firm innovative performance via employee competence and commitment are significantly positive only in firms that do not implement T&D evaluation ( $b = .16$ , 95% CI of .07 and .29;  $b = .13$ , 95% CI of .03 and .33, respectively) but not in those implementing T&D evaluation. The conditional indirect effect of employee positive perceptions of T&D on firm innovative performance via employee competence is also significant and positive for firms without T&D evaluation ( $b = .16$ , 95% CI, .08 and .28). However, inconsistent with our expectation, the

conditional indirect effect of employee positive perceptions of T&D on firm innovative performance via employee commitment is significant and positive for firms that implement T&D evaluation ( $b = .12$ , 95% CI, .03 and .26) but not for firms without T&D evaluation. Thus, Hypothesis 6 is partially supported.

## 5 | DISCUSSION

This study addressed the challenges posed by inconclusive findings related to the performance implications of T&D. Consistent with our theoretical propositions to address such challenges, the current analysis of multisource, time-lagged, firm-level data demonstrated that

**TABLE 5** Bootstrapped moderated mediation

Independent variable	Mediator	Dependent variable	Moderator level	Conditional indirect effect	Product of coefficients		Bootstrapping bias-corrected 95% CI		
					SE	Z	p	Lower	Upper
Firm investment in T&D	Employee competence	Firm innovative performance	Voluntary	.18	.06	2.98	<.01	.09	.33
			Nonvoluntary	.02	.06	.25	ns	-.13	.12
			T&D evaluation	.03	.07	.34	ns	-.12	.18
			No T&D evaluation	.16	.05	2.94	<.01	.07	.29
	Employee commitment		Voluntary	.13	.07	1.89	<.10	.02	.31
			Nonvoluntary	.05	.04	1.17	ns	.00	.16
			T&D evaluation	.03	.03	.86	ns	-.02	.12
			No T&D evaluation	.13	.08	1.73	<.10	.03	.33
Employee positive perceptions of T&D	Employee competence	Voluntary	.25	.08	3.11	<.001	.11	.43	
		Nonvoluntary	.06	.04	1.60	ns	-.01	.15	
		T&D evaluation	.09	.05	1.73	<.10	.01	.22	
		No T&D evaluation	.16	.05	3.11	<.001	.08	.28	
	Employee commitment	Voluntary	.10	.06	1.73	<.10	.02	.27	
		Nonvoluntary	.06	.04	1.61	ns	.00	.17	
		T&D evaluation	.12	.05	2.09	<.05	.03	.26	
		No T&D evaluation	.05	.04	1.19	ns	-.01	.17	

**Note.** Bootstrap sample size = 1,000. Coefficients in bold indicate significant mediation. CI = confidence interval.

T&D enhances firm innovative performance through employee commitment and competence, which are differentially activated by the two T&D-related moderating contingencies. We highlight the implications and limitations of this study and the directions for future research in the subsequent section.

### 5.1 | Implications of T&D toward employee outcomes and firm innovation

To clarify the elusive relationships between T&D and firm performance, particularly innovation in the present research, we explored the following possibilities. First, to avoid the confusion involving disparate approaches or conceptualizations of T&D, we differentiated the top-down process of firm investment in T&D and bottom-up process based on employee positive perceptions of T&D to examine their distinct performance implications. Second, we specified employee competence and commitment as two intermediate T&D outcomes that explain the influence of T&D on firm innovative performance. Third, we identified voluntary participation and T&D evaluation as the moderating contingencies that determine the value of T&D for employee outcomes and firm innovative performance by accentuating or attenuating the potential benefits of T&D. The current firm-level data revealed largely confirming but some unexpected empirical patterns.

The present analysis showed that the direct effect of T&D on firm innovative performance is significant only for firm investment in T&D, but not for employee positive perceptions of T&D. Given the five-year gap between T&D measures and firm innovation, the significant effect of a firm's resource allocation to T&D may be confounded with other firm characteristics, such as financial performance, support for R&D, and other firm-specific features that may have more enduring effects on firm performance compared with employee perception and attitude (Sung & Choi, *In Press*). These complicated firm-level processes that may unfold over an extended period require further investigation.

The two dimensions of T&D are significantly related to both employee outcomes, including competence and commitment. Confirming our theoretical expectation, we observed that the two T&D dimensions exhibit significant, indirect effects on firm innovative performance through their direct effects on employee competence and commitment. The present longitudinal investigation demonstrated that T&D affects critical organizational outcomes, including firm innovation, by improving internal human capital represented by employee competence and commitment, thereby verifying the emerging SHRM perspective (Combs et al., 2006).

Notably, the two dimensions of T&D showed different patterns in predicting employee outcomes (Table 2). Firm investment in T&D showed a larger effect on employee commitment than on employee competence. A firm's resource investment in T&D may urge employees to perceive sincere organizational support and thus motivate them to ascribe humanlike attributes to their organization, leading to felt obligation toward their organizations (cf. social exchange theory; Glaveli & Karassavidou, 2011; Masterson & Stamper, 2003; Rhoades & Eisenberger, 2002). By contrast, employees' positive experiences and perceptions of T&D exhibited a larger effect on employee

competence than on commitment. Employees who perceive T&D programs as high quality, useful, and pertinent to their tasks may transform themselves into proactive and motivated learners, thereby accomplishing the effective acquisition of KSAs (Bell & Kozlowski, 2008; Noe et al., 2010).

These contrasting patterns provide valuable insights into the effectiveness and appropriateness of the ISD model. The conventional instructor-centric ISD model focuses on the design and delivery of training activities, thus representing the top-down, organization-driven approach that limits employee control regarding the content and method of learning (Kraiger, 2008). Although depriving control from learners is desirable for some outcomes, allowing learner control can provide remarkable benefits for learners who are increasingly characterized by self-regulation and learning motivation (Kraiger & Jerden, 2007). Apparently, scholarly attention is moving from the traditional ISD model (top-down) to the learning design model, which underscores the proactive self-regulatory processes of learning (bottom-up) (Bell & Kozlowski, 2008). The present analysis demonstrated that both top-down and bottom-up approaches to T&D can be conducive but can yield different employee and organizational outcomes. Further conceptual and empirical efforts may ascertain the distinct functions and boundary conditions of such functions involving top-down versus bottom-up approaches to T&D (cf. Sung & Choi, 2014b).

Our analysis further showed that the effect of employee competence on firm innovative performance is larger than that of employee commitment (Table 3), indicating that employee KSAs are more essential than their organizational commitment in terms of generating useful and novel ideas. Compared with generalized task motivation based on affective commitment, the task-related KSAs, expertise, and efficacy of employees are instrumental to promote new product development and differentiation in the firm's products and services (Choi & Chang, 2009; Clardy, 2008). This pattern reinforces the widely accepted knowledge-based view of firm competitive advantage and innovation (Noe et al., 2010).

### 5.2 | Boundary conditions of the T&D effects on employees and firm innovation

Our moderated mediation analyses confirmed the formation of distinct indirect paths from T&D to firm innovation through employee outcomes dependent on T&D-related characteristics. First, the present analysis confirmed that employees' voluntary participation in T&D is a positive moderator to channel the effects of the top-down (i.e., firm investment) and bottom-up (i.e., employee positive perceptions of T&D) approaches to T&D on employee and firm outcomes. Voluntary participation highlights the positive effect of firm investment in T&D on employee commitment and the influence of employee positive perceptions of T&D on competence. The results of moderated mediation analysis revealed that the indirect effects of T&D on firm innovation via employee outcomes are significant and positive only when employees are allowed to volunteer in T&D activities.

The significance of the employees' voluntary participation in T&D is consistent with the increasingly appreciated importance of

employees' self-initiated pursuits of voluntary activities and their spontaneous engagement in their preferred tasks (Bidee et al., 2013; Haiva et al., 2013; Vandercammen et al., 2014). Employees' voluntary choice regarding T&D is linked to the mastery or learning goal orientation, and such employees have an increased tendency to actively search for opportunities to learn new skills and appreciate such situations (Hurtz & Williams, 2009). SDT and accompanying intrinsic motivation theories proposed that employees with a voluntary choice for T&D activities may experience a remarkable positive affect and cognitive flexibility, thereby leading to high-order thinking and improved firm innovation (Deci & Ryan, 2002; Gagné & Deci, 2005).

Second, the current findings indicated the risk associated with the implementation of T&D evaluation. This finding confirms the drawbacks of evaluation practice observed, particularly in the context of learning and creative engagement (Bouskila-Yam & Kluger, 2011). The negative moderating effect of T&D evaluation is clearly observed in the top-down approach to T&D based on a firm's resource allocation. The effects of firm investment in T&D on employee outcomes and the indirect effects on firm innovative performance become consistently positive only without T&D evaluation. The indirect effect of bottom-up employee positive perceptions of T&D on firm innovation also supports the negative effect of T&D evaluation in the context of learning.

However, the effects of employee positive perceptions of T&D on employee commitment and its accompanying indirect effects on firm innovation are unexpectedly positive in firms that implemented T&D evaluation. This pattern suggested that employees become committed to their organization and perform innovatively when they experience the evaluation of T&D activities that they found beneficial and relevant to their tasks. Evaluation is originally based on performance improvement theory that encourages the identification and selection of effective solutions to task problems, implements corrective actions, and optimizes task practices (Guerra-López & Hicks, 2015). Employees who evaluate T&D as useful and effective for their tasks may perceive T&D evaluation as a necessary follow-up procedure to maximize the benefit of T&D to improve their performance. Thus, T&D evaluation can be considered the firm's sincere effort to achieve the maximum benefits of T&D and support employee performance, thereby enhancing employee sympathy and commitment to the organization (Glaveli & Karassavidou, 2011). This post hoc speculation requires further conceptual elaboration and empirical validation, which may lead to an expanded theoretical understanding of the role of evaluation in the T&D context.

### 5.3 | Implications for practice

Our analysis provides practical guidelines for business leaders in designing and implementing T&D activities for organizations. First, employer-centered financial investment in T&D showed a greater effect on employee commitment than on competence. Financial investment in employee T&D is the most straightforward indicator of organizational support and care for employees (Huerta, Audet, & Pergeot, 2006). Organizations' actual resource allocation on employees' development and growth may improve the employee's affective commitment and sense of obligation to repay their organization

(Masterson & Stamper, 2003; Rhoades & Eisenberger, 2002). Apart from the basic goal of building high-quality human capital, business leaders may use internal and external T&D opportunities as a form of reward for high-performing employees to earn their commitment and loyalty.

Second, employees' positive perceptions of T&D are more strongly associated with enhanced employee competence than with commitment. Bottom-up employee-centered approaches to T&D may be highly effective in achieving the fundamental goal of T&D to promote KSAs and thus build internal human capital. Such goals may be accomplished only when employees turn into proactive learners based on favorable perceptions of the usefulness or benefits of T&D (Glaveli & Karassavidou, 2011; Tabassi et al., 2012). Following the popular expression "quality before quantity," managers should provide high-quality programs with practical values for participants committing to quality over quantity toward activities. If the T&D topic is irrelevant to their task, if T&D programs fail to deliver the necessary information, if employees are already knowledgeable about the topics covered, and if employees only need to learn a few of the skills taught in the T&D program, then the employees may have negative perceptions of T&D and immediately lose their interest in T&D activities. In this regard, managers should convince employees of the significance of T&D by carefully designing and delivering realistic and effective T&D programs. Such managerial efforts should maximize the competence of employees through T&D and help accomplish the intended benefits of T&D.

Third, employees' voluntary participation generally promoted the positive function of firms' T&D efforts, whereas T&D evaluation stifled such efforts to promote employee commitment and competence. The current results provide evidence that an organization's T&D practice should be implemented along with empowering practices for self-initiated design and participation in T&D programs to maximize the benefits of T&D provided to employees and organizations. Sitzmann and Weinhardt (2017) emphasized the role of employee attribution of T&D in its successful implementation. Organizations can promote positive attributions of T&D among employees toward favorable causes, such as helping employees grow and develop, by providing HR practices, such as autonomous task design, self-managing teams, and participative decision making, which practically support employees' autonomous work behavior. These supportive HR practices may encourage employees to become self-determined proactive learners.

### 5.4 | Study limitations and future research directions

The present findings required cautious interpretations by considering several limitations. First, the current study used multisource and three-wave time-lagged data to overcome the common methodological limitations, such as "post-predictive" (i.e., predicting past performance) or "retrospective" (i.e., asking respondents to recall HR practices that existed prior to the performance period) measures (P. M. Wright et al., 2005), in existing studies on T&D. Nonetheless, the dependent variable of this study was based on a subjective measure of firm innovative performance. Although prior research

confirmed the validity of the use of subjective measures of firm performance by reporting the convergent validity and equivalence between subjective and objective measures (Wall et al., 2004), future studies may further validate the present framework by using the objective indicators of firm innovation. Moreover, scholars reported that firm investment in T&D may have idiosyncratic implications for each employee, depending on the design and delivery of T&D activities (Aragón-Sánchez et al., 2003). Thus, further research should consider the potential multilevel dynamics involving T&D operationalized at organization and individual levels.

Second, although we regarded employees' T&D appraisal and subsequent motivation as a theoretical underpinning, we did not test the intermediate psychological processes specifically targeted at T&D. Researchers may further examine the potential predictors of T&D-targeted motivation, such as self-efficacy, job involvement, and career orientation, which may shape individual reactions to different T&D characteristics (Sitzmann & Weinhardt, 2017). Furthermore, prior research proposed diverse dimensions of evaluation according to different purposes (Youngcourt, Leiva, & Jones, 2007). In this study, T&D evaluation was examined using a single measurement item. Thus, diverse dimensions (behavioral vs. performance aspects of T&D) or purposes (for incentive vs. for promotion) of evaluation were not differentiated. Future research should investigate the diverse dimensions or purposes of T&D evaluation to elaborate its ramifications in forming subsequent employee and firm outcomes.

Third, the present data included companies in manufacturing, service, and financial industries. The meaning of each T&D dimension proposed in the current study may vary across industries. Future studies should investigate industry-specific dynamics and internal firm environments that render a specific T&D dimension more important than others in explaining employee and organizational outcomes.

Finally, the present research context could have affected the current findings. Training opportunities are frequently available to employees as a form of extra incentives in Korean organizations. Accordingly, T&D programs are consistently delivered in a relaxed atmosphere, and not all companies implement T&D evaluation (cf. mean value of T&D evaluation = .43, Table 1). Under such situations, T&D evaluation could be interpreted as a managerial control mechanism, and employees might develop negative responses toward such evaluation practices. In addition, given that male workers generally dominate Korean companies (as shown in the present stratified random sample), gender imbalance in a Korean context may have affected the current empirical patterns. Future research should validate the current framework in other cultural and national contexts.

Despite these limitations, the current study provides novel theoretical insights and practical guidelines for managers by elaborating when and how different dimensions of T&D can predict employee and firm outcomes. We theorized and validated the distinct functions of top-down (firm investment) and bottom-up (employee perception) approaches to T&D toward employee outcomes. We also isolated critical T&D-related contingencies that channel the effects of T&D toward desirable employee outcomes, which contribute to firm innovative performance. The present contingency-based T&D framework offers valuable theoretical and practical insights into effective strategies for T&D implementation. Future studies may investigate the

potential multilevel dynamics of T&D by considering individual differences, such as personality, cognitive style, organizational attitudes, skill levels, and performance, which should create employee outcomes from T&D and firm performance.

## ACKNOWLEDGMENT

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## ENDNOTE

<sup>1</sup>Given that we have two T&D-related contingent factors, we further tested the significance of three-way interactions in predicting employee outcomes. Of the four possible three-way interactions, our analysis identified a marginally significant interaction among employee positive perceptions of T&D, voluntary participation of employees, and T&D evaluation in predicting employee commitment ( $\beta = -.13, p < .10$ ). We further conducted a slope difference test by comparing the slopes of four different conditions to interpret this interaction. Of the six slope comparisons, only one pair of slopes was significantly different: When the level of voluntary participation of employees was low, the effect of positive perceptions of T&D on employee commitment was more positive when T&D evaluation was present than when it was absent ( $t = 2.11, p < .05$ ). All of the other three-way interactions were not statistically significant.

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