



European Journal of Training and Development

The moderating role of non-controlling supervision and organizational learning culture on employee creativity: The influences of domain expertise and creative personality

Shinhee Jeong, Gary N. McLean, Laird D. McLean, Sangok Yoo, Kenneth Bartlett,

Article information:

To cite this document:

Shinhee Jeong, Gary N. McLean, Laird D. McLean, Sangok Yoo, Kenneth Bartlett, (2017) "The moderating role of non-controlling supervision and organizational learning culture on employee creativity: The influences of domain expertise and creative personality", European Journal of Training and Development, Vol. 41 Issue: 7, pp.647-666, <https://doi.org/10.1108/EJTD-03-2017-0025>

Permanent link to this document:

<https://doi.org/10.1108/EJTD-03-2017-0025>

Downloaded on: 21 October 2018, At: 13:16 (PT)

References: this document contains references to 88 other documents.

To copy this document: permissions@emeraldinsight.com

The fulltext of this document has been downloaded 879 times since 2017*

Users who downloaded this article also downloaded:

(2017),"High-performance work system and employee creativity: The roles of perceived organisational support and devolved management", Personnel Review, Vol. 46 Iss 7 pp. 1318-1334 https://doi.org/10.1108/PR-09-2016-0235

(2015),"Developing organizational creativity and innovation: Toward a model of self-leadership,employee creativity,creativity climate and workplace innovative orientation", Management Research Review, Vol. 38 Iss 11 pp. 1126-1148 https://doi.org/10.1108/MRR-01-2014-0017

Access to this document was granted through an Emerald subscription provided by emerald-srm:100007 []

For Authors

If you would like to write for this, or any other Emerald publication, then please use our Emerald for Authors service information about how to choose which publication to write for and submission guidelines are available for all. Please visit www.emeraldinsight.com/authors for more information.

About Emerald www.emeraldinsight.com

Emerald is a global publisher linking research and practice to the benefit of society. The company manages a portfolio of more than 290 journals and over 2,350 books and book series volumes, as well as providing an extensive range of online products and additional customer resources and services.

Emerald is both COUNTER 4 and TRANSFER compliant. The organization is a partner of the Committee on Publication Ethics (COPE) and also works with Portico and the LOCKSS initiative for digital archive preservation.

*Related content and download information correct at time of download.

The moderating role of non-controlling supervision and organizational learning culture on employee creativity

The influences of domain expertise and creative personality

Domain
expertise and
creative
personality

647

Received 16 March 2017
Revised 11 July 2017
Accepted 13 July 2017

Shinhee Jeong

*Department of Educational Administration and Human Resource Development,
Texas A&M University, College Station, Texas, USA*

Gary N. McLean and Laird D. McLean

McLean Global Consulting, Inc., St. Paul, Minnesota, USA, and

Sangok Yoo and Kenneth Bartlett

*Organizational Leadership, Policy, and Development, University of Minnesota,
Minneapolis, Minnesota, USA*

Abstract

Purpose – By adopting a multilevel approach, this paper aims to examine the relationships among employee creativity and creative personality, domain expertise (i.e. individual-level factors), non-controlling supervision style and organizational learning culture (i.e. team-level factors). It also investigates the cross-level interactions between individual differences and organizational context influencing employee creativity.

Design/methodology/approach – Hierarchical linear modeling was performed to test the hypotheses using multisource data with 416 employees and their supervisors in 86 research and development teams.

Findings – This paper found that domain expertise and non-controlling supervision style are positively associated with employee creativity. Also, a positive moderating role of non-controlling supervision style was found in explaining the relationship between domain expertise and employee creativity. However, no significant relationship was found between creative personality and employee creativity, and there was no moderating effect of organizational learning culture. The paper discusses the theoretical implications of these findings and provides practical suggestions based on the findings

Originality/value – This paper has begun to address the significant gap in the extant employee creativity literature and has departed from the common research practice of investigating creativity at a single level. It has expanded understanding of the antecedents of creativity with empirical evidence, as it revealed domain expertise and non-controlling supervision as influential factors. Further, domain expertise has generally positive effects on creative performance, whether non-controlling leadership is high or low. Additionally, this study brings an interesting insight in interpreting the contribution of organizational learning culture as measured by the Dimensions of Learning Organization Questionnaire to creativity and also affirms the importance of autonomy that increases intrinsic motivation and creativity. Another theoretical contribution of this study can be found from an intriguing contradiction in the literature that understands the role of expertise



in creative performance. Moreover, the finding on non-controlling supervision supports the effectiveness of a freedom approach.

Keywords Multilevel analysis, Employee creativity, Organizational learning culture, Creative personality, Domain expertise, Non-controlling supervision style

Paper type Research paper

In this era of globalization and knowledge-driven economies, the competitive pressure on firms is intense. The role of research and development (R&D) functions is emphasized more than ever before and is recognized as a key pipeline for corporate innovation and sustainability. One key determinant of R&D effectiveness is each employee's individual creativity to generate useful ideas and produce novel work (Dewett, 2007). Employee creativity contributes to transforming individual work performance, work groups and the entire organization into a desired future state (Shalley *et al.*, 2004). For these reasons, corporations are looking for R&D personnel with creative talent and seeking ways to encourage their individual creativity so they can adapt to today's ever-changing business environment (Zhang and Bartol, 2010).

Considering the importance of creativity at work, scholars have paid substantial attention to this concept and conducted numerous studies to better understand creativity at a deeper level (Shalley *et al.*, 2004). Creativity has been extensively studied at the individual level, including personal traits, abilities and experiences that encompass both cognitive (e.g. knowledge and skills) and non-cognitive (e.g. personality) aspects (Woodman *et al.*, 1993). Personality-related factors such as self-confidence, tolerance of ambiguity (Feist, 1999) and self-efficacy (Tierney and Farmer, 2002) have been found to be associated with creativity. More recently, a number of scholars have focused on the organizational context as a factor that promotes or stifles employee creativity (Zhou and George, 2003). The supervisor's leadership style and organizational culture have also been largely discussed as crucial contextual factors influencing employees' intrinsic motivation that, in turn, affects their creativity process (Zhang and Bartol, 2010). However, surprisingly, these antecedents have been rarely examined by empirical research in the R&D context (Shalley and Gilson, 2004; Dewett, 2007).

Another gap is that relevant research has predominantly examined main effects by focusing solely on either individual or contextual factors, but researchers have largely neglected the joint effects of these factors on employee creativity (Hirst *et al.*, 2009; Madjar and Ortiz-Walters, 2009; Sagiv *et al.*, 2010). Drawing on the strong theoretical base of interactional psychology (Schneider, 1983), Woodman and Schoenfeldt (1990) and Woodman *et al.*, (1993) proposed an interactionist model of creative behavior at the individual level and described creativity as a product of dynamic interactions between individual and contextual factors in complex social settings. They emphasized the importance of identifying or understanding cross-level interactions to explain factors that enhance or hinder individual creativity. In other words, the interactionist approach is premised on the idea that creativity is an individual-level phenomenon that can be influenced by both personal and situational variables (Joo *et al.*, 2013).

The impact of contextual factors on employee creativity may vary depending on individual differences or vice versa (Zhou, 2003). Several researchers (Joo *et al.*, 2013; Sternberg and Lubart, 1999) have also stated that to avoid a narrow, unsatisfying vision of creativity, a confluence of multiple components or variables across levels (e.g. individual, contextual) is necessary for creativity research. Despite growing attention on the cross-level interactions, only a handful of empirical studies have investigated the person–environment interaction (Hirst *et al.*, 2009, 2011; Sun *et al.*, 2012). In fact, the leverage point between individual and organizational factors, the

interactionist approach (Woodman and Schoenfeldt (1990)), is one of the most important but under-explored areas of creativity (Choi *et al.*, 2009; Hirst *et al.*, 2011; Zhou, 2003).

The purpose of this study is to develop and test the interactionist model considering the cross-level interplay between individual differences and organizational context influencing employee creativity. Drawing on Amabile's (1988) componential theory of creativity, we proposed domain expertise, creative personality, non-controlling supervisory style and organizational learning culture as individual or contextual antecedents and examined their main effects on employee creativity. Grounded in the person–situation interaction theory (Jansen and Kristof-Brown, 2006), we also investigated the moderating effects of a non-controlling supervision style and organizational learning culture (i.e. team-level factors) to explain the relationships between employee creativity and creative personality and domain expertise (i.e. individual-level factors). Each guiding theory is discussed in greater detail in the following section. We also provide an integrated framework that combines individual differences with contextual influences to describe the dynamic nature of creativity in complex social systems. The findings may help workplaces find new ways to promote innovation through creativity.

Theoretical framework and research hypotheses

Numerous scholars have defined creativity from one of three perspectives:

- (1) individual characteristics and intellectual traits;
- (2) the creative process itself; and
- (3) outcomes of creativity (e.g. a service, procedure or product) (Sawyer, 2011).

We adopted Amabile's (1988, p. 126) outcome-oriented definition: "creativity is the production of novel and useful ideas [products or services] by an individual", as it is intuitive and measureable.

The theoretical foundations used in developing our conceptual framework were the componential theory of creativity (Amabile, 1988) and person–environment (P-E) fit (Jansen and Kristof-Brown, 2006). Amabile (1988) developed a creativity model consisting of three core components: domain-relevant skills, creativity-relevant skills and intrinsic motivation. Domain-relevant skills represent in-depth familiarity with a field such as knowledge and technical skills, also known as domain expertise. Creativity-relevant skills are related to a person's personality. Domain expertise and creative personality are important individual resources for creativity (Amabile, 1988), but these two components must be linked to achieve creative performance. For example, a person with extensive knowledge of automobiles might not be able to produce an innovative car without having a risk-taking personality. The third and most important component, intrinsic motivation, denotes a person's attitude to engage in an activity for its own sake (Ryan and Deci, 2000). The degree of motivation is largely influenced by various qualities of the environment, which can either promote or undermine individual creativity (Amabile *et al.*, 2004).

The general definition of fit by Jansen and Kristof-Brown (2006) is "the congruence, match, similarity, or correspondence between the person and the environment" (Edwards and Shipp, 2007, p. 211). Different types of fit exist in organizations, including person–supervisor, person–group and person–organization. Perceptions of fit determine attitudes and behaviors of employees (Greguras and Diefendorff, 2009). When an employee's personal traits, goals or values are congruent with those of his or her organization, it is considered a good fit, and a positive match is expected to

maximize an employee's attitudes (Jansen and Kristof-Brown, 2006). Thus, personal characteristics and the work environment are joint determinants of employees' work behaviors. Drawing on this theory, individual-level factors (i.e. creative personality and domain expertise) and contextual-level factors (i.e. non-controlling supervision style and organizational learning culture) jointly predict employee creativity. If the context matches the employee's personal characteristics, the match may produce a higher level of employee creativity (Shalley *et al.*, 2004). Thus, we examined a series of interaction effects from the standpoint that employee creativity differs based on a combination of personal and environmental influences.

Main effect of creative personality

A person with a creative personality has a sense of self as creative with high self-confidence (Feist, 1999; Shalley and Gilson, 2004). The person tends to be curious, engage in divergent thinking, confidently explore alternatives and solve problems in an innovative way (Mumford *et al.*, 2002). Owing to these psychological traits, it is believed that creativity springs from creative personalities. Numerous scholars (Amabile, 1988; Barron and Harrington, 1981; Gough, 1979) have described a creative personality as an essential element of creative performance. Tierney and Farmer (2002) found that creative self-efficacy positively predicted creative performance. Kim *et al.* (2010) and Joo *et al.* (2013) demonstrated that a proactive personality predicted employee creativity. Dul and Ceylan (2011) found a positive relationship between a creative personality and creative performance. However, current research has yielded mixed results. For example, several studies (Madjar *et al.*, 2002; Zhou and George, 2003) have not found a significant association between a creative personality and creative performance. Thus, more empirical studies are needed. Therefore:

H1. A creative personality is positively associated with employee creativity.

Main effect of domain expertise

Domain expertise refers to deep knowledge, experience and problem-solving skills in a specific area (Germain and Tejada, 2012; Herling, 2000). A person with domain expertise utilizes his or her extensive knowledge and experience effectively to solve complex problems (Swanson and Holton, 2001). It has been suggested that employees with high expertise reflect on their methods and performance, and engage in continuous learning and practice to perform faster and better (Chi, 2006).

Creative performance inevitably requires expertise (Amabile, 1988; Mumford *et al.*, 2002). When employees possess task-domain knowledge and skills, they are more confident to exhibit creativity (Tierney and Farmer, 2002). Furthermore, by virtue of expertise in a reflective cognitive style and knowledge base, they explore alternatives and conduct experiments, which increases the incidence of creative performance (Herling, 2000). Bender and Fish (2000, p. 126) discussed the inexplicable relationship of expertise with creativity by claiming, "Any individual with expertise is able to create uniquely new knowledge". Tiwana and McLean (2005) found a strong association between expertise integration and team-level creativity. Vincent *et al.* (2002) demonstrated that expertise predicted idea generation and implementation. Andrews and Smith (1996) found that product managers' knowledge and experience accounted for differences in marketing creativity. However, few studies have directly investigated the relationship among these constructs in work settings (Germain and Tejada, 2012). Thus:

H2. Domain expertise is positively associated with employee creativity.

Main effect of non-controlling supervision style

Autocratic, controlling leadership impedes employees' intrinsic motivation, whereas democratic, participative leadership enhances intrinsic motivation and creativity (Ryan and Deci, 2000). A non-controlling supervision style enables employees to feel safe and free to pursue new insights by granting autonomy and encouraging change. Thus, it is likely to facilitate employee creativity (Chong and Ma, 2010). Madjar and Ortiz-Walters (2009) found that trust in the supervisor stimulated employees' psychological safety, and psychological safety increased both employee performance and creativity. Moreover, transformational leadership positively affected psychological empowerment, and psychological empowerment increased employee creativity (Sun *et al.*, 2012). Similarly, empowering leadership made a significant contribution to psychological empowerment, which influenced intrinsic motivation and creative process engagement. These, in turn, had a positive effect on creativity (Zhang and Bartol, 2010). Madjar *et al.* (2002) and Tierney and Farmer (2002) also demonstrated that a supportive supervisor style predicted creative performance. Thus:

H3. Non-controlling supervision is positively associated with employee creativity.

Main effect of organizational learning culture

Organizational culture refers to a set of beliefs, assumptions and values shared by organizational members, which provides behavioral norms, and such norms affect employees' creativity-relevant behaviors (McLean, 2005). Based on cognitive evaluation theory (Ryan and Deci, 2000), the literature has discussed the role of organizational culture on employee creativity, arguing that a controlling and rigid culture that does not allow for divergent thinking or applies strict observance of corporate procedures or policies may restrict intrinsic motivation, which stifles employee creativity (Mumford *et al.*, 2002; Shalley *et al.*, 2004). In contrast, organizational culture characteristics that are conducive to employee creativity include intellectual orientation, freedom, risk-taking, task support, uncertainty acceptance, open communication, collaboration and rewards (McLean, 2005; Mumford *et al.*, 2002; Shalley and Gilson, 2004), all of which are characteristics of learning organizations.

Learning organizations promote inquiry and dialogue to support a person's unique view and experimentation, encourage collaboration for knowledge sharing and transfer and empower members to achieve the organizational vision (Marsick and Watkins, 2003). Learning organizations also strive to capture learning opportunities in embedded systems such as rewards, appraisals or promotion, with a goal of enhanced knowledge performance (Song *et al.*, 2013). Creativity is often described as a process to acquire new knowledge based on trial-and-error learning. Song *et al.* (2013, p. 227) argued that "the concept of the learning organization may serve as a foundation for increasing employees' creativity". Further, Martins and Terblanche (2003) posited that work environments that foster new knowledge generation lie at the heart of employee creativity. Despite extensive literature on the connection between creativity and organizational learning culture, surprisingly few studies (Joo *et al.*, 2013; Yoon *et al.*, 2010) have been published empirically demonstrating this positive association (McLean, 2005). Thus:

H4. Organizational learning culture is positively associated with employee creativity.

Cross-level interactions

The development of creativity does not take place in a vacuum, but constantly interacts with the social system in which a person is embedded (Amabile, 1988; Drazin *et al.*, 1999). As

previously discussed, person–environment fit theory (Jansen and Kristof-Brown, 2006) supports an interactionist approach describing the contextual influences that may interact with individual characteristics, and their good fit produces positive outcomes. Thus, the impact of non-controlling supervision and organizational learning culture on employee creativity may vary for those with different personalities or cognitive abilities (Shalley and Gilson, 2004).

Research suggests that the extent to which a person has a creative personality and domain expertise determines how he or she responds to the contextual environment (e.g. non-controlling supervision style and organizational learning culture) (Oldham and Cummings, 1996). Individuals with a highly creative personality are more likely to appreciate supportive environments and flexible leadership that accept uncertainty and risk-taking ideas (Chong and Ma, 2010; Madjar *et al.*, 2002; Woodman *et al.*, 1993). Research has also reported that supervisor support predicts an employee’s creative efficacy beliefs, affecting creative performance (Tierney and Farmer, 2002). Moreover, Oldham and Cummings (1996) demonstrated that an employee with a more creative personality responds more positively to supportive environments. As with domain expertise, experts appreciate an atmosphere in which free dialogue with peers is encouraged, active collaboration takes place and autonomy is granted (Herling, 2000; Mumford *et al.*, 2002). Eraut (2005) claimed that development of expertise involves social interaction because what makes knowledge and skills valuable is the social context in which a person operates. Domain expertise also enriches the communication of ideas and information that enhances creativity and is further developed through interactions with peers and supervisors (Hakkara *et al.*, 2004).

To summarize, the characteristics of non-controlling leadership and organizational learning culture are congruent with those of employees with great expertise and a highly creative personality. When the workplace culture supports and values creative performance, those employees perceive that their creative efforts will be valued, resulting in a greater level of creativity (Amabile *et al.*, 2004). Therefore:

- H5. Non-controlling supervision positively moderates the relationship between a creative personality and employee creativity.
- H6. Non-controlling supervision positively moderates the relationship between domain expertise and employee creativity.
- H7. Organizational learning culture positively moderates the relationship between a creative personality and employee creativity.
- H8. Organizational learning culture positively moderates the relationship between domain expertise and employee creativity.

Based on this theoretical foundation and literature review, we developed the conceptual framework for this research, as shown in Figure 1.

Methods

In this section, we describe the population and sample; data collection procedures; protection of human subjects; the instrument, including reliability and validity; and data analysis.

Population and sample

The population for this study was employees in R&D functions who designed and developed new products. Based on convenience sampling and cluster sampling methods, teams in R&D departments from four large, private organizations were recruited. Three of

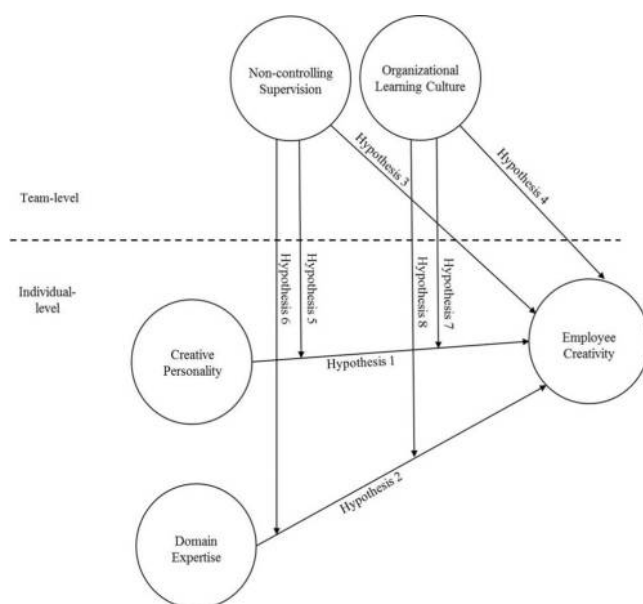


Figure 1.
Conceptual multilevel
model incorporating
the research
hypotheses

the organizations were large medical device companies and one was a large consumer package food company. We collected data from 416 employees in 86 teams, with an overall response rate of 70 per cent. Supervisors of each team (a total of 86) also participated in the survey that asked them to rate each team member's domain expertise. As individuals were nested in teams, the sample size of this study was 86 teams and 416 individuals. The average responding team size was approximately 5, which is sufficient for multilevel modeling (Maas and Hox, 2005). For education level, 40 per cent had undergraduate degrees, 54 per cent held graduate degrees and only 6 per cent had certificate/associate degrees or lower. Employees had worked in the current organization for 11.0 years, on average, and the average number of years of field experience was 13.3.

Data collection procedures and protection of human subjects

Following institutional review board approval at the university of the second, third and fifth authors, two separate online surveys were distributed: one for employees regarding their demographic information, creative personality, their supervisor's non-controlling supervision and organizational learning culture, and another for their supervisors regarding each team member's expertise. A secondary data source was collected regarding the number of invention disclosures authored, patent applications submitted and the number of patents awarded, to determine each employee's creative performance.

Instrument

An instrument was created to measure the dependent, independent and controlling variables in the study.

Creative personality. Gough's (1979) Creative Personality Scale (CPS) was used to measure creative personality, consisting of 30 adjectives; 18 adjectives are associated with highly creative personalities (e.g. "capable", "clever" and "confident") (Oldham and Cummings, 1996).

The remaining 12 adjectives are related to low creative personalities (e.g. “cautious”, “conservative” and “conventional”) (Oldham and Cummings, 1996). Participants choose adjectives that best describe them. Each positive adjective was calculated as +1, while each negative adjective was given a value of -1. The sum represents an individual’s creative personality. Gough (1979) found the CPS showed positive and significant relationships with six prior measures, including Domino, Schaefer, Welsh’s A-1, A-2, A-3 and A-4. Further, the CPS was superior in the criterion evaluations compared to the six measures (Gough, 1979).

A weighted composite technique (Lord *et al.*, 1968) was applied to calculate the reliability of the CPS index using a formula that included reliability coefficients of the positive and negative subscales and the correlation between the subscales (Oldham and Cummings, 1996). The reliability coefficient of the total CPS index was 0.64, which is close to the 0.70 value found in previous studies (Oldham and Cummings, 1996; Shane and Nicolaou, 2015), and generally accepted minimum of 0.70 (Hair *et al.*, 2010).

Domain expertise. An individual’s domain expertise was measured by his or her direct supervisor. Each supervisor was asked to assess the participant’s expertise level relative to other R&D employees on a five-point Likert-type scale (1 = much lower than average, 5 = much higher than average).

The correlations among the supervisor, peer and self-assessments can provide evidence of convergent validity (Campbell and Fiske, 1959). In addition to the supervisor’s direct report, employees were asked to assess their own expertise level on a five-point Likert-type (self-rating) scale and nominate peers on the team who had the greatest expertise in their field (peer-ratings). According to the correlations among the scores from the three assessment groups, the supervisor ratings showed significant ($p < 0.01$) and weak (0.27) to moderate (0.48) associations with the peer and self-ratings, respectively. These results reflect the generally weak correlations found with multi-rater assessments (McLean, 1997).

Non-controlling supervision. Four items validated by Oldham and Cummings (1996) were used to measure non-controlling supervision style. Their study indicated that these items were adopted from the Michigan Organizational Assessment Package (Nadler *et al.*, 1975). They examined the relationship between supervision style and creativity. A sample item is: “My supervisor leaves it up to me to decide how to go about doing my job”. A five-point Likert-type scale was used (1 = strongly disagree to 5 = strongly agree), and three of the four questions were reverse-coded. The reliability of non-controlling supervision was 0.75. The construct validity of the non-controlling supervision scale was confirmed ($\chi^2(2) = 3.569, p > 0.05$; CFI = 0.997; RMSEA = 0.043; RMR = 0.016).

Organizational learning culture. We adopted the abbreviated version of the Dimensions of Learning Organization Questionnaire (DLOQ-A) (Yang *et al.*, 2004) to measure organizational learning culture. The DLOQ was developed by Watkins and Marsick (1997) based on the literature of learning organization theory. Later, Yang *et al.* (2004) developed the abbreviated version, with 21 items. A sample item is: “In my organization, people are given time to support learning”. A five-point Likert-type scale was used for all items (1 = almost never to 5 = almost always). The reliability coefficient for the instrument in our study was 0.92, which is almost the same as the 0.93 calculated by Yang (2003). Confirmatory factor analysis was performed to confirm the construct validity of the seven-factor model of DLOQ-A ($\chi^2(168) = 422.392, p < 0.01$; CFI = 0.925; RMSEA = 0.060; RMR = 0.039).

Employee creativity. Intellectual property was used to measure creativity, as it is considered to be a more objective measure of creativity (Dakhli and Clercq, 2003; Shalley *et al.*, 2004). In particular, in the R&D context, the numbers of patents or patent disclosures are considered to be relevant indicators of creative performance for an individual employee

(Zhou and Shalley, 2003). Data on the quantity of intellectual property were calculated using the number of invention disclosures authored, patent applications submitted and patents awarded.

Control variables. Four covariates were controlled for in the multilevel analysis. Education level (1 = Did not complete high school, 2 = High school graduate, 3 = Certificate or associate degree, 4 = Undergraduate degree, 5 = Graduate degree), the number of years in the current career and the number of years in the current organization were controlled for at Level 1 (individual-level). Team size was also controlled for at Level 2 (team-level).

Data analysis

We used hierarchical linear modeling (HLM) because it provides an improved estimation of direct effects at different levels, as well as cross-level effects, honoring the nested structure of the multilevel data (Raudenbush and Bryk, 2002).

We developed and tested a series of multilevel models using the incremental improvement procedure (Hox, 2010), reflecting four aspects as follows:

- (1) the multilevel structure;
- (2) the Level-1 influences of creative personality and domain expertise on employee creativity;
- (3) the Level-2 influences of non-controlling supervision and organizational learning culture on employee creativity; and
- (4) the cross-level moderating effects of non-controlling supervision and organizational learning culture on the relationships among creative personality, domain expertise and employee creativity.

In the construction of the models, all variables were grand-mean-centered.

Data aggregation. We calculated the $r_{WG(1)}$ (James *et al.*, 1984) and intraclass correlation coefficients (ICCs; McGraw and Wong, 1996) to verify the presence of employees' shared perceptions (e.g. within-group agreement) for two team-level variables (non-controlling supervision style and organizational learning culture). In terms of non-controlling supervision, the ICC(1) and ICC(2) were 0.41 and 0.77, respectively, which justifies the use of data aggregation. The values of the ICCs for organizational learning culture [ICC(1) = 0.18, ICC(2) = 0.52] also supported the appropriateness of aggregating data to the higher level of analysis (Glick, 1985; Klein *et al.*, 2000; LeBreton and Senter, 2008). Further, the average r_{WG} values of non-controlling supervision and organizational learning culture were 0.87 and 0.86, respectively, which suggests strong within-team agreement of both variables (LeBreton and Senter, 2008). To summarize, non-controlling supervision and organizational learning culture demonstrated acceptable levels of between-unit variability as well as within-unit reliability and agreement.

Results

In this section, we report the results of our study including the descriptive statistics and testing of the eight hypotheses.

Descriptive results

Table I shows the means, standard deviations and correlations of the variables. The correlation results indicate that employee creativity was positively correlated with domain expertise ($r = 0.23$, $p < 0.01$) and non-controlling supervision ($r = 0.17$, $p < 0.01$). Further, among the independent variables at different levels, creative personality was correlated with

Table I.
Means, standard
deviations and
correlations^a

Variables	Mean	SD	1	2	3	4	5	6	7	8	9
1. Team_size	4.86	1.77		0.06	-0.17	-0.11	0.08	-0.27*	0.09	0.08	0.06
2. Edu	4.44	0.71	0.07		0.05	0.07	0.23*	-0.07	-0.00	0.19	0.09
3. Career_exp	13.29	9.41	-0.07	-0.11*		0.84**	0.32**	0.25*	-0.20*	0.16	-0.02
4. Org_tenure	11.01	8.79	-0.03	-0.12*	0.78**		0.31**	0.30*	-0.29**	0.29**	-0.05
5. CP ^b	5.77	3.52	0.09	0.06	0.18**	0.16**	(0.64)	0.18	-0.27*	0.23*	0.08
6. DE ^b	3.80	0.85	-0.13*	0.04	0.35**	0.31**	0.16*		-0.07	0.02	0.15
7. NS	8.04	2.40	0.02	-0.00	-0.12*	-0.21**	-0.18**	-0.15*	(0.75)	-0.41**	0.48**
8. OLC	70.42	7.19	-0.07	0.03	0.11*	0.16**	0.09	0.12	-0.25**	(0.92)	-0.19
9. Creativity	7.97	15.07	0.08	0.04	0.09	0.09	0.06	0.23**	0.17**	-0.08	

Notes: ^aValues below the diagonal result from individual-level analyses; those above the diagonal result from team-level analyses; $N = 86$ teams comprising 416 employees; internal consistency reliabilities are in parentheses; ^bThe means and standard deviations of CP and DE were calculated using the team-level data; Team_size = the number of employees per supervisor; Edu = education level; Career_exp = the number of years in career; Org_tenure = the number of years in organization; CP = creative personality; DE = domain expertise; NS = non-controlling supervision; OLC = organizational learning culture; * $p < 0.05$; ** $p < 0.01$

non-controlling supervision ($r = -0.27$, $p < 0.05$) and organizational learning culture ($r = 0.23$, $p < 0.05$).

Hierarchical linear modeling results

As specified in the Methods section, HLM was used to test the hypotheses; the results are shown here.

Null model. We first examined the between-team variance in employee creativity through the random-effects ANOVA. Employee creativity showed significant between-team variation ($\tau_{00} = 53.91$, $\chi^2[86] = 211.85$, $p < 0.001$) (see Table II). The intraclass correlation (ICC) and design effect (*deff*) were calculated as 0.24 and 1.93, respectively. The value of ICC indicates that 24 per cent of the variance in employee creativity resided between supervisors. Further, a *deff* larger than 1.5 indicates the existence of a considerable clustering effect; therefore, it was necessary to use multilevel analysis (Lai and Kwok, 2014). Thus, the values of ICC and *deff* required the use of HLM.

Model 1. The control variables were added in Model 1, including education level, number of years in the current career and number of years in the current organization as individual-level variables and team size as a team-level variable. Only number of years in the current organization ($\hat{\gamma} = 0.21$, $p < 0.05$) exhibited a significant relationship with employee creativity (see Table II).

Model 2. Creative personality and domain expertise were included in Model 2 as individual-level variables. Model 2 provided the effects of creative personality and domain expertise on employee creativity, after controlling for individual- and team-level control variables (see Model 1). Model 2 indicated that creative personality ($\hat{\gamma} = 0.27$, n.s.) was not significantly related to employee creativity; thus, *H1* was not supported. However, the relationship between domain expertise and employee creativity was positively significant ($\hat{\gamma} = 4.72$, $p < 0.01$), supporting *H2*.

Model 3. Model 3 included non-controlling supervision and organizational learning culture as team-level variables. Model 3 assessed *H3* and *H4*. After controlling for the individual- and team-level predictors, non-controlling supervision ($\hat{\gamma} = 1.98$, $p < 0.01$) was positively associated with employee creativity, supporting *H3*. However, as organizational

Variables	Null model	Model 1	Model 2	Model 3	Model 4	Domain expertise and creative personality
<i>Level 1</i>						
(Intercept)	7.77** (1.03)	7.62** (1.07)	8.75** (1.35)	8.59** (1.14)	8.64** (1.16)	
Edu		1.15 (0.96)	0.55 (1.54)	0.44 (1.61)	0.17 (1.62)	
Career_exp		0.08 (0.08)	−0.13 (0.14)	−0.15 (0.14)	−0.13 (0.13)	
Org_tenure		0.21* (0.09)	0.15 (0.11)	0.16 (0.12)	0.14 (0.12)	
CP			0.27 (0.21)	0.39 (0.23)	0.40 (0.22)	
DE			4.72** (1.35)	4.76** (1.27)	4.38** (1.05)	
<i>Level 2</i>						
Team_size		0.51 (0.59)	1.18 (0.74)	0.39 (0.59)	0.47 (0.62)	
NS				1.98** (0.67)	2.47** (0.86)	
OLC				0.11 (0.12)	0.14 (0.17)	
<i>Interaction effects</i>						
CP × NS					0.05 (0.16)	
DE × NS					1.34* (0.64)	
CP × OLC					0.02 (0.03)	
DE × OLC					−0.01 (0.14)	
Deviance	3399.05	3390.82	2096.32	2084.63	2084.54	
Level 2 <i>n</i>	86	86	68	68	68	
Level 1 <i>n</i>	416	416	253	253	253	
Notes: ^a Entries are estimations of fixed effects with robust standard errors. Standard errors are in parentheses; Team_size = the number of employees per supervisor; Edu = education level; Career_exp = the number of years in career; Org_tenure = the number of years in organization; CP = creative personality; DE = domain expertise; NS = non-controlling supervision; OLC = organizational learning culture; * <i>p</i> < 0.05; ** <i>p</i> < 0.01						

Table II.
Multilevel analysis results for employee creativity as the dependent variable^a

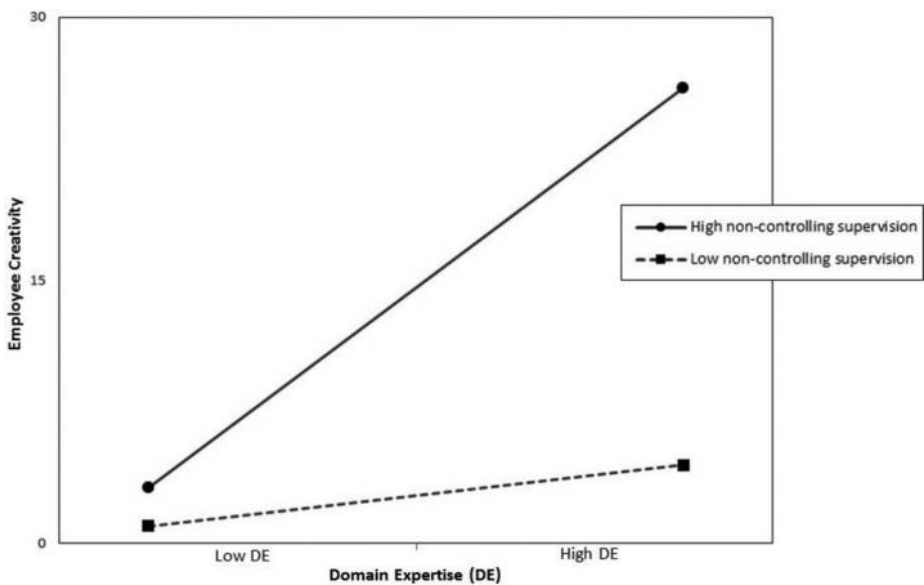
learning culture ($\hat{\gamma} = 0.11$, n.s.) was not significantly associated with employee creativity, *H4* was rejected.

Model 4. We assessed the slopes-as-outcomes model (Model 4) to examine the moderation effects of non-controlling supervision (*H5* and *H6*) and organizational learning culture (*H7* and *H8*) on the relationships among creative personality, domain expertise and employee creativity (see Table II). The results of Model 4 are shown in the last column in Table II. As for *H5*, the moderation effect of non-controlling supervision on the relationship between creative personality and employee creativity was rejected. The relationship between domain expertise and employee creativity was positively moderated by non-controlling supervision ($\gamma = 1.87$, $p < 0.05$), supporting *H6*. Their interaction effects are depicted in Figure 2. As with *H7* and *H8*, both interaction effects of organizational learning environment on the relationship of creative personality and domain expertise with creativity were not significant; therefore, they were rejected.

Discussion

This study investigated the independent and joint influences of individual non-cognitive and cognitive characteristics (i.e. creativity personality and domain expertise) and organizational contexts (i.e. non-controlling supervision and organizational learning culture) on an indicator of employee creativity, the quantity of intellectual property. The contribution of this study can be found not only in that we developed an interactionist model with a unique combination of variables based on a firm theoretical foundation, but in that

Figure 2.
Interaction between
domain expertise and
non-controlling
supervision
predicting employee
creativity



we also empirically tested it. The findings from the hypotheses of the model are discussed with their distinct contributions.

First, we found that employees' creative personality did not affect their creative performance. Rather, we demonstrated that domain expertise is a strong antecedent of employee creativity. Thus, the current study adds empirical evidence that expertise rather than having a creative personality matters in creative performance at work in the R&D context. [Weisburg \(1999\)](#) asserted that achieving creative problem-solving skills depends on expertise, not intelligence or divergent thinking skills. [Tierney and Farmer \(2002\)](#) also suggested that employees who feel that they lack expertise, even though they see themselves as highly creative, are likely to believe that their attempts to achieve creative performance will fail. A finding of no relationship between creative personality and creativity may not be surprising because, as mentioned earlier, prior studies have reported inconsistent results. This study provides additional empirical evidence to affirm the relationship between creative personality and creativity at work.

Second, we found a positive main effect of non-controlling supervision style on employee creativity, which is consistent with prior studies ([Chong and Ma, 2010](#); [Madjar et al., 2002](#)). [Elkins and Keller \(2003\)](#), in their literature review on leadership in the R&D context, revealed that leaders who develop a high-quality exchange relationship with team members are likely to have project success. A higher quality of leader-member exchange provides team members with greater support and autonomy ([Basu and Green, 1997](#)). Autonomy plays an important role in operating at a high level of intrinsic motivation that is a key component of creativity ([Ryan and Deci, 2000](#)). Empirical evidence also supports positive relationships between autonomy support and intrinsic motivation ([Guay et al., 2001](#)) and intrinsic motivation and employee creativity ([Zhang and Bartol, 2010](#)). Leadership is of particular interest to R&D functions because R&D team leaders are required to possess certain leadership skills in addition to their technical expertise ([Mumford et al., 2002](#)). The findings demonstrated in this study

provide useful insights into the leadership style necessary for creativity to occur in R&D settings.

Third, we demonstrated that supervisors' non-controlling leadership style positively moderates the relationship between employees' domain expertise and creativity. The literature supports that experts have a strong identity as professionals and a desire for autonomy, and they perform better under conditions where autonomous achievement is allowed (Mumford *et al.*, 2002). Moreover, this study is the first to affirm empirically that non-controlling leadership style is effective in explaining an expertise-creativity association. In contrast, we showed that non-controlling supervision does not moderate the creative personality-creativity association, which is consistent with Madjar *et al.*'s (2002) study that found no interaction effect between creative personality and work support. This result also suggests that a supervisor's non-controlling leadership style generally has positive effects, regardless of the employee's creative personality.

Fourth, in contrast to a non-controlling leadership style, we found no relationship between organization learning culture and employee creativity, which was surprising, considering the considerable discussion in the literature elaborating on and hypothesizing about their positive association. This finding is consistent with Joo *et al.* (2013). Although they reported that organizational learning culture is a distal antecedent ($p < 0.10$) of employee creativity, they concluded that the association was statistically insignificant because its p -value was outside of their desired p -value. In our study, organizational learning culture also failed to have significant interaction effects with domain expertise and creative personality influencing employee creativity.

A possible reason for these non-significant main and moderating effects may be attributed to the use of the DLOQ as a measurement of organizational learning culture. The DLOQ captures overall organizational efforts to facilitate learning that reflect not only intrinsic rewards but also extrinsic reward systems. Interestingly, research has reported that external rewards diminish people's feelings of autonomy and intrinsic motivation, thereby hindering creativity (Gagne, 2014; Lepper and Greene, 1975). Kohn (1999), in his book, *Punished by Rewards*, posited that rewards destroy intrinsic desirability, ignore reason and discourage risk-taking, which finally leads to inferior creative performance. Deci (1971) and Deci *et al.* (1999), in their respective experimental and meta-analytic studies, also concluded that extrinsic rewards undermine intrinsic motivation and enjoyment to perform a given task. Thus, we suspect that the external rewards aspects of the instrument may have buffered or eliminated the positive effect of organizational learning culture on creativity. Moreover, organizational learning culture reflected in the DLOQ does not necessarily imply an autonomous working culture, which is an unfavorable environment for employees who have gained expertise. Considering the extrinsic factors, learning may be imposed by the organizational system, not self-determined by an employee's choice.

Another possible explanation is the conjecture that the DLOQ does not capture the characteristics of organic systems well, a factor that is claimed to be the most relevant organizational culture that is conducive to creativity (McLean, 2005). As opposed to mechanistic systems that are identified with bureaucratic and formalized organizational structures, organic systems emphasize flexibility, horizontal coordination, decentralized decision-making processes and power based on each person's expertise instead of on position (Mumford *et al.*, 2002; Sine *et al.*, 2006). These characteristics promote a context that results in greater creativity and innovation, but DLOQ may not be directly related to the construct. It may, instead, focus on the learning perspective, which might not be sufficiently relevant to creativity.

Theoretical implications

Overall, our findings support an interactionist approach in which both individual and contextual factors come into play in determining creativity in the workplace. We also address the person–environment (i.e. cross-level) fit in that individuals with considerable expertise are more likely to value the contextual qualities of non-controlling supervision and, as a result, exhibit higher creativity. In other words, we provide evidence that creativity is a function of social processes, which has been rarely researched (Sagiv *et al.*, 2010). In that respect, we have begun to address the significant gap in the extant employee creativity literature and have departed from the common research practice of investigating creativity at a single level.

This study also contributes to the existing creativity literature and relevant theories. The findings expand our understanding of the antecedents of creativity with empirical evidence, as they reveal that domain expertise and non-controlling supervision are influential factors. Further, we show that domain expertise has generally positive effects on creative performance, whether non-controlling leadership is high or low. Additionally, this study provides an interesting insight for interpreting the contribution of organizational learning culture to creativity as measured by the DLOQ and also affirms the importance of employees' sense of autonomy, which increases intrinsic motivation and creativity.

Another theoretical contribution of this study can be found from an intriguing contradiction in the literature related to the role of expertise in creative performance. Although Amabile's (1988) creativity theory and relevant studies explicitly discussed domain expertise as an essential component, other literature has argued that domain expertise blocks creativity because experts are inflexible and have difficulty adapting to new rules and thinking from other domains (i.e. functional fixedness) (Chi, 2006). The argument of the counter-productive relations between expertise and creativity has also been further supported by some empirical work that shows an inferior role of systematic cognitive style on intuitive cognitive style in enhancing creative behavior (Sagiv, 2010). However, the current study results advocate for Amabile's (1988) point of view and suggest reconsidering the trade-off between expertise and creativity (Dane, 2010). Our findings indicate that rather than creative personality that may reflect intuitive style, experts' systematic thinking style works better in creative performance and generates a synergy when self-determination is granted.

The finding on non-controlling supervision also supports the effectiveness of a freedom approach. There are contradictory approaches in the literature in understanding the situational factors that are conducive to creativity: the freedom approach versus the structure approach. The freedom approach claims that creative ideas can be generated when freedom is ensured, whereas the structure approach argues that directional guidance or certain types of restrictions enhance creativity (Sagiv *et al.*, 2010). The positive effects of non-controlling leadership affirm that creative ideas are engendered when imposed control, structure and procedures are eliminated. To be effective in exercising influence, leaders of creative people should understand that the use of conformity pressure and position power will be counter-productive for such subordinates (Mumford *et al.*, 2002).

We have also added methodological contributions. We collected data from different sources, and therefore, our results are not inflated by common method variance. Furthermore, we used objective measures to gauge employee creativity rather than using a survey rated by the participants themselves or other individuals, so the results are more subjective.

Practical implications

The findings of this study offer practical implications for R&D organizations to increase creativity among their employees. Organizations should consider both personal and contextual factors when designing interventions, as creativity is a product of social interactions. Management needs to provide employees with training and learning opportunities to enhance their domain expertise and allow them to engage in the deliberate practice of task domain skills and activities. Moreover, considering that expertise does not necessarily emerge only in a single person through education, training and experience, but also from a system of shared expertise (Reilly, 2008; Shalley and Gilson, 2004), a knowledge management system may be utilized to share and restore the knowledge and skills that each individual possesses. Organizations should strive to attract and select persons with greater domain-relevant expertise. Organizations also need to be aware of the characteristics of highly knowledgeable and skilled employees that value an autonomous, non-controlling work environment, which also has implications for employee recruitment and selection.

As a way to enhance work autonomy, managers should empower subordinates to use various means to accomplish the project goals of their choice and provide minimal guidelines or directions, encouraging them to feel free to explore their unique insights. Leaders' positive feedback, allowance for risk-taking behaviors and participative leadership practice would further fit with the strong need for autonomy among expert followers.

R&D organizations should also understand what leadership styles are needed to encourage creative people and to develop leaders through training and education. Vision-based leadership such as transformational leadership is more suitable to influence them in R&D settings, as creative people resist control or pressure from position power (Gumusluoglu and Ilsev, 2009). Transformational leaders intellectually stimulate subordinates, encourage them to think in new ways, arouse followers' motivation and build mutual trust (Bass, 1985). It has also been pointed out that leaders of creative people should have persuasive skills, wisdom, flexibility and social perceptiveness (Zaccaro *et al.*, 2000).

Finally, R&D organizations should cultivate a creative-friendly environment that enhances intrinsic motivation. As part of this effort, organizations may need a system of self-management. Organizations may provide an inspiring vision, co-create clear goals with employees, delegate employees to choose how to fulfill those goals and help them maintain motivation through positive but accurate feedback and skill recognition. These strategies can provide employees with a sense of meaningfulness, choice and competences (Thomas, 2009).

Limitations and recommendations for future research

Our study is limited in terms of its generalizability because our findings are specifically applicable to white-collar workers whose jobs require creativity in the R&D context. Thus, the findings may not be the same for other populations such as blue-collar workers, or employees outside of the R&D function, or those who work in different cultural contexts. Moreover, the extent to which creativity is required will vary across jobs, sectors, industries and countries (Unsworth, 2001). For example, Tierney and Farmer (2002) pointed out that their findings on creative performance were different between blue-collar and white-collar samples. Future researchers might use other contexts such as different industrial types or in other cultures.

We only tested two team-level moderators, non-controlling leadership and organizational learning culture; however, other contextual factors are likely to play a role in the creativity process. Future research should continue exploring other sets of contextual factors or moderators. In particular, the non-significant influence of organizational learning culture

and our possible explanations raise questions that might intrigue future researchers. Do extrinsic motivators really have a detrimental effect on creativity in the workplace as opposed to intrinsic motivation? It would be worthwhile to conduct a comparative study that tests the effectiveness of each type of reward on creativity.

Considering the significant relationship of non-controlling supervision with employee creativity, another question can be raised: What is the proper degree of freedom? Sagiv *et al.* (2010) provided a caveat that an environment granting absolute freedom might have a reverse effect that hinders creativity. Therefore, some degree of restrictions or guidelines may help. Then, how do we define absolute freedom or measure the degree of freedom? What type of restrictions would be beneficial and to what extent? Such questions remain unanswered.

Above all, the current study may stimulate future research efforts to investigate dynamic interactions that influence creativity between the person and environment. Clearly, much more work is needed to collect evidence to comprehend person–environment interactions influencing employee creativity by incorporating different combinations of variables, validating models across populations and replicating those studies to increase confidence in them.

References

- Amabile, T.M. (1988), "A model of creativity and innovation in organizations", in Staw, B.M. and Cummings L.L. (Eds), *Research in Organizational Behavior*, JAI Press, Greenwich, CT, pp. 123-167.
- Amabile, T.M., Schatzel, E.A., Moneta, G.B. and Kramer, S.J. (2004), "Leader behaviors and the work environment for creativity: perceived leader support", *The Leadership Quarterly*, Vol. 15 No. 1, pp. 5-32.
- Andrews, J. and Smith, D.C. (1996), "In search of the marketing imagination: factors affecting the creativity of marketing programs for mature products", *Journal of Marketing Research*, Vol. 33 No. 2, pp. 174-187.
- Barron, F. and Harrington, D.M. (1981), "Creativity, intelligence, and personality", *Annual Review of Psychology*, Vol. 32 No. 1, pp. 439-476.
- Bass, B. (1985), *Leadership and Performance Beyond Expectations*, Free Press, New York, NY.
- Basu, R. and Green, S.G. (1997), "Leader-member exchange and transformational leadership: an empirical examination of innovative behaviors in leader-member dyads", *Journal of Applied Social Psychology*, Vol. 27 No. 6, pp. 477-499.
- Bender, S. and Fish, A. (2000), "The transfer of knowledge and the retention of expertise: the continuing need for global assignments", *Journal of Knowledge Management*, Vol. 4 No. 2, pp. 125-137.
- Campbell, D.T. and Fiske, D.W. (1959), "Convergent and discriminant validation by the multitrait-multimethod matrix", *Psychological Bulletin*, Vol. 56 No. 2, pp. 81-105.
- Chi, M.T.H. (2006), "Two approaches to the study of experts' characteristics", in Ericsson, K.A., Charness, N., Feltovich, P. and Hoffman, R.R. (Eds), *The Cambridge Handbook of Expertise and Expert Performance*, Cambridge University Press, Cambridge, MA, pp. 21-30.
- Choi, J.N., Anderson, T.A. and Veillette, A. (2009), "Contextual inhibitors of employee creativity in organizations the insulating role of creative ability", *Group & Organization Management*, Vol. 34 No. 2, pp. 330-357.
- Chong, E. and Ma, X. (2010), "The influence of individual factors, supervision and work environment on creative self-efficacy", *Creativity and Innovation Management*, Vol. 19 No. 3, pp. 233-247.
- Dakhli, M. and Clercq, D.D. (2003), "Human capital, social capital, and innovation: a multi-country study", *Entrepreneurship and Regional Development*, Vol. 16 No. 2, pp. 107-128.

- Dane, E. (2010), "Reconsidering the trade-off between expertise and flexibility: a cognitive entrenchment perspective", *Academy of Management Review*, Vol. 35 No. 4, pp. 579-603.
- Deci, E.L. (1971), "Effects of externally mediated rewards on intrinsic motivation", *Journal of Personality and Social Psychology*, Vol. 18 No. 1, pp. 105-115.
- Deci, E.L., Koestner, R. and Ryan, R.M. (1999), "A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation", *Psychological Bulletin*, Vol. 125 No. 6, pp. 627-668.
- Dewett, T. (2007), "Linking intrinsic motivation, risk taking, and employee creativity in an R&D environment", *R&D Management*, Vol. 37 No. 3, pp. 197-208.
- Drazin, R., Glynn, M.A. and Kazanjian, R.K. (1999), "Multilevel theorizing about creativity in organizations: a sensemaking perspective", *Academy of Management Review*, Vol. 24 No. 2, pp. 286-307.
- Dul, J. and Ceylan, C. (2011), "Work environments for employee creativity", *Ergonomics*, Vol. 54 No. 1, pp. 12-20.
- Edwards, I.R. and Shipp, A.I. (2007), "The relationship between person-environment fit and outcomes", in Ostroff, C. and Judge, T.A. (Eds), *Perspectives on Organizational Fit*, Jossey-Bass, San Francisco, CA, pp. 209-258.
- Elkins, T. and Keller, R.T. (2003), "Leadership in research and development organizations: a literature review and conceptual framework", *The Leadership Quarterly*, Vol. 14 No. 4, pp. 587-606.
- Eraut, M. (2005), "Expert and expertise: meanings and perspectives", *Learning in Health and Social Care*, Vol. 4 No. 4, pp. 173-179.
- Feist, G.J. (1999), "The influence of personality on artistic and scientific creativity", in Sternberg, R.J. (Ed.), *Handbook of Creativity*, Cambridge University Press, Cambridge, MA, pp. 273-296.
- Gagne, M. (2014), *The Oxford Handbook of Work Engagement, Motivation, and Self-Determination Theory*, Oxford University Press, New York, NY.
- Germain, M.L. and Tejada, M.J. (2012), "A preliminary exploration on the measurement of expertise: an initial development of a psychometric scale", *Human Resource Development Quarterly*, Vol. 23 No. 2, pp. 203-232.
- Glick, W.H. (1985), "Conceptualizing and measuring organizational and psychological climate: pitfalls in multilevel research", *Academy of Management Review*, Vol. 10 No. 3, pp. 601-616.
- Gough, H.G. (1979), "A creative personality scale for the adjective check list", *Journal of Personality and Social Psychology*, Vol. 37 No. 8, pp. 1398-1405.
- Greguras, G.J. and Diefendorff, J.M. (2009), "Different fits satisfy different needs: linking person-environment fit to employee commitment and performance using self-determination theory", *Journal of Applied Psychology*, Vol. 94 No. 2, pp. 465-477.
- Guay, F., Boggiano, A.K. and Vallerand, R.J. (2001), "Autonomy support, intrinsic motivation, and perceived competence: conceptual and empirical linkages", *Personality and Social Psychology Bulletin*, Vol. 27 No. 6, pp. 643-650.
- Gumusluoglu, L. and Ilsev, A. (2009), "Transformational leadership, creativity, and organizational innovation", *Journal of Business Research*, Vol. 62 No. 4, pp. 461-473.
- Hair, J., Black, W., Babin, B. and Anderson, R. (2010), *Multivariate Data Analysis*, Prentice Hall, Upper Saddle River, NJ.
- Hakkara, K., Palonen, T., Paavola, S. and Lehtinen, E. (2004), *Communities of Networked Expertise: Professional and Educational Perspectives*, Elsevier, Amsterdam.
- Herling, R.W. (2000), "Operational definitions of expertise and competence", *Advances in Developing Human Resources*, Vol. 2 No. 1, pp. 8-21.
- Hirst, G., Van Knippenberg, D. and Zhou, J. (2009), "A cross-level perspective on employee creativity: goal orientation, team learning behavior, and individual creativity", *Academy of Management Journal*, Vol. 52 No. 2, pp. 280-293.

- Hirst, G., Van Knippenberg, D., Chen, C.H. and Sacramento, C.A. (2011), "How does bureaucracy impact individual creativity? A cross-level investigation of team contextual influences on goal orientation-creativity relationships", *Academy of Management Journal*, Vol. 54 No. 3, pp. 624-641.
- Hox, J.J. (2010), *Multilevel Analysis: Techniques and Applications*, 2nd ed., Routledge, New York, NY.
- James, L.R., Demaree, R.G. and Wolf, G. (1984), "Estimating within-group interrater reliability with and without response bias", *Journal of Applied Psychology*, Vol. 69 No. 1, pp. 85-98.
- Jansen, K.J. and Kristof-Brown, A. (2006), "Toward a multidimensional theory of person-environment fit", *Journal of Managerial Issues*, Vol. 18 No. 2, pp. 193-212.
- Joo, B.K.B., McLean, G.N. and Yang, B. (2013), "Creativity and human resource development an integrative literature review and a conceptual framework for future research", *Human Resource Development Review*, Vol. 12 No. 4, pp. 390-421.
- Kim, T.Y., Hon, A.H.Y. and Lee, D.R. (2010), "Proactive personality and employee creativity: the effects of job creativity requirement and supervisor support for creativity", *Creativity Research Journal*, Vol. 22 No. 1, pp. 37-45.
- Klein, K.J., Bliese, P.D., Kozlowski, S.W., Dansereau, F., Gavin, M.B., Griffin, M.A., Hofmann, D.A., James, L.R., Yammarino, F.J. and Bligh, M.C. (2000), "Multilevel analytical techniques: commonalities, differences, and continuing questions", in Klein, K.J. and Kozlowski, S.W.J. (Eds), *Multilevel Theory, Research and Methods in Organizations*, Jossey Bass, San Francisco, CA, pp. 512-556.
- Kohn, A. (1999), *Punished by Rewards: The Trouble with Gold stars, Incentive plans, A's, Praise, and Other Bribes*, Houghton Mifflin Company, New York, NY.
- Lai, M.H. and Kwok, O.M. (2014), "Standardized mean differences in two-level cross-classified random effects models", *Journal of Educational and Behavioral Statistics*, Vol. 39 No. 4, pp. 282-302.
- LeBreton, J.M. and Senter, J.L. (2008), "Answers to 20 questions about interrater reliability and interrater agreement", *Organizational Research Methods*, Vol. 11 No. 4, pp. 815-852.
- Lepper, M.R. and Greene, D. (1975), "Turning play into work: effects of adult surveillance and extrinsic rewards on children's intrinsic motivation", *Journal of Personality and Social Psychology*, Vol. 31 No. 3, pp. 479-486.
- Lord, F.M., Novick, M.R. and Birnbaum, A. (1968), *Statistical Theories of Mental Test Scores*, Addison-Wesley, Reading, MA.
- Maas, C.J. and Hox, J.J. (2005), "Sufficient sample sizes for multilevel modeling", *Methodology*, Vol. 1 No. 3, pp. 86-92.
- McGraw, K.O. and Wong, S.P. (1996), "Forming inferences about some intraclass correlation coefficients", *Psychological Methods*, Vol. 1 No. 1, pp. 30-46.
- Madjar, N. and Ortiz-Walters, R. (2009), "Trust in supervisors and trust in customers: their independent, relative, and joint effects on employee performance and creativity", *Human Performance*, Vol. 22 No. 2, pp. 128-142.
- Madjar, N., Oldham, G.R. and Pratt, M.G. (2002), "There's no place like home? The contributions of work and nonwork creativity support to employees' creative performance", *Academy of Management Journal*, Vol. 45 No. 4, pp. 757-767.
- Marsick, V.J. and Watkins, K.E. (2003), "Demonstrating the value of an organization's learning culture: the dimensions of the learning organization questionnaire", *Advances in Developing Human Resources*, Vol. 5 No. 2, pp. 132-151.
- Martins, E.C. and Terblanche, F. (2003), "Building organizational culture that stimulates creativity and innovation", *European Journal of Innovation Management*, Vol. 6 No. 1, pp. 64-74.
- McLean, G.N. (1997), "Multirater 360 feedback", in Bassi, L.J. and Russ-Eft, D. (Eds), *What Works: Assessment, Development, and Measurement*, American Society for Training and Development, Alexandria, VA, pp. 87-108.

- McLean, L.D. (2005), "Organizational culture's influence on creativity and innovation: a review of the literature and implications for human resource development", *Advances in Developing Human Resources*, Vol. 7 No. 2, pp. 226-246.
- Mumford, M.D., Scott, G.M., Gaddis, B. and Strange, J.M. (2002), "Leading creative people: orchestrating expertise and relationships", *The Leadership Quarterly*, Vol. 13 No. 6, pp. 705-750.
- Nadler, D.A., Jenkins, G.D., Cammann, C. and Lawler, E.E. (1975), *The Michigan Organizational Assessment Package: Progress Report II*, University of Michigan, Institute for Social Research, Ann Arbor.
- Oldham, G.R. and Cummings, A. (1996), "Employee creativity: personal and contextual factors at work", *Academy of Management Journal*, Vol. 39 No. 3, pp. 607-634.
- Raudenbush, S.W. and Bryk, A.S. (2002), *Hierarchical Linear Models: Applications and Data Analysis Methods*, Sage Publications, Thousand Oaks, CA.
- Reilly, R.C. (2008), "Is expertise a necessary precondition for creativity? A case of four novice learning group facilitators", *Thinking Skills and Creativity*, Vol. 3 No. 1, pp. 59-76.
- Ryan, R.M. and Deci, E.L. (2000), "Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being", *American Psychologist*, Vol. 55 No. 1, pp. 68-78.
- Sagiv, L., Arieli, S., Goldenberg, J. and Goldschmidt, A. (2010), "Structure and freedom in creativity: the interplay between externally imposed structure and personal cognitive style", *Journal of Organizational Behavior*, Vol. 31 No. 8, pp. 1086-1110.
- Sawyer, R.K. (2011), *Explaining Creativity: The Science of Human Innovation*, Oxford University Press, New York, NY.
- Schneider, B. (1983), "Interactional psychology and organizational behavior", in Cummings, L.L. and Staw, B.M. (Eds), *Research in Organizational Behavior*, Vol. 5, JAI Press, Greenwich, CT, pp. 1-31.
- Shalley, C.E. and Gilson, L.L. (2004), "What leaders need to know: a review of social and contextual factors that can foster or hinder creativity", *The Leadership Quarterly*, Vol. 15 No. 1, pp. 33-53.
- Shalley, C.E., Zhou, J. and Oldham, G.R. (2004), "The effects of personal and contextual characteristics on creativity: where should we go from here?", *Journal of Management*, Vol. 30 No. 6, pp. 933-958.
- Shane, S. and Nicolaou, N. (2015), "Creative personality, opportunity recognition and the tendency to start businesses: a study of their genetic predispositions", *Journal of Business Venturing*, Vol. 30 No. 3, pp. 407-419.
- Sine, W.D., Mitsuhashi, H. and Kirsch, D.A. (2006), "Revisiting burns and stalker: Formal structure and new venture performance in emerging economic sectors", *Academy of Management Journal*, Vol. 49 No. 1, pp. 121-132.
- Sternberg, R.J. and Lubart, T.I. (1999), "The concept of creativity: prospects and paradigms", in Sternberg, R.J. (Ed.), *Handbook of Creativity*, Cambridge University Press, Cambridge, MA, pp. 3-15.
- Sun, L.-Y., Zhang, Z., Qi, J. and Chen, Z.X. (2012), "Empowerment and creativity: a cross-level investigation", *The Leadership Quarterly*, Vol. 23 No. 1, pp. 55-65.
- Song, J.H., Chermack, T.J. and Kim, W. (2013), "An analysis and synthesis of DLOQ-based learning organization research", *Advances in Developing Human Resources*, Vol. 15 No. 2, pp. 222-239.
- Swanson, R.A. and Holton, E.F. (2001), *Foundations of Human Resource Development*, Berrett-Koehler, San Francisco, CA.
- Thomas, K.W. (2009), *Intrinsic Motivation at Work: What Really Drives Employee Engagement*, Berrett-Koehler Publishers, San Francisco, CA.
- Tierney, P. and Farmer, S.M. (2002), "Creative self-efficacy: its potential antecedents and relationship to creative performance", *Academy of Management Journal*, Vol. 45 No. 6, pp. 1137-1148.

- Tiwana, A. and Mclean, E.R. (2005), "Expertise integration and creativity in information systems development", *Journal of Management Information Systems*, Vol. 22 No. 1, pp. 13-43.
- Unsworth, K. (2001), "Unpacking creativity", *Academy of Management Review*, Vol. 26 No. 2, pp. 289-297.
- Vincent, A.S., Decker, B.P. and Mumford, M.D. (2002), "Divergent thinking, intelligence, and expertise: a test of alternative models", *Creativity Research Journal*, Vol. 14 No. 2, pp. 163-178.
- Watkins, K.E. and Marsick, V.J. (1997), *Dimensions of the Learning Organization Questionnaire*, Partners for the Learning Organization, Warwick, RI.
- Woodman, R.W. and Schoenfeldt, L.F. (1990), "An interactionist model of creative behavior", *The Journal of Creative Behavior*, Vol. 24 No. 1, pp. 279-290.
- Woodman, R.W., Sawyer, J.E. and Griffin, R.W. (1993), "Toward a theory of organizational creativity", *Academy of Management Review*, Vol. 18 No. 2, pp. 293-321.
- Weisburg, R.W. (1999), "Creativity and knowledge: a challenge to theories", in Sternberg, R.J. (Ed.), *Handbook of Creativity*, Cambridge University Press, Cambridge, MA, pp. 226-250.
- Yang, B. (2003), "Identifying valid and reliable measures for dimensions of a learning culture", *Advances in Developing Human Resources*, Vol. 5 No. 2, pp. 152-162.
- Yang, B., Watkins, K.E. and Marsick, V.J. (2004), "The construct of the learning organization: dimensions, measurement, and validation", *Human Resource Development Quarterly*, Vol. 15 No. 1, pp. 31-55.
- Yoon, S.W., Song, J.H., Lim, D.H. and Joo, B.K. (2010), "Structural determinants of team performance: the mutual influences of learning culture, creativity, and knowledge", *Human Resource Development International*, Vol. 13 No. 3, pp. 249-264.
- Zaccaro, S.J., Mumford, M.D., Connelly, M.S., Marks, M.A. and Gilbert, J.A. (2000), "Assessment of leader problem-solving capabilities", *The Leadership Quarterly*, Vol. 11 No. 1, pp. 37-64.
- Zhang, X. and Bartol, K.M. (2010), "Linking empowering leadership and employee creativity: the influence of psychological empowerment, intrinsic motivation, and creative process engagement", *Academy of Management Journal*, Vol. 53 No. 1, pp. 107-128.
- Zhou, J. (2003), "When the presence of creative coworkers is related to creativity: role of supervisor close monitoring, developmental feedback, and creative personality", *Journal of Applied Psychology*, Vol. 88 No. 3, pp. 413-422.
- Zhou, J. and George, J.M. (2003), "Awakening employee creativity: the role of leader emotional intelligence", *The Leadership Quarterly*, Vol. 14 No. 4-5, pp. 545-568.
- Zhou, J. and Shalley, C.E. (2003), "Research on employee creativity: a critical review and directions for future research", *Research in Personnel and Human Resources Management*, Vol. 22, pp. 165-218.

Further reading

- Deci, E.L. and Ryan, R.M. (1985), "The general causality orientations scale: self-determination in personality", *Journal of Research in Personality*, Vol. 19 No. 2, pp. 109-134.

Corresponding author

Shinhee Jeong can be contacted at: jeongsh00@tamu.edu

For instructions on how to order reprints of this article, please visit our website:

www.emeraldgroupublishing.com/licensing/reprints.htm

Or contact us for further details: permissions@emeraldinsight.com