PRINT: ISSN 0972-0073 ONLINE: 2456-6802
Anthropologist, 24(2): 454-463 (2016)
DOI: 10.31901/24566802.2016/24.02.08

Do Self-efficacy and Competency-Position Fit Determine R&D Employees' Innovative Behavior? Integrating an Anthropological View

Wu Weiwei[1], Wang Yan[2], Liu Yexin[3] and Chin Tachia[4*]

[1, 2, 3]School of Management, Harbin Institute of Technology, Harbin, PR China, 150001
[4] School of Management, Hangzhou Dianzi University, 310018
E-mail: [1]<wuweiwei@hit.edu.cn>, [2]<lwangyan@126.com>,
[3]<liuyexin1990@163.com>, [4]<cori5cori@hotmail.com>

KEYWORDS Creativity. Innovation. R&D. Self-efficacy. Social Cognitive Theory

ABSTRACT Creativity research in the field of business anthropology has focused on the relationship between personality and innovative behavior, in business organizations. However, few studies have empirically examined the effect of positive personality traits on innovative behavior of R&D staff. The purpose of this paper is to reveal the correlations among self-efficacy, competency-position fit (CPF), and R&D employees' innovative behavior, in different work settings. With 328 R&D staff in China participating in the survey, this research employs a profile deviation analysis to conduct a comparison between R&D employees working on R&D project, and those in R&D program. The researchers' findings indicate that the ideal type of R&D employees will perform significantly better in creativity than non-ideal ones, while self-efficacy and CPF are key factors that facilitate R&D staff to achieve outstanding innovative performance. The results give credence to the notion that the holistic perspective of fit between positive personality traits and work settings has a significant impact on R&D employees' innovative behavior. Overall, this paper brings new insights into the understanding of how R&D employees' positive personality traits influence their own creativity which provides valuable implications for business organizations, to motivate innovative behavior of R&D staff.

INTRODUCTION

Given that the anthropological theory primarily concentrates on the cultural and social environment where human beings live in (Tian 2013; Tian and Dai 2013), there has been an increase in the number of studies that syncretize an anthropological perspective, to explore the management issues with context-sensitive features or humanistic elements; creativity research appears to be a typical example. Employee creativity is defined as the generation of novel and useful ideas for organizational innovation, production and business operations (Amabile 1997), and has been empirically determined to be a prerequisite for performance, development and improvement, in business organizations (Chae et al. 2015; Chen et al. 2015). Being actually involved with creative processes is regarded as an important professional resource for R&D employees to produce creative outcomes (Montag et al. 2012). They apply creative ideas by recognizing and synthesizing what they could transfer to their jobs, from the knowledge they acquired. Although businesses engage in innovation because of its potential for power and profits (Wu et al. 2012), to create in its purest form, is to fully and freely become more of oneself and it is one of the most gratifying aspects of the human condition (Weiner 2000). Many anthropologists and sociologists argue that creativity seems to be a potentiality given to everyone (Tian and Dai 2013); however, if indeed we do possess such inherent creative potentials, then, why don't all R&D employees exhibit great innovative behavior at work?

Previous studies tried to answer this question by applying the Social Cognitive Theory (SCT) from the view of anthropology. SCT posits that human behavior within a specific social context is the result of the continuous interplay of person (whether the individual has positive or negative personality traits toward the behavior), environment (an important setting-specific

*Address for correspondence:
Chin Tachia
Xiasha Higher Education Zone,
Hangzhou, 310018,
Zhejiang Province, China
Telephone: +86-13437838355,
E-mail: cori5cori@hotmail.com;
tachia1231@yahoo.com.sg

factor with potential effects on the way an individual actually acts and thinks), and behavior (the response which an individual receives after he/she performs a behavior) (Perdue et al. 2007). Recently, scholars who employ SCT in conducting creativity research tend to further emphasize the effect of self-efficacy on innovative behavior and performance (Gong et al. 2009; Bandura 2015; Dogan 2015; Karatas 2015; Uredi 2015).

Bandura (1986) defined self-efficacy as, 'individual judgments about one's own capabilities to organize himself/herself and get into action in alignment with desired goals'. Therefore, self-efficacy per se could not be seen as an innovation capability, but refer to an individual's faith in his/her capability to perform a specific task in the innovation process (Ozmercan 2015). If R&D employees hold positive evaluations of their own capabilities which are necessary for being creative in their jobs, they will be more willing to overcome the challenges of facing with high uncertainty in the process of innovating. Thus, self-efficacy is widely recognized as an important positive personality trait that significantly associates with R&D employees' working effort and performance (Tierney and Farmer 2004; Seo and Ilies 2009).

SCT indicates that individuals are motivated by their expectations of the outcomes of their actions (Bandura 2015) which is closely related with their beliefs upon their competence to fulfil the obligation to organizational innovative performance. Cable and DeRue (2002), defined competency-position fit (CPF) as, the judgments of congruence between employees' abilities (skills, quality, talents, and experience) and the demands of a job. Strong belief of being qualified in their profession can make R&D employees feel positive, conscientious and vibrant which is helpful for them to deliver quality work with professional satisfaction (Cable and DeRue 2002; Erdogan and Bauer 2005). Chang et al. (2010) indicated that under different levels of CPF, R&D employees showed very different attitudes toward work, and with a high level of CPF, they also demonstrated a high level of innovative performance.

Examining the Mechanisms among Self-efficacy, CPF and Innovation

Although related research of SCT has proven that both self-efficacy and CPF have positive effects on innovative performance of R&D employees, a notable phenomenon is that not every best-performing R&D employee working on R&D project has the same impressive achievement when involved in R&D program, and vice versa. Oldham and Cummings (1996) have argued that employees will achieve the most creative performance when they have appropriate creativity-relevant personality traits and work in the suitable organizational context. Previous research also pointed out that innovative behavior can be attributed to the interactions between individual differences and contextual factors (Zheng et al. 2010; Vila et al. 2014; Tong et al. 2015). It is implied that R&D employees' innovative performance is not only influenced by the positive personality traits (for example, self-efficacy and CPF) but that it is also affected by situational influences. However, little researches have explored the complex congruence relations between positive personality traits (for example, self-efficacy and CPF) and organizational contexts in order that desired innovative performance can be achieved. To fill this gap therefore, the major objective of this research is to extend the literature on creativity by employing the profile deviation analysis approach which empirically examines the mechanisms among self-efficacy, CPF, different work settings, and innovative performance.

Ideal R&D Employees

While working in a R&D organization, those with positive personality traits prefer to challenge themselves generally to do better than others, due to the requirements of their roles in creativity and risk-resistance. However, even though both self-efficacy and CPF have been found to correlate positively with the innovative performance of R&D employees (Seo and Ilies 2009; Chang et al. 2010), the possession of a high level of self-efficacy or CPF may not ensure good performance if they operate under unsuitable conditions and work settings.

Given that the variety of positive personality traits leads to individuals' distinct way of perceiving and responding to different work contexts, some literatures have suggested an investigation into the various forms of interactions among personal and contextual characteristics in creativity research, which may represent a fruitful direction for addressing some paradoxical phenomena (Anderson et al. 2014; Chen et al.

2015). SCT provides a perspective for understanding how the arrangement of R&D employees is done in accordance with the compatibility between their personality traits and work settings which affects their innovative behavior and performance. Specifically speaking, and all other things being equal, people are likely to become more creative in their favorable work settings where they have a feeling of satisfaction and empowerment, and to avoid those where they feel inadequate (Chin 2015; Chin and Liu 2015). Following this logic, at the individual level, the increase in creativity could be attributable to the congruence between his/her personality traits and the social-environmental factors within a work context. Hence, it is critical to identify the best level of CPF and self-efficacy of R&D people, depending on the workplace, whereby their creativity could be largely stimulated. While a more holistic, ideal profile about the perfect combination of self-efficacy and CPF emerges, R&D employees would feel more encouraged to conduct innovation.

Accordingly, for a given work setting, the R&D employees who closely resemble the ideal profile may receive a positive feedback from the environment which is the strongest predictor of innovative performance. In other words, the more a R&D employee is similar to the ideal type (characterized by self-efficacy and CPF), the better he/she performs in R&D. As such, the researchers hypothesize that:

Hypothesis 1: The innovative performance of ideal R&D employees will be extraordinarily better than the non-ideal type of employees for different work settings.

Innovating under the Influence of Work Settings

In the current business environment, R&D projects are often considered crucial to business success. And, oftentimes, these R&D projects are implemented in a multiple-project management environment, where some R&D projects are managed individually, and the others collectively as R&D program (Abbassi et al. 2014). Usually, R&D projects are strategic oriented and relatively complex, and the projects under R&D program are tactical and associated with each other (Wysocki et al. 2002). Although the projects under R&D program are occasionally independent in terms of goals or deliverables, they are integrated to maximize resource efficiency and to minimize administrative cost (Patanakul and Milosevic 2008). Therefore, there are two basic work settings for R&D employees, who are participating in R&D project or in R&D program.

Generally, R&D program could comprise of many simultaneous R&D projects in the different stage of technology life cycles. R&D employees working in a program are likely to face the conundrum of coping with the parallel tasks that may vary in technical uncertainty. Thus, it's more difficult for the R&D employees who participated in R&D program with multi-project, to comprehensively master the required knowledge and skills than those who are engaged in only one project (Patanakul and Milosevic 2008).

However, dealing with several projects simultaneously may give R&D people a false impression of accomplishment; they may feel successful already even if it is only one of the projects at hand that is completed. Those working in R&D project are usually under mounting pressures, and are often different from the R&D employees in a program whose pressures can be eased in some ways, especially when faced with the slow progress of an only task. As a result, different work settings between R&D project and R&D program could lead to various levels of difficulty; the one who is with high self-efficacy and CPF and who performs excellently in R&D project may not be able to perform well enough in a R&D program, and vice versa. As Chen et al. (2015) emphasized that contextual characteristics must be considered together with self- efficacy and CPF in order to maximize each R&D member's creativity, by achieving "contextual fit". The purpose of this section of the research is to investigate how differences in positive personality traits affected the creativity which individuals working in the two diverse work settings showed. Based on this, the researchers' hypothesize that:

Hypothesis 2: There will be a noticeable difference in self-efficacy and CPF between the ideal profiles of the two diverse work settings.

METHODOLOGY

Sample

This research examines the researchers' hypotheses by investigating a Chinese firm that is undertaking a lot of high-tech R&D projects. This sample firm has relied on R&D employees to maintain a competitive advantage since it com-

prehensively adjusted its development strategy in 2003. Nevertheless, not all the R&D employees are psychologically adapted to the changes in terms of work intensity. For instance, despite the fact that more powerful incentives were being implemented to stimulate innovative behavior, some of the R&D staff still performed relatively low in their creativity. But, whether this problem is due to the fact that they were made to pass through tougher appraisal standards is yet to be ascertained. Therefore, due to the urgency of this problem, it seems particularly appropriate to choose this firm as the sample pool.

Taking Stewart and Aldrich's (2015) suggestion to heart, the researchers incorporated an anthropological angle to carry out this research and thus, spent two weeks staying at this field site to observe the R&D staff before distributing questionnaires. Two types of questionnaires were prepared according to the research purpose: the one about self-efficacy and CPF was distributed to the R&D staff, and the other about innovative performance of the R&D staff was filled and checked by those executives in charge of performance appraisal. All the completed questionnaires were returned directly to the researchers in December, 2014. To ensure anonymity, the researchers numbered the questionnaires based on the name list, and then distributed the questionnaires to each employee along with his/her performance assessment of last quarter, in order to match with his/her creative productivity.

The data were collected via field surveys which could diminish selection bias. 120 R&D employees in a project and 230 employees in a program received the questionnaires. After pairing the two types of questionnaires and excluding invalid ones, 114 valid questionnaires were obtained for R&D project employees while 214 for R&D program staff.

The participants in the R&D project were predominantly male (62.3%), within the 25-35 years old range (55.3%), in which most had a bachelor or post graduate degree (83.3%). The socio-demographic features of respondents are typical in similar industries. As far as the R&D program was concerned, participants were also predominantly male (63.0%), within the 25-35 years old range (44.9%), and most had a bachelor or post graduate degree (58.4%). The similarity between the two populations implies that no significant non-response bias existed.

Instruments

To measure self-efficacy of R&D employees, the researchers used the 10-item scale for measuring general self-efficacy (that is, GSES) developed by Schwarzer et al. (1997). Participants were asked to rate each statement based on their own experience. Sample statements included the followings: "I can always manage to solve difficult problems if I try hard enough", and "No matter what comes my way, I'm usually able to handle it". The scale's Cronbach's alpha was 0.93.

CPF was assessed as per Abdel-Halim' (1981) scale. It contains five items, whose sample items included the followings: "I feel I have adequate preparation for the job I now hold", and "My job gives a chance to do the things I feel I do best", and the Cronbach's alpha was 0.80.

Welbourne's (1998) 20-item scale was employed to measure participants' performance regarding innovation and creativity. To ensure objectivity, unlike self-efficacy and CPF, participants' innovative performance was measured with supervisory ratings. The scale's Cronbach's alpha was 0.86.

The researchers then used a five-point Likert rating scale with responses ranging from "strongly disagree" to "strongly agree" to measure all items. Most of the Cronbach's alphas fell within the range of 0.75 to 0.83 with at least one above 0.90 (see Table 1), and therefore the reliability of the researchers' measurement was acceptable (Nunnally 1978). KMO test showed a KMO value of over 0.7, and Bartlett Test of Sphericity indicated no partial correlation between the items and good construct validity ($p < 0.001$). The result of the exploratory factor analysis showed that each of the three scales had a factor-loading value which was bigger than 0.5, and the total cumulative was more than 70 percent. All the ten items measuring self-efficacy, the five items measuring CPF, and the four items measuring innovative performance yielded one factor. The confirmatory factor analysis suggested that the hypothesized three-factor model (that is, self-efficacy, CPF, and innovative performance) fit the data well (the ratio of chi-square value to degree of freedom was less than 5, and all the GFI were greater than 0.9). Besides, all factor loadings in our three-factor model were significant ($p < 0.01$) in a statistical sense, indicating that there was a sound construct validity (Bagozzi et al. 1991).

Table 1: Cronbach's alpha of constructs and factor loadings of the items

Item	*R&D project*		*R&D program*	
	Factor Loading	*á*	*Factor Loading*	*a*
Self-efficacy		*0.903*		*.936*
I can always manage to solve difficult problems if I try hard enough.	.542		.669	
If someone opposes me, I can find means and ways to get what I want.	.758		.806	
It is easy for me to stick to my aims and accomplish my goals.	.708		.752	
I am confident that I could deal efficiently with unexpected events.	.754		.839	
Thanks to my resourcefulness, I know how to handle unforeseen situations.	.698		.831	
I can solve most problems if I invest the necessary effort.	.759		.809	
I can remain calm when facing difficulties because I can rely on my coping abilities.	.805		.831	
When I am confronted with a problem, I can usually find several solutions.	.759		.798	
If I am in a bind, I can usually think of something to do.	.786		.848	
No matter what comes my way, I'm usually able to handle it.	.733		.810	
Competency-position Fit		*.852*		*.886*
I feel I have adequate preparation for the job I now hold.	.865		.906	
I feel competent and fully able to handle my job.	.769		.805	
I feel that my job and I are well-matched.	.679		.715	
I feel my work utilizes my full abilities.	.800		.830	
My job gives me a chance to do the things I feel I do best.	.861		.883	
Innovative Performance		*.877*		*0.926*
Coming up with new ideas in his/her job.	.814		.776	
Working to implement new ideas in his/her job.	.773		.719	
Finding improved ways to do things in his/her job.	.736		.880	
Creating better processes and routines in his/her job.	.701		.839	

á: Cronbach's Alpha.

RESULTS

Self-efficacy, CPF and Innovative Performance

To verify the effects of self-efficacy and CPF on innovative performance, Pearson correlation analysis was performed in this study. Table 2 gives variables' means, standard deviations, and a correlation matrix. For the participants in R&D project, the correlation coefficient of innovative performance with self-efficacy and CPF are 0.399 and 0.453, respectively, indicating both self-efficacy and CPF can effectively improve innovative performance of R&D employees in R&D project. Similarly, for the participants in R&D program, the correlation coefficient of innovative performance with self-efficacy and CPF are 0.493 and 0.396, respectively, also indicating a significant positive correlation. These results suggest that no matter the type of work environment, higher self-efficacy and CPF would always help to improve innovative performance.

It should be noted that for both the participants in R&D project and the participants in R&D

Table 2: Simple statistics and correlations

Variables	*R&D project*				*R&D program*			
	Simple statistics		*Pearson correlation coefficients*		*Simple statistics*		*Pearson correlation coefficients*	
	Mean	*Std. dev.*	*1*	*2*	*Mean*	*Std. dev.*	*1*	*2*
1. Self-efficacy	3.623	.660			3.785	.809		
2. Competency-position fit	3.876	.727	.731**		4.003	.825	.653**	
3. Job performance	3.977	.633	.399**	.453**	4.049	.704	.493**	.396**

N =114 for the R&D project. N =214 for the R&D program. ** $p < 0.01$.

program, self-efficacy and CPF show a significant positive correlation. Especially for the R&D project employees, the correlation coefficient reaches up to 0.731, suggesting that self-efficacy and CPF, as two important positive personality traits, are affected by individual learning activities and thus, have some common trends. The R&D employee with higher self-efficacy would feel more confident in his/her innovative capability, and could easily get pleasure and fulfillment from innovative activities, along with a higher CPF. Furthermore, lower CPF may prevent R&D person from displaying creativity, and in that case, he/she may either experience discomfort when feeling over qualified for the job or frustration when feeling under qualified, which would invariably affects the positive assessment of his/her innovative capability and results in a low level of self-efficacy. Nevertheless, it is worth noting that the significant positive correlation between self-efficacy and CPF would produce multi-collinearity in linear regression, so, their influences on innovative performance should be further explored.

Profile Deviation Analysis

The profile deviation (PD) analysis was employed to assess the fit between the positive personality traits and working settings, by indicating the extent to which self-efficacy and CPF of each R&D employee were similar to those of the ideal profile in which they fit together in ways that produce superior innovative performance (Zajac et al. 2000; Yarbrough et al. 2011). The frequencies of the outcome variable (innovative performance in this research) would be examined. Participants with the highest innovative performance were selected as calibration sample to form the ideal personality profile in the light of their self-efficacy and CPF. The researchers then followed the general guidelines in PD analysis, to identify the personality characteristics of the top performers (about 10 percent) as the ideal profile for each working environmental type (Venkatraman and Prescott 1990). In this study, the top 15 or 34 employees rank-ordered by innovative performance were selected for calibration because a significant drop-off in innovative performance appeared there (resulting in the fact that all the participants who got a score of 5, comprised of the calibration sample). And the calibration sample was considered as the benchmark to compare with the rest non-ideal employees in terms of self-efficacy and CPF (Doty et al. 1993; Yarbrough et al. 2011). Misalignment is conceptualized in accordance with the degree of being inconsistent with an ideal personality profile for a specified working environment, and a unit of misalignment means a unit deviation from such an ideal calibration sample which should be negatively associated with desired innovative performance (Venkatraman and Prescott 1990). The degree of deviation from the best performing employees in their personality profile can be measured via Euclidian distance, and the prediction of PD can be described in this study as: 'The innovative performance will deteriorate dramatically as the deviation from the calibrating ideal employee profile gets bigger and bigger'.

Misalignment is termed as MISALIGH which is calculated by the following function:

$$\text{MISALIGH} = \sum_{j=1}(b_1(X_{sj} - \overline{X}_{Cj}))^2$$

where $\overline{X}_{cj}$ stands for the mean score for the calibration sample (or the mean score of the ideal employees) along the variable; X_{sj} is the score in the study sample for the variable; b_j is the standardized beta weight; and *j* equals to 1 or 2 means the variable is self-efficacy or CPF respectively. Then this study used a regression model to test predictions of profile deviation.

The results of PD analysis for the two given work settings are negative and significant (see Table 3, β= -0.646, -0.871 respectively, $p<0.001$). This finding indicates that R&D employees

Table 3: Profile deviation: Innovative performance - R&D project vs. - R&D program

Variables	*R&D project*		*R&D program*	
	Ideal	*Random*	*Ideal*	*Random*
Profile deviation	-0.646***	-0.336	-0.871***	-0.117
R Sqr.	0.630	0.097	0.578	0.007
Adj. R Sqr.	0.626	0.088	0.575	0.000
F-ratio	163.153***	10.342	211.935***	1.409

***p<0.001.

whose personality traits diverging from the ideal profile would hardly achieve a satisfactory innovative performance, and therefore Hypotheses 1 is supported.

Further analyses were carried out to test the robustness of the results by using a non-ideal personality profile based on a random sample, to examine whether the non-ideal profiles had similar performance implications. If the result of PD analysis for the random sample is not significant, the notion that taking ideal personality profiles as benchmark has stronger explanatory power than the calibrating non-ideal profiles will be further proved (Cohen et al. 2003; Malhotra et al. 2013). The regression coefficients of the random sample are non-significant (β= -0.336, -0.117 respectively, $p>0.1$), revealing that calibrating ideal sample can guarantee the robustness of the model.

This study also examined the positive personality traits of the bottom 10 percent employees for the two given work settings and compared it with the ideal employees. Interestingly, the result shows that some differences exist in the positive personality traits among the best performers in the two given work settings: self-efficacy is the dominant driver to achieving better innovative performance for R&D employees working in a project, while CPF seems to be relatively more effective for those in a program. Furthermore, for R&D employees in a project, self-efficacy levels drop significantly between the top and bottom participants, and the vector standing for the direction of improvement indicates that self-efficacy is the key factor for achieving superior performance. In contrast, CPF can help those dealing with multiple projects simultaneously to do an excellent job. Therefore, Hypothesis 2 is also supported.

DISCUSSION

Recently, researchers of anthropology have started to investigate employee behavior from the perspective of cognitive and personality psychology, and how those individual dispositions are linked to innovative activities, such as academic performance or academic success (Karatas 2015), and teachers' creative thinking skills (Malkoç 2015). Assessing employees' cognitive characteristics and personality traits can serve to select appropriate candidates who have potential for high innovative performance (Caroff and Lubart 2012). However, positive personality traits only provide individuals with the potential to be creative, but are not a guarantee for high creativity. Therefore, whether or not employees with better creative potential will actually exhibit high level of creativity depends on not only the positive personality traits (for example, self-efficacy and CPF), but also on the organizational context. As explained by Belias et al. (2015), employees with high conflict between their personality traits and what their roles demand will have a high level of job dissatisfaction, because they may have many negative emotions about their workplace.

This research provides empirical evidence delineating the within-person relationships among positive personality traits, work settings, and innovative performance. First, it is suggested that in both R&D project and R&D program, self-efficacy and CPF as important personality traits are key drivers of R&D staffs' innovative achievement. It has been argued that organizations that wish to emphasize creativity and innovation can be more successful if they recruit employees who possess innovative cognitive style, as well as positive personality traits (Chen et al. 2015), and the findings of this study are in line with this perspective.

Second, the PD analysis manifests that the relationships between self-efficacy, CPF, and innovative performance could be strengthened by the extent to which R&D employees resemble the ideal group of employees in both R&D project and R&D program (see Table 3). This finding implies that the closer to the ideal personality profile R&D employees' perceptions of self-efficacy and CPF are, the better they may perform in creative activities. Hence, managers should weigh the influence of positive personality traits (self-efficacy and CPF in this research) on innovative productivity, when selecting suitable people to engage in R&D project or in R&D program. After all, the R&D employee who performs unsatisfactorily in R&D project may achieve a better innovative performance in R&D program, since his/her self-efficacy and CPF might be relatively closer to the ideal employee type of R&D program than that of R&D project. If people could just rely on using swift horses to ride their carriages, then, the talent required for horse racing cannot be presented any more. Therefore, the organizations should take into full consideration the overall fit between the work settings and R&D employee's self-efficacy and

CPF, to expand their potential and innovation. Analogously, Chae et al. (2015) indicated that employees' innovate outcomes may not only be affected by their personality factors, but also by social environmental factors within a work context; Liu et al. (2015) argued that differential human resource management practices embodied in the recruitment channel, training system, compensation and incentives, benefits, promotion, performance appraisal, job content and organization authorization should be adopted by enterprises according to the employee's classification.

Third, self-efficacy and CPF positively contribute to the innovative performance of R&D project staffs and the innovative performance of R&D program staffs, but the former relies more on self-efficacy and less on CPF comparing to that of R&D program employee. The contrasting results could be explained by and attributed to the differences in context and work settings between R&D project and R&D program. For those working in a specific R&D project, the failure of this project might represent a total failure of their jobs, and bring about tremendous pressure which could make all their hard work to go down the drain. In this sense, individuals with higher self-efficacy may tend to believe that they should maintain their commitment to the goals, believing that the problem would be ultimately solved. These people may constantly give themselves positive psychological hints, thus remaining less affected by disruptive thinking in face of repeated difficulties and failures (Seo and Ilies 2009).

As far as the R&D program is concerned, employees, handling multiple projects simultaneously implies that they must adapt to changing requirements on knowledge and skills, whereas, each switch of role and working context may cause frustration, making the employees to doubt their own capability. R&D employees with higher CPF usually have a firm belief that they possess sufficient knowledge, skills, and abilities to meet the demands of their jobs and therefore perform competently and effectively on the jobs. Working on multiple projects at the same time may stimulate their potential and enthusiasm. Considering the foregoing, organizations could put more emphasis on training investment, facilitating R&D employees to strengthen their self-efficacy and CPF, according to their respective work settings in such a way that performance improvements can also be obtained.

CONCLUSION

In summary, this study describes the ideal personality profile of R&D employees working in both R&D project and R&D program by applying a PD analysis. The findings of this research contribute to the literature mainly by offering the statistical evidence that could explicitly illustrate the following mechanisms: (1) Self-efficacy and CPF have a strong relationship with R&D staffs' innovative performance in different work settings; (2) The profile deviations for R&D staffs working in R&D project and those in R&D program significantly indicate an inferior innovative performance. (3) Self-efficacy is more likely the dominant driver of the better achievement for R&D employees working in R&D project, while CPF seems to play the major role for those who work in R&D program.

This paper is different from previous research in so many aspects in the sense that we conducted an empirical test to explore whether the innovative performance of R&D employees will differ significantly according to their personality traits as well as work settings, while most of the other studies merely focused on theoretical analysis. Also, while integrating an anthropological perspective with SCT to interpret creativity and to do survey, this research highlights the critical role of context factors in characterizing the pattern-match rules on R&D employees' positive personality traits. As such, it enriches the researchers' understanding of using a cross-disciplinary view to carry out business research. Finally, this study brings about some new insight into identifying the ideal R&D employees under different work settings and through a new approach namely, the PD analysis, which has rarely been used in the management and in anthropology domains.

As far as the managerial implications are concerned, this study suggests that most of R&D people may frequently struggle with the long process of exploring and venturing into uncharted areas, given that they are often required to seek solutions to the unknown problems and thus, are unlikely to predict in advance how to accomplish the desired results. In other words, R&D employees who possess higher self-efficacy beliefs and CPF may intend to spend or even actually spend more effort in engaging in innovative activities, whereas, they can recover very quickly when encountering setbacks. As a result, these people may achieve higher innovative performance in the end.

The researchers acknowledge that there are still some limitations that need to be addressed. For instance, further research need to be carried out to test the generalizability of the results because the researchers' sample comes from a single firm. The calibration sample can be drawn with variable approaches; for example, outstanding performers selected according to different standards and some other positive personality variables can be added to identify ideal profiles. In addition, future research could further discuss how to empirically improve the innovative performance of R&D employees by testing the interaction effects of self- efficacy and CPF.

RECOMMENDATIONS

It becomes more and more crucial for managers to realize and handle a variety of diversities in today's globalized world. Managers should adjust their philosophy from treating everyone alike, to recognizing individual differences in ways that could retain good employees. Based on this study, special attention should be paid to the development of self-efficacy for the R&D staff engaged in R&D project, and the promotion of CPF for those in R&D program, as self-efficacy and CPF dominates the ideal personality profiles in R&D project and R&D program respectively. Viewed from this angle, this paper also shows implicitly that the PD approach can be quite beneficial in designing a positive work environment and fostering a high-performance work system, whereas organizations need to establish suitable selection mechanisms that can decipher the positive personality profiles from the candidates applying for R&D positions.

ACKNOWLEDGEMENTS

The authors are grateful for the supports from the National Natural Science Foundation of China (71472055, 71272175). This research is also supported by the National Science Foundation for Post-doctoral Scientists of China (201104424, 2012M520697), the Heilongjiang Philosophy and Social Science Research Project (14B105), and the Project sponsored by SRF for ROCS, SEM.

REFERENCES

Abbassi M, Ashrafi M, Tashnizi ES 2014. Selecting balanced portfolios of R&D projects with interdependencies: A cross-entropy based methodology. *Technovation*, 34(1): 54-63.

Abdel-Halim AA 1981. A reexamination of ability as a moderator of role perceptions-satisfaction relationship. *Employees Psychology*, 34(3): 549-561.

Amabile TM 1997. Motivating creativity in organizations: On doing what you love and loving what you do. *California Management Review*, 40(1): 39-58.

Anderson N, Potocnik K, Zhou J 2014. Innovation and creativity in organizations a state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management*, 40(5): 1297-1333.

Bagozzi RP, Yi Y, Phillips LW 1991. Assessing construct validity in organizational research. *Administrative Science Quarterly*, 36(3): 421-458.

Bandura A 1986. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Upper Saddle River: Prentice-Hall.

Bandura A 2015. On deconstructing commentaries regarding alternative theories of self-regulation. *Journal of Management*, 41(4): 1025-1044.

Belias D, Koustelios A, Sdrolias L, Aspridis G 2015. Job satisfaction, role conflict and autonomy of employees in the Greek banking organization. *Procedia-Social and Behavioral Sciences*, 175(2): 324-333.

Cable DM, DeRue DS 2002. The convergent and discriminant validity of subjective fit perceptions. *Journal of Applied Psychology*, 87(5): 875-884.

Caroff X, Lubart T 2012. Multidimensional approach to detecting creative potential in managers. *Creativity Research Journal*, 24(1): 13-20.

Chae S, Seo Y, Lee KC 2015. Effects of task complexity on individual creativity through knowledge interaction: A comparison of temporary and permanent teams. *Computers in Human Behavior*, 42(1): 138-148.

Chang H, Chi N, Chuang A 2010. Exploring the moderating roles of perceived person-job fit and person-organisation fit on the relationship between training investment and knowledge workers' turnover intentions. *Applied Psychology: An International Review*, 59(4): 566-593.

Chen MH, Chang YY, Chang YC 2015. Exploring individual-work context fit in affecting employee creativity in technology-based companies. *Technological Forecasting and Social Change*, 98(9): 1-12.

Chin T 2015. Harmony and organization citizenship behavior in Chinese organizations. *International Journal of Human Resource Management*, 26(8): 1110-1129.

Chin T, Liu RH 2015. Understanding labor conflicts in Chinese manufacturing: A Yin-Yang harmony perspective. *International Journal of Conflict Management*, 26(3): 288-315.

Cohen J, Cohen P, West SG, Aiken LS 2003. *Applied Multiple Reg./Cor. Analysis for the Behavioral Sciences*. Mahwah: Lawrence Erlbaum Ass. Publishers.

Dogan U 2015. Student engagement, academic self-efficacy, and academic motivation as predictors of academic performance. *Anthropologist*, 20(3): 553-561.

Doty HD, Glick WH, Huber GP 1993. Fit, equifinality and organizational effectiveness: A test of two configurational theories. *Academy of Management Journal*, 36(6): 1196-1250.

Erdogan B, Bauer TN 2005. Enhancing career benefits of employee proactive personality: The role of fit with jobs and organizations. *Employees Psychology*, 58(4): 859-891.

Gong Y, Huang JC, Farh JL 2009. Employee learning orientation, transformational leadership and creativity: The mediating role of employee creative self-efficacy. *Academy of Management Journal*, 52(4): 765-778.

Karatas H 2015. Correlation among academic procrastination, personality traits, and academic achievement. *Anthropologist*, 20(1, 2): 243-255.

Liu XL, Liu SS, Wang HL 2015. Workforce differentiation and human resource management practices: An exploratory research in China. *Anthropologist*, 21(3): 450-460.

Malhotra N, Mavondo F, Mukherjee A, Hooley G 2013. Service quality of frontline employees: A profile deviation analysis. *Journal of Business Research*, 66(9): 1338-1344.

Malkoç T 2015. The variants that effecting creative thinking skills of music teachers. *Anthropologist*, 21(3): 474-481.

Montag T, Maertz CP, Baer M 2012. A critical analysis of the workplace creativity criterion space. *Journal of Management*, 38(4): 1362-1386.

Nunnally J 1978. *Psychometric Theory*. New York: McGraw-Hill.

Oldham GR, Cummings A 1996. Employee creativity: Personal and contextual factors at work. *Academy of Management Journal*, 39(3): 607-634.

Ozmercan EE 2015. Determining the tendencies of academic dishonesty and senses of self-efficacy with discriminant analysis. *Anthropologist*, 20(1, 2): 353-359.

Patanakul P, Milosevic D 2008. A competency model for effectiveness in managing multiple projects. *Journal of High Technology Management Research*, 18(2): 118-131.

Perdue SV, Reardon RC, Peterson GW 2007. Person-environment congruence, self-efficacy, and environmental identity in relation to job satisfaction: A career decision theory perspective. *Journal of Employment Counseling*, 44(1): 29-39.

Schwarzer R, Bäßler J, Kwiatek P, Schröder K, Zhang JX 1997. The assessment of optimistic self-beliefs: Comparison of the German, Spanish, and Chinese versions of the General Self-efficacy Scale. *Applied Psychology*, 46(1): 69-88.

Seo M, Ilies R 2009. The role of self-efficacy, goal, and affect in dynamic motivational self-regulation. *Organizational Behavior and Human Decision Processes*, 109(2): 120-133.

Stewart A, Aldrich H 2015. Collaboration between management and anthropology researchers: Obstacles and opportunities. *Academy of Management Perspectives*, 29(2): 173-192.

Tian G 2013. Business anthropology and cultural difference management. *Nationalities Research in Qinghai*, 24(3): 1-9.

Tian G, Dai QQ 2013. Anthropology and business management: Probing the pathway of localization in China. *Chinese Journal of Management*, 10(6): 789-795.

Tierney P, Farmer SM 2004. The Pygmalion process and employee creativity. *Journal of Management*, 30(3): 413-432.

Tong J, Wang L, Peng K 2015. From person-environment misfit to job burnout: Theoretical extensions. *Journal of Managerial Psychology*, 30(2):169-182.

Uredi L 2015. The predictive power of classroom teachers' self-efficacy beliefs related to implementing the constructivist approach upon their level of creating a constructivist learning environment: A Mersin case. *Anthropologist*, 20(1, 2): 256-267.

Venkatraman N, Prescott JE 1990. Environment strategy co-alignment: An empirical test of its performance implications. *Strategic Management Journal*, 11(1): 1-23.

Vila LE, Pérez PJ, Coll-Serrano V 2014. Innovation at the workplace: Do professional competencies matter? *Journal of Business Research*, 67(5): 752-757.

Weiner R 2000. *Creativity and Beyond: Cultures, Values, and Change*. New York: State University of New York Press.

Welbourne TM, Johnson DE, Erez A 1998. The role-based performance scale: Validity analysis of a theory-based measure. *Academy of Management Journal*, 41(5): 540-555.

Wu WW, Yu B, Wu C 2012. How China's equipment manufacturing firms achieve successful independent innovation: The double helix mode of technological capability and technology management. *Chinese Management Studies*, 6(1): 160-183.

Wysocki RK, Beck R, Crane D 2002. Extensions to multiple projects. In: James S Pennypacker, Lowell D Dye (Eds.): *Managing Multiple Projects*. New York: Marcel Dekker Inc., pp. 153-162.

Yarbrough L, Morgan NA, Vorhies DW 2011. The impact of product market strategy-organizational culture fit on business performance. *Journal of the Academy of Marketing Science*, 39(4): 555-573.

Zajac EJ, Kraatz MS, Bresser RKF 2000. Modeling the dynamics of strategic fit: A normative approach to strategic change. *Strategic Management Journal*, 21(4): 429-453.

Zheng W, Khoury AE, Grobmeiher C 2010. How do leadership and context matter in R&D team innovation? A multiple case study. *Human Resource Development International*, 13(3): 265-283.

Paper received for publication on December 2015
Paper accepted for publication on May 2016