



THE ANTECEDENTS OF INNOVATION CLIMATE: CROSS-LEVEL MEDIATION PERSPECTIVES

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ABSTRACT

Purpose: This study aims to examine the significance of person-organizational fit on innovation climate through a mechanism of the cross-level mediation effects of emotional intelligence and psychological climate. The moderating effect of leader openness on the relationship between emotional intelligence and psychological safety is also examined in this study.

Design/methodology/approach: First, a random sampling technique was adopted to select 158 high-tech firms in Taiwan. Second, a purposive sampling technique was also adopted to select 1:4 dyadic managers and employees relationships in the Research & Development (R&D) department of each selected sample firms. The valid of respondents is tested on 252 subordinates and 67 managers. Structural equation modeling (SEM) in AMOS 21 and hierarchical linear modeling (HLM 7) were used to test six research hypotheses.

Findings: At cross-level of analysis, the results of a hierarchical regression analysis indicated that person-organizational fit is positively related to emotional intelligence and innovation climate, respectively. The moderating role of leader openness is also confirmed in this study. At individual level of analysis, SEM showed that emotional intelligence is positively related to psychological safety, and psychological safety is positively related to innovation climate. Form mediation aspects by using a Sobel's test, the findings indicated that psychological safety is partially mediated the relationship between emotional intelligence and innovation climate. Therefore, these findings suggest that person-organizational fit and emotional intelligence can play very critical roles as predictors of innovation climate through a mediation of psychological safety.

Research limitation/implications: The main research limitations include the use of high-tech industries in Taiwan. This study also focused on subordinate-manager dyadic relationship in each of the R&D department, which seems to be a small portion of the total staffs of such organizations. Drawing upon person-organizational fit and the affective event theories, this study found that the emotional intelligence partially mediates the effect of person-organizational fit on psychological safety. These research findings may also provide significant contributions to both academics and professionals by which to understand matched pairs in employee-manager relationships in order to improve organizational innovation climate.

Originality/value: This study primary integrates the affective events and person-environment fit theories to test the comprehensive research framework of the influences of person-organizational



fit on innovation climate through a mechanism of the cross-level mediation of emotional intelligence.

Keywords: person-organizational fit, leader openness, emotional intelligence, psychological safety, innovation climate

Paper type: Research paper

INTRODUCTION

Innovation is of great significance with regard to organizational effectiveness and competitive advantage (Hirst, Knippenberg, and Zhou, 2009; Saenz, Aramburu, and Rivera, 2009), and firm performance (Gong, Zhou, and Chang, 2013). Davila, Epstein, and Shelton (2006) indicated that superior innovation provides companies with opportunities to grow faster, better, and smarter than their competitors. In the strategic management literature, innovation climate is recognized as a critical enabler for firms to create value and sustain competitive advantage in the increasingly complex and rapidly changing environment (Chen and Huang, 2009; Daft, 2007; Somech and Drach-Zahavy, 2013). Firms with greater innovativeness tend to be more successful in responding to changing environments and in developing new capabilities that allow them to achieve better performance (Montes, Moreno, and Fernandez, 2004), which result in increasing profits and market share (Baer and Frese, 2003). It is argued that process innovations are assumed to bring multiple benefits to an organization and help an organization achieve competitive advantage (Chen, Li, and Tang, 2009). In this paper we concentrate on key antecedents of innovation climate as a contingency and identify those determinant factors that positively affect innovation climate.

The antecedents of innovation climate have been proposed by several researchers (i.e., Baer and Frese, 2003; Elenkov and Manev, 2009; Gumusluoglu and Ilsev, 2009), however, no studies in organizational innovativeness have simultaneously examined the interrelationships among person-organization fit, leader openness, emotional intelligence, psychological safety, and innovation climate in either at organizational-level or individual-level of analysis. Therefore, this study draws upon multiple perspectives of person-environment fit theory (Kristof-Brown, Zimmerman, and Johnson, 2005), an extension of emotional intelligence research framework (Wong, Law, and Wong, 2004), and available literatures on leader openness (Detert and Burris, 2007), psychological safety (Detert and Burris, 2007; Troster and van Knippenberg, 2012) and innovation climate (Daft, 2007) to focus on three main research objectives. First, the cross-level mediation effect of emotional intelligence on the influence of person-organization fit and psychological safety, and second, the cross-level relationship of person-organization fit on emotional intelligence and psychological safety. Third, the individual-level relationships among emotional intelligence, psychological safety, and innovation climate are also examined by this study.

This study brings contributions to the literature in two important ways. First, by examining emotional intelligence as a cross-level mediation variable, this study extends previous research frameworks that have primarily examined the direct or main effect of person-organization fit on psychological climate and innovation climate (Lee and Wu, 2011). It is expected that the

mediators of this relationship may provide theoretical insight into the mechanism through which person-organization fit influences psychological safety and innovation climate. Second, this study operationalizes the stream of research on the impact of emotional intelligence on employee innovation climate through a mechanism of the mediating effect of psychological safety. Based on the above discussions, the following research framework is developed as shown in Figure 1.

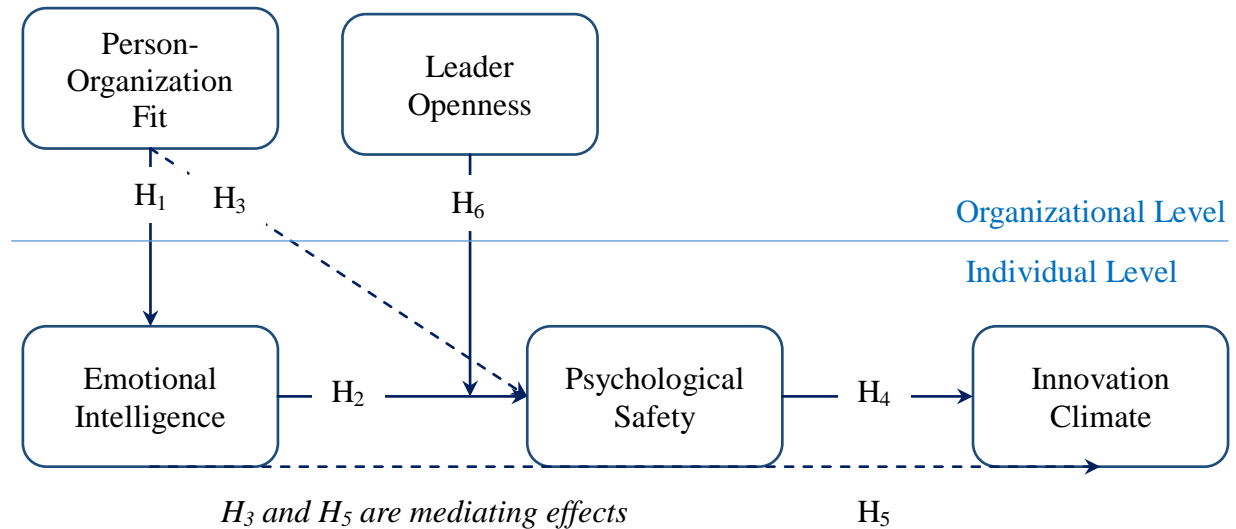


Figure. 1A cross-level mediation of emotional intelligence

THEORETICAL AND HYPOTHESES DEVELOPMENT

The effect of person-organization fit

Kristof-Brown et al.(2005) conducted a meta-analysis and empirically summarized the existing literature in four critical domains that included person-environment (PE) fit: person-job (PJ) fit (i.e., matching employees' skills, knowledge, and abilities to performing specific job-related tasks), person-organization (PO) fit (i.e., matching between the organization's values and individual values), person-group (PG) fit (i.e., matching employees' skills, knowledge, and abilities to both the complementary and supplementary requirements of the specific workgroup), and person-supervisor (PS) fit (i.e., the perceived fit between employee and supervisor characteristics (i.e., values, personality, and behavioral styles). Person-organization fit has been proposed and categorized as an organizational level (Werbel and DeMarie, 2005; Werbel and Johnson, 2001), thus person-organization fit is adopted for this study.

Person-organization fit has been suggested that organizational values may be an important factor influencing employee behaviors and attitudes (Tak, 2011; Van Vianen, Shen, and Chuang, 2011). Previous studies investigated the idea that employee attitudes should provide a more complete



picture of how perceived person-organization fit impacts their job satisfaction and performance (Glomb and Welsh, 2005; Kristof-Brown *et al.*, 2005). However, the antecedents of person-organization fit foremotivational intelligence of employees have not been empirically tested.

This study argues that person-organization fit plays an important role in transforming organizational value and improving daily working environments (Kristof-Brown *et al.*, 2005; Van Vianen *et al.*, 2011). Employees with higher match with organizational values may experience an increase in their positive emotional intelligence (Kim, Cable, Kim, and Wang, 2009) based upon their individual responses to their work environment (Kristof-Brown *et al.*, 2005). When individuals have similar personal values to those of their organization, they are likely to experience higher levels of fit, which, in turn, enhance their emotional intelligence. Based on above the rationale, the following hypothesis is proposed:

Hypothesis 1: Person-organization fit positively affects employee's emotional intelligence.

The effect of emotional intelligence

Mayer and Salovey(1997)describe emotional intelligence (EQ) as the ability to perceive emotions and to use them to improve performance on cognitive tasks, and to effectively regulate these emotions. According to Davies, Stankov, and Roberts (1998), EQ has been composed of four sub-dimensions (i.e., appraisal and expression of emotion in one's self, appraisal and recognition of emotion in others, regulation of emotion in one's self, and use of emotion to facilitate performance). These dimensions were validated by the recent studies on expatriate context (Wong *et al.*, 2004). EQ enables expatriates to grasp reason correctly with emotional concepts (Côté and Miners, 2006). Mol, Born, Willemsen, and Van Der Molen(2005), define EQ as an ability to perceive, adapt, and perform emotion effectively in new cultural settings. This study assumes that individuals with high EQ can understand their own deep emotions about psychological safety, and thus may be particularly able to maintain and regulate their emotions to complete innovation implementation effectively(Côté and Miners, 2006; Somech and Drach-Zahavy, 2013). Consequently, high EQ individuals are effective interpersonally and this may, in turn, enhance their psychological safety. Theory of person-environment fit suggests that emotionally intelligent individuals are likely to experience a higher level of psychological safety (Carmeli, Yitzhak-Halevy, and Weisberg, 2009; Mayer, Caruso, and Salovey, 1999). The above arguments suggest the following hypothesis.

Hypothesis 2: Emotional intelligence positively affects employee's psychological safety.

The cross-level mediation effect of emotional intelligence

According to person-organization fit theory, person-organization fit may increase in employee's positive emotional intelligence (Ang and Van Dyne, 2008; Kristof-Brown *et al.*, 2005). Emotional intelligence has potential for improving safety-related efforts and other aspects of individuals' work (Wiegand, 2007). The key concept of emotional intelligence is associated with self-awareness, where individuals are able to identify their emotions and manage them in various social environments (Seligson and MacPhee, 2004). Emotional intelligence is positively



significant related to retention and workplace environment safety (Codier, Kooker, and Shoultz, 2008). At the work place emotional intelligence is to be developed and a favorable psychological work climate (Owolabi, 2012), which in turn is more likely to experience a higher level of psychological safety (Carmeli *et al.*, 2009). Thus, this study posits that person-organization fit has influence on employee's emotional intelligence, which in turn to enhance employee's psychological climate. Based on above rationale, the following hypothesis is proposed:

Hypothesis 3: Emotional intelligence positively mediates the relationship between person-organization fit and psychological safety.

The mediation effect of psychological safety

As stated earlier, the key concept of emotional intelligence is to enhance employee's psychological safety (i.e., Codier *et al.*, 2008; Owolabi, 2012; Wiegand, 2007). Psychological safety refers to individuals shared belief about the consequences of interpersonal risk taking within the organization (Kessel, Kratzer, and Schultz, 2012). Psychological safety is associated with the work environment, such as the degree of supportive relationships and the degree to which innovation is promoted (Schneider, Smith, and Paul, 2001; Tordera, González-Roma, and Peiró, 2008). In turn, psychosocial safety determines work performance (Idris, Dollard, Coward, and Dormann, 2012), creative performance (Kessel *et al.*, 2012), leader-direct behavior (Troster and van Knippenberg, 2012), and team innovation (Peltokorpi and Hasu, 2013). It is argued that psychological safety can facilitate an organization's innovative climate (González-Roma, Peiró, and Tordera, 2002). Psychological safety is hypothesized to link innovation (Post, 2012). In line with previous study proposed that psychological safety partially mediated the relationship between the structural and cognitive capital and innovation (Gu, Wang, and Wang, 2013). Thus, this study posits that the influence of emotional intelligence on innovation climate while considering psychological climate as a mediating variable. Based on above research arguments, the following hypotheses are proposed:

Hypothesis 4: Psychological safety positively affects innovation climate.

Hypothesis 5: Psychological safety positively mediates the relationship between emotional intelligence and innovation climate.

The moderating effect of leader openness

Leader openness refers to the extent to which leaders engage with idea and suggestions from team or individual member in an open-minded fashion (Milliken, Morrison, and Hewlin, 2003). Leaders who are open to their subordinates' ideas and suggestions decrease the salient of power differential between leaders and subordinates and they may fear to speak up (Edmondson, 2003). Because leader openness signals subordinates that they may not be afraid of open criticism (Detert and Burris, 2007; Troster and van Knippenberg, 2012). This study hypothesized that when individual employees perceive higher levels of emotional intelligence, their psychological safety would be likely to increase. In addition, emotional intelligence would account for greater



variance in employee's psychological safety among individuals whose effort is determined by what managers perceived as being open to new ideas and suggestions. It is expected that leader openness will moderate the relationship between emotional intelligence and psychological safety so that the relationship will be stronger for those individuals with high perceived leader openness. In turn, leader openness plays a very critical role in the extent to which employees will vary their psychological safety depending on the perceptions of emotional intelligence they receive from managers. Leader openness (Detert and Burris, 2007) may play an important role as a moderating variable in a cross-level effect that can improve the relationship between emotional intelligence and psychological safety. For example, leader openness may moderate the impact of emotional intelligence on employee's psychological safety in such a way that emotional intelligence relates more positively to employee's psychological safety when individual employee perceived leader openness is higher, rather than lower. Thus, the following hypothesis is proposed:

Hypothesis 7: Leader openness moderates the relationship between emotional intelligence and psychological safety such that employees with higher emotional intelligence will have higher levels of psychological safety.

METHOD

Samples and data collection

The sampling process of this study involved three phases. First, a random sampling technique was adopted to select 158 high-tech firms out of the 200 listed by the Common Wealth Magazine in Taiwan (2010). Second, a purposive sampling technique (i.e., quota sampling) (Cooper and Schindler, 2011) was also adopted to select 1:4 dyadic managers and employees relationships in each R&D department of the 158 firms. Finally, email based survey was used to send 5 questionnaires (one for manager and 4 for employees at the same department). In this stage, we requested via e-mail for the help of managers in each R&D department of each high-tech firm to identify employees as participants. A total of 78 high-tech firms were responded (i.e., cross-industrial zones in Taiwan), which included 78 managers and 234 employees from the R&D departments. Similarly, 11 high-tech firms (i.e., 11 managers and 33 employees) had to be excluded as outliers, and these were deleted using graphic methods, with a residual scatter plot in the range of ± 3 standard deviation. Finally, a total of 67 managers and 252 employees from 67 high-tech industries were determined to be usable. The effective responsive rate was 42.40 percent (67/158). As suggested by Saunders, Lewis, and Thornhill (2007), given that the likely response rate range between 30% and 50%, this response rate was viewed as adequate.

MEASUREMENT SCALES

Person-organization fit

Person-organization fit was assessed with three items which were operationalized from Kristof-Brown et al. (2005). The items were: "My values match or fit the values of this organization"; "I am able to maintain my values at this company"; and "My values support me to fit in at this



company because they are same with the company's values." According to Werbel and DeMarie(2005), and Werbel and Johnson (2001), this study treats person-organization fit as an organizational-level of analysis and 3 to 4 employees of each sample firms were invited to rate these measurement items.

Leader openness

In line with Detert and Burris (2007), we used three items. The items were: "My supervisor is open to suggestions"; "Good ideas get serious consideration from my supervisor"; and "When good suggestions are made to my supervisor, they receive fair evaluation." According to Troster and van Knippenberg(2012), we treated leader openness as an organizational-level of analysis and 3 to 4 employees were invited to rate these measurement items.

Emotional intelligence

Twelve items and 4 sub-dimensions of emotional intelligence were developed by Wong, Law and Wong(2004): 1) Self-emotional appraisal contains 3 items related to the statement: 'When I am upset, I will talk to someone who is close to me about my feelings'; 2) Other's emotional appraisal contains 3 items related to the statement: 'When a friend comes to me because he/she is not happy, I will share his/her feeling'; 3) Regulation of emotion contains 3 items related to the statement: 'When you have to do something you don't like, you will try to gain something interesting from it'; and 4) Use of emotion contains 3 items related to the statement: 'When you face problems regarding your work, you will handle the problem yourself because everyone should deal with his/her own life'. We treated emotional intelligence as an individual-level of analysis and self-rating scales were rated by 3 to 4 individual subordinates.

Psychological safety

Psychological safety was assessed with three items which were adopted from Troster and van Knippenberg(2012). The items were: "It is safe for me to speak up around here"; "In this organization, I feel safe to discuss problems and difficult issues"; and "In this organization, I feel safe to say my opinion and make suggestions for improvement even when other disagree." We treated psychological safety as an individual-level of analysis and self-rating scales were rated by 3 to 4 individual subordinates.

Innovation climate

Six items of innovative climate were operationalized from Daft (2007). The items were: "My firm provides the climate for me to search out new technologies, processes, techniques, and/or product ideas"; " Firm provides the climate for individuals to generate creative ideas"; "Firm provides the climate for individuals to promote and champion ideas to others"; "Firm provides the climate for individuals to investigate and secure funds to implement new ideas"; "Firm provides the climate for individuals to develop adequate plans and schedules for the implementation of new ideas"; and "Firm provides the climate for individuals to be innovative". We treated innovation

climate as an individual-level of analysis and 1 manager was invited to rate 3 to 4 individual subordinates.

All measurement item scales were measured in a 7-point Likert scale (i.e. from 1 = 'strongly disagree' to 7 = 'strongly agree'). The questionnaire items were translated from English to Chinese. A standard translation and back-translation procedure was adopted to ensure the accuracy of the meaning of measurement items.

Analytic procedure

Person-organization fit ratings by the subordinates were aggregated to the organizational level by averaging their values for each organization. The Intraclass Correlation Coefficients (ICCs—ICC1 and ICC2) technique was adopted to assess the interrater reliability of judgments as provided by each department and organization. The term *interrater reliability* is used here to refer to the degree to which judges are "inter-changeable", which is to say the extent to which judges "agree" on a set of "judgments" (James, Demaree, and Wolf, 1984, p. 86). The ICC1 coefficient represents the proportion of variance in ratings at an individual level that is attributed to group membership; whereas the ICC2 coefficient represents the reliability of the group level means (Bliese, 2000). According to James et al. (1984) and Mathieu, Gilson, and Ruddy (2006), the minimum cut-off value for ICC1 is .12, and for ICC2, it is .60. One-way ANOVA was implemented to provide empirical justification for aggregating subordinate ratings of person-organization fit. The results showed that between-group differences were significantly higher than within-group differences (person-organization fit: $F=3.26$, $p<.001$). The ICC1 of person-organization fit was .325; the ICC2 of person-organization fit was .72. The within-group agreement ($r_{wg(j)}$) was also calculated at an organizational level of analysis. In the case of the 67 high-tech firms, the mean of their $r_{wg(j)}$ was .85 for person-organization fit. All of the mean $r_{wg(j)}$ were greater than the conventionally accepted value of .70 (James, Demaree, and Wolf, 1993). Taken together, these results showed that aggregation was appropriate and acceptable for these research constructs.

This study employed a cross-level mediational and moderational framework between an organizational level and an individual level of analysis. To test the cross-level mediation and moderation effects of Hypotheses 1, 3, and 6, we adopted the statistical procedures as proposed by Mathieu, Maynard, Taylor, Gilson, and Ruddy, (2007), and Mathieu and Taylor (2007). Hierarchical linear modeling (HLM 7) was used to test the cross mediation and moderation relationships (Hofmann, Giffin, and Gavin, 2000; Raudenbush and Bryk, 2002). At the individual-level of analysis, structural equation modeling (SEM) (i.e., software package AMOS 21 and SPSS 19) was adopted to test hypotheses H2, H4, and H5, respectively.

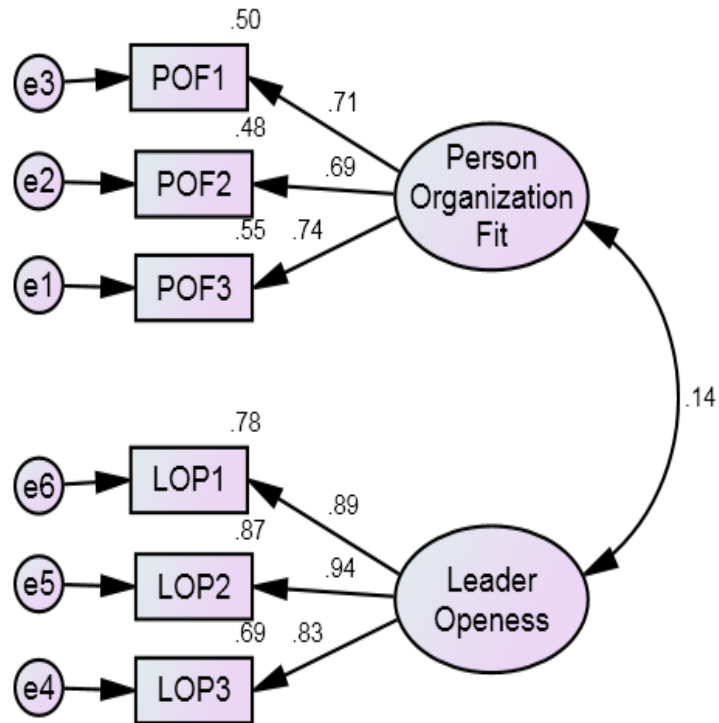
Confirmatory factor analysis (CFA)

Confirmatory factor analysis (CFA) was performed using AMOS 21 to evaluate the distinctiveness of the measures used in the present study. Anderson and Gerbing's (1988) procedure was adopted to assess the convergent and construct validity of measurement model. According to Koufteros, Babbar, and Kaighobadi (2009), the CFA procedure consists of two



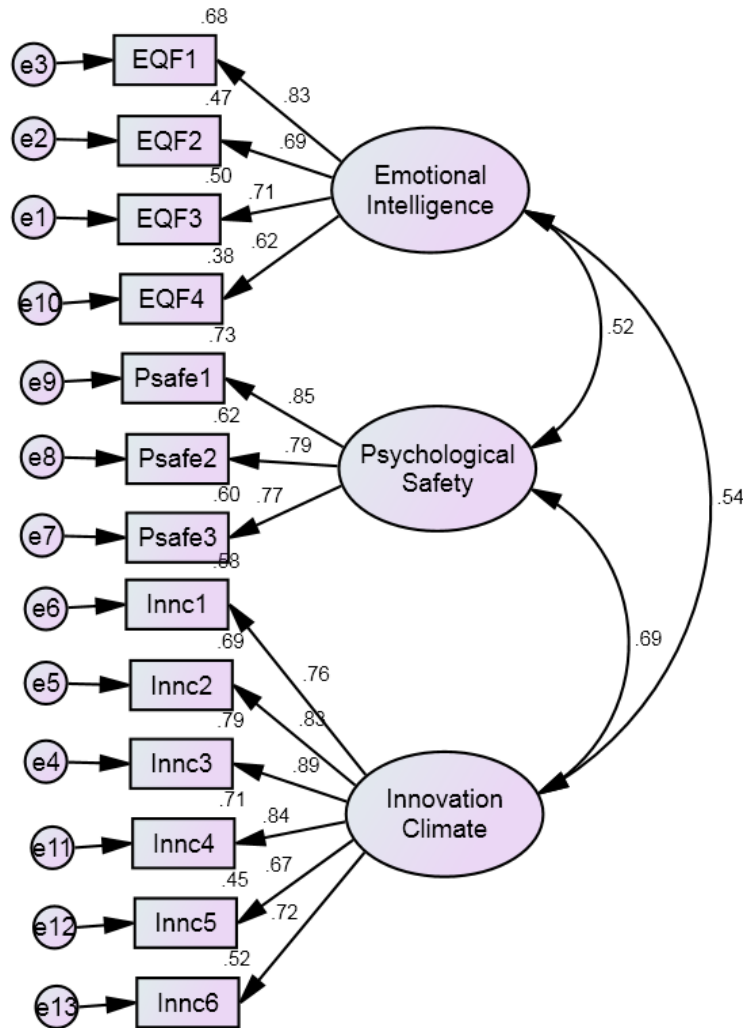
factor models, such as a first order-factor model and a second order-factor model. A first order-factor model was adopted to examine the individual research constructs of both levels of analyses (i.e., organizational and individual levels), and the results of this procedure indicated that the standardized loading for all items exceeded .70 and that the t-values higher than 1.96 ($p < .05$), thus satisfying the threshold recommended by Hair, Black, Babin, and Anderson, (2010) and Kline (2011). Then, a second-order factor model was conducted to examine the overall model fit of each research construct at both levels of analyses. The following goodness of fit indices were chosen for this analysis, based on suggestions that can be found in previous studies (Bagozzi and Yi, 1988; Baumgartner and Homburg, 1996; Hair et al., 2010; Koufteros et al., 2009; Shumacker and Lomax, 2004).

The results of overall CFA of organizational-level analysis (Fig.2) showed that absolute fit indices (i.e., $\chi^2=10.49$; $df=7$; $\chi^2/df= 1.499$; $GFI=.953$; $AGFI=.858$; $RMR=.065$) and incremental fit indices ($NNFI= .951$; $CFI=.982$) were appropriate. At the individual-level of analysis (Fig.3), the results showed that the overall goodness-of-fit assessment satisfied the threshold of (i.e., $\chi^2=69.255$; $df=55$; $\chi^2/df= 1.259$; $GFI=.962$; $AGFI=.937$; $RMSEA=.017$) and incremental fit indices ($NNFI= .964$; $CFI=.992$) all achieved the minimums threshold. Thus, the model fit assessment of both levels (i.e., organizational level and individual level) can be presented as a good model fit with adequate convergent validity and construct reliability (Gerbing and Anderson, 1992; Hair *et al.*, 2010). Therefore, descriptive statistics, including means, standard deviations, coefficient alpha, and correlations among the research variables are reported in Tables 1 and 2, respectively.



Model=Standardized estimates
 Group=Group number 1
 Ch-square=10.490,
 df=7, Chi-square/df=1.499,
 GFI=.953 , AGFI=.858,
 NFI=.951, CFI=.982,
 RMR=.065, RMSEA=.087, P=.162

Figure-2 The results of overall CFA—Organizational-level of analysis



Model=Standardized estimates
 Group=Group number 1
 Ch-square=69.255,
 df=55, Chi-square/df=1.259,
 GFI=.962, AGFI=.937,
 NFI=.964, CFI=.992,
 RMR=.017, RMSEA=.032, P=.094

Figure-3 The results of overall CFA—Individual-level of analysis

Table 1 Descriptive statistic and correlations (Organizational-Level, N=67)

Variables	Mean	Std. Deviation	1	2	3	4
1. Person-organization fit	5.470	.701	.777			
2. Leader openness	4.872	1.020	.053*	.913		
3. Education	1.343	.617	-.098	-.047	n/a	
4. Job Tenure	1.567	.802	-.008	-.042	.734**	n/a

Note:

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Cronbach's alpha (α) is shown on the diagonal. n/a= not available.

Table 2 Descriptive statistic and correlations (Individual-Level, N=252)

Variables	Mean	Std. D	1	2	3	4	5	6	7	8
5. EQF1	3.609	.723	.750							
6. EQF2	3.729	.747	.578**	.798						
7. EQF3	3.911	.713	.552**	.523**	.776					
8. EQF4	3.427	.797	.557**	.384**	.453**	.856				
9. PSFT	3.873	.649	.434**	.268**	.334**	.365**	.843			
10. INNC	3.800	.636	.416**	.358**	.379**	.285**	.595**	.915		
11. Education	1.611	.813	.127*	.016	-.036	-.034	.055	.024	n/a	
12. Job Tenure	1.552	.753	.087	-.04	-.030	.039	.065	-.052	.410**	n/a

Note:

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Cronbach's alpha (α) is shown on the diagonal. n/a= not available.

Emotional intelligence (i.e., EQF1= Self-emotional appraisal; EQF2= Other's emotional appraisal; EQF3= Regulation of emotion; EQF4= Use of emotion); PSFT = Psychological safety; INNC=Innovation climate.

RESEARCH FINDING

Cross-level mediation and moderation effects (HLM)

As shown in Table 3, the person-organization fit has positive and significant effect on emotional intelligence ($\gamma_{02}=.314$, $p<.001$, $R^2=.237$), which provided support for Hypothesis 1. By testing the cross-level mediation effect of Hypothesis 3, four conditions of mediation procedures were adopted from Mathieu et al. (2007), and Mathieu and Taylor (2007). Furthermore, the results also showed that emotional intelligence is partially mediated the relationship between person-organization fit and psychological safety also has a positive and significant influence on employee engagement ($\gamma_{03}=.266$, $p<.05$, $R^2=.198$) which confirmed Hypothesis 3. The results in Table 4 also indicated that leader openness positively moderates the relationship between

emotional intelligence and psychological safety ($\gamma_{02}=.186$, $p<.05$, $R^2=.158$), which confirmed Hypothesis 6.

Table 3 The results of HLM (cross-level and cross-level interaction)

Independent variables	Dependent variables	
<i>Individual-level (N=252)</i>	Emotional intelligence	Psychological safety
	Hypothesis 1	Hypothesis 3
	Education (γ_{05})	.019
Job Tenure (γ_{04})	.033	.045
<i>Organizational-level (N=67)</i>		
Person-organization fit (γ_{02})	.314***	-
<i>Cross-level interaction</i>		
Leader openness x emotional intelligence (γ_{03})	-	.226**
R^2	.237	.198

Note: *** $p < .001$, ** $p < .05$. They are significant at a $t\text{-value} > |1.96|$. γ = Intercept (standardized coefficient). R^2 calculations were computed following Hofmann et al. (2000) and HofmannMorgeson, andGerras(2003).

Table 4 The results of HLM (cross-level mediation)

Independent variables	Dependent variable			
	Psychological safety			
	Step 1	Step 2	Step 3	Step 4
<i>Individual-level (N=252)</i>				
Education (γ_{04})	.116**	.061	.117*	.191**
Job Tenure (γ_{03})	.086	.021	.065	.092
Emotional intelligence (γ_{01})	-	-	.218**	.291***
<i>Organizational-level (N=67)</i>				
Transformational leadership (γ_{02})	.315**	.314**	-	.186**
R^2				.158

Note: *** $p < .001$, ** $p < .05$, * $p < .01$. They are significant at a $t\text{-value} > |1.96|$. γ = Intercept (standardized coefficient). R^2 calculations were computed following Hofmann et al. (2000) and Hofmann et al.(2003).

Structural equation modeling (SEM)

Structural equation modeling (SEM) was adopted to test the maximum likelihood estimate method, and Hypotheses 2, 4, and 6. The results showed (see Figure 4) that $\chi^2 = 74.932$; $df = 57$; $GFI = .958$; $AGFI = .933$; $RMR = .016$, and $p = .056$, all of which satisfied the threshold as suggested by Hair et al. (2010). Hypothesis 2 predicted emotional intelligence to have a positive

effect on psychological safety. The findings provided support for Hypothesis 2 ($\beta=.552$; $p < .001$; $t= 6.446$). Hypothesis 4 predicted psychological safety to have a positive effect on innovation climate. The results provided support Hypothesis 4 ($\beta=.563$; $p < .001$; $t= 7.268$). As suggested by Baron and Kenny’s test (1986) and (i.e., structural models of First: independent variable must be shown to be significant related to the mediator; Second: independent variable must be shown to be significant related to the dependent variable, and Third: mediator must affect the dependent variable) which indicated that psychological safety has partially mediated the relationship between emotional intelligence and innovation climate. This notion is in line with Sobel’s test (1982) which illustrated that z-test statistic must be exceeded a value of $t\text{-test}=|1.96|$. In this study z-test was $4.541 > |1.96|$ and significant at $p < .001$ (more details of z-test can be seen (more details of z-test can be seen in Iacobucci, 2012; MacKinnon and Cox, 2012). Therefore, we assume that psychological safety plays an important role as mediating effect, as proposed in Hypothesis 5.

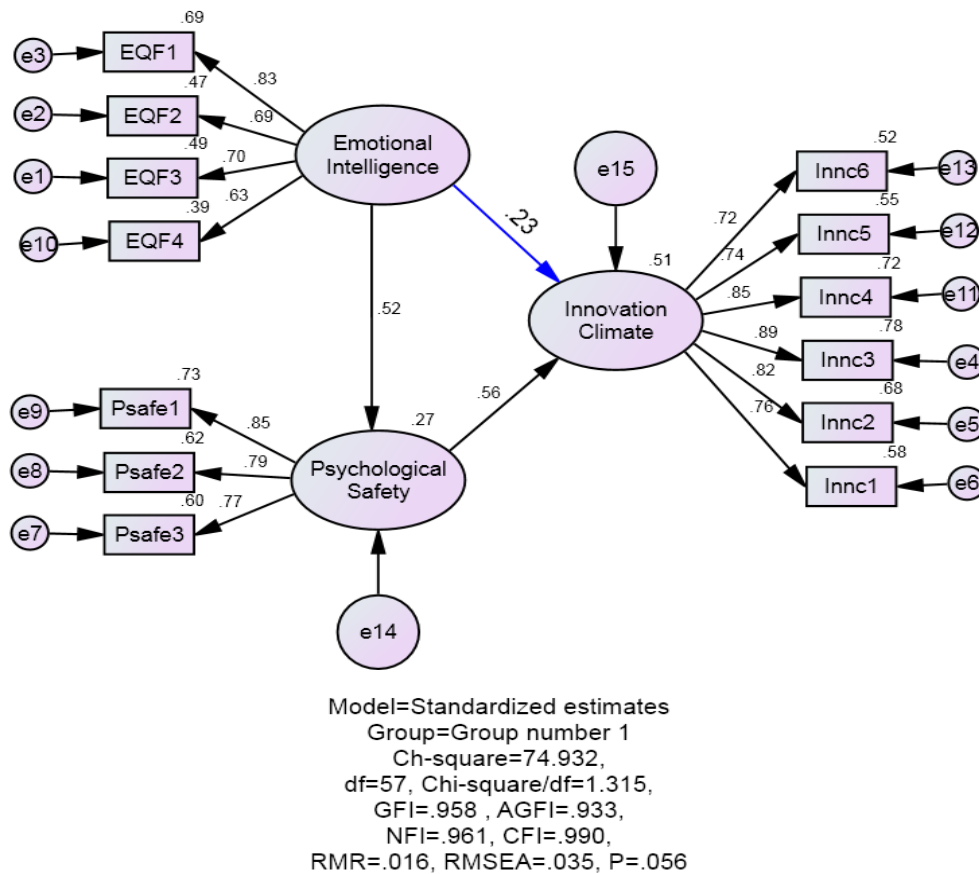


Figure-4 The results of SEM—Individual-level of analysis (N=252)



RESEARCH DISCUSSIONS

This study drew from multiple perspective theory of person-environment fit, and an extension of extension of emotional intelligence research framework, available literatures on leader openness, psychological safety, and innovation climate to explain the proposed hypotheses. Empirical data collected from two different sources, including managers (organizational-level) and subordinates (individual-level), were analyzed. At the cross-level of analysis, the research findings indicated the effect of person-organization fit on emotional intelligence (H1) is significant. This is confirmed that employees with higher match with organizational values may experience an increase in their positive emotional intelligence (Kim *et al.*, 2009).

At the cross-level mediation and moderation of analysis, the findings of this study showed that emotional intelligence partially mediated the relationship between person-organization fit and psychological safety (H3). This is confirmed that person-organization fit may increase in employee's positive emotional intelligence (Kristof-Brown *et al.*, 2005; Owolabi, 2012), which in turn to likely to experience a higher level of psychological safety (Carmeli *et al.*, 2009). The research findings also found that leader openness has a positive moderating effect the relationship between emotional intelligence and psychological safety (H5). This is confirmed by this study and expected that leader openness may play an important role as a moderating variable in a cross-level effect that can improve the relationship between emotional intelligence and psychological safety (Detert and Burris, 2007; Troster and van Knippenberg, 2012).

At the individual-level of analysis, the results of SEM showed that emotional intelligence has significant effect on psychological safety (H2). This is consistent with research arguments as proposed by previous studies (i.e., Carmeli *et al.*, 2009; Côté and Miners, 2006; Somech and Drach-Zahavy, 2013), which argued that individuals with higher emotionally intelligence are likely to experience a higher level of psychological safety. Indeed, psychological safety has found to be significant positively related to innovation climate (H4). This is in line with previous research arguments as proposed by recent studies (i.e., Gu *et al.*, 2013; Peltokorpi and Hasu, 2013; Post, 2012), which argued that psychological safety is hypothesized to enhance organizational innovation and innovation climate. The results also indicated that psychological safety partially mediated the relationship between emotional intelligence and innovation climate (H5). This is confirmed by this study.

Implications and Future Research

Although the present study provides valuable insights into an understanding of the extension literature of person-environment fit, emotional intelligence, psychological safety, and personality traits (i.e., leader openness) to explore innovation climate through a mechanism of cross-level mediation effects of emotional intelligence, there are a few limitations that should be recognized and these may provide a departure for future research. First, although there is theoretical and empirical support both the mediation and the moderation of our research model, using the 67 high-tech firms in Taiwan as the sample, the sample size may need to be increased. Second, this study focused on subordinate-manager pairs in each of the R&D department, which seems to be a small portion of the total staffs of such organizations. Therefore, future research should



take a closer look at cross-functional units or teams rather than single units alone. This study proposes that cross-functional units (i.e., R&D, marketing, and HRM departments) will also be important for the developing and creating innovation climate. Thus, individuals from cross-functional units need to bring together to perform unique tasks to create innovative services designed to achieve high levels of organizational performance and customer service (Lussier&Achua, 2007). Third, this study failed to prove that two control variables (i.e., educational and job tenure) are significantly related to their innovation climate. This study suspected that cultural effects including power distance and collectivism(Farh, Hackett, and Liang, 2007; Kirkman, Chen, Farh, and Lowe, 2009) may impact the results of this study. Future research should replicate the findings in this study by using samples from different cultural contexts.

Fourth, this study argues that hiring employees who belong to Gen Y are key human assets and capitals in terms of effectively adopting new learning processes and creating new ideas to innovate services or products in order to meet customer expectations, as well as increase the market share. Similarly, Gen Yers are even more comfortable with technology and are able to make use of collaborative tools such as cell phones, and social networking platforms to communicate with others and facilitate a collective process of creative problem solving (Mhatre and Conger, 2011). Indeed, Gen Y individuals exhibit a greater preference for seeking guidance, and supervision from their superiors. They tend to follow directions well, value collaboration and teamwork (Dolezalek, 2007; Hastings, 2008). However, Gen Yers seem to be in lack of cooperation and communication with leaders (i.e., Erickson, Alsop, Nicholson, and Miller, 2009). Gen Yers are less loyal to their employers than previous generations (i.e., Durkin, 2008; Hira, 2007). Along with these debates should be further addressed by future study.

In summary, the results presented here contribute to our understanding of how the mechanisms of the effect of emotional intelligence and psychological safety can manipulate innovation climate and offer insights on how to enhance organizational innovation from various person-organizational fit perspectives. These research findings may also provide significant in this study have contributed to both academics and professionals to understand how matched pairs in employee-supervisor relationships can improve emotional intelligence and psychological safety and meet the demands of organizational innovation, as well as organizational expectations.

REFERENCES

1. Anderson, J. C., and Gerbing, D. W. (1988), "Structural equation modeling in practice: A review and recommended two-step approach", *Psychological Bulletin*, Vol.103 No.3, pp. 411-423.
2. Ang, S., and Van Dyne, L. (2008), "Conceptualization of cultural intelligence: Definition, distinctiveness, and nomological network", In S. Ang and L. Van Dyne (Eds.), *Handbook of cultural intelligence: Theory, measurement, and applications*, Armonk, New York: M.E Sharpe, pp. 3-15.



3. Baer, M., and Frese, M. (2003), "Innovation is not enough: Climates for initiative and psychological safety, process innovations, and firm performance", *Journal of Organizational Behavior*, Vol.24 No.1, pp. 45-68.
4. Bagozzi, R. P., and Yi, Y. (1988), "On the evaluation of structural equation models", *Journal of the Academy of Marketing Science*, Vol.16 No.1, pp. 74-94.
5. Baron, R. M., and Kenny, D. A. (1986), "The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations", *Journal of Personality and Social Psychology*, Vol.55 No.6, pp. 1173-1182.
6. Baumgartner, H., and Homburg, C. (1996), "Applications of structural equation modeling in marketing and consumer research: A review", *International Journal of Research in Marketing*, Vol.13 No.2, pp. 139-161.
7. Bliese, P. D. (2000), "Within-group agreement, non-independence, and reliability: Implications for data aggregation and analyses", In K. J. Klein and S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions*, San Francisco: Jossey-Bass,
8. Carmeli, A., Yitzhak-Halevy, M., and Weisberg, J. (2009), "The relationship between emotional intelligence and psychological wellbeing", *Journal of Managerial Psychology*, Vol.24 No.1, pp. 66-78.
9. Chen, and Huang, J. W. (2009), "Strategic human resource practices and innovation performance: The mediating role of knowledge management capacity", *Journal of Business Research*, Vol.62, pp. 104-114.
10. Chen, C.-H., Li, H.-H., and Tang, Y.-Y. (2009), "Transformational leadership and creativity: exploring the mediating effects of creative thinking and intrinsic motivation", *International Journal of Management and Enterprise Development*, Vol.6 No.2, pp. 198-211.
11. Codier, E., Kooker, B. M., and Shoultz, J. (2008), "Measuring the emotional intelligence of clinical staff nurses: An approach for improving the clinical care environment", *Nursing Administration Quarterly*, Vol.32 No.1, pp. 8-14
12. Cooper, D. R., and Schindler, P. S. (2011), *Business research methods*, New York: McGraw Hill.
13. Côté, S., and Miners, C. T. H. (2006), "Emotional intelligence, cognitive intelligence, and job performance", *Administrative Science Quarterly* Vol.51 No.1, pp. 1-28.
14. Daft, R. L. (2007), *Understanding the theory and design of organization*, China: Thomson-South Western.
15. Davies, M., Stankov, L., and Roberts, R. D. (1998), "Emotional intelligence: In search of an elusive construct", *Journal of personality and social psychology*, Vol.75 No.4, pp. 989-1015.
16. Davila, T., Epstein, M. J., and Shelton, R. E. (2006), *Making innovation work: How to manage it, measure it, and profit from it*, Upper Saddle River, NJ: Pearson Education.



17. Detert, J. R., and Burris, E. R. (2007), "Leadership behavior and employee voice: Is the door really open?", *Academy of Management Journal*, Vol.50 No.4, pp. 869-884.
18. Dolezalek, H. (2007), "X-Y Vision", *Training*, Vol.44 No.6, pp. 22-27.
19. Durkin, D. (2008), "Youth movement", *Communication World*, Vol.25, pp. 23-26.
20. Edmondson, A. C. (2003), "Speaking up in the operating room: How team leaders promote learning in interdisciplinary action teams", *Journal of Management Studies*, Vol.40 No.6, pp. 1419-1452.
21. Elenkov, D. S., and Manev, I. M. (2009), "Senior expatriate leadership's effects on innovation and the role of cultural intelligence", *Journal of World Business*, Vol.44 No.4, pp. 357-369.
22. Erickson, T., Alsop, R., Nicholson, P., and Miller, J. (2009), "Gen Y in the workforce", *Harvard Business Review*, Vol.87 No.6, pp. 43-49.
23. Farh, J.-L., Hackett, R. D., and Liang, J. (2007), "Individual-level cultural values as moderators of perceived organizational support—employee outcome relationships in china: comparing the effects of power distance and traditionalism", *Academy of Management Journal*, Vol.50 No.3, pp. 715-729.
24. Gerbing, D. W., and Anderson, J. C. (1992), "Monte Carlo evaluations of goodness of fit indices for structural equation models", *Social Methods & Research* Vol.21, pp. 132-160.
25. Glomb, T. M., and Welsh, E. T. (2005), "Can opposites attract? Personality heterogeneity in supervisor-subordinate dyads as a predictor of subordinate outcomes", *Journal of Applied Psychology*, Vol.90 No.4, pp. 749-757.
26. Gong, Y., Zhou, J., and Chang, S. (2013), "Core knowledge employee creativity and firm Performance: The moderating role of riskiness orientation, firm size, and realized absorptive capacity", *Personnel Psychology*, Vol.In Press, pp.
27. González-Roma, V., Peiró, J. M. a., and Tordera, N. (2002), "An examination of the antecedents and moderator influences of climate strength", *Journal of Applied Psychology*, Vol.87, pp. 465-473.
28. Gu, Q., Wang, G. G., and Wang, L. (2013), "Social capital and innovation in R&D teams: The mediating roles of psychological safety and learning from mistakes", *R&D Management*, Vol.43 No.2, pp. 89-102.
29. Gumusluoglu, L., and Ilsev, A. (2009), "Transformational leadership, creativity, and organizational innovation", *Journal of Business Research*, Vol.62 No.4, pp. 461-473.
30. Hair, J., Black, W., Babin, B. J., and Anderson, R. E. (2010), *Multivariate data analysis*, New Jersey: Prentice Hall.
31. Hastings, R. R. (2008), "Millennials expect a lot from leaders", *HR Magazine*, Vol.53 No.1, pp. 30-30.
32. Hira, N. A. (2007), "You raised them, now manage them", *Fortune*, Vol.155 No.10, pp. 38-46.



33. Hirst, G., Knippenberg, D. V., 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.
34. Hofmann, D. A., Giffin, M. A., and Gavin, M. B. (2000), "The application of hierarchical linear modeling to organizational research", In K. J. Klein and S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organization: Foundation, extensions, and directions*, San Francisco: Jossey-Bass, pp. 467-511.
35. Hofmann, D. A., Morgeson, F. P., and Gerras, S. J. (2003), "Climate as a moderator of the relationship between leader-member exchange and content specific citizenship: Safety climate as an exemplar", *Journal of Applied Psychology*, Vol.88 No.1, pp. 170-178.
36. Iacobucci, D. (2012), "Mediation analysis and categorical variables: The final frontier", *Journal of Consumer Psychology*, Vol.22 No.4, pp. 582-594.
37. Idris, M. A., Dollard, M. F., Coward, J., and Dormann, C. (2012), "Psychosocial safety climate: Conceptual distinctiveness and effect on job demands and worker psychological health", *Safety Science*, Vol.50 No.1, pp. 19-28.
38. 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.
39. James, L. R., Demaree, R. G., and Wolf, G. (1993), "rwg: An assessment of within-group interrater agreement", *Journal of Applied Psychology*, Vol.78 No.5, pp. 306-309.
40. Kessel, M., Kratzer, J., and Schultz, C. (2012), "Psychological safety, knowledge sharing, and creative performance in healthcare teams", *Creativity and Innovation Management*, Vol.21 No.2, pp. 147-157.
41. Kim, T.-Y., Cable, D. M., Kim, S.-P., and Wang, J. (2009), "Emotional competence and work performance: The mediating effect of proactivity and the moderating effect of job autonomy", *Journal of Organizational Behavior*, Vol.30 No.7, pp. 983-1000.
42. Kirkman, B. L., Chen, G., Farh, J.-L., and Lowe, K. B. (2009), "Individual power distance orientation and follower reactions to transformational leaders: A cross-level, cross-cultural examination", *Academy of Management Journal*, Vol.52 No.4, pp. 744-764.
43. Kline, R. B. (2011), *Principles and practice of structural equation modeling*, New York: Guilford Press.
44. Koufteros, X., Babbar, S., and Kaighobadi, M. (2009), "A paradigm for examining second-order factor models employing structural equation modeling", *International Journal of Production Economics*, Vol.120 No.2, pp. 633-652.
45. Kristof-Brown, A. L., Zimmerman, R., and Johnson, E. C. (2005), "Consequences of individuals' fit at work: A meta-analysis of person-job, person-organization, person-group, and person-supervisor fit", *Personnel Psychology*, Vol.58 No.2, pp. 281-342.



46. Lee, F. H., and Wu, W. Y. (2011), "The relationships between person-organization fit, psychological climate adjustment, personality traits, and innovative climate: Evidence from Taiwanese hightech expatriate managers in Asian countries", *African Journal of Business Management*, Vol.5 No.15, pp. 6415-6428.
47. MacKinnon, D. P., and Cox, M. C. (2012), "Commentary on "mediation analysis and categorical variables: The final frontier" by Dawn Iacobucci", *Journal of Consumer Psychology*, Vol.22 No.4, pp. 600–602.
48. Mathieu, J. E., Gilson, L. L., and Ruddy, T. M. (2006), "Empowerment and team effectiveness: An emperical test of an intergrated model", *Journal of Applied Psychology*, Vol.91 No.1, pp. 97-108.
49. Mathieu, J. E., Maynard, M. T., Taylor, S. R., Gilson, L. L., and Ruddy, T. M. (2007), "An examination of the effects of organizational district and team contexts on team processes and performance: A meso-mediational model", *Journal of Organizational Behavior*, Vol.28 No.7, pp. 891-910.
50. Mathieu, J. E., and Taylor, S. R. (2007), "A framework for testing meso-mediational relationships in organizational behavior", *Journal of Organizational Behavior*, Vol.28 No.2, pp. 141-172.
51. Mayer, J. D., Caruso, D., and Salovey, P. (1999), "Emotional intelligence meets traditional standards for an intelligence", *Emotional Intelligence: Key readings on the Mayer and Salovey model*, Vol.27, pp. 267-298.
52. Mayer, J. D., and Salovey, P. (1997), "What is emotional intelligence?", In P. Salovey and D. J. Sluyter (Eds.), *Emotional Development and Emotional Intelligence*, New York: Basic Books, pp. 3-31.
53. Mhatre, K. H., and Conger, J. A. (2011), "Bridging the gap between Gen X and Gen Y", *Journal of Leadership Studies*, Vol.5 No.3, pp. 72-76.
54. Milliken, F. J., Morrison, E. W., and Hewlin, P. F. (2003), "An exploratory study of employee silence: Issues that employees don't communicate upward and why", *Journal of Management Studies*, Vol.40 No.6, pp. 1453-1476.
55. Mol, S. T., Born, M. P., Willemsen, M. E., and Van Der Molen, H. T. (2005), "Predicting expatriate job performance for selection purposes", *Journal of Cross-Cultural Psychology*, Vol.36 No.5, pp. 590-620.
56. Montes, F. J. L., Moreno, A. R., and Fernandez, L. M. M. (2004), "Assessing the organizational climate and contractual relationship for perceptions of support for innovation", *International Journal of Manpower*, Vol.25 No.2, pp. 167–180.
57. Owolabi, A. B. (2012), "Effect of psychological work climate and emotion intelligence on teamwork", *Journal of Asian Scientific Research*, Vol.2 No.3, pp. 150-158.
58. Peltokorpi, V., and Hasu, M. (2013), "How participative safety matters more in team innovation as team size increases", *Journal of Business and Psychology*, Vol.In Press, pp.



59. Post, C. (2012), "Deep-level team composition and innovation: The mediating roles of psychological safety and cooperative learning", *Group & Organization Management*, Vol.37 No.5, pp. 555-588.
60. Raudenbush, S. W., and Bryk, A. S. (2002), *Hierarchical linear models: Applications and data analysis methods*, Newbury Park, CA: Sage.
61. Saenz, J., Aramburu, N., and Rivera, O. (2009), "Knowledge sharing and innovation performance: A comparison between high-tech and low-tech companies", *Journal of Intellectual Capital*, Vol.10 No.1, pp. 22-36.
62. Saunders, M., Lewis, P., and Thornhill, A. (2007), *Research methods for business students*, London: Prentice Hall.
63. Schneider, B., Smith, D. B., and Paul, M. C. (2001), "P-E fit and the attraction-selection-attrition model of organizational functioning: Introduction and overview", In M. Erez, U. Kleinbeck and H. Thierry (Eds.), *Work motivation in the context of a globalizing economy*, Mahwah: Erlbaum, pp. 231-246.
64. Seligson, M., and MacPhee, M. (2004), "Emotional intelligence and staff training in after-school environments", *New Directions for Youth Development*, Vol.2004 No.103, pp. 71-83.
65. Shumacker, R., and Lomax, R. G. (2004), *A beginner's guide to structural equation modeling*, Mahwah, New Jersey: Lawrence Erlbaum.
66. Sobel, M. E. (1982), "Asymptotic confidence intervals for indirect effects in structural equation models", *Sociological Methodology*, Vol.13 No.1982, pp. 290-312.
67. Somech, A., and Drach-Zahavy, A. (2013), "Translating team creativity to innovation implementation: The role of team composition and climate for innovation", *Journal of Management*, Vol.39 No.3, pp. 684-708.
68. Tak, J. (2011), "Relationships between various person-environment fit types and employee withdrawal behavior: A longitudinal study", *Journal of Vocational Behavior*, Vol.78 No.2, pp. 315-320.
69. Tordera, N., González-Roma, V., and Peiró, J. M. a. (2008), "The moderator effect of psychological climate on the relationship between leader –member exchange (LMX) quality and role overload", *European Journal of Work and Organizational Psychology*, Vol.17 No.1, pp. 55-72.
70. Troster, C., and van Knippenberg, D. (2012), "Leader openness, nationality dissimilarity, and voice in multinational management teams.", *Journal of International Business Studies*, Vol.43 No.6, pp. 591-613.
71. Van Vianen, A. E. M., Shen, C. T., and Chuang, A. (2011), "Person–organization and person–supervisor fits: Employee commitments in a Chinese context", *Journal of Organizational Behavior*, Vol.32 No.6, pp. 906-926.



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72. Werbel, J. D., and DeMarie, S. M. (2005), "Aligning strategic human resource management and person–environment fit", *Human Resource Management Review*, Vol.15 No.4, pp. 247-262.
73. Werbel, J. D., and Johnson, D. J. (2001), "The use of person–group fit for employment selection: A missing link in person–environment fit", *Human Resource Management*, Vol.40 No.3, pp. 227-240.
74. Wiegand, D. M. (2007), "Exploring the role of emotional intelligence in behavior-based safety coaching", *Journal of Safety Research*, Vol.38 No.4, pp. 391-398.
75. Wong, C.-S., Law, K. S., and Wong, P.-M. (2004), "Development and validation of a forced choice emotional intelligence measure for Chinese respondents in Hong Kong", *Asia Pacific Journal of Management*, Vol.21 No.4, pp. 535-559.