The role of perception of effort-reward in the relationship between team cohesion and innovative work behaviour

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ABSTRACT: Based on organisational climate for innovation theory and social exchange theory, the relationship between team cohesion and innovative working behaviour has been assumed to be moderated by fairness perceptions about the ratio between efforts spent and reward received at work for school administrative teams. This study aimed to investigate the influence of team cohesion (TC) on innovative working behaviour (IWB) and to examine whether perception of effort-reward fairness (PERF) was a moderator of the relationships between them. The instruments used in this study were reliable and produced internal consistency. Multiple hierarchical regression analysis (HRA) was used to test the models, with a sample consisting of 546 administrative staff in post-secondary schools in Taiwan. The findings of this study provided evidence that TC and PERF had a significant influence on IWB. Yet the research demonstrated that there was no significant effect on the relationship between TC and IWB about the moderation effect of PERF.

INTRODUCTION

Innovation is an important factor for organisations in pursuit of success and competitiveness [1]. A school is an organisation, and most school organisations are facing a dynamic environment characterised by rapid social changes, educational policies, and globalisation. Recently, Taiwan's post-secondary schools face the impact of the *baby boom*, open enrolments and school choice. These external factors bring many challenges to school organisations. Schools need to be more creative and innovative in order to compete, to grow and to lead. School leaders are providing inspiration and motivation for their staff (including teachers and administrators). The teachers are undertaking more innovative activities in their classrooms and the administrators are showing more innovative behaviour in their work [2].

The organisational climate in schools may refer to various physical and psychosocial structures that shape schools' social and physical environments [3]. Bennett noted that there is a positive relationship between the autonomous climate and both the total number of innovations and the curricular innovations adopted [4]. The controlled climate was related negatively to those two measures of innovativeness. There is other evidence that a supportive environment is positively associated with innovation [5]. This supportive environment enables team-building and provides them with direction, energy and support for the processes of change and for increasing their cohesion [6]. When everyone in a school has the same general feelings about what is important or how well things are working, the effect of these attitudes will be more than the sum of the individual parts. One meta-analysis found that across dozens of different samples, psychological climate was strongly related to individuals' level of job satisfaction, involvement, commitment and motivation [7]. Dozens of dimensions of climate have been studied, including safety, justice, diversity, and customer service, to name a few [8]. The attitudes generated by justice were most important for predicting behaviours and performance in an organisation [10].

As equity theory, the individuals compare their job inputs and outcomes with those and then respond to eliminate any inequities [11]. School leaders are encouraged to use various activities and diverse management strategies to facilitate the innovation of its teachers [12]. Leadership becomes recognised as the presence of followership [8]. Leadership provides meaning for those within an institution by defining and espousing the values of the organisation [13]. Successful organisations require both trust leadership and equal treatment within an organisation. Lehmann-Willenbrock and Kauffeld pointed out that co-worker trust can enhance group cohesion, supervisor trust can foster innovative work behaviour, while organisational justice was associated with affective commitment [14].

Based on what was mentioned above, the purpose of this study is to further examine how team cohesion positively relates to innovative working behaviour according to a proposed model (see Figure 1). Team cohesion may positively relate to innovative working behaviour. Perception of effort-reward fairness may also positively relate to innovative

working behaviour. Thus, this paper intends to demonstrate that the perception of effort-reward fairness moderates the relationship between team cohesion and innovative work behaviour.
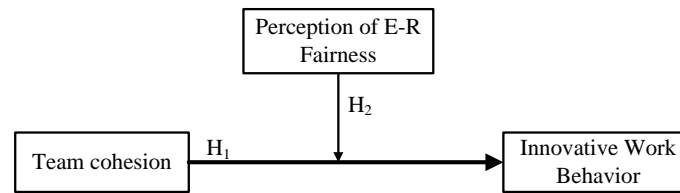

Figure 1: The conceptual model.

THEORY BACKGROUND AND HYPOTHESES

Team Cohesion and Innovative Organisation

Carron, Brawley and Widmeyer defined *team cohesion as a dynamic process that is reflected in the tendency of a group to stick together and remain united in pursuit of its instrumental objectives and/or for the satisfaction of the effective needs of the members* [9]. Team members engage in constructive discussions and support each other in pursuit of their common objectives [15]. Cohesive teams are likely to provide team psychological safety. This includes a shared belief that the team is safe for interpersonal risk-taking [16] and supports innovation project performance under financial constraints through team experimentation and learning [17].

Cohesive teams are able to achieve goals because they are familiar with the members of the team and are motivated to complete the task successfully [18]. Their willingness to participate and their commitment to learning explain a significant portion of the team cohesion variance. However, more research is required to understand the influences of other factors on team cohesion in organisational innovation [1]. Further, it necessarily takes a lot of time to form the team, no matter who is involved. Compared to permanent newcomers, temporary newcomers caused teams to experience more conflict and less group identification, illustrating the tension between innovative group performance and team cohesion [8]. Moreover, leadership had a direct impact on team processes [19]. It has been argued that leaders played important roles in modelling effective teamwork and in setting fair rules for team members to engage in successful team processes [20]. The team approach significantly increased co-worker cohesion, personal habits, and co-workers' behaviours. These researchers made an assumption that the member of the team would increase shared vision and team commitment, which would increase team cohesion. They also suggested that team cohesion leads to an increased team task performance and innovation. This implies that leaders can have an effect on team cohesion that ultimately leads to changes in team performance and innovation. Thus, under this research, the following hypothesis is proposed: *Hypothesis 1: Team cohesion relates positively to innovative work behaviour*.

The Perception of Effort-Reward Fairness and Innovative Work Behaviour

There is evidence that employees' innovation is positively associated with organisational performance [21] or with the different aspects of innovation (e.g., innovation design or speed, flexibility) and performance [22]. With careful analysis, researchers were able to find that most innovative organisations keep an eye on fairness to maintain employees' innovative work behaviour. Under the climate of fairness, employees not only willingly work hard but they also feel satisfied with their job [23].

Recently, many researchers have been expanding the meaning of equity or fairness [24]. Historically, equity theory focused on distributive justice, the employee's perceived fairness of the amount and allocation of rewards among individuals. But increasingly one thinks of equity from the standpoint of organisational justice, a larger perception of what is fair in the workplace. Employees perceive their organisations as being just when they believe the outcomes and the way they received them are fair. One key element of organisational justice is an individual's perception of fairness. In other words, fairness or equity can be subjective, residing in our own perception. What one person sees as unfair, another may see as perfectly appropriate. In general, people have an egocentric or self-serving bias. They see allocations or procedures favouring them as fair [14].

It is very important that the teachers in charge of administration feel that their treatment is fair and that at the same time, they are enjoying a sense of accomplishment in their job with team members through their innovative work behaviour. However, available research does not examine the moderating role of perception of fairness in the relationship between team cohesion and innovative work behaviour. So, the purpose of this study is to determine if teachers in charge of administrative duties have perceptions of effort-reward fairness.

Perceptions of fairness of team members and team spirit are the mechanisms underlying the effects of organisational innovation. Due to the positive scoring of the perception of effort-reward fairness, under this research, the following hypothesis is proposed: *Hypothesis 2: Perception of effort-reward fairness relates positively to innovative work behaviour*.

In order to examine the impact of individual variables to innovative work behaviours, this study also estimates a hierarchy regression model for individual data. Thus: *Hypothesis 3: Perception of effort-reward fairness moderates the relationship between team cohesion and innovative work behaviours*.

METHOD

Sample

To explore the perception of effort-reward fairness in team cohesion and innovative work behaviour, the study utilised an empirical research methodology. This study used the stratified random sampling method to select the teachers of 38 secondary schools in Taiwan. All members of the sample were teachers in charge of administration in the administrative group. The sample comprised 546 teachers, which accounted for 78.0% of the sample. The samples consisted of 194 female (35.5%) and 352 male (64.5%) teachers. Of the participants, 78.8% were from public schools and 21.2% were from private schools. The average years of working at the schools was 16.5 years (SD=4.6 years) with a range of 2.5 and 32 years. Further, 4.4% of the participants were department chiefs, 55.0% were division directors, and 40.7% were vice-directors (or mentors).

Procedures

Based on the literature review and previous research, the three hypotheses outlined above were formulated and examined. The questionnaires were administered to participants during their work time. All participants responded to the same questionnaire, which consisted of two sections. The top half of the questionnaire consisted of general questions, and the bottom half of the questionnaire contained more specific questions. The bottom half of the questionnaire comprised 21 items of which six items were about the perception of effort-reward fairness, six items were about team cohesion, and nine items were about innovative work behaviour. A 7-point Likert-type scale was used for measurement.

Measurements

Team cohesion was measured by six items adapted from the scale proposed by Michalisin, Karau and Tangpong [25]. All items were rated using a 7-point scale ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*). Sample items included the following questions: *I enjoyed working with my teammates*, and *The team worked well together*. These six items were loaded on one factor and explained 71.97% of the variance. They were averaged to form a scale with a reliability of 0.804.

Perceptions of effort-reward fairness were measured by a Dutch scale [26] consisting of six statements, according to a 7-point response scale ranging from 1 (*totally disagree*) to 7 (*totally agree*). Sample items included the following questions: 1) *I work myself too hard considering my outcomes*; and 2) *I give a great deal of time and attention to the organisation, but get very little appreciation*. All responses were reverse-coded, so that higher scores indicated more effort-rewarded fairness. These six items were loaded on one factor and explained 65.53% of the variance. Cronbach's α of the summative scale was 0.759.

For this study, several widely-available innovative behaviour questionnaires were assessed, such as a re-examination of the *innovative work behaviours scale* developed by Scott and Bruce [27] and three stages for innovation assessed by Kanter [28]. Finally, Janssen's nine-item scale to measure the concept of innovative work behaviour was chosen [29]. In Janssen's nine-item scale, three items refer to idea generation, three items refer to idea promotion, and other three items refer to idea realisation. Teachers were asked to report on the extent to which they engage in and display innovative behaviours at work in school. *I create new ideas for difficult issues,* is an example of a measurement item. The items were scored on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Results of factor analysis on all measurement items used in this study showed that these nine items loaded on one factor and explained 58.399% of the variance. They were averaged to form a scale with a reliability of 0.909.

Data Analysis

Questionnaires were inspected and processed in order to exclude returns with incomplete answers. Valid returns were then assigned numbers and filed. Analysis software, i.e. SPSS 15.0, was applied for data analysis and processing. The tests included factor analysis, reliability analysis and descriptive statistics analysis. The Multiple Regression Analysis was also employed to examine relationships among the team cohesion items, perception of effort-reward fairness and innovative work behaviour.

RESULTS AND DISCUSSION

Correlation between the Measures

The Pearson's correlation coefficients among the variables are presented in Table 1. There were links between perceptions of effort-reward fairness (PERF), team cohesion (TC) and innovative work behaviour (IWB) for all

participants. It showed the means, standard deviations, correlations and alpha coefficients of the measures. Table 1 indicates that the PERF significantly positively correlated with TC ($r=0.237$, $p< .001$), and positively correlated with IWB ($r=0.152$, $p< .001$). TC had significant positive correlations with IWB ($r=0.304$, $p< .001$).

Table 1: Means, standard deviations, correlations and alpha coefficients.

Variable	M	SD	PERF	TC	IWB
Perception of E-R Fairness(PERF)[*]	3.74	1.03	(0.759)		
Team cohesion(TC)	5.08	1.01	0.237[***]	(0.804)	
Innovative Work Behaviour(IWB)	4.96	0.88	0.152[***]	0.304[***]	(0.909)

Note: * means that all items are reversed scoring. n=546, ***$p< .001$

The Moderated Effect of Perception of Effort-Reward Fairness between Team Cohesion and Innovative Work Behaviour

In Table 2, a four-stage hierarchical regression analysis was used to test the hypothesis about the direct effect of team cohesion and the moderating effects of perception of effort-reward fairness for innovative work behaviour. In Model 1, the background variables (gender, property, position and seniority) were entered as predictors of innovative work behaviour. In Model 2, the independent variable (team cohesion) was entered as a predictor of innovative work behaviour with background variables. In Model 3, the main effect predictor variables (perception of effort-reward fairness) were entered. In Model 4, the multiplicative interaction term was entered. The moderator hypotheses were tested by examining the significance of the interaction teams and the F-tests associated with the changes in the multiple squared correlation coefficients (R^2's) of the equations in the Model 4. According to Aiken and West's recommendation for regression analysis with multiplicative interaction terms, all the variables in the regression equation were entered [30]. Table 2 shows the results of this analysis.

Table 2: Results of the moderated regression analysis.

	Model 1	Model 2	Model 3	Model 4
• Gender	-0.153[***]	-1.47[***]	-0.146[****]	-0.149[***]
• Property	0.021	0.022	0.021	0.021
• Position	0.001	0.002	0.003	0.003
• Seniority	0.061	0.069	0.079	0.079
• Team Cohesion		0.303[***]	0.360[***]	0.219
• Perception of E-R Fairness			0.239[***]	0.436[*]
• TC × PERF				0.271
F	3.957[***]	14.781[***]	18.963[***]	16.438[***]
df	545	545	545	545
R^2	0.028	0.120	0.174	0.176
$\triangle R^2$	0.028	0.092	0.054	0.002

$n = 546$, *$p < .05$, ***$p<.001$

H$_1$ predicted a positive relationship between TC and IWB. H$_2$ predicted a positive relationship between PERF and IWB. Results of the analysis revealed that TC had a significant positive effect on IWB (β=0.303, $p<.05$). Gender, a background variable, had significant negative effect on innovative work behaviour. It meant that innovative work behaviour by male teachers was higher than for female teachers. In Model 2 and Model 3, the main effect predictor variables (TC and PERF) had significant positive effects on IWB (β_1=0.360, β_2=0.239, $p<.05$). Judging from this, H$_1$ and H$_2$ were supported.
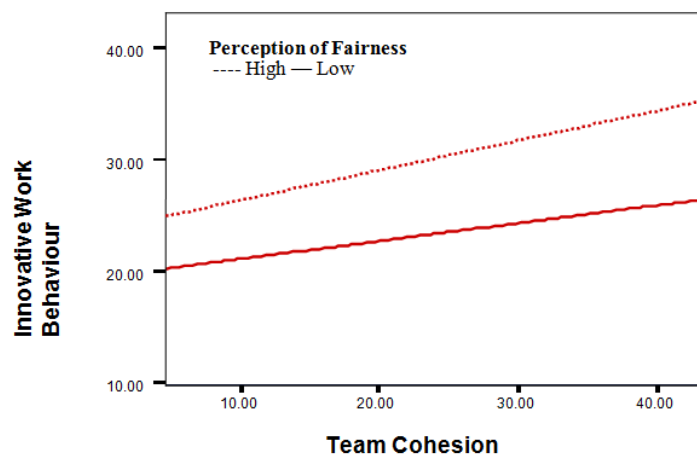

Figure 2: The interaction of team cohesion and perception of effort-reward fairness on innovative work behaviour.

H$_3$ was related to the moderating effect of PERF on the relationship between TC and IWB. In Model 4, the result revealed that the interaction of TC and PERF was not significant (β=0.271). Although there was a lack of effective upward influence within team cohesion, if teachers' fairness strategies were used by school principals, it could have a considerable impact on innovative work behaviour. That is to say, even the school principals could use team cohesion strategies to promote the innovation of teachers, so this influence on innovative work behaviour was insufficient.

To interpret the form of the moderated relationship, the interaction effect was plotted using the procedure suggested by Aiken and West [30]. Specifically, the regression lines of team cohesion on innovative work behaviour for high and low levels of moderating variable perception of effort-reward fairness were as shown in Figure 2. As predicted by H$_3$, the positive impact of team cohesion on IWB is stronger for higher levels of PERF. Figure 2 depicts the interaction plot. The results show that the interaction between perceptions of TC and PERF was not significant. Thus, H$_3$ was not supported.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The result reveals that when the teachers were embedded in a climate or culture that included perceptions of fairness and team cohesion respectively, team cohesion would be a highly effective influence for achieving innovative work behaviour in secondary high schools. The school principals or department chiefs played the key roles in establishing an organisational innovative climate or culture. Rodríguez et al, proposed a causal model of communication and cooperation as an important determination of organisational climate [31]. Janssen pointed out that the managers who perceived effort-reward fairness performed better and felt more satisfied in response to intermediate levels of job demands than managers who perceived *under-reward unfairness* [23]. This study supported the findings from previous studies.

This study found that even if the principals do not use the strategy of Team Cohesion (TC) in school, the use of teachers' Perception of Effort-Reward Fairness (PERF) strategies used by school principals still have a tremendous impact on Innovative Work Behaviour (IWB). As a result of increasingly rapid innovation, schools have changed in order to survive and to be effective [14]. However, this study also found that if the strategy of effort-reward fairness is not used by school principals, even if the school principals use TC, the influence on IWB were insufficient. In addition, the effect of TC and PERF were positively related to IWB. This finding supported the proposition that TC has positive influences on IWB. PERF also influences IWB more than TC. These findings are similar to those found by Janssen, that encouraging leaders to engage in the employees' perception of effort-reward fairness would promote IWB [29][23].

This study made several contributions to research on school administration. First, PERF did not moderate the relationship between TC and IWB, but the effect of PERF influenced IWB more than TC in the interaction with PERF. Second, the findings of this study supported previous studies, such as one by Simons and Roberson, which found that effort-reward fairness had a significant positive influence on innovative work behaviour and performance [32] and another by Cremer et al, which found that procedural fairness interacted with outcome fairness to influence employees' work attitude and behaviours [33]. Third, TC has a positive and significant effect on IWB, and the effect of PERF on IWB is more than on TC separately. This study does not support the moderation relationship between TC and IWB. IWB still relies on leaders and teachers to develop innovative strategies and performance.

Recommendation

Besides distribution justice and procedural justice, more recently, many researchers have demonstrated empirically that *interactional justice* reflects on two dimensions: *interpersonal justice* (Are people treated with respect and sensitivity during the implementation of procedures perceived as being fair?) and *informational justice* (Is the rationale for decisions explained adequately?) [24]. Hence, the principals or chiefs of offices (leaders) can help to foster teachers' perception of fairness. First, they should realise that teachers are especially sensitive to unfairness in procedures when bad news has to be communicated (that is, when effort-reward fairness is low). Thus, it is especially important to share openly information about how allocation decisions are made, to follow consistent and unbiased procedures, and to engage in similar practices to increase the perception of procedural justice. Second, when addressing perceived injustices, managers need to focus their actions on the source of the problem. Leaders should realise that sometimes it is necessary to offer a tangible remedy rather than apologies or changes in procedures.

REFERENCES

1. Woodman, R.W., Sawyer, J.E. and Griffin, R.W.,Toward a theory of organizational creativity. *Academy of Management*, 18, **2**, 293-321 (1993).

2. Hsiao, H.C., Chang, J.C. and Tu, Y.L., The influence of transformational leadership and support for innovation on organizational innovation: from the vocational high school teachers' perspective. *Proc. 2009 International Conf. on Industrial Engng. and Engng. Management*, Hong Kong, China, 1988-1992 (2009).

3. Parcel, G.S., Perry, C.L., Kelder, S.H., Elder, J.P., Mitchell, P.D., Lytle, L.A., Johnson, C.C. and Stone, E.J., School climate and the institutionalization of the CATCH program. *Health Educ. and Behavior*, 30, **4**, 489-502 (2003).

4. Bennett, R.E., An Analysis of the Relationship of Organizational Climate to Innovations in Selected Secondary Schools of Pennsylvania and New York. PN: Pennsylvania State University (DOI: 10.1007/BF00598815) (1968).

5. Montes, F.J.L., Moreno, A.R. and Morales, V.G., Influence of support leadership and teamwork cohesion on organizational learning, innovation and performance: an empirical examination. *Technovation*, 25, **10**, 1159-1172 (2005).

6. Tushman, M.L. and Nadler, D.A., Organization for innovation. *California Manage*, *Review*, 28, **3**, 74-92 (1986).

7. Carr, J.Z., Schmidt, A.M., Ford, J.K. and DeShon, R.P., Climate perceptions matter: A meta-analytic path analysis relating molar climate, cognitive and affective states, and individual level work outcomes. *J. of Applied Psychology*, 88, 587-619 (2003).

8. Robbins, P.S. and Judge, A.T., *Organizational Behavior*. (13th Edn), Singapore: Pearson Prentice Hall (2009).

9. Carron, A.V., Brawley, L.R. and Widmeyer, W.N., *The Measurement of Cohesiveness in Sport Groups*. In: Duda, J. (Ed), Advances in Sport and Exercise Psychology Measurement, Morgantown, WV: Fitness Information Technology, 213-226 (1998).

10. Kim, W.C. and Mauborgne, R.A., Procedural justice, attitudes, and subsidiary top management compliance with multinationals' corporate strategic decisions. *The Academy of Management J.*, 36, **3**, 502-526 (1993).

11. Robbins, P.S. and Judge, A.T., *Organizational Behavior*. (14th Edn), Singapore: Pearson Prentice Hall (2010).

12. Chan, L., Hong, J., Horng, J., Chang, S. and Chu, H., Factors influencing technology integration in teaching - a Taiwanese perspective. *Innovations in Educ. and Teaching International*, 43, **1**, 57-68 (2006).

13. Fidler, B., *Strategic Management for School Development*. London: Paul Chapman (2003).

14. Lehmann-Willenbrock, N. and Kauffeld, S., Development and construct validation of the German workplace trust survey (G-WTS). *European J. of Psychological Assessment*, 26, **1**, 3-10 (2010).

15. Hoegl, M. and Gemuenden, H.G., Teamwork quality and the success of innovative projects: A theoretical concept and empirical evidence. *Organization Science*, 12, **4**, 435-449 (2001).

16. Edmondson, A.C., Psychological Safety and learning behavior in work teams. *Administrative Science Quarterly,* 44, 350-394 (1999).

17. Amabile, T.M., *Creativity in the Context*. CO: Westview Press (1996).

18. Wang, E.T.G., Ying T.C., Jiang J.J. and Klein, G., Group cohesion in organizational innovation: An empirical examination of ERP implementation. *Information and Software Technol.*, 48, **4**, 235-244 (2006).

19. Zacarro, S.J., Ardison, S.D. and Orvis, K.L., *Leadership in Virtual Teams*. In: Day, D.V., Zaccaro, S.J. and Halpin, S.M. (Eds), Leader Development for Transforming Organizations: Growing Leaders for Tomorrow. New Jersey: Lawrence Erlbaum Associates (2004).

20. Cascio, W.F. and Shurygailo, S., E-leadership and virtual teams. *Organizational Dynamics*, 31, **4**, 362-376 (2003).

21. Zaltman, G., Duncan, R. and Holbeck, J., *Innovations and Organizations*. NY: Wiley (1973).

22. Calantone, R.J., Cavusgil, T.S. and Zhao, Y., Learning orientation, firm innovation capability, and firm performance. *Industrial Marketing Management*, 31, **6**, 515-524 (2002).

23. Janssen, O., Fairness perceptions as a moderator in the curvilinear relationships between job demands, and job performance and job satisfaction. *Academy of Management J.*, 44, **5**, 1039-1050 (2001).

24. Colquitt, J.A., Conlon, D.E., Wesson, M.J., Porter, C.O.L.H. and Ng, K.Y., Justice at the Millennium - a meta-analytic review of the 25 years of organizational justice research. *J. of Applied Psychology*, June, 425-445 (2001).

25. Michalisin, M.D., Karau, S.J. and Tangpong, C., The effects of performance, team cohesion, and uncertainty on attribution: A longitudinal study. *J. of Business Research*, 57, **10**, 1108-1115 (2004).

26. van Yperen, N.W., Informational support, equity and burnout: The moderating effect of self-efficacy. *J. of Occupational and Organizational Psychology*, **71**, 29-33 (1998).

27. Scott, S.G. and Bruce, R.A., Determinates of innovation behavior: a path model of individual innovation in the workplace. *Academy of Management J.*, 37, **3**, 580-607 (1994).

28. Kanter, R., *When a Thousand Flowers Bloom: Structural, Collective, and Social Conditions for Innovation in Organizations*. In: Staw, B.M. and Cummings, L.L. (Eds), Research in Organizational Behavior. CT: JAI Press, Greenwich, 169-211 (1988).

29. Janseen, O., Job demands, perceptions of effort-reward fairness, and innovative work behavior. *J. of Occupational and Organizational Psychology*, 73, **1**, 287-302 (2000).

30. Aiken, L.S. and West, S.G., *Multiple Regression: Testing and Interpreting Interactions*. Newbury Park, CA: Sage (1991).

31. Rodríguez, N.G., Pérez, M.J.S. and Gutiérrez, J.A.T., Can a good organizational climate compensate for a lack of top management commitment to new product development? *J. of Business Research*, 61, **2**, 118-131 (2008).

32. Simons, T. and Roberson, Q., Why managers should care about fairness: the effects of aggregate justice perceptions on organizational outcomes. *J. of Applied Psychology*, June, 432-443 (2003).

33. Cremer, D.D., Brockner, J., Fishman, A., van Dijke, M., van Olffen, W. and Mayer, D.M., When do procedural fairness and outcome fairness interact to influence employees' work attitude and behaviors? The moderating effect of uncertainly. *J. of Applied Psychology*, 5, **2**, 291-304 (2010).