

# **The Effects of Social Exchange Perspective on Employee Creativity: A Multilevel Investigation**

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## **Abstract**

Procedural justice and perceived organizational support as rational social exchange mechanisms, this study examined its role on employee-supervisor pair relationships at specific work units in R&D of a field survey, which obtained from employee-supervisor dyads of 78 high-tech firms located in a major city in southern Taiwan. At cross-level analysis, the results of hierarchical linear modeling (HLM) indicated that both the procedural justice and perceived organizational support were significantly related to individual outcomes, such as job engagement, satisfaction, and creativity. At individual-level analysis, the results of structural equation modeling (SEM) provided support for all proposed hypotheses. The extension of the study findings related to the conceptual and practical issues of social exchange perspectives are discussed.

*Keywords:* perceived organizational support, procedural justice, employee engagement, job satisfaction, employee creativity

## **Introduction**

When employees are satisfied and deeply engaged in jobs, they may refer to their organizations treat them fairly and perceive higher levels of support. This phenomenon can be referred to the social exchange or organizational justice theories. Social exchange theory has provided very clear conceptual lens with regard to employment relationship [1, 2]. Social exchange theory explains the formation and maintenance of interpersonal relationship between two parties (i.e., employees and employers) in terms of the reciprocation procedures [3, 4]. It is more likely to signal to increase employees' beliefs and organization values [5]. A major social exchange perspective in an organizational behavior refers to perceived organizational support (POS) [4, 6].

At individual-level analysis, organizational researchers have proposed that employees with higher levels of perceived organizational support will result in higher levels of job satisfaction [e.g., 7, 8, 9], organizational commitment [e.g., 5, 7, 10], and decrease employee's intention to quit [11]. However, cross-level investigations have been very rare, we thus proposed POS as one of key independent factors to predict employee's job engagement, satisfaction, and creativity, using cross-level analysis.

Furthermore, organizational justice has been regarded as another important factor for employee engagement, satisfaction, and creativity. Previous studies have identified four dimensions of organizational justices: Procedural justice, distributive justice, informational justice, and interpersonal justice. As suggested by Holtz and Harold [12], and Loi and Yang [13], organizational justice has been classified into two levels of analyses: distributive and procedural justice at organization-focused or the between-person level (group-level), and interpersonal and

informational justice at supervisor-focused or the within-person level (individual-level), respectively. Interestingly, George and Jones [14] recognizes procedural justice as one of the most key factors of organizational justice. Therefore, procedural justice is proposed to examining the influences on individual outcomes, such as employee engagement, job satisfaction, and employee creativity at cross-sectional studies on high-tech industries.

Since previous studies have tested four sub-dimensions of organizational justice as single field studies at different situations, such as national health insurance [15], and the Chinese steel state-owned enterprise [16] and cross-sectional companies [17], university faculty [18], and acquisition companies [19], they failed to classify and test these sub-dimensions as individual level or organizational level analyses. Therefore, multilevel validation about organizational justice deserves further validation.

Research on perceived organizational support [20, 21] and procedural justice [18, 22] have demonstrated the fairness can affect attitudes and behaviors of employees, as well as organizational outcomes. Based on these rationales, this study intends to integrate social exchange theory, organizational justice theory, and relevant creativity theory to understand how perceived organizational support and procedural justice influence employee individual outcomes at the cross-level analysis. This study also aims to identify the effects of employee engagement in job satisfaction and employee creativity at work.

## **Theoretical Background and Hypotheses development**

### *The effects of procedural justice*

According Greenberg [23] and Lambert, Hogan, and Griffin [24], all types of justice (i.e., procedural, distributive, informational, and interpersonal) play an important role on

individuals' organizational attitudes. However, at some level procedural justice and interactional justice grew in prominence. Procedural justice focuses on fair distribution of outcomes across employees to encourage high levels of work motivation [14, 25]. Justice theories suggest that when an organization is deemed as fair, employees will be more likely to make an effort to improve their work [26]. According, Loi and Yang [13], and Holtz and Harold [12], procedural justice has been classified as between-person level (group-level) or organization-focused. Thus, procedural justice at organizational level is emphasized in this study. Procedural justice refers to the perceived fairness of the procedures used to make decisions about the distribution of outcomes [14, 27].

Most of recent studies use procedural justice to predict employee's trust behavior in organization [e.g., 5, 28], and organizational citizenship behavior (OCB), affective commitment, and turnover intention [29]. However, the link between procedural justice and employee's job engagement is very rare, especially in a cross-level study. While at individual level analysis and self-report scale, this relationship has been uncovered at unspecific and cross-samples studies [e.g.,30, 31]. Following social exchange theory and procedural justice, when organizational decision-making is consistent and meets the bias suppression rule [32], employees have positive assessments of procedural justice [14, 33]. In addition, the job engagement model suggests that when employees have high perceptions of justice in their organization, they are more likely to feel obliged to perform greater levels of engagement [34]. Based on this rationale, the following hypothesis is proposed:

*Hypothesis-H1: Procedural justice is positively related to employee's job engagement.*

McFarlin and Sweeney [35], and Alexander and Ruderman [36] indicated that procedural justice accounted for job satisfaction. Organizational justice research indicates that procedural justice is positively related to job satisfaction [e.g., 30], and expatriate outcomes in the Chinese hotel industry [37]. Therefore, when individuals who feel that their organizations or supervisors value and support them and treat them fairly, these individuals tend to be more committed to the organization and more satisfied with the jobs [38]. A meta-analysis study of Colquitt et al. [27] reported that procedural justice has positive influence on job satisfaction. However, at cross-level analysis, this relationship has been not examined. Therefore, the following hypothesis is proposed:

*Hypothesis-H2:* Procedural justice is positively related to employee's job satisfaction.

From the procedural justice perspective, it is more likely to observe creativity [39]. An empirical investigation uncovered the perception of procedural justice and its influence on individual creative performance [40]. It is important that individual employees perceive procedural justice so that they feel valued and are motivated to produce creative work [41]. Clark and James [38] proposed that procedural justice will help stimulate positive creativity. This is consistent with Dayan and Colak [42], who suggested that a procedural justice climate has a positive influence on new product creativity. Thus, the following hypothesis is proposed:

*Hypothesis-H3:* Procedural justice is positively related to employee's work creativity.

#### *The effects of perceived organizational support*

The concept of perceived organizational support (POS) has been drawn from the social exchange theory, which explains the relationship between employees' behavior and

organizational outcomes [20, 21]. According to Eisenberger et al. [20], POS is defined as “the global belief held by an employee that the organization values his/her contributions and cares about their well-being” (p. 501). It is suggested that employee with higher level of POS tends to improve their work attitudes and engender effective work behavior [43]. This sense of supportive organization is committed to its employees to achieve higher performance [1, 44]. Most recently, POS enhances individual outcomes, such as trust in organization [e.g., 4, 5], organizational citizenship behavior (OCB), leave intention [e.g., 11], and affective organizational commitment [e.g., 7]. However, the link between POS and employee’s job engagement has been mostly ignored in the literature. Thus, this relationship was established and explored by the present study at cross-level analysis in high-tech firms.

Social exchange perspective also promotes our understandings on why employees would choose to be less or more engaged in their jobs. It is suggested that when individual employees perceive that their organization cares or supports for their well-being, they would oblige to help the organization reach its goals [1, 45]. Saks [30] reports that POS is positively related to employee’s job and organization engagement. Based on above rationale, this study proposes that POS could motivate employees to be more engagement in their jobs [46]. Thus, the following hypothesis is proposed:

*Hypothesis-H 4:* Perceived organizational support is positively related to employee’s job engagement.

POS appears to be a useful theoretical framework for assessing individual behavior in organizations [1]. Conceptually, individual employees with higher levels of POS are more committed to the organizations they work for and more satisfied with their jobs [47]. At individual-level analysis, research has established the link between POS and job satisfaction [1,

7, 8, 48]. However, this relationship has not examined at a cross-level analysis. With regard to the social support concepts, we expect that a high level of POS received by individual employees will increase their job satisfaction [9, 46]. Thus, the following hypothesis is proposed.

*Hypothesis-H5:* Perceived organizational support is positively related to employee's job satisfaction.

The influence of POS is likely to extend to creativity and innovation along with other outcomes, but this possibility has received little empirical attention [38]. Similarly, empirical evidences indicated that supportive social relationships in organizations are crucial to predict individual creativity [49], especially support from top management [50]. According to the social exchange theory, the support provided by immediate supervisors exerts an influence on subordinates' creativity [51]. This notion is similar with the findings of Lin and Liu [52], who reported that supervisory encouragement and work group support are significantly related to individual perceived innovation. Based on these reasons, we believe that similar effects may hold for employee creativity. Thus, the following hypothesis is proposed:

*Hypothesis-H6:* Perceived organizational support is positively related to employee's work creativity.

#### *The effects of employee engagement*

Engagement is an individual-level construct, which lead to and an impact on individual-level outcomes [30]. Employee's job engagement is associated with individuals feel obliged to bring themselves more deeply involvement in their role performances [53]. Since the term "employee engagement" has been titled in the way of model or theory development [30]. Thus, this study operationalizes the definition of job involvement as "employee engagement", which refers to the degree to which employee identifies with his or her job, actively involved in it, and

express his or her performance important to self-worth [54]. In practical terms, engagement may be viewed as an energized satisfaction [55]. The correlation between employee engagement and job satisfaction have examined in nursing context [e.g., 56, 57], non-specific research context [e.g., 30], and undergraduate students at Kansas State University and Midwestern public university [e.g., 58, 59]. Although previous studies tend to support the hypothesis that engagement and job satisfaction are distinct, it remains unclear how an established employee engagement scale will relate to job satisfaction, which is mostly ignored to examine in high-tech industry research. Along with these arguments, we assume that employees engaging more in their work will result in higher level of job satisfaction. Thus, the following hypothesis is proposed:

*Hypothesis-H7: Employee's job engagement is positively related to job satisfaction.*

Ul-Haq et al. [60] has confirmed that higher employee engagement will result in higher creativity. Ul-Haq et al. argued that both employee engagement and job satisfaction predict employee creativity at work. In problem solving, when employees are deeply engagement in their job, they are more likely to enhance higher levels of job satisfaction, which in turn to lead them to generate more innovative or creative ideas to achieve high performance. If engagement does predict the employee creativity when she/he satisfies with her/his job, it also demonstrates the functional nature of job satisfaction. Therefore, the following hypothesis is proposed:

*Hypothesis-H8: Job satisfaction partially mediates the relationship between employee's job engagement and creativity.*

#### *The effect of job satisfaction*

Job satisfaction can be considered as the employees' satisfaction, which reflects the extent to which they enjoy the job [45]. Job satisfaction is defined as being a positive feeling about one's job resulting from an evaluation of its characteristics [61]. Employees' job satisfaction is



one of the most important factors predicting organizational performance [62]. Existing literature generally assumes that higher job satisfaction is associated with higher individual outcomes [9, 63]. This study outlines that the link between job satisfaction and employee creativity has rarely been explored. Logical thinking, we assume that when employees are satisfied with their job, they would spend more time to work better and more innovatively. Therefore, this study believes that a higher level of job satisfaction is associated with better employee creativity at work. Thus, the following hypothesis is proposed:

*Hypothesis-H9: Employee's job satisfaction is positively related to employee creativity.*

## **Research Framework**

This present conceptual model is expected to contribute to our understanding about how social exchange and organizational justice theories impact on employee's job engagement, satisfaction, and creativity, at cross-level analysis (i.e., Hypothesis 1, 2, 3, 4, 5, & 6). At individual-level analysis (Hypothesis 7, 8 & 9), the relationship among employee's job engagement, satisfaction, and creativity can be explained by individual creativity theory. The interrelationships among research constructs and the corresponding nine hypotheses are illustrated in Figure 1.

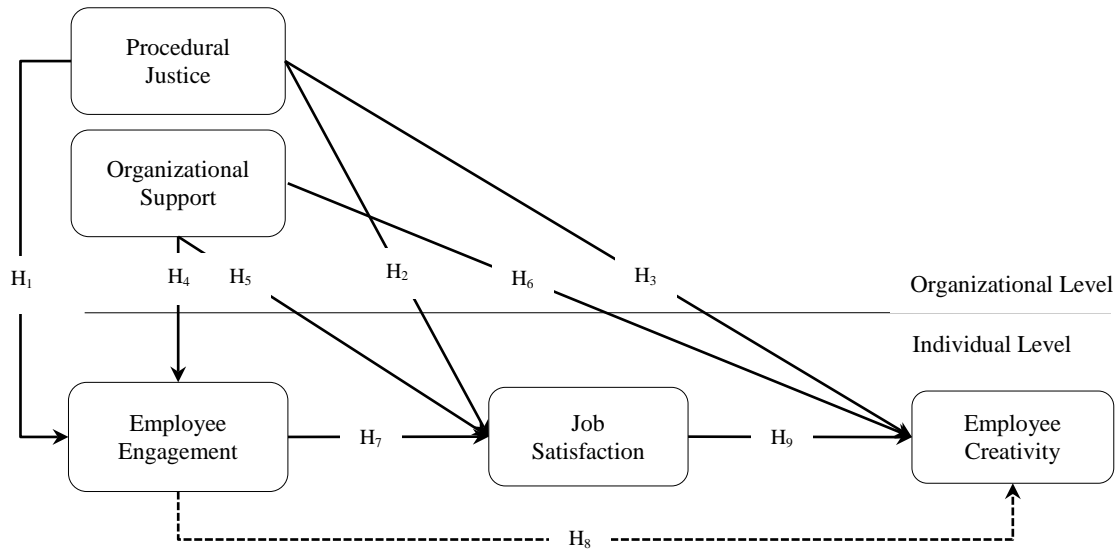


Figure 1. Proposed cross-level framework of employee creativity

## Method

### Measurement scales

#### *Procedural Justice*

According to Loi and Yang [13], and Holtz and Harold [12], procedural justice was treated at the organizational-level, and six items ( $\alpha=.85$ ) were adopted from Scott, Colquitt, and Zapata-Phelan [15]. Three employees in R& D department were invited to rate the degree of procedure justice toward their manager.

#### *Perceived Organizational Support*

Eight items of perceived organizational support ( $\alpha=.93$ ) were adopted from Rhoades, Eisenberger, and Armeli [64]. This construct was also treated at the organizational level analysis. Three employees in R& D department were invited to rate overall perceptions of their organizations.

### *Employee Engagement and Job Satisfaction*

At individual analysis, six items ( $\alpha=.87$ ) of employee engagement were operationalized from Avery, McKay, and Wilson [65] and five items of job satisfaction ( $\alpha=.95$ ) were adopted from Brayfield and Rothe [66], which were modified by Lambert, Hogan, and Griffin [24]. Three employees in R& D department were invited to rate these items.

### *Employee Creativity*

To reduce common bias issues from data collection procedures, which collected from the same sources [67]. This study asked one manager in R&D department of each sample firms to rate their three subordinates using six-item scale of employee creativity ( $\alpha=.90$ ) from Scott and Bruce [68]. This construct has been treated as individual analysis [e.g., 69, 70].

The measurement of questionnaire items was translated from English to Chinese. A standard translation and back-translation procedure was performed to validate the meanings of measurement items and a 7 point Likert scale was used for all research constructs (i.e., from 1=strongly disagree to 7=strongly agree).

### *Control Variables*

Two control variables were included in the study: (1) job tenure, and (2) educational background to control of both levels for further analyses.

### *Sampling Procedures*

Data collection procedure was focused on two level analyses: organizational level (manager/supervisor) and individual level (employees/subordinates). This study selected 200 high-tech firms from the top 1000 firms as listed by Common Wealth Magazine in Taiwan

(2010). Then, a 1:3 matched pairwise of one manager/ or supervisor and three subordinates in the R&D department of each high-tech firm were designed and operated. This procedure consists of two stages: First, the managers of human resource department of each high-tech firm were asked to select one manager and three employees from the R&D department to participate in our survey. Second, the survey package were sent to the assigned R&D managers/supervisors to rates measurement items of procedural justice and perceived organizational support that exercised by the managers/supervisors. The managers/supervisors are also asked to rate their three subordinates with measurement items of employee creativity. Then, three assigned subordinates of the assigned managers were asked to rate the measurement items of employee engagement and job satisfaction. A total of 200:600 (1:3 x 200) pairwise questionnaires were sent to 200 high-tech firms and 106 were returned. However, 28 matched pairs of samples for the firms (i.e., 28 supervisors/ or managers and 84 subordinates) were excluded as outliers. The outliers were deleted using the graphical method, which is a residual scatter plot in the range of  $\pm 3$  standard deviation [71]. Finally, the valid responses received from 78 firms which included 78 supervisors/ or managers and 234 subordinates (with a response rate of 53 percent). Therefore, data from 78 supervisors/ or managers at the organizational-level and 234 subordinates at individual-level were used for further analysis.

### *Analytical Strategy*

The Intraclass Correlation Coefficients (ICCs) technique was adopted to assess the interrater reliability of judgments as provided by the R&D department the high-tech firms. 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” [72]. In this study, 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 [73].

According to James et al. [72] and Mathieu, Gilson, and Ruddy [74], the minimum cut-off value for ICC1 is .12 and for ICC2 is .60. The ICC1 coefficients were .425 for employee engagement, .287 for job satisfaction, and .412 for employee creativity. The ICC2 coefficients were .887 for employee engagement, .725 for job satisfaction, and .789 for employee creativity, respectively. Taken together, these results showed that the inter-rater (within-group) agreement to be acceptable.

The within-group agreement ( $r_{wgs}$ ) was calculated for organizational level of analysis. In the case of the 78 high-tech firms, the mean of their  $r_{wgs}$  was .91 for procedural justice, 0.96 for perceived organizational support. All of the mean  $r_{wgs}$  were greater than the conventionally accepted value of .70 [75], indicating a reasonable level of agreement.

Hierarchical linear modeling was used to test cross-level effects of relationship within-person (individual level) and between-person (organizational level) [e.g., 76, 77]. Thus, this study uses hierarchical linear modeling (HLM 7) to conduct a cross-level analysis of Hypotheses 1-6 and structural equation modeling (SEM: AMOS 20) to test Hypotheses 7-9 at individual-level.

In HLM, Level 2 models estimate the intercepts and slopes of between-person relations. To test cross-level effects of Hypotheses 1-6, we regressed employee engagement, job satisfaction, and creativity onto procedural justice and perceived organizational support at Level 2 and entered control variables (i.e., education and job tenure) at Level 1. In these analyses, we centered the Level 2 predictor variables at each individual's means. This procedure effectively

controls for the potentially confounding effects of between-person (organizational-level) differences on the within-person (individual-level) relationships [e.g., 13, 78].

At Level 1, the pooled values of the Level 2 parameters are used as dependent variables that are predicted by the between individual variables (i.e., procedural justice and perceived organizational support) and control variables. To assess the cross-level effects of between-individual level procedural justice and perceived organizational support, a precondition of significant variance in the Level 2 slopes should be supported [79].

## **Results**

### *Reliability Tests*

Confirmatory factor analysis (CFA) was conducted to assess convergent and construct validity of the measurement model at both organizational and individual levels [80]. First order-factor model was adopted to examine each individual research construct, the result of these procedures indicated that standardized loading for all items exceeded .70 and that t-values were higher than 1.96 ( $p < .001$ ), which satisfied the threshold as recommended by Hair et al. [71]. Then, second order CFA was conducted to examine overall measurement model of the organizational level (i.e., procedural justice and perceived organizational support), as shown in Figure 2 and Table 1. The second order CFA of overall measurement model of individual level was also performed (i.e., employee engagement, job satisfaction, and employee creativity), as shown in Figure 3 and Table 2. The results showed the overall goodness-of fit assessment for both level analyses are satisfied with the threshold, which thus demonstrating that the research model can be presented as a good model fit with adequate convergent validity and construct reliability [e.g., 71, 81, 82, 83]. Therefore, means, standard deviations, and correlations among control and research

variables of both level analyses are reported in Table 3 and 4. Consistent with the literature, each research variable had significant correlations.

Table 1 Results of CFA (organizational level—N=78)

Construct	Variables	Standardized loading	t-value	AVE
<b>Procedural justice (PJ)</b>				<b>.680</b>
Pj1	Job decisions are made by this organization in an unbiased manner.	.774***	9.591	
Pj2	This organization makes sure that all employee concerns are heard before job decisions are made.	.761***	9.24	
Pj3	To make job decisions, this organization collects accurate and complete information.	.903***	13.741	
Pj4	This organization clarifies decisions and provides additional information when requested by employees.	.943***	A	
Pj5	All job decisions are applied consistently across all affected employees.	.781***	9.586	
Pj6	Employees are allowed to challenge or appeal job decisions made by this organization.	.766***	9.217	
<b>Perceived organizational support (POS)</b>				<b>.637</b>
Pos1	This organization really cares about my well-being.	.800***	A	
Pos2	This organization strongly considers my goals and values.	.843***	8.545	
Pos3	This organization shows little concern for me. (Reversed code)	.823***	8.273	
Pos4	This organization cares about my opinions.	.765***	7.547	
Pos5	This organization is willing to help me if I need a special favor.	.823***	8.265	
Pos6	Help is available from this organization when I have a problem.	.748***	7.236	
Pos7	This organization would forgive an honest mistake on my part.	.781***	7.694	
Pos8	If given the opportunity, this organization would take advantage of me. (Reversed code)	<.60	Deleted	

Notes:  $\chi^2 = 62.904$ ,  $df = 58$ ,  $GFI = .903$ ,  $AGFI = .847$ ,  $CFI = .994$ ,  $RMSEA = .033$ , ( $p = .307 > .05$ ).

\*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ , and significant level at a t-value  $> 1.96$

Table 2 Results of CFA (employee level—N=234)

Construct	Variables	Standardized loading	t-value	AVE
<b>Employee engagement (ENG)</b>				<b>.744</b>
Eng1	I spend much effort to engage in my job.	.827***	18.623	
Eng2	I spend considerable time trying to do my work right.	.921***	24.987	
Eng3	I often think about having greater opportunities at work to learn and grow.	.923***	A	
Eng4	The company's mission makes me feel my job is important.	.892***	22.775	
Eng5	I am highly committed to improving quality work.	.855***	20.21	
Eng6	My supervisor/fellow employees encourage my job development.	.745***	15.297	
<b>Job satisfaction (JS)</b>				<b>.699</b>
Js1	I feel fairly well satisfied with my job.	.770***	14.813	
Js2	I find real enjoyment in my job.	.840***	17.592	
Js3	Most days I am enthusiastic about my job.	.810***	16.327	
Js4	I like my job better than the average worker does.	.871***	18.726	
Js5	I definitely dislike my job (Reverse coded).	.885***	A	
<b>Employee creativity (ECR)</b>				<b>.665</b>
Ecr1	We encourage and emphasize or reinforce creativity by employees.	.902***	19.506	
Ecr2	We respect employees' ability to function creatively.	.869***	20.333	
Ecr3	We allow employees to try to solve the same problems in different ways.	.907***	A	
Ecr4	We expect employees to deal with problems in different ways.	.882***	21.06	
Ecr5	We will reward employees who are creative in doing their job.	.907***	22.585	
Ecr6	We will publicly recognize those who are creative.	.902***	19.506	

Notes:  $\chi^2 = 95.812$ ,  $df = 79$ ,  $GFI = .952$ ,  $AGFI = .917$ ,  $RMR = .027$ , ( $p = .096 > .05$ ).  
 \*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ , and significant level at a  $t$ -value  $> 1.96$

Table 3 Correlation matrix of research variables (supervisor level—N=78)

Variables	Mean	Std. D	1	2	3	4
1. POS	5.039	1.025	<b>.928</b>			
2. PJ	4.842	1.140	.697**	<b>.926</b>		
3. Education	1.410	0.746	0.023	-0.007	n/a	
4. Job tenure	1.513	0.785	-0.119	-0.152	.589**	n/a

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

Internal consistency reliabilities appear as bold numbers along the diagonal. n/a=not available.



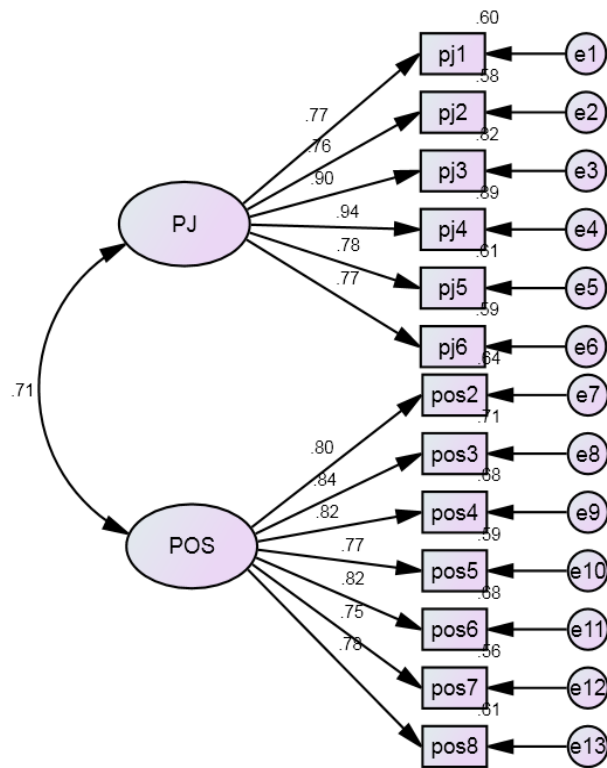
Table 4 Correlation matrix of research variables (employee level—N=234)

Variables	Mean	Std. D	1	2	3	4	5
1. ENG	4.187	1.138	<b>.942</b>				
2. JS	3.799	0.800	.771**	<b>.926</b>			
3. ECR	4.687	0.991	.761**	.797**	<b>.939</b>		
4. Education	1.594	0.819	0.056	0.056	0.01	n/a	
5. Job tenure	1.539	0.753	.146*	.148*	.206**	.453**	n/a

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

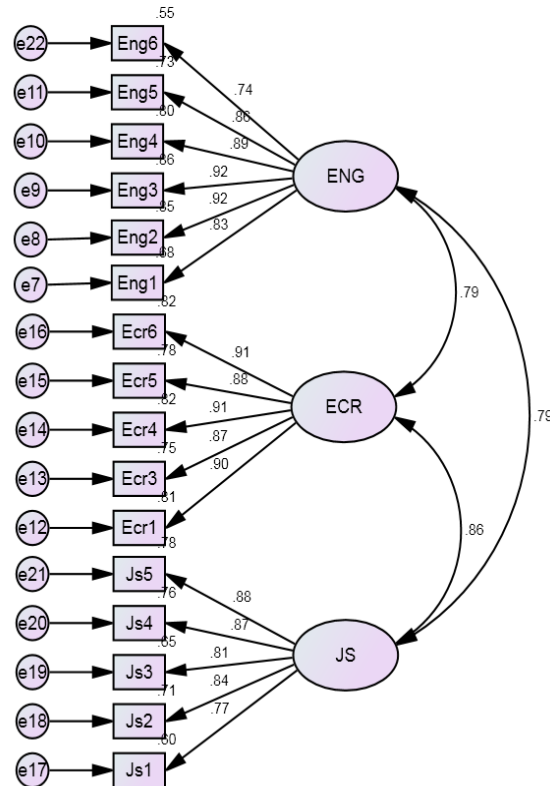
\* . Correlation is significant at the 0.05 level (2-tailed).

Internal consistency reliabilities appear as bold numbers along the diagonal. n/a=not available.



Model=Standardized estimates  
Group=Group number 1  
Ch-square=62.904,  
df=58, Chi-square/df=1.085,  
GFI=.903, AGFI=.847,  
NFI=.929, CFI=.994,  
RMSEA=.033, P=.307

Figure 2 Second order-CFA of organizational level (N=78)



Model=Standardized estimates  
Group=Group number 1  
Ch-square=95.812,  
df=79, Chi-square/df=1.213,  
GFI=.952, AGFI=.917,  
NFI=.977, CFI=.996,  
RMR=.027, RMSEA=.030, P=.096

Figure 3 Second order-CFA of individual level (N=234)

## *Hypotheses Testing*

### *Cross-Level Hypotheses (HLM)*

To determine if the variance in slopes at Level 2 was related to procedural justice and perceived organizational justice (Hypotheses 1-6), we first examined an intercepts-as-outcomes model as a preliminary model, which includes procedural justice and perceived organizational justice as predictors of employee engagement, job satisfaction, and employee creativity, respectively. This procedure provided a baseline model for illustrating the change in explained variance ( $R^2$ ) in the Level 1 slopes with the addition of the interaction terms. Then, we examined a slopes-as-outcomes model at Level 2. Table 5 provides a summary of the models and results used to test Hypotheses 1-6. We controlled for job tenure and education in our tests of each hypothesis. Only, job tenure and education were significant in the model for Hypothesis 3 ( $\gamma_{10}=.075$  and  $\gamma_{10}=.081$ ,  $p<.05$ ).

The findings indicated that procedural justice has positive and significant effect on employee engagement ( $\gamma_{01}=.284$ ,  $p<.01$ ,  $R^2=.267$ ), job satisfaction ( $\gamma_{01}=.553$ ,  $p<.001$ ,  $R^2=.392$ ), and creativity ( $\gamma_{01}=.519$ ,  $p<.001$ ,  $R^2=.307$ ), which provided support for Hypothesis 1, Hypothesis 2, and Hypothesis 3, respectively. As can be seen in Table 5, results showed that perceived organizational support also has a positive and significant influence on employee engagement ( $\gamma_{01}=.366$ ,  $p<.001$ ,  $R^2=.208$ ), job satisfaction ( $\gamma_{01}=.647$ ,  $p<.001$ ,  $R^2=.367$ ), and employee creativity ( $\gamma_{01}=.511$ ,  $p<.001$ ,  $R^2=.289$ ), which confirmed Hypothesis 4, Hypothesis 5, and Hypothesis 6, respectively.

Table 5 Hierarchical Linear Modeling Results for procedural justice and perceived organizational support

Model	Parameter Estimates							<i>R</i> <sup>2</sup>
	$\gamma_{00}$	$\gamma_{01}$	$\gamma_{10}$	$\gamma_{11}$	$\sigma^2$	$\tau_{00}$	$\tau_{11}$	
Hypothesis 1: Procedural justice and employee engagement								
L1: $ENG_{ij} = \beta_{0j} + \beta_{1j}*(JT_{ij}) + \beta_{2j}*(Edu_{ij}) + r_{ij}$								
L2: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(PJ_j) + u_{0j}$	3.636*** (t= 44.99, p<.001)	.284** (t=2.442, p<.01)	.014	.024	.331	.039	.048	.267
$\beta_{1j} = \gamma_{10} + u_{1j}$								
$\beta_{2j} = \gamma_{11} + u_{2j}$								
Hypothesis 2: Procedural justice and job satisfaction								
L1: $JS_{ij} = \beta_{0j} + \beta_{1j}*(JT_{ij}) + \beta_{2j}*(Edu_{ij}) + r_{ij}$								
L2: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(PJ_j) + u_{0j}$	3.777*** (t=38.454, p<.001)	.553*** (t=5.870, p<.001)	.056	.005	.346	.078	.026	.392
$\beta_{1j} = \gamma_{10} + u_{1j}$								
$\beta_{2j} = \gamma_{11} + u_{2j}$								
Hypothesis 3: Procedural justice and employee creativity								
L1: $ECR_{ij} = \beta_{0j} + \beta_{1j}*(JT_{ij}) + \beta_{2j}*(Edu_{ij}) + r_{ij}$								
L2: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(PJ_j) + u_{0j}$	3.654*** (t=50.48, p<.001)	.519*** (t=7.883, p<.001)	.075*	.081*	.245	.031	.018	.307
$\beta_{1j} = \gamma_{10} + u_{1j}$								
$\beta_{2j} = \gamma_{11} + u_{2j}$								
Hypothesis 4: Perceived organizational support and employee engagement								
L1: $ENG_{ij} = \beta_{0j} + \beta_{1j}*(JT_{ij}) + \beta_{2j}*(Edu_{ij}) + r_{ij}$								
L2: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(POS_j) + u_{0j}$	3.631*** (t=44.37, p<.001)	.366** (t=2.496, p<.01)	.0032	.013	.329	.068	.038	.208
$\beta_{1j} = \gamma_{10} + u_{1j}$								
$\beta_{2j} = \gamma_{11} + u_{2j}$								
Hypothesis 5: Perceived organizational support and job satisfaction								
L1: $JS_{ij} = \beta_{0j} + \beta_{1j}*(JT_{ij}) + \beta_{2j}*(Edu_{ij}) + r_{ij}$								
L2: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(POS_j) + u_{0j}$	3.766*** (t=50.74, p<.001)	.647*** (t=8.22, p<.001)	.097	.050	.347	.098	.049	.367
$\beta_{1j} = \gamma_{10} + u_{1j}$								
$\beta_{2j} = \gamma_{11} + u_{2j}$								
Hypothesis 6: Perceived organizational support and employee creativity								
L1: $ECR_{ij} = \beta_{0j} + \beta_{1j}*(JT_{ij}) + \beta_{2j}*(Edu_{ij}) + r_{ij}$								
L2: $\beta_{0j} = \gamma_{00} + \gamma_{01}*(POS_j) + u_{0j}$	3.642*** (t=48.176, p<.001)	.511*** (t=7.570, p<.001)	.032	.028	.268	.046	.028	.289
$\beta_{1j} = \gamma_{10} + u_{1j}$								
$\beta_{2j} = \gamma_{11} + u_{2j}$								

Note: \*\*\* p<0.001, \*\* p<0.01, \* p<0.05. L1 = Level 1 (N=234) ; L2 = Level 2 (N=78);  $\gamma_{00}$  = Intercept (unstandardized coefficient) of Level 2 regression predicting  $\beta_{0j}$ ;  $\gamma_{01}$  = Slope (standardized coefficient) of Level 2 regression predicting  $\beta_{0j}$ ;  $\gamma_{10}$  = Intercept (standardized coefficient) of Level 2 regression predicting  $\beta_{1j}$ ;  $\gamma_{11}$  = Intercept (standardized coefficient) of Level 2 regression predicting  $\beta_{2j}$ ;  $\sigma^2$  = Variance in Level 1 residual (i.e., variance in  $r_{ij}$ );  $\tau_{00}$  = Variance in Level 2 residual for models predicting  $\beta_{0j}$  (i.e., variance in  $u_{0j}$ );  $\tau_{11}$  = Variance in Level 2 residual for models predicting  $\beta_{1j}$  (i.e., variance in  $u_{1j}$ ). POS= Perceived organizational support; PJ=Procedural justice; JT = Job tenure; Edu = Education; ENG= Employee engagement; JS= Job satisfaction, ECR = Employee creativity.  $R^2$  calculations were computed following Hofmann, Griffin, and Gavin [84] and Hofmann, Morgeson, and Gerrass [85].

### *Structural Equation modeling (SEM)*

Structural equation modeling (SEM) was adopted to test the maximum likelihood estimate method and Hypotheses 7-9. The results showed (see Figure 8 and Table 6) that  $\chi^2 = 106.676$ ;  $df = 80$ ;  $GFI = .945$ ;  $AGFI = .907$ ;  $RMR = .033$ , and  $p = .025$ , all of which satisfied the threshold as suggested by Hair et al. [71]. Hypothesis 7 predicted employee engagement to have a positive effect on job satisfaction. The findings provided support for Hypothesis 7 ( $\beta = .80$ ;  $p < .001$ ;  $t = 12.827$ ). Hypothesis 9 predicted job satisfaction to have a positive effect on employee creativity. The results provided support Hypothesis 9 ( $\beta = .69$ ;  $p < .001$ ;  $t = 8.715$ ). Finally, the prediction of the effect of employee engagement and employee creativity has confirmed and provided partially support for Hypothesis 8 ( $\beta = .22$ ;  $p < .01$ ;  $t = 3.151$ ). As suggested by Baron and Kenny's test [86] (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 job satisfaction has partially mediated the relationship between employee and employee creativity. This notion is in line with Sobel's test [87] illustrated that  $z$ -test statistic must be exceeded a value of  $t$ -test=1.96, which indicated that mediator effect exists. In this study  $z$ -test=6.151, ( $p < .001$ )  $> 1.96$ . Therefore, we assume that job satisfaction plays an important role as mediating effect, as proposed in Hypothesis 8.

Table 6. Path coefficient of structural model

Path relationship	Standardized coefficient	SE	t-value	p
H7: Employee engagement → Job satisfaction	.80***	.039	12.827	<.001
H9: Job satisfaction → Employee creativity	.69***	.107	8.715	<.001
H8: Employee engagement → Employee creativity	.22**	.059	3.151	.002
<b>Goodness of fit assessment</b>				
Chi-square ( $\chi^2$ )	= 106.676 (p=.025)			
Df	= 80			
GFI	= .945			
AGFI	= .907			
RMR	= .033			

Notes: \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , and significant level at t-value  $> 1.96$ .

ENG=Employee engagement; JS=Job satisfaction; ECR=Employee creativity.

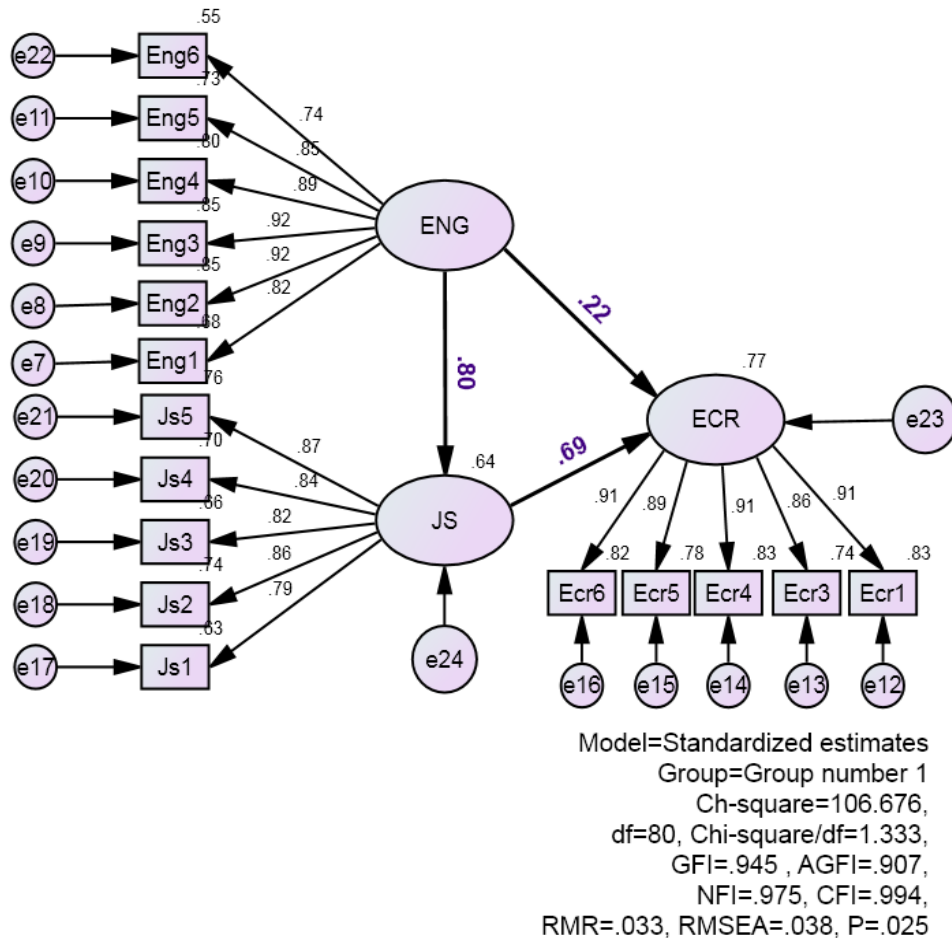


Figure 4 Structural model of individual level

## Discussion

In a case of the analysis of cross-level, the effects of procedural justice on employee engagement, job satisfaction, and employee creativity were confirmed by this study, such as Hypothesis 1 ( $\gamma_{01}=.284$ ,  $p<.01$ ,  $R^2=.267$ ), Hypothesis 2 ( $\gamma_{01}=.553$ ,  $p<.001$ ,  $R^2=.392$ ), and Hypothesis 3 ( $\gamma_{01}=.519$ ,  $p<.001$ ,  $R^2=.307$ ), respectively. Conceptually, these relationship have been mostly ignored with regard to empirical testing, therefore, this study may lack the evidence to support the present findings. Since previous studies have fail to discover the effect of procedural justice on employee's job engagement in individual analysis at non-specific research context [e.g.,30] and cross-sectional of service contexts in Malaysia [e.g., 31]. Thus, the findings of this study were confirmed at cross-level analysis of employee-supervisor pairs in high-tech industries. This finding is also in line with previous findings at individual analysis, such as Saks [30] used unspecific samples, McFarlin and Sweeney [35] used student samples, Hon and Lu [37] examined expatriate outcomes, and cross-sectional survey about complaint handling experiences of passengers waiting [e.g., 88]. The effect of procedural justice on employee creativity was confirmed in this study, while this effect at individual analysis was uncovered by Simmons [40] in a study of doctoral students.

To verify whether the perceived organizational support has a positive and significant on employee engagement, job satisfaction, and employee creativity, the results of the analysis provided support for Hypothesis 4 ( $\gamma_{01}=.366$ ,  $p<.001$ ,  $R^2=.208$ ), Hypothesis 5 ( $\gamma_{01}=.647$ ,  $p<.001$ ,  $R^2=.367$ ), and Hypothesis 6 ( $\gamma_{01}=.511$ ,  $p<.001$ ,  $R^2=.289$ ), respectively. The link between POS and employee engagement was confirmed by this study at cross-level analysis. This finding is also in line with previous empirical findings at individual analysis, which proposed that social exchange perspectives (i.e., perceived organizational support) [e.g., 30], and supervisory support

have a positive influence on employee work engagement [e.g., 89], and job engagement [e.g., 31]. At individual level analysis, the relationship between POS and job satisfaction has been empirical examined by previous studies on a variety of research contexts [e.g., 1, 7, 8, 13, 16, 17, 48]. However, at cross-level analysis, this relationship is confirmed by this study. In previous extension literature of POS, cross-level effects of relationship between POS and employee creativity has been very rare. These study results are in in line with a few findings in the social exchange literature, which posited that the support provided supervisor has a positive influence on subordinate's work creativity [51], and supervisory encouragement and work group support are positively related to individual perceived work innovation [52].

In summary, the findings of this study at cross-level analysis were validated previous empirical evidences which examined at individual analysis. According to the extension theory of social exchange, we can conclude that POS and procedural justice play very critical role in explaining individual behavior and outcomes at cross-level analysis. Based on the findings of this study, it is indicated that supervisors/managers in the R&D of each high-tech firm has similar perceptions on how to treat and encourage their subordinates to achieve work performance. On the other hand, individual employees with higher levels of support and justice or fair treatment from managers in work units seem to be key sources to build high level of individual's commitment to job engagement, satisfaction, and creativity at work.

### **Managerial Implications**

The aim of this study was to enable managers to adopt more appropriate work practices to enhance individual employee's job engagement and thereby their job satisfaction and creativity at work. This research provides additional evidence to support the limited amount in

the literature of organizational justice indicating that procedural justice of treatment can influence employee engagement, job satisfaction and employee creativity [38]. The extension literature of the social exchange theory also confirmed that perceived organizational support can predict employee engagement, job satisfaction, and employee creativity at cross-level analysis in high-tech context. Thus, this study contributes to cross-effects that employee-supervisor pairs can be explained by the social exchange and organizational justice theories. The findings of this study are to provide manager-employee dyadic relationship with some efforts for decision-making process, using fair procedures to enhance employee performance [90].

From another perspective, the findings of this study also indicated that fair treatment and high level support from organization either among supervisors or between supervisor and subordinates are key resources by which to increase employee retention, and reduce turnover intention [e.g., 29, 91]. When subordinates feel satisfied with the fairness of treatment and higher levels of support from their working unit, they tend to have higher levels of organizational commitment, as well as lower levels of work conflict and job stress [e.g., 5, 7]. In line with previous study, procedural justice leads to promote better perceptions of legitimacy and trust in the organization [24]. According to Farne, Tierney, and Kung-McIntyre [92], “if employees view procedures as fair, they may view the organization positively (commitment), even if they are currently dissatisfied with such personal outcomes.” Basically, it is imperative for correctional organizational support and fair treatment to recognize those characteristics of the organization that contribute to a less stressed, more satisfied and committed to engaging in workforce, which may lead to increase more work creativities. Therefore, it is expected that these additional findings may be good resources to enhance the relationship between employees and managers/organizations at work units. It is also believed that a better understanding of



matched employee-manager pair relationships is very important for building human and social capital in organizational learning and justice context.

### **Limitations and Future Research**

This study integrates a comprehensive model to investigate employee-supervisor/or manager dyadic relationship at high-tech industries, by extending theories of social exchange and organizational justice. These theories revealed that procedural justice and POS can predict individual employee outcomes, such as job engagement, satisfaction, and creativity. However, a few limitations were still recognized by this study that may provide better development for future research. First, this study suspects that employee engagement may play an important role as mediator for the influences of procedural justice on employee creativity and job satisfaction. For example, the influence of each procedural justice is first on job satisfaction, and through employee attitudes toward work engagement [24]. Thus, it is suggested that further research should examine cross-mediating effects in order to better provide additional findings which can enhance the validity and generalizability of the current findings. We hope this study will stimulate further interest in examining the effects of support and justice on both level analyses.

Second, since our research samples focus on Chinese context, this study suspects that leadership styles (i.e., transformational) [e.g., 93], empowerment leadership [e.g., 69], and cross-cultural differences (i.e., individualism vs collectivism, and power distance) [e.g., 94, 95] may influence individual employee outcomes, such as employee creativity. Thus, the above variables should be included for future study. Third, at both organizational and individual level analyses, most justice research ignores the relationships among employee engagement, job satisfaction, and employee creativity. Thus, the findings of this study are also in lack of empirical support

from previous studies. Future research can extend this framework to study on cross-sectional contexts, such as using samples from the United States, European, and other Asia countries in order to achieve generalizability of research findings.

Fourth, this study focuses on employee-supervisor pairs in the R&D department of high-tech firms in Taiwan, which seems to be a small portion for representing for total staffs of such high-tech firms. It is suggested that future research should take a closer look at cross-functional units or teams rather than single units alone. Cross-functional units (i.e., R&D, marketing, and production department) may enhance individual employees to come up with developing and creating useful ideas to perform their job effectively. As suggested by Lussier and Achua [96], cross-functional units/teams are brought together to perform unique tasks to create innovative product designed to achieve high levels of organizational performance and satisfy customers.

Fifth, future studies should explore not only the impact of perceived organizational support and procedural justice on employee's job engagement, satisfaction, and creativity, but also the impact of perceived organizational support and procedural justice on other areas of employee behaviors, such as life satisfaction, psychological and emotional withdrawal from the job, intention to quit, turnover, and absenteeism [24]. Finally, a basic direction for future research is to determine whether organizational expectations and individual outcomes other than those constructs that examined here in this study will yield similar predictive patterns for procedural justice and organizational support [35]. It is suggested that a more accurate conceptualization of the extension literature of social exchange, and procedural justice will better serve both researchers and practitioners in understanding the impact of justice or fair procedures in organizations [17, 88]. Organizations should encourage managers to enhance quality

relationship, which may in turn foster POS and fairness procedures to increase subordinates attitudes and behavior at workplace.

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