An Application of Moderation Analysis: The Situation of School Size in the Relationship among Principal's Leadership Style, Decision Making Style, and Teacher Job Satisfaction

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Abstract- The main purpose of this research is to illustrate that school size a moderator can effect on the relationship among principal’s leadership style (PLS), principal’s decision making style (PDMS), and teacher job satisfaction (TJS). Moreover, in this article, some hypotheses have been proposed to verify the existing relations among TJS, PLS, and PDMS. Based on samples randomly chosen from primary, secondary and high schools in Chinese educational systems in China, the required data are gathered through a mail survey, and the proposed hypotheses are tested via moderation analysis and structural equation modeling.

Keywords- Moderation Analysis; Structural Equation Modeling; Principal’s leadership style; principal’s decision making style; teacher job satisfaction; school size.

1. INTRODUCTION

Roles of principals and teachers of an educational institute are significant factors in determining the quality of education in that institute [1]. However, the role that teachers play regarding student’s achievement is more important since they are directly involved in educational activities carried out in class and are in more contact with students than any other staff of the educational system [2]. Therefore, taking into consideration that the staff that have high job satisfaction, tend to work more effectively with high performance level, for which the significance of the TJS in educational success and improvement of student learning will be more understandable [3]. Teachers, who are satisfied with their job, are more enthusiastic and interested in devoting more energy and time to student achievement [4]. Therefore, understanding the important factors affecting the TJS is vital to attain the required information to support an educational system to succeed in its objectives [5]. In this respect, numerous studies have been conducted on the relationship between TJS with PLS [6], PDMS [7], and both PLS and PDMS [8]. This study is improvement study Hui, Jenatabadi [8] which was concentrated the relationship among PLS, PDMS, and TJS. In this study we tested the impact school size on this relation. Therefore, the main contribution the paper is to examine the moderation effect of school size in the research model.

2. MATERIALS AND METHODS

Panel Data [9-11], ANOVA [12-14], and Regression [15-17] are the most familiar methodology which is used in so many studies related to operations research area. In recent years, SEM has attracted the attention of many researchers as a commonly adopted method used in various disciplines like Management [18-24], Transportation [25-29], and Computer Science [30-33].

2.1 Research Design

In this study, a system perspective is utilized that considers the PLS as a significant input, the PDMS as an essential process, and the TJS as an ultimate output. As per the
relevant literature, the current study builds up a framework for research as displayed in Figure 1.

![Research Model](image)

**Figure 1: Research Model**

Based on research model we propose the following hypotheses:

H₁: The PLS affects the PDMS.
H₂: The PLS relates positively to TJS
H₃: The PDMS relates positively to TJS.
H₄: The PDMS is a mediator between the PLS and the TJS.
H₅: School size is a moderation in the relationship among PLS, PDMS, and TJS.

### 2.2 Sample and Data Collection

According to Jöreskog and Sörbom [34], SEM requires a large size of sample cases to be able to get reliable estimations. As Kline [35] suggests, estimation reliability is based on the number of selected sample cases, i.e., below 100 samples is considered as small; between 100 and 200 represents an average reliability level, and above 200 samples is taken as large. The prepared questionnaire was mailed to the randomly selected participants in this survey. A total of 539 copies of the questionnaire were posted to teachers in 180 elementary schools, 172 secondary schools, and 187 high schools situated within the province of Xinjiang in China. Of the total questionnaires delivered only 210 copies were completed and returned, which make up 38% of the total posted questionnaires. The participants were from a wide variety of demographic backgrounds with their specific characteristics for each. The majority of the respondents, i.e., 84%, were female teachers. Around 83% of the participants were university graduates with the Bachelor’s degree, 13% were the college graduates, and the rest held a Master’s degree. In terms of age, 72% of the teachers were between 30 and 40 at the time of responding, 21% were less than 30 years old, and the rest were over 40 years old. The work experience of only 46% of the teachers was between 10-20 years, while 32% had less than 10 years job experience, and 23% had over 20 years of experience.

### 2.3 Measures

This study is a quantitative research in which a survey, specifically prepared for this topic, was employed to collect the required data for the underlying analysis. The questionnaire that prepared and employed for the current research, consisted of four sections. The first section contained some general questions about the respondent’s, principal’s or teacher’s, demographic background, while the second part contained some questions related to the employed leadership style. This section was prepared in accordance with the researches and conclusions achieved by Bass and Avolio [36]. According to Bass and Avolio’s definition, the two dimensions in leadership style, are transactional and transformational leadership styles. The third section included questions about the PDMS based on the researches conducted by Scott and Bruce [37] who defined five dimensions in decision making style, namely, rational, dependent, intuitive, avoidant, and spontaneous. The last section concerned job satisfaction based on the TJS, suggested by Lester [38]. The two significant factors explored in TJSQ were: supervision and working conditions.

### 3. ANALYSIS

#### 3.1 Validity and Reliability

As it is seen from Table 1, all factor loadings, other than the avoidant factor, could meet the recommended norms and standards, which mean that the proposed construct convergent validity of the measurement model is adequate. However, the avoidant factor was required for further investigation, since the correlation rate of this item with other items in the construct (dependent items) was significant, i.e., (r = .30, p < .01).

| Latent Variable | Item | Factor Loading (>.70)* | AVE (>.50)* | Composite reliability (>.70)* |
|-----------------|------|------------------------|------------|-----------------------------|
| PLS             |      | .91                    | .71        |
|                 | PLS1 | .99                    |
|                 | PLS2 | .92                    |
| PDMS            |      | .51                    | .78        |
|                 | PDMS1| .74                    |
|                 | PDMS2| .70                    |
|                 | PDMS3| .73                    |
|                 | PDMS4| .43                    |
|                 | PDMS5| .89                    |
| TJS             |      | .81                    | .88        |
|                 | TJS1 | .92                    |
|                 | TJS2 | .87                    |

As shown, in Table 2, the AVEs square roots have been substituted with the diagonal elements of the correlation matrix. Therefore, the resulting Discriminant validity for all constructs seems to be adequate enough and satisfactory.
3.2 Measurement and Structural Model

For assessment of the strength, the outcomes and the model stability, SEM with AMOS 16 was employed, for which the estimated parameters and suitability of indicators have been illustrated in Table 3. As the results support, this structure suits the data satisfactorily: $\chi^2 (23, n = 210) = 91.166, p < .01$, CFI = .943, TLI = .911, IFI = .944, NFI = .926, RMSEA = .019. The displayed results in Table 3 further support the Hypothesis 1. Therefore, there is a significant positive relationship between the PLS and the PDMS: $\beta = .26$, C.R. = 2.284, $p < .05$. The data in Table 3 also provides sufficient support for Hypotheses 2 and 3. Therefore, the PLS and TJS are significantly and positively related to each other: $\beta = .69$, C.R. = 9.179, $p < .01$. A further positive and significant relationship exists between the PDMS and the TJS: $\beta = .39$, C.R. = 3.320, $p < .01$.

Finally, as per H$_5$, school size plays the role of moderator on the relationships among the variables PLS, PDMS, and TJS. To assess the moderation effects of school size, this paper utilizes the two-group comparison of path model. For this purpose, the database is divided into two types of schools along each factor level median. Therefore, schools with moderators of higher grades are involved in one group, call it bigger, and those with lower grade moderators are categorized in another group which is called smaller. To examine the differences in the firm size and the age among the regression weights, the Critical Ratio (C.R.) test ($> \pm 1.96$, $p < .05$) should be used to obtain the statistics of the critical ratio for the differences among regression weights of subjects of lower and higher sizes or ages [39]. As Arbuckle and Wothke [40] state, the critical ratio of an estimate pair, tests the hypothesis to arrive at confirmation of the two parameters equality. Table 4 demonstrates that the relationships among three main constructs are significantly positive in case of all groups, and the three variables in question, affect the intensity level of these relationships. Therefore, the variable of school size plays a role of the moderators in the model which, in turn, supports the H$_5$ proposed in this research.

### Table 2. Discriminant validity for the measurement model.

|      | PLS       | PDMS     | TJS     |
|------|-----------|----------|---------|
| PLS  | (.91)     |          |         |
| PDMS | .26 (.51) |          |         |
| TJS  | .23 (.45) | .45 (.81)|         |

### Table 3. Estimating research parameters

| Hypotheses | Path         | Standardized coefficient | C. R. | p-value | Result  |
|------------|--------------|--------------------------|-------|---------|---------|
| H$_1$      | PLS $\rightarrow$ PDMS | .51                      | 6.480 | < .01   | Supported |
| H$_2$      | PLS $\rightarrow$ TJS  | .17                      | 2.195 | < .05   | Supported |
| H$_3$      | PDMS $\rightarrow$ TJS  | .60                      | 7.058 | < .01   | Supported |

$\lambda^2 (23) = 91.166$  
CFI=.943  
TLI=.911  
RMSEA=.019  
IFI=.944  
NFI=.926

Figure 2: Conceptual Model Result
The style of leadership has been practiced in various environments recently. The efficiency of the style, however, is dependent from a variety of important factors. The main objective of this study is an attempt to declare the significance of the relationships that exist among leadership style, decision making style and TJS. As the achieved empirical evidence substantiates, a thorough implementation of leadership style is required. In addition, the leadership style should accompany the decision making style, which will finally result in TJS. In case the decision making stage is neglected by a school, the employed leadership style can hardly lead to the promotion of TJS. Therefore, the role that decision making style plays is to bridge the leadership style and the TJS, linking the weak points to the leadership style to obtain the optimal result. Concisely, schools cannot achieve TJS through the implementation of leadership style alone and must utilize the decision making style, which mediates the relationship between the two other variables, i.e., the PLS and the TJS.

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REFERENCES

[1] Hallinger, P. and R.H. Heck, Reassessing the principal's role in school effectiveness: A review of empirical research, 1980-1995. Educational Administration Quarterly, 1996. 32(1): p. 5.

[2] Rowan, B., R. Correnti, and R. Miller, What Large-Scale Survey Research Tells Us About Teacher Effects on Student Achievement: Insights from the Prospects Study of Elementary Schools. The Teachers College Record, 2002. 104(8): p. 1525-1567.

[3] Ostroff, C., The relationship between satisfaction, attitudes, and performance: An organizational level analysis. Journal of Applied Psychology, 1992. 77: p. 963-963.

[4] Nguni, S., P. Sleegers, and E. Denessen, Transformational and transactional leadership effects on teachers' job satisfaction, organizational commitment, and organizational citizenship behavior in primary schools: The Tanzanian case. School Effectiveness and School Improvement, 2006. 17(2): p. 145-177.

[5] Perie, M., et al., Job satisfaction among America's teachers: Effects of workplace conditions, background characteristics and teacher compensation. 1997: US Dept. of Education, Office of Educational Research and Improvement, National Center for Education Statistics.

[6] Bogler, R., The influence of leadership style on teacher job satisfaction. Educational Administration Quarterly, 2001. 37(5): p. 662.

[7] Lynch, D., THE EFFECT OF INVOLVEMENT IN DECISION MAKING ON TEACHER RETENTION. 2010.

[8] Hui, H., et al., Principal's leadership style and teacher job satisfaction: A case study in China. Interdisciplinary Journal of Contemporary Research in Business, 2013. 5(4): p. 175-184.
[9] Jenatabadi, H.S. and N.A. Ismail, The Determination of Load Factors in the Airline Industry. International Review of Business Research Papers, 2007. 3(4): p. 125-133.
[10] Samimi, P. and H.S. Jenatabadi, Globalization and Economic Growth: Empirical Evidence on the Role of Complementarities. PloS one, 2014.
[11] Naghavi, N. and W.-Y. Lau, Exploring the nexus between financial openness and informational efficiency–does the quality of institution matter? Applied Economics, 2014. 46(7): p. 674-685.
[12] Noudoostbeni, A., et al., An effective end-user knowledge concern training method in enterprise resource planning (ERP) based on critical factors (CFs) in Malaysian SMEs. International Journal of Business and Management, 2010. 5(7): p. P63.
[13] Noudoostbeni, A., N.M. Yasin, and H.S. Jenatabadi, To investigate the success and failure factors of ERP implementation within Malaysian small and medium enterprises. in Information Management and Engineering, 2009. ICIME’09. International Conference on. 2009. IEEE.
[14] Noudoostbeni, A., N.M. Yasin, and H.S. Jenatabadi, A mixed method for training ERP systems based on knowledge sharing in Malaysian Small and Medium Enterprise (SMEs), in Information Management and Engineering, 2009. ICIME’09. International Conference on. 2009. IEEE.
[15] Jenatabadi, H.S. and A. Noudoostbeni, End-User Satisfaction in ERP System: Application of Logit Modeling. Applied Mathematical Sciences, 2014. 8(24): p. 1187-1192.
[16] Arashi, M., et al., Bayesian analysis in multivariate regression models with conjugate priors. Statistics, 2013(ahead-of-print): p. 1-11.
[17] Barkhordar, B. and R. Ahmad, The Moderating Impact of Individual Ownership on The Relationship between Dividend Yield and Ex-dividend Day Excess Return. International Journal of Research in Business and Technology, 2014. 5(2): p. 635-644.
[18] Radzi, C.W.J.W.M., et al., The Relationship among Transformational Leadership, Organizational Learning, and Organizational Innovation: A Case Study in Asian Manufacturing Food Industry. Asian Journal of Empirical Research, 2013. 3(8): p. 1051-1060.
[19] Jenatabadi, H.S., Situation of Innovation in the Linkage between Culture and Performance: A Mediation Analysis of Asian Food Production Industry. Contemporary Engineering Sciences, 2014. 7(7): p. 323-331.
[20] Hui, H., et al., The Impact of Firm Age and Size on the Relationship Among Organizational Innovation, Learning, and Performance: A Moderation Analysis in Asian Food Manufacturing Companies. Interdisciplinary Journal of Contemporary Research In Business, 2013. 5(3).
[21] Jasimah, C.W., et al., Explore Linkage between Knowledge Management and Organizational Performance in Asian Food Manufacturing Industry. International Journal of Asian Social Science, 2013. 3(8): p. 1753-1769.
[22] Hui, H., H.S. Jenatabadi, and S. Radu, Knowledge Management and Organizational Learning in Food Manufacturing Industry. in International Conference on Economic, Finance and Management Outlooks (ICEFMO 2013). October 5-6 2013, Kuala Lumpur, Malaysia. 2013. Kuala Lumpur, Malaysia.
[23] Hui, H., et al., Influence of Organizational Learning and Innovation on Organizational Performance in Asian Manufacturing Food Industry. Asian Journal of Empirical Research, 2013. 3(8): p. 962-971.
[24] Hui, H., et al., Impact of knowledge management and organizational learning on different dimensions of organizational performance: A case study of asian food industry. Interdisciplinary Journal of Contemporary Research in Business, 2013. 5(3): p. p148.
[25] Jenatabadi, H.S., Impact of Economic Performance on Organizational Capacity and Capability: A Case Study in Airline Industry. International Journal of Business and Management, 2013. 8(17): p. p112.
[26] Jenatabadi, H.S., Introduction Latent Variables for Estimating Airline Assessment. International Journal of Business and Management, 2013. 8(18): p. p78.
[27] Jenatabadi, H.S. and N.A. Ismail, A NEW PERSPECTIVE ON MODELING OF AIRLINE PERFORMANCE. 3rd International Conference on Business and Economic Research, March 12-13 2012, Bandung, Indonesia., 2012.
[28] Jenatabadi, H.S. and N.A. Ismail, Application of structural equation modelling for estimating airline performance. Journal of Air Transport Management, 2014. 40: p. 25-33.
[29] Ismail, N.A. and H.S. Jenatabadi, The influence of firm age on the relationships of airline performance, economic situation and internal operation. Transportation Research Part A: Policy and Practice, 2014. 67: p. 212-224.
[30] Jenatabadi, H.S., et al., Impact of supply chain management on the relationship between enterprise resource planning system and organizational performance. International Journal of Business and Management, 2013. 8(19): p. p107.
[31] Moghavvemi, S. and N.A.M. Salleh, Malaysian entrepreneurs propensity to use IT innovation.
Journal of Enterprise Information Management, 2014. 27(2): p. 1-26.

[32] Moghavvemi, S., et al., *An Empirical Study of IT Innovation Adoption Among Small and Medium Sized Enterprises in Klang Valley, Malaysia*. 2011.

[33] Jenatabadi, H.S., *An Application of Moderation Analysis in Structural Equation Modeling: A Comparison Study between MIS and ERP*. Applied Mathematical Sciences, 2014. 8(37): p. 1829 - 1835.

[34] Bass, B.M. and B.J. Avolio, *MLQ multifactor leadership questionnaire for research: permission set*. Redwood City, California: Mind Garden, 1995.

[35] Scott, S.G. and R.A. Bruce, *Decision-making style: The development and assessment of a new measure*. Educational and Psychological Measurement, 1995. 55(5): p. 818.

[36] Lester, P.E., *Development of an instrument to measure teacher job satisfaction*. 1983: New York University, School of Education, Health, Nursing, and Arts Professions.