1998-F-520-02-1

Research Paper Critique

Paper R5: "Following the Leader in R&D: The Joint Effect of Subordinate Problem-Solving Style and Leader-Member Relations on Innovative Behavior"

Scott Robertson
November 23rd, 1998

Portland State University
EMGT 520
Dr. Kocaoglu

CONCEPTS STUDIED

Susanne Scott and Reginald Bruce researched how a manager's relationship with subordinate research and development professionals can impact innovative behavior, and how problem-solving style relates to innovative behavior. For the manager/subordinate relationship, they focused on an area called 'leader-member exchange' (LMX) theory. LMX recognizes both the transactional and transformational aspects of leadership, emphasizing the relationship between managers and employees. Transactional leadership is based on fulfilling contractual obligations – performing the duties of the job for pay. Transformational leadership dictates that leaders can motivate employees to work at a high level than they otherwise would. Through vision and expressions of confidence in employee abilities, managers transform employees so that they transcend their individual needs to pursue group goals. This has traditionally been viewed as a unidirectional flow from managers to employees. LMX cites the social exchange between managers and employees, a bi-directional flow in which managers and employees influence each other, as the key element influencing productivity and innovative behavior. 'High' LMX relationships are characterized by collaborative partnerships between managers and employees.

For problem-solving style, Scott and Bruce considered associative and bisociative styles. Associative problem solvers follow habitual routines or established procedures for finding solutions. Bisociative problem solvers process information from multiple sources and different paradigms, looking outside of conventional thinking to find solutions.

Scott and Bruce formed two hypothesis in their research: 1) The higher the level of LMX between manager and subordinate, the higher will be the level of subordinate innovative behavior. 2) Innovative behavior will be related to problem-solving style.

METHODS

After reviewing published materials on leadership and problem-solving style with respect to innovative behavior, Scott and Bruce devised surveys for employees and managers. The surveys were divided into sections to gauge manager/subordinate relation, innovative behavior, and problem-solving style. They sampled two independent groups of R&D professionals. The first group consisted of 110 research professionals at a central R&D facility for an industrial company (average age was 44 and 78% had postgraduate degrees). The second group consisted of 149 engineers of an electronics equipment manufacturer, distributed across four locations, engaged in research, product development, and product modifications (average age was 34 and 28% had postgraduate degrees). In the analysis, Scott and Bruce tried to isolate the effect of education and problem-solving style from manager/employee relations.

RESULTS

The results of the investigation supported both hypotheses in each sample. Unexpectedly, this study did not show a correlation between level of education and innovative behavior (a well-documented phenomenon). This may be attributable to small sample size and limited variation of education level in the population. While this result does not support the findings of other researchers in the field, it does not refute it either.

The overall results indicate that LMX plays an important role in innovative behavior for associative problem solvers as well as bisociative. This result extends the current body of research, which did not specifically identify that leader/member relationships could make associative problem solvers more innovative.

The study results also suggest that LMX has a stronger potential for innovative behavior than bisociative problem-solving style. This refutes much of the literature on innovative behavior, which identifies bisociative problem-solving style as a leading factor for innovative behavior.

CONCLUSIONS

Scott and Bruce conclude "high LMX leadership is strongly related to the innovative behavior of R&D professionals, regardless of problem solving style or task type". While this conclusion is supported by the research they performed, Scott and Bruce did not take into account all the pertinent factors that influence innovative behavior (see Strengths and Weaknesses below). More studies, which take into account all well-known impacts on innovative behavior and consider a larger sample size, are required. The analysis leading to this conclusion is not well stated. The paper presupposes that audience is well versed in statistical analysis and will easily comprehend the limited data and discussion presented.

STRENGTHS AND WEAKNESSES

Neither of the two hypotheses set forth in this study is unique. They follow directly from previous studies in the field [1], [2]. However, the results show interesting correlation between LMX and innovative behavior over and above problem-solving style. If true, this has definite implications for managers of engineering professionals. The results show a need for more study, since a sample size of two companies is too small to consider conclusive.

Given the limited scope of this paper, the references are adequate. Scott and Bruce provide ample references for leader-member behavior and problem solving style.

This study was based on individuals filling out questionnaires. While this is a well-used technique for gathering information, it is also subject to many pitfalls. The reader must assume that the questionnaires were well structured and not biased toward the researcher's expected results. The questionnaires were not published with the paper, so their legitimacy is an unknown.

While Robertson [3] agrees that interpersonal communication is a basis for change in an individual's attitude or behavior, there are many other factors that are well documented as predecessors to innovative behavior which were not considered in this study. Quinn, Baruch, and Zien state that the "most crucial element in stimulating innovation is top management's outlook" [4, p. 185], not the immediate manager/subordinate relationship. Sandkull states that creative individuals "are bounded by the scope of the organization's tasks" [5, p. 99]. Scott and Bruce did not consider the corporate culture (empowerment and creative freedom) or alignment of the individual contributors with the organization's goals, even though their study was based on individuals rather than groups. These factors have been shown to play a significant part in innovative behavior and need to be taken into account and, if possible, isolated from the manager/subordinate relationship before definitive conclusions about factors for innovative behavior can be stated.

FUTURE WORK

This study has shown interesting correlation between leader/member relations, problem-solving style, and innovative behavior. Additional studies which account for corporate culture, top management support of innovative behavior, and the goals of the organization vs. the goals of the individual, along with leader/member relations, problem-solving style, and level-of-education, must be performed on a statistically significant population size. Definitive conclusions about the relative significance of different contributors to innovative behavior can only be ascertained by taking into account all known factors regarding innovative behavior over a large sample of R&D organizations.

REFERENCES

[1] M. Kirton, "Adaptors and Innovators: A Description and Measure," *Journal of Applied Psychology*, vol. 61, pp. 622-629, 1976.

[2] M. Jabri, "The Development of Conceptually Independent Subscales in the Measurement of Modes of Problem Solving," *Education Psychology Measurement*, vol. 52, pp. 975-983, 1991.

[3] T. Robertson, *Innovative Behavior and Communication*. Holt, Rinehart, and Winston, 1971.

[4] J. Quinn, J. Baruch, K. Zien, *Innovation Explosion.* The Free Press, 1997.

[5] B. Sandkull, *Innovative Behavior of Organizations.* Sweden: Studentlitteratur Lund, 1970.