# Leaders Can Enable Innovative Behavior

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This is an evaluation of the study by Susanne Scott and Reginald Bruce, documented in "Following the Leader in R&D: The Joint Effect of Subordinate Problem-Solving Style and Leader-Member Relations on Innovative Behavior."

### **Concepts Studied in the Paper**

In this paper, the authors secondarily discuss the transactional and transformational nature of leadermember-exchange (LMX) theory, then primarily describe the relationship of LMX and problem-solving style to individual innovative behavior. (Note that the innovative behavior of teams is not a part of this research.)

The authors define transformational leadership theory as "leaders activate followers' higher order needs, influencing them to transcend their own self-interest in pursuit of group goals." They also tell the reader that transformational leadership assumes 'charisma' on the part of a leader, and some believe that charismatic leaders bring about an increase in subordinate capabilities/innovativeness through the leaders' expression of belief in followers' ability to perform. The authors write that transactional leadership theory "involves the exchange of leaders' positional resources (which usually are of a material nature) for subordinates' effort on prescribed role behaviors." According to Scott and Bruce, LMX theory "recognizes that leaders engage in both transactional and transformational leadership behaviors." This means that leaders who build highly effective relationships with their employees (subordinates) demonstrate a combination of transformational and transactional leadership

The primary objective of the research performed by Scott and Bruce was to determine the relationship of LMX and problem-solving style to individual innovative behavior. They began their work with two hypotheses. The first hypothesis to be proved (or disproved) was "the higher the level of LMX between manager and subordinate, the higher will be the level of subordinate innovative behavior." The second hypothesis was "innovative behavior will be related to problem-solving style. Specifically, innovative behavior will increase with increasing levels of bisociative problem-solving style and with decreasing levels of associative problem-solving style."

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It should be noted that some researchers speculate that based on their problem-solving style, some individuals may react differently to leadership. In other words, the various personality characteristics associated with an innovative problem-solving style might neutralize the effects of leadership. In fact, there is some empirical study support for this view; however, Scott and Bruce propose that these innovative problem-solvers do indeed recognize the benefits of collaborative partnership agreements (LMX) even though they may sometimes view leader involvement as micro-managing and may prefer that the leader function in more of a 'hands-off' mode. To take this one step further, the authors believe that high LMX relationships should encourage these innovators to even higher levels of autonomous behavior that allows them to reach their fullest potential. And along the same line, high LMX relationships may also create safe environments (i.e., freedom to fail) so that those with less innovative problem-solving styles gain the courage to act innovatively (i.e., become risk-takers).

Although problem-solving style is more established in the R&D literature as an antecedent of innovative behavior than is LMX, this study takes us one step closer toward the realization that the quality of the relationship between employees and their direct supervisors strongly influences individual innovative behavior --- perhaps even more than problem-solving style.

# Methodology

Two independent samples of research and development (R&D) professionals were used in this study. One sample consisted of all engineers and scientists employed in a large centralized R&D. The second sample consisted of R&D engineers working at four locations of a major manufacturer of electronic equipment.

Questionnaires were used to gather feedback from employees and managers. LMX and problem-solving styles were determined through employee responses and were measured using Graen's [3] seven-item scale (Sample item: "I know where I stand with my manager; I usually know how satisfied my manager is with what I do.") and Jabri's [6] associative and bisociative indexes of problem-solving style, respectively. (A high score on the associative scale indicated a preference for systematic, habitual problem-solving. A high score on the bisociative scale indicated a preference for more intuitive problem-solving.) A confidential questionnaire was sent to each employee via company mail, and respondents were encouraged to complete them during working hours --- most likely in hopes that this would yield more responses and more accurate/valid data.

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A questionnaire assessing subordinate innovative behavior was completed simultaneously by the managers at each research site. Using a measure developed by Kanter [7], managers rated the degree to which the subordinate (1) searched out new technologies, processes, techniques, and/or product ideas; (2) generated creative ideas; (3) promoted and championed ideas to others; and (4) was innovative in general. Employees' names were used on the assessment in order to match them with the employee data.

Three-step hierarchical regressions were used to test Hypothesis 1 and 2. Hierarchical regression was used so that the researchers could test whether the addition of each independent variable to the regression equation explained unique variance in innovative behavior. Education was used as a covariate (since education is an antecedent of innovative behavior).

# Contributions

Study results showed that LMX was positively related to both associative and bisociative problem-solving style (an unexpected finding). Scott and Bruce drew a conclusion that this fact suggests that leaders form high-quality relationships with those who are more conventional thinkers (i.e., higher associatives) and with those that are more innovative thinkers (i.e., bisociative). It seems clear that leaders should strive to form high-quality relationships with all employees (whether conventional thinkers or innovative thinkers) in order to create an environment where people want to excel --- and thus to create an environment for innovation.

Study results also showed that associative and bisociative problem solving and LMX were all significantly related to innovative behavior. In fact, both hypothesis 1 and 2 both received support in Sample 1 and further support in Sample 2.

It was also found that, in both samples, the regression coefficient for bisociative problem solving showed a small decrease when LMX entered the equation in step 3, causing the variable to become nonsignificant. The authors believe this suggests that LMX has a somewhat stronger potential for explaining variation in innovative behavior than does bisociative problem-solving style.

In the current study, the quality of the relationship between R&D professionals and their direct supervisors was positively related to innovative behavior, and (in both samples studied here) LMX was related to the innovative behavior of R&D professionals regardless of problem-solving style. In fact, the authors state that "LMX explained

variation in individual innovative behavior over and above that explained by problem-solving style," a new finding in this study.

### **Comparison With Other Research Publications in the Field**

Scott and Bruce found that, contrary to prior research, the correlations between education and innovative behavior were not significant in either of the samples. They explained this away with, "Given the sample descriptive statistics and our operationalization of the education variable, it is likely that we did not have adequate variance in education to detect statistical effects." Also, some researchers have proposed that R&D task type influences innovative behavior; however, results of this study showed that R&D task type has no effect on the positive relationship between LMX and innovative behavior.

For the engineers and scientists studied here, the higher the self-reported level of bisociative problemsolving style, the higher the assessment provided by their managers of their innovative behavior. In contrast, the higher the reported associative problem-solving style of the engineers and scientists, the lower their innovative behavior as assessed by managers. This finding further supports prior research findings that problem-solving style is related to innovative behavior.

In their work, Paolillo and Brown [13] analyze relationships between organizational innovation in R&D units and both structural characteristics and organizational climate. Their study was carried out with a sample of research scientists and professional engineers in six R&D organizations. Study findings included the confirmation that organizational climate (autonomy, information flow, creativity, rewards and training) was significantly and positively related to innovativeness. These results draw attention to the need for R&D management to consider the allocation of non-financial resources as well as financial resources in their attempts to enhance innovativeness. Results lead to specific suggestions such as the maintenance of a technical library, subscriptions to a wide variety of technical periodicals, and company sponsored seminars by prominent guest lecturers. Implications for managers of organizational R&D subsystems: encourage autonomy of R&D personnel as well as research project teams; foster the acquisition, exchange and dissemination of information between R&D personnel, research project teams, and differentiated R&D laboratories; nurture creative and educational opportunities for R&D personnel; and institute a system which rewards R&D personnel monetarily and professionally. Also, a financial assistance program for formal

course work undertaken and expenses for travel to professional meetings, and the allocation of company time to work on technical articles for publication are some specific recommendations that might enhance R&D innovativeness. These findings and the subsequent recommendations fit well with Scott's and Bruce's findings and the suggestion to meet these "higher-order needs" and build high LMX relationships as a way to enable individual innovation.

The contention of Kirton's paper [9] is that everyone can be located on a continuum ranging from an ability to "do things better" to an ability to "do things differently," and the ends of this continuum are labeled adaptive and innovative, respectively. It is further contended that adaption-innovation is a basic dimension of personality relevant to the analysis of organizational change, in that some people characteristically adapt while some characteristically innovate. From this, some people might draw the conclusion that leader behavior really does not impact adaptive or innovative behavior in employees; however, Scott and Bruce have proved that, in fact, leaders can influence innovative behavior in employees.

Although Graen's, Novak's, and Sommerkamp's work [3] focuses primarily on job satisfaction rather than innovation, it does support the idea that high LMX relationships lead to greater individual innovation. They write that, as a party to a mutually beneficial relationship, organizations provide the means to satisfy some of their members' needs in exchange for job performance. Most organizations have sought to fulfill these obligations by responding to the economic or material needs of their employees; however, the psychological or nonmaterial needs have been less well attended. Needs for personal growth and development and needs for meaningful social relationships are two of these psychological/nonmaterial needs. In exchange for positional resources (e.g., privileged information, challenging projects), the employee commits himself/herself to higher degrees of involvement in the unit's functioning, including greater time and energy expenditures than required by formal contract, acceptance of greater responsibility, and a vested interest in the success of unit functioning --- resulting in the development of individual innovators.

This paper differs from the works of other researchers in that Scott and Bruce focus on the individual, the R&D professional, rather than the team; whereas other researchers have focused on R&D teams.

# Strengths and Weaknesses of Methodology, Paper, and Conclusions Drawn

The concepts are strong. Scott and Bruce seem to put emphasis on the power of a leader's belief in the individual (self-fulfilling prophecy). And, in fact, they have backed up these beliefs through their research studies. For example, in another study they performed in 1994 [15], the results supported their hypothesis that "the degree to which a supervisor expects a subordinate to be innovative is positively related to the subordinate's behavior." It was in this 1994 study that they also proved that the quality of leader-member exchange between an individual and her/his supervisor is positively related to the individual's innovative behavior.

For the most part, the methodology and the results are strong. The results of the employee questionnaires indeed should be a good indicator of the strength of the relationship between the employee and her/his leader. A weakness in the methodology, if any, may arise with the way in which innovativeness is measured. Because managers are rating the innovativeness of their employees, the results are subjective. A manager may perceive an employee as innovative (as measured by the four items), when in fact the employee may not be an innovator. The reverse may be true as well. A manager may not perceive an employee as demonstrating innovative behavior, when indeed the employee may be an innovator. The data is only as good as the manager providing it. This may be a weakness in the methodology and the results.

Another weakness, as noted by the authors, is that the cross-sectional nature of the data prevents the drawing of causal conclusions. It could as easily be argued that managers in R&D settings place such high value on innovative behavior that they actively seek to develop strong working relationships with those professionals that exhibit it. Despite the limitations inherent in a cross-sectional design, the relationships found here have important implications for practicing managers.

The results show that high LMX leadership is strongly related to the innovative behavior of R&D professionals, regardless of problem-solving style or task type. This study suggests that establishing high LMX relationships will provide substantial benefits in terms of greater innovative behavior for all subordinates, regardless of their problem-solving style. Thus, the current study contributes to our understanding of the role of leadership in R&D settings. Specifically, the conclusions drawn here are that R&D managers would be wise to develop strong, supportive relationships built on mutual trust with all of their subordinates. This conclusion is very well supported based on the results of this study.

# **Research Ideas for Future Work**

There are some other researchers/resources worth mentioning here. For example, Starcevich and Otto [16] performed a literature search of over 200 books and articles and confirmed that successful companies had more innovative employees and also had leaders who exhibited characteristics that "transformed a group of individuals into a high performance team." Transformational leadership behaviors include: sharing the vision, building a learning environment, being a positive role model, recognizing individual abilities/values, reinforcing self-confidence/independence, supporting employees, driving out fear, encouraging participation/self-expression, fostering continuous improvement, fostering initiative and responsibility, encouraging persistence, emphasizing intrinsic outcomes, advocating shared leadership. Starcevich and Otto also administered a survey to 800 direct reporting employees of 77 first through middle level leaders in two different organizations. Their findings "clearly demonstrated a path to achieving employee productivity and innovation through transformational leaders saw their role as helper, facilitator, partner, or ally. Low transformational leaders saw their role as a boss. Employees said conversations with high transformational leaders were enjoyable and productive. Employees saw low transformational leaders as jerks who didn't really care. High transformational leaders utilized strong interpersonal communication skills. High transformational leaders took a more telling/dictating approach.

In "Building a Culture for Innovation" [2] Frohman states, "It is part of a technology leader's job to create the culture that fosters innovation." Key principles: Decisions are based on clear goals; people recognize that helping others to be innovative is part of their job; people are willing to share ideas because they find others will invariably build on and strengthen the ideas; experimentation is prized and expected from everyone throughout the organization; mistakes are seen as lessons to learn from; learning is expected and celebrated; people trust; innovation is seen as something to be sought, not as something to be managed.

While reading other papers/articles such as "Building Effective R&D Teams: The Senior Manager's Role" [5], "Managing Discontinuous Innovation" [14], "Transactional and Transformational Leadership: A Constructive/Developmental Analysis" [10], "Managing Innovation: When Less is More" [12], and "Transformational Leadership and the Performance of Research and Development Project Groups" [8], real similarities are seen between LMX and transformational leadership. In fact, it is difficult to distinguish between these two types

of leadership. It would be good to see future research investigate LMX and transformational leadership behaviors to examine whether LMX and transformational leadership can be empirically distinguished from one another. This type of research was also recommended by Scott and Bruce.

Other desirable future research might involve finding out what specific methods, procedures, or techniques are most successful in creating an R&D subsystem climate which is perceived as: encouraging individual and project team autonomy; facilitating the acquisition, exchange, and dissemination of information; nurturing creative and educational opportunities for R&D personnel; and rewarding R&D personnel monetarily and professionally? These are the attributes of leadership and work environment which encourage innovativeness. This was something recommended by Paolillo and Brown [13].

Kuhnert and Lewis [10] suggest that perhaps leaders who function at developmental levels beyond the levels of their followers are better able to motivate their followers. Even more intriguing is the question "can transactional leaders be effective in motivating subordinates whose organizing processes are more developed and encompassing than their own?" To take it one step further, perhaps it could be determined whether these leaders may actually demotivate their employees so that the employees are even less innovative than they might be with a strong leader.

Another important question is whether or not leaders can be trained to be inspirational and to stimulate intellectual curiosity and diversity. Keller [8] states that these behaviors appear to be somewhat beyond the general literature on leadership training; thus, the question of trainability is an important one for future research.

Finally, as already mentioned, the direction of causality between LMX and innovative behavior also remains unclear. That is, does high LMX lead to innovative behavior or do leaders build closer relations (establish higher LMX) with employees who demonstrate innovative behavior?

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