LEADERSHIP AND INNOVATION:
CHAMPIONS AND TECHIES AS AGENTS OF INFLUENCE

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ABSTRACT

The effects of innovation on leadership abilities have not been widely investigated. Although diffusion of innovation theory has existed for some time, there is a need for other perspectives. In two (N=238, N=294) related studies it was found that innovation, leadership, and influence were related, though specific relationship indicated tendencies toward certain styles of influence. Innovation was significantly related to transformational leadership abilities. Implications emerging from the relationship between transformational leadership and innovation are discussed, including the distinction between the champion and "techie" styles of innovation and their basis in leadership activity

INTRODUCTION

Computerization has changed the way people do their jobs and, even the way people look at work (Kling & Dunlop, 1993). Technological changes have had a major effect on how business is done and on the managerial utilization of communication. Today's organization is different in structure and function due to the integration of new technology. This study explores the process of innovation as an act of leadership, and the subsequent influence required.

Diffusion of Innovation

Communication interfaces have grown faster to meet the needs of communication systems and the growing number of people interested in networking. New technology is different because of the integration of programmable machinery (Sproull & Goodman, 1990). The challenge is the useful harnessing of technology by individuals within a social context for beneficial outcomes (Biocca, 1993). Giacquinta, Bauer, and Levin (1993) indicated that whatever technology is used for, "the attitudes and activities that people need to adopt " (p. 134) are critical elements for innovation to occur. The social component shapes how technology is used; people use new technology in ways that mirror existing purposes. Innovation is planned, executed, and evaluated by people. It is also social, since people rarely adopt without others adopting. Research about innovation assumes that technological innovation occurs within a social context. Innovation is also a natural process; those not adopting technology are in the minority. Technological innovation is studied with a positive bias; progress is positive and reluctance to innovate stops progress. Innovation is universally good (Van de Ven, 1986). The "technological fix" implies technology can solve all social problems. The drive for technology is the fulfillment of a need (Van de Ven, 1986).

Rogers (1983) suggests that innovation is a communication process about something newer or better. Innovation, like communication, is not a one-way linear event. Innovation is relational and dynamic. He defined a range of personal behaviors toward innovation based on a bell-shaped curve. Behavioral categories range from an innovator (at the highly innovative end) to a laggard (at the low innovation end). Rogers (1986) explained that diffusion is the process that communicates an innovation over time among members of a social system. Thus, diffusion of innovation is both a social and individual activity. He theorized that a small number of people innovate very quickly. Next, a substantial number of individuals are early adopters. Early adopters precede the early majority who adopts a little before others in their social network. The next group, on the other side of the mean, is late adopters. Late adopters are still ahead of the final classification, the laggard. Laggards are not interested in integrating new technology. Rogers' theory helps define the range of personal behaviors in relation to innovation. His model is an appropriate foundation for empirical study and gives further basis for the quantification of personal innovativeness.

Innovation and the Modern Organization

Morton (1991) suggested that the marketplace of the 1990s is a turbulent business environment impacted by information technology integration. Information

technology is changing the way that work is done, integrating business functions at all levels within and between organizations, causing shifts in the competitive climate in many industries. Cushman and King (1993) stated that the integration of new manufacturing, marketing, and management information technologies contributed to the emergence of the global organization. The high-speed management wave, which began in the high-tech sector, has spread outward.

Hiemstra (1983) suggested that information technology was the central issue for all organizations. Carroll and Prein (1994) noted that computer integration has both positive and negative consequences. Information technology allowed organizations to reassess their missions and operations, change management and organizational structure, and challenge leadership to transform organizations for the future (Morton, 1991). Markus, Bikson, El-Shinnawy, and Soe (1992) indicated that media usage differs by workgroup, people want integration of communication technologies and integration may not lead to seamless collaborative work. Schein (1994a) claimed that information technology impacts the organization's culture and leadership. Furthermore, the culture impacts the structure and processes of the organization, which influence innovation. Innovation is partially mediated by the external constraints on technology. Allen and Hauptman (1994) posited that functional organization is replaced with project organization (teaming). If technology is manageable, people work together for a short time and if there is high interdependence, then project teaming is preferable to functional organizing. Communication and innovation play interdependent roles and communicative coordination should take place in functional or project organizations. Flexible hierarchies will allow organizations to react and adapt. Loveman (1994) suggested that overall productivity has not climbed due to expenditures on information technologies, but the future should yield more efficient use of information technology and a boost in productivity.

Social changes occur when technology is introduced. Employees that were more successful at integrating new technology interacted more frequently, were more communicatively competent, and had better listening abilities (Papa & Tracy, 1988). People who champion innovation tend to be risk takers, use more influence, use a greater variety of influence methods, and they have higher levels of transformational leadership behaviors (Howell & Higgins (1990a). Crowston and Malone (1994) examined personal effects from the introduction of new technology. Increased information technology effects the content and quantity of communication patterns. Individuals using electronic communication channels have lower status differentials than people not using electronic media; using electronic communication media helps remove the occupational role identity and helps people communicate as equals. Recent research on innovation and influence indicated that innovators used no more team or charismatic influence methods than moderate or laggard adopters (Crawford & Strohkirch, 1996; 1997). Innovators did have a higher preference for the use of reward/punishment/ manipulation influence methods.

Historically, innovation research focused more on the process of adoption as the phenomenon of interest. More recent research has been centered on the social implications of innovation. Research from authors like Walther (1994), Howell and Higgins (1990a, 1990b, 1990c), and Rice (1987) suggests that the act of innovating has

definite social implications in the personal, organizational, and global context. Given the current social influence direction of modern leadership, it seems reasonable that innovation may be related to transformational leadership qualities.

Transformational Leadership

The original formulation of transformational leadership theory comes from Burns (1978). At the core of transformational leadership is the concept of transformation, or change of the organization. Tichy and Devanna (1986a) noted that companies were being asked to make fundamental changes. Transformational leadership best reflects this change (Bass, 1985).

Burns (1978) defined transformational leadership as a process in which "leaders and followers raise one another to higher levels of morality and motivation" (p. 20). A chief element of transformation is the ability to cultivate the needs of the follower in a follower centered (person-centered) manner. According to Burns, focusing on needs makes leaders accountable to the follower. First, Burns contended that followers are driven by a moral need, the need to champion a cause, or the need to take a higher moral stance on an issue. People like to feel that a higher organizational spiritual mission guides their motives. The second need is a paradoxical drive for consistency and conflict. Transforming leaders must help followers make sense out of inconsistency. Conflict is necessary to create alternatives and to make change possible. The process of transformation is empathy, understanding, insight, and consideration; not manipulation, power wielding, or coercion.

Tichy and Devanna (1986a) defined transformation best, "Transformational leadership is about change, innovation, and entrepreneurship" (p. viii). Transformational leadership is a process of micro-level and macro-level influence (Yukl, 1989). At the macro-level, transformational leaders must take charge of the social systems and reform the organization by creating an appropriate power situation. At the micro-level, transformational leaders must attend to the personalities in the organization to facilitate change at an interpersonal level. Tichy and Devanna assumed that transformational leaders begin with a social fabric, disrupt that environment, then recreate the social fabric to better reflect the overall business climate.

According to Bass and Avolio (1994), organizational managers should move toward more transformational leadership behaviors to facilitate a culture that is purposeful, interdependent, and beyond self-interest. Leadership style plays a major role in creating and maintaining the culture. Transforming leadership is based on interaction and influence, not directive power acts (Barker, 1984). Leadership is a social process (not linear), ethically constrained, and emerges from crisis. Leaders are interested in collective results not maximum benefit for individual gain; collective action for collective relief. Leadership must forgo emphasizing productivity and performance and embrace a theory of change centered on human potential, common good, and interaction.

Ray, Ugbah, Brammer, and DeWine (1996) discussed the attributes of maverick leaders: the crucial characteristic was the ability to make change occur. Maverick leaders fight the status quo to test the limits of the environment; helping establish a

culture that expects change. Ray et al. (1996) contended that mavericks make innovation occur through several means: total destruction of the old organization, introduce new technology, change the physical structure, restructure departments, or conduct training interventions. Ray et al. (1996) concluded that loose-coupled organizations tended to be more tolerant of innovation and maverick leaders. Since they create a culture of change, maverick leaders often groom other "maverick apprentices" to take their role as surrogate mavericks when the time comes.

Relationship Between Innovation, Transformational Leadership, and Influence

Although much is written about organizational innovation, relatively little addresses the influence of leadership on the design and implementation of information technology (Klenke, 1994). Few researchers address the link between innovation and leadership, and even fewer have explored the relationship between transformational leadership and innovation. Tichy and Devanna (1986b) refer to transformational leaders as change oriented, but they give little attention to the relationship between new technology and transformational leadership. Contractor and Eisenberg (1990) argued that people knowledgeable about the communication network rise faster, but make no mention of the role of innovation and its impact on leadership.

Schein (1994a, 1994b) indicated that cultures could be assessed on their degree of innovativeness. Some cultures are built around information technology. Schein (1994a) hypothesized that organizations innovate to the extent people are proactive, problem oriented, and desire improvement. These characteristics are similar to the attributes of transformational leaders (Tichy & Devanna, 1986b). Schein (1994a) suggested that innovative leaders implement faster under conditions of groupism, collegial or participation, or even authoritarian methods of decision making. Participative leaders use the innovation more appropriately and sensitively. Schein (1994b) concluded that managers who viewed innovation as a method of transformation, and were positively focused on information technology, had more successful transitions.

According to Klenke (1994), information technology and the actions of leaders create new organizational forms. Leadership is at the center of the interaction between task demands, people, technology, and organization structure. The relationship between innovation and leadership is difficult to articulate given the variety of functional leadership behaviors and the range of information technologies. Technology and leadership have reciprocal effects on each other; a change in one leads to a change in the other.

Brown (1994) speculated that transformational leadership is needed in an evolving technological society. We are moving from controlled change to accelerated change nearly beyond control. Both attitude and behavior must be the target of transformational leaders. The primary reason for technological change failure was fear and the role of transformational leaders was to reform fear into motivation. He adopted a framework similar to Schein’s (1994a). Transformational leaders must meet market demands faster and better than before, given the increasingly interdependent economy.

Limited research addressed the relationship between innovation and transformational leadership. Howell and Higgins (1990a, 1990b, 1990c) contended that

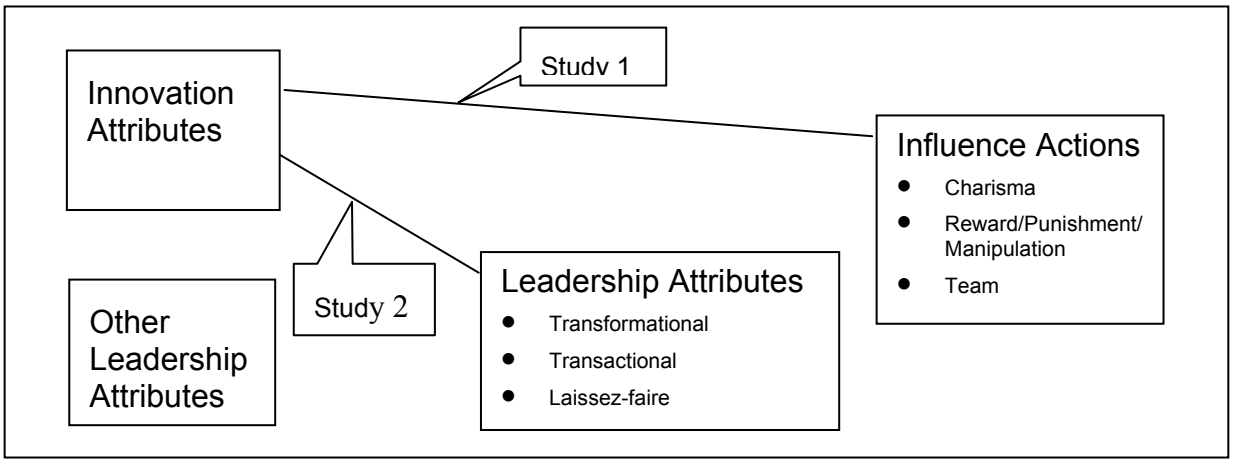
champions of innovation were significantly more transformational than non-champions. Champions operate in three ways: a rational method that promotes sound decision making based on organizational rules and procedures; a participative process, enlisting others' help to gain approval and implementation of the innovation; go outside the formal channels of bureaucratic rules and engage in the renegade process. Howell and Higgins (1990c) compiled a list of attributes of champions: high self-confidence, persistence, energy, risk taking, credible, and winning. They concluded that champions are found in all organizations and without champions "organizations may have lots of ideas but few tangible innovations" (p. 36). Their research was deficient in the methods used in identifying champion status.

Research Focus

In attempting to understand the fuller relationship between innovation, influence, and leadership one might reason that the leaders' general level of innovation would impact their overall leadership demeanor. The innovation would impact the act of influence through the leader. Thus, innovation is seen as the cognitive aspect of the leadership action, and the resulting manifest behavior would be the overt act of influence. The central focus of the research is the relationship between innovation and influence, and the extent to which leadership impacts that relationship.

Figure 1.

Model of Innovation, Leadership, and Influence



METHODS

Study 1

Subjects. The subject pool came from a university setting consisting of traditional as well as non-traditional students. Of the sample (N=238), 19% were less than 20 years, 70% were between 20 and 29, 6% were 30 to 39 years of age, and the remainder were above 39 years of age. Demographics regarding the work history, the ownership (or use) of a computer, and the connectedness to an internet service provider (ISP) were deemed important to the research. Most respondents (n = 100) indicated that they spend "some, but less than half" of their workday using information technology. Almost 39% said they used information technology more than half of their workday. Most respondents said they had access to a computer at home (n = 162) and most also reported that they had access to a computer at work (n = 124).

Procedure. Subjects were instructed on the nature of the survey battery as well as directions for the timely completion of the surveys. Following administration of the instrument the subjects were debriefed about the nature of the assessment and the outcomes of the assessment. Data analysis ensued.

Instruments. The Acceptance of Technological Innovation survey was developed based on the taxonomy of innovativeness developed by Rogers (1983). Specifically, three questions were asked about each of the levels of innovativeness from innovator to laggard. Three additional questions were included asking subjects about their rejection of innovation for personal or moral/ethical reasons (Gracquinta, et al., 1993). The results of a pilot study (N = 101) indicated weakness in the wording of a few questions. Those revisions were integrated into the final form of the instrument. Since the instrument was designed to measure up to six different categories of innovation, reliability of the overall measure was found to be insufficient ($\alpha = .59$). However, three distinct condensed prederived subscales were assessed for reliability. The innovation subscale was found to be sufficiently reliable ($\alpha = .83$) as well as the laggard subscale ($\alpha = .71$). However, the early and late majority subscale was not highly reliable ($\alpha = .60$). Subjects were then categorized according to the highest mean score on each of the three subscales.

The Assessment of Influence Behaviors was revised to assess attitudes of various forms of organizational influence. Various methods have been employed to assess the use of influence, but this method involved subjects responding to 20 specific influence behaviors. DuBrin (1991) used the "Survey of Influence Tactics" to assess the sex and gender differences among working adults. The DuBrin survey was significantly modified by changing the structure of some of the items and by adding four more items. Following the administration of the revised device (N = 235) the alpha reliability on the overall assessment was satisfactory ($\alpha = .77$). Three specific subscales were examined for alpha reliability: team influence behaviors ($\alpha = .71$), charismatic influence behaviors ($\alpha = .63$), and reward/punishment/manipulation influence behaviors ($\alpha = .70$). Given the early nature of the research the subscale reliabilities were seen as acceptable given the improvement over the pilot and the acceptable overall reliability of the instrument.

Study 2

Subjects. Subjects (N = 294) came from five organizational sources. The organizations have differing primary missions: an educational organization, medical organization, manufacturing organization, automobile sales and service organization, and utility organization. The utility, manufacturing, and medical facility received a full census sampling of all departments and personnel. The educational organization had a full sampling of staff members and several classes were polled as well. The automobile sales organization was based on a sample of approximately 50% of the total staff as determined by the researchers and the automobile liaison.

The median age range was 30 to 39. The sample consisted of 167 females (61.9%) and 103 male respondents (38.1%). Nearly 50% of the sample had some college education. Respondents were asked if they had a computer at work and home, the number of hours spent using their home and work computer, and if they had a recent technological innovation in the workplace. In terms of recent innovation, 161 subjects (60.1%) claimed they recently encountered an innovation (within the last six months) while 107 subjects (39.6%) did not. Sixty eight percent have workplace computers, and 61% have them at home.

Procedure. Organizations with diverse missions were contacted and approval was received before procedural steps involving subjects were taken. Once contacted, organizational liaisons were informed about the instrument, confidentiality, and results of the instrument and were given a copy of the instruments. Following the meeting, the liaison contacted the researcher with a timetable for convenient implementation.

Once the subjects were selected (in those organizations not doing a full sampling) the survey battery was administered either personally or in small group sessions. Upon completion, those subjects that desired were debriefed about the study and their contribution to the study. Following administration of the instrument battery data analysis occurred.

Instruments. Two assessment instruments and limited demographic questions were administered. The first part of the survey battery was the Acceptance of Technological Innovation (Appendix A) instrument reported in the Crawford and Strohkirch (1996, 1997) studies. This instrument consists of 30 items dealing with the adoption of innovative technologies as rated on a five point Likert scale ranging from strongly agree to strongly disagree. Several items were also reverse coded. Prior research found the measure to be reliable and validity emerged from significant correlation to actual media use (Crawford & Strohkirch, 1996, 1997). A pilot test of the actual 30 item report was conducted (N=100) on an unrelated sample finding a strong level of reliability as well (α = .93). For the final project (n = 276) the alpha coefficient of the overall instrument showed it highly reliable (α = .92). The instrument included two six item subscales: one for technological orientation and one considering the ability to influence others about technology. The subscales were also analyzed for reliability with both the technology subscale (α = .77) and the influence subscale (α = .75) showing modest reliability. A factor analysis of the twelve items was performed to check the stability of the factor structure but the results did not confirm the expected factor

structure. One item from each of the subscales was dropped based on alpha reliability analysis. The reliability of the revised technology subscale was an improved α = .82, and for the revised influence subscale α = .83.

The second instrument, the Multifactor Leadership Questionnaire (Version 5-S) created by Bass (1985), is a 70 item survey consisting of four subscales of transformational leadership acts (charisma, individual consideration, intellectual stimulation, and inspiration), two subscales of transactional leadership acts (contingent reward and management by exception), and one scale measuring laissez-faire leadership. Subject's self-reported specific leadership attributes using five point Likert scales ranging from strongly agree to strongly disagree. The MLQ has been found to be very reliable (Howell & Higgins, 1990a) as both a self-report measure or as a measure of a superior's performance. In the present application the MLQ was used as a self-report of transformational, transactional, and laissez-faire leadership attributes and had an α = .89 reliability score which was consistent with prior research. Subscale reliabilities ranged from a of α = .89 to α = .60.

RESULTS

Study 1

Subjects were classified as innovator, majority adopter, or laggard according to highest score on the three subscales. There were 80 innovators, 148 majority adoptors, and 3 laggards identified in this process.

In terms of the internal reliability of the innovation measure, certain demographics seemed to indicate that the innovation measure was consistent with specific behaviors indicative of innovation. Subjects reporting that they used information technology were more likely to be innovators than those reporting they used very little information technology ($F = 5.601$; $df = 3, 225$; $p = .001$). Subjects indicating that they had unrestricted access to a home personal computer were more likely to be innovators too ($F = 10.313$; $df = 1, 224$; $p = .002$). Respondents reporting the use of electronic mail or internet service provider ($F = 3.85$, $df = 1, 225$; $p = .05$) were more innovative.

The relationship between innovativeness and influence methods was mixed. The level of innovativeness had no effect on the subjects level of charisma ($F = .253$; $df = 2, 224$; ns) and on team level of influence ($F = .037$; $df = 2, 226$; ns). However, for the reward/punishment/manipulation variable there were significant differences ($F = 3.962$; $df = 2, 224$; $p = .02$) dependent on innovativeness. Innovators had the highest mean score for the variable, majority adopters had the next highest level, and laggards had the lowest mean score for the use of reward/punishment/ manipulation influence behaviors.

Study 2

Table 1 displays the correlations for the scales and subscales of innovation and leadership ability.

Table 1

Correlations between Innovation and Leadership Abilities

Leadership Variable	**Innovation Scale**	**Influence Subscale**	**Technology Subscale**
Transformational Scale	* r = 48, p = .001	* r = .55, p = .001	* r = .43, p = .001
Charisma Subscale	* r = .34, p = .001	* r = .44, p = .001	* r = .35, p = .001
Individual Consideration Subscale	* r = .34, p = .001	* r = .42, p = .001	* r = .29, p = .001
Intellectual Stimulation Subscale	* r = .43, p = .001	* r = .46, p = .001	* r = .37, p = .001
Inspiration Subscale	* r = .36, p = .001	* r = .41, p = .001	* r = .36, p = .001
Transactional Scale	r = .11, p = .150	r = .14, p = .055	* r = .16, p = .025
Contingent Reward Subscale	* r = .30, p = .001	* r = .32, p = .001	* r = .28, p = .001
Management by Exception Subscale	* r = -.15, p = .026	* r = -.14, p = .04	r = -.05, p = .479
Laissez-faire Scale	*r = -.25, p = .001	* r = -.22, p = .001	* r = -.18, p = .005

* indicates significance at standard criterion level for two-tailed test

The correlation matrix displayed in Table 1 suggests that there is a strong relationship between transformational leadership (and subscales) and innovation generally, the technical aspect of innovation, as well as the influence aspect of innovation. The correlation between the overall transformational leadership scale and innovation is a highly significant r = .48, for the technology subscale the correlation is a strong r = .43, and for the technology subscale the correlation is highly significant with an r = .55 value. All of the correlations were positive providing support for H_1, H_{1a}, and H_{1d}. Furthermore, the relationship between the transactional leadership scale and innovation can be understood in light of the correlations listed in Table 4. Transactional leadership was not related to the overall measure of innovation or the influence subscale, but was unexpectedly related to the technology subscale. This finding is further complicated by the fact that the contingent reward factor was correlated, fairly significantly, to all three innovation variables. Management by exception was correlated to both the innovation scale as well as the influence subscale. These findings provided little support for retaining H_{1b} and H_{1e}. Finally, the relationship between the laissez-faire leadership scale and innovation was significantly negative as evidenced by the negative correlations ranging from r = -.25 (p = .001) to r = -.18 (p = .005).

Regression analyses were performed to determine levels of shared variance between innovation and leadership. The influence and technology subscales were entered into a regression model to measure their effects on transformational leadership.

The innovation and technology factors of innovation accounted for a highly significant 30.8% of the variance of transformational leadership ($F = 43.75$, $df = 2, 196$; $p = .0001$). The overall innovation measure was also entered into a regression model finding 23% of the variance of transformational leadership explained ($F = 55.50$, $df = 1, 188$, $p = .0001$). In terms of the shared variance with transactional leadership, neither the overall innovation measure ($F = 2.09$, ns) or the influence and technology subscales ($F = 2.69$, ns) were predictive. For laissez-faire leadership, the overall innovation measure was significantly predictive ($F = 14.45$; $df = 1, 220$; $p = .0002$) accounting for 6% of the variance of laissez-faire leadership. The influence and technology subscales were also significantly predictive of laissez-faire leadership ($F = 6.31$; $df = 2, 231$; $p = .002$) accounting for over 5.2% of the variance of laissez-faire leadership. The negative correlations indicate that as innovation goes up, the level of laissez-faire leadership diminishes providing support for H_1 (innovation is positively related to transformational leadership abilities. Overall, these results demonstrate a link between innovation and transformational leadership abilities.

DISCUSSION

Our most notable finding regarding innovation centers on the relationship between innovation and transformational leadership. These results demonstrate a strong relationship between transformational leadership and innovation. In addition, the technology and influence subscales were strongly related to transformational leadership suggesting that transformation has both elements as well as the gestalt of innovation. Furthermore, transactional leadership was not significantly related to innovation, though the contingent reward element was significant across both innovation subscales as well as the overall measure. Finally, the laissez-faire subscale had a significant negative relationship to innovation. Among the most striking of the results is that 30% of the variance of transformational leadership was accounted for by the technology and influence subscale; 23% was accounted for by the overall innovation measure. For the laissez-faire measure, 6% of the variance was accounted for by overall measure, and 4% by the technology and influence subscales. These findings are significant and provide basis for further theorization on the relationship between leadership and innovation.

Prior research has established the link between transformation and champions of innovation (Howell & Higgins, 1990a, 1990b, 1990c), but little research focused on either the non-champion technocrat or the innovator without a upper-level organizational title. There is good reason for the relationship between transformational leadership and innovation. Innovation shares one major characteristic with transformational leadership - change. The basic concept that underlies transformational leadership is the ability to change the current - transcend the present - to achieve a higher plane of leadership. The concept of transformation is very similar to innovation, although change is largely assumed in the innovation and technology literature. Innovation is the process of adaptation to the changing technical environment. This also requires change. Thus the relationship between these elements is not accidental or contrived. Innovators at all levels are interested in change.

The negative relationship between laissez-faire leadership and innovation is also parsimonious. Laissez-faire leaders, as the opposite of transformational leaders in Bass' (1985) definition, are stuck in the status quo. Laissez-faire means literally "leave it be", and these leaders resist change as a threat to status quo homeostasis. Given that innovation seeks to change the current state it makes sense that there would be either no relationship or a negative relationship with laissez-faire leadership. This study found that laissez-faire leadership is negatively associated with innovation. If managers are laissez-faire, then they are not interested in bringing innovation into the organizational context.

Transactional leadership, which was not significantly associated with innovation or the two subscales, is the quest for mediocrity through management. A key element of transactional leadership is the "quid pro quo" mentality (i.e., if the workers produce then they will be rewarded, if they do not then rewards will be less). Transaction produces a less enlightened organization, members worry about how others can benefit them rather than how they can benefit the organization and achieve better results. Bass (1985) and Burns (1978) argued that the transactional state of leadership is immature and should be pushed aside; other methods (transformational leadership) produce more effective results. In this study there was no link between innovation and transactional leadership as expected, but there was a correlation with contingent reward, one aspect of transactional leadership. Contingent reward is strikingly similar to the reward/ punishment/manipulation influence method isolated by Crawford and Strohkirch (1997). Innovators use this less than mature form of leadership to elicit action on the part of others. The longer the innovation takes the further behind the organization will be. Perhaps the perception is that a more direct method (like contingent reward or reward/punishment /manipulation influence) will produce results faster. A second alternative is that direct methods are fallback positions, perhaps innovators feel pressure to use methods that are proven though less effective. Whatever the motive, innovators have a "dark side" when it comes to influencing others. This non-person centered, non-transformational side should be more thoroughly investigated.

Given the strength of correlation between innovation and transformational leadership, there is ample evidence to suggest that innovation and transformation share common features. Though not the same, transformational individuals are likely to also be highly innovative. This finding has serious implications for modern organizations as innovation and transformation are elements they might want to encourage. In the computer age, many organizations probably want to lead the innovation curve, or at least, not be lagging on the innovation cycle. Transformational leadership should be the path utilized for innovative results. If organizations want to be on the slower end of the innovation curve, then leaders that are highly transformational may not fit the culture since they may force innovation. A similar implication results from the interrelationship between transactional and laissez-faire leadership and innovation. Given that laissez-faire leadership and innovation are moderately negatively correlated, then innovative organizational cultures should avoid laissez-faire leadership. Furthermore, since transactional leadership was not related to innovation then innovation effects stemming from transactional leadership have not been sufficiently documented. Contingent reward behaviors and innovation, however, were moderately correlated. One may expect

innovators to use transformational leadership behaviors as well as contingent reward behaviors to achieve results.

Application of Current Findings to Innovation Research

First, this research extended the work of innovation researchers like Rogers (1983, 1986) and Giacquinta et al. (1993), producing needed empirical evidence that diffusion of innovation is a real phenomenon. Furthermore, this research contextualized innovation within organizations. Little empirical organizational research delineates the process of innovation in organizations, let alone the personal differences that make innovation possible or unlikely. This research also supports the research of Rice (1987), Fulk (1993), and Markus et al. (1992) who suggested that innovation is a function of the social network, technology is simply interjected but the change comes from the adaption to technology. It is important to consider that innovators use different leadership methods, which implies using different methods to influence others (Crawford & Strohkirch; 1996, 1997).

A few cautions seem necessary. First, those "with" advanced leadership skills innovate; those "without" are relegated to a subsidiary status in the acquisition and use of technology. Some are limited by their ability to purchase and use technology. People who do not see the application of technology (for whatever reason) or those who are not able to acquire and hone their leadership skills suffer. As a social condition, there must be more discussion over the process of innovation and how or why people are left out of the innovation process.

Furthermore, Beniger (1990) and Weick (1990) reasoned that technology and technical systems differ. Technology is the machinery and tools, but technical systems are human creations for purposes. These technical systems are created to reflect the worldview of their creator. Again, the issue of adopters and laggards emerges, but this time it occurs in the organization. Other authors (Schein, 1994a) posit that innovators and leaders have great control over the culture. When the conditions created by the technical system are imposed on the culture, there could be conditions of excessive control occurring.

Profiles of Innovators: Champions and "Techies"

The two innovation subscales were included to determine if people higher in technological focus or more able to influence others about innovation were different. When significant findings for the main innovation measure occurred, they also did for the subscales. The results can potentially support that these are discrete innovator profile types, and some conclusions regarding each type of innovator can be advanced.

The "champion" of innovation, as described by Howell and Higgins (1990a, 1990b, 1990c) is transformational in nature and seeks to innovate through the infusion of new technology. The champion uses direct means of influence, but is transformative, not manipulative or transactional. Behaviors of the champion make this person very similar to the Ray et al. (1996) maverick leader. The maverick leader seeks to tear down the old structure and rebuild with innovation; the defining part of mavericks is the ability

to innovate and to change the organization. Our research supports the findings of Howell and Higgins as well as Ray et al. in suggesting that champions or mavericks exist. The influence subscale captures the essence of what makes champions and mavericks successful - influence. These types succeed only because of the change they promote in an organization. This change, or transformation, occurs because the influence innovator has the ability to make people understand that they can overcome the inertia of the status quo.

The "techie" innovator, as measured through a subscale of the innovation measure, was envisioned as a person that understands more about technology than the average person. Although contemporary wisdom suggests that this personality type exists, we were not able to detect much difference between the "techie" and the innovator. There is a part of the innovator that uses the reward/punishment/ manipulation influence strategies. It should be expected that the "techie" would use less person-centered means to influence change. The use of direct means is not uncommon and has been found before. Whether this direct and impersonal influence method is an absolute indicator and predictor of being a "techie", unfortunately, is beyond the scope of this research.

Concluding Remarks

Cushman and King (1993) and Morton (1991) saw the importance of information technology in the global business environment. Innovation is, and will be, central to doing business. Kling and Dunlop (1993) note the impact to the changing business environment - computers change our jobs and how we look at business, perhaps even the way we look at out personal and social lives. As the business environment seeks more efficiency from innovation (Loveman, 1994), the effects of innovation will be more obvious. Rogers (1983) asserted that innovation goes on all the time in organizations, but only effective organizations use the process of innovation and the resulting effects. A fuller understanding of innovation process is needed. This research has attempted to highlight the importance of an examination of innovation in terms of transformational leadership ability.

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