LEADERS' SKILL OF INNOVATION AND RELATIONSHIP TO PREFERENCES FOR HANDLING RISK & UNCERTAINTY

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ABSTRACT

Intrapreneurship, or entrepreneurship inside of an organization, has had a rich history in literature (Pinchot, 1984). The qualities (Honig, 2001; Seshadri & Tripathy, 2006; Amo & Kolvereid, 2005,) and context (Feyzbakhsh, Sadeghi & Shoraka, 2008; Willison, 2006; Amo, & Kolvereid, 2005; Koen, 2000) supporting intrapreneurs in an organization have been well studied. A goal of intrapreneurship is to increase the innovativeness of organizations (Luchsinger & Bagby, 1987). Given that this research and call for intrapreneurs began in the 1980s, and the high amount of innovation that has been incorporated into organizations (especially technological innovation, Howell & Higgins, 1990), it seems that acting entrepreneurially within an organization is useful for organizations. This paper examines the relationship among a leader's style with regard to innovation, risk, and product innovation. The questions and provides an answer based on several organizations found in the southwestern part of the United States.

INTRODUCTION

Entrepreneurship inside of an organization or intrapreneurship has been around for over a quarter of a century (Pinchot, 1984). Several scholars have looked at the qualities of a successful entrepreneur (Honig, 2001; Seshadri & Tripathy, 2006; Amo & Kolvereid, 2005,) and the context that supports having intrapreneurs in an organization (Feyzbakhsh, Sadeghi & Shoraka, 2008; Willison, 2006; Amo, & Kolvereid, 2005; Koen, 2000). The general goal of implementing intrapreneurship was to increase the innovativeness of organizations enabling them to be successful (Luchsinger & Bagby, 1987). Given that this research and call for intrapreneurs began in the 1980s, and the high amount of innovation that has been incorporated into organizations (especially technological innovation, Howell & Higgins, 1990), it seems that acting entrepreneurially within an organization is useful for organizations. Indeed, one model of leadership and managerial behaviors, the competing values framework, has being innovative as a descriptor of a master manager (Quinn, Faerman, Thompson, & McGrath, 2003).

Have the behaviors of the intrapreneur migrated into our expectations of what it means to be a leader within an organization? If the answer to this question is yes, then there are a number of interesting questions to ask. Are there any differences between a leader's skill set with regard to innovation and, say, a professional's approach to innovation? Intrapreneurs are risk takers. When we look at leaders with a skill set related to innovation, are they also risk takers? Are there any differences between the risk taking preferences of a leader with high innovation and those with low innovation? This paper examines these questions and provides an answer based on several organizations found in the southwestern part of the United States.

We begin by detailing the qualities of innovation as a skill of a master manager as proposed by the competing values framework. We follow this by reviewing some of the qualities of an intrapreneur especially those related to risk and innovativeness. A framework for risk orientation called entrepreneurial conation is summarized from the literature. After detailing our hypotheses, we present our methods and results. We conclude with a discussion about our findings and their implications for our understanding of leaders, organizations, and intrapreneurs.

LEADERS & INNOVATION

We choose to use the term "leaders" to refer to those organizational employees that are in formal positions of leadership or management no matter the level in the hierarchy that they are populating. While we acknowledge that there are those who will argue that managers and leaders are not the same thing (beginning with Zalenik, 1977), we are taking the balanced perspective that argue they are at least complementary (Bass, 1985, Kotter, 1990, Black, Oliver, Howell & King, 2005). As a reflection of this perspective and explicitly building on existing literature, we will base our summary of leaders and innovation on the competing values framework (CVF) (Quinn et al., 2003). We chose this framework because it explicitly includes elements that may traditionally be associated more with one or the other between leader behaviors and managerial behaviors.

CVF assembles eight managerial roles that a master manager can successfully handle even when they may cause cognitive dissonance. The four roles are: Mentor, Facilitator, Producer, Director, Coordinator, Monitor, Broker & Innovator (Quinn et al., 2003). Subsequent scholars have demonstrated the validity of the operationalization (Denison, et al., 1995) and found that effective leaders are associated with higher skill levels in the behaviors associated with each of the roles (Hart & Quinn, 1993; Hooijberg, 1996). Thus, part of being one of the best managers is being innovative which is also integral to being an intrapreneur.

Other common attributes between managers and intrapreneurs include having effective communication skills (presentation, oral and written), good organizing skills, sound interpersonal skills, quick responses but being goal oriented and resourceful (Davis, 1999). Personally, both manages and intrapreneurs are smart high achievers who are approachable optimistic and resourceful (Davis, 1999). An interesting attribute in the light of more recent corporate scandals is that both are ethical (Davis, 1999). Perhaps not so surprising given the most recent recession is that both can handle stress and are willing to take well-calculated risks (Davis, 1999).

INTRAPRENEURS

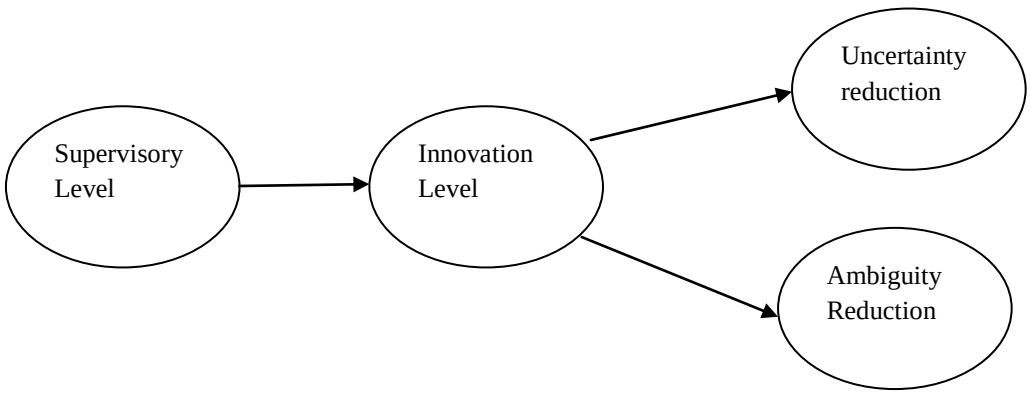
While in 1999 there was a lot in common between leaders and intrapreneurs, at that time some scholars also found differences. Unlike administrative managers, intrapreneurs tend to be visionary with a sense of urgency and unconventional innovative with creativity and resilience (Davis, 1999). Added to the previous list was being sensitive to the current corporate culture with respect to starting new ventures and establishing a supportive network within the corporation (Koen, 2000, Honig2001). Because of the focus on innovation within a corporation, the intrapreneur is expected to have creativity, as mentioned above, but to also bring the project to a successful conclusion (Luchsinger & Bagby, 1987). The intrapreneur tends to problem solve

to effect change and innovation (Luchsinger & Bagby, 1987) in a social environment and thus also has the potential for high levels of ambiguity (Czernich, 2003).

Even more recently, this idea of intrapreneurs being idea generators and nurturers to successful implementation is confirmed (Seshadri & Tripathy, 2006). When we realize that contrary to most risk adverse perspectives of established organizations, the intrapreneur is expected to promote risky ideas that may only tangentially relate to the firm's established base, it is evident that the intrapreneur must be not only persuasive but dedicated and persistent. This persuasive aspect is linked to the intrapreneurs' ability to frame the entrepreneurial idea so that is can be accepted by the corporation (Czernich, 2003). This does not mean that the ideas being promoted or the proposed new venture is certain to succeed; on the contrary, they are highly risky and often fail (Czernich, 2003). Thus, the ability to take action in the face of risk is important and integral to the intrapreneurial focus.

Intrapreneurs were, then, organizational members who arise from the general population of employees in response to corporate innovation initiatives (Amo & Kolvereid, 2005). They are given a corporate culture in which they engage in relatively low risk entrepreneurial activity since they have room to fail but still remain employed (Seshadri &Tripathy, 2006). Since the conditions which sparked the interest in intrapreneurship have not dissipated but rather intensified (global competition, ongoing technology innovation and so forth), innovation behaviors found in both intrapreneurs and leaders remain an important area of research.

Model



INNOVATION AND LEADERS

Some have found that managers in the United States of America have been shown to be a laggard in innovation (Latta & Twigg, 2008). This lag suggests either markets are not as receptive to U.S. innovations as business leaders might think, transformational leaders are not as effective as thought in fostering successful innovation, or the leaders just don't have innovation skills. A leader tends to engage in coaching, mentoring, and facilitating the work of others; whereas, a manager engages in planning, directing, organizing, and controlling (Bass & Riggio, 2006; Twigg, 2008). Neither of these styles of leadership explicitly includes a focus on innovation.

In the classical view, organizational innovativeness includes two sources; innovation (Baker & Sinkula, 2009) and product innovativeness (Wang & Ahmed, 2004) as strategies to improve an organization's effectiveness. Intrapreneurs, on the other hand, are responsible for much larger scale innovation (Czernich, 2003). Innovation requires a break with in status quo of the culture, processes, developments, and delivery of products and services (Baker & Sinkula, 2009) to have any success in the innovative initiative. Leaders thus need to be supportive of divergent thinking. Supporting change and innovation thus becomes an important part of the leadership's tool set when striving for increased innovation within a firm.

Therefore, if we expect that the innovative expectations embodied by an intrapreneur have become embedding in the general construct of what it is to be a leader; then we anticipate that it is found in this dimension of innovation as posited by the competing values framework. By definition, a top performing manager will have high levels of innovation behaviors; however, we would anticipate that in general, given the current conditions faced by U. S. businesses that a transactional leader (one with skills high in planning, directing, organizing and controlling) will also have relatively high levels of innovation skills.

H1) *Individuals in a leadership position with high transactional skills will have higher innovation skills than those with high transformational skills.*

RISK TAKING AND LEADERS

Innovation can be defined as an idea, practice, or object viewed by a market, a business, or an individual as new. Innovation implies risk. A transformational leader challenges followers through intellectual stimulation to challenge assumptions and take risks (Bass & Riggio, 2006; Judge & Piccolo, 2004). Questioning the status quo is a basic prerequisite for creativity and innovation. Being willing to put something out for the market to judge is an example of risk taking. Addressing a problem in a new way is another example.

Rogers (2003) postulated that there are individual members of a social system who are predisposed to be innovative and will adopt an innovation sooner than those who are not. The tendency of members of a social system to adopt innovations was classified into five categories according to the amount of time passing from innovation availability to adoption: 1) Innovators (2.5%), 2) Early Adopters (13.5%), 3) Early Majority (34.0%), 4) Late Majority (34.0%), 5) Traditionalists (16.0%). The proportion of members of a social system falling into each of these categories appears in parentheses above. Note that Rogers' label for the fifth category is actually Laggards, but Traditionalists has been used in prior research at the behest of research participants (Latta & Twigg, 2008). At one end are the risk takers or pioneers who adopt innovations early; while, at the other end are those who resist adopting innovations for a long time, if they ever adopt.

These categories of market adoption have a mirrored side with the entrepreneurial endeavor offerer (typically an entrepreneur but in this instance the intrapreneur and by extension the leader) willingness to proffer market innovations called entrepreneurial conation (Berry, 1996; Black & Farias, 2005). Conation means the volition to take action (Berry, 1996). Entrepreneurial conation means the volition to take entrepreneurial action. This latter category is based on each entrepreneurial entity's action taking preferences with regard to ambiguity and uncertainty (Black & Farias, 2000). At the market level, an investigation of new businesses reported in popular entrepreneurial magazines like *Inc. and Entrepreneur* showed that the

majority reported at this national level were oriented to preferring to deal with high levels of uncertainty across all levels of ambiguity.

Ambiguity and uncertainty were conceived of as separate dimensions. One dimension had ambiguity reduction as a preference and the other had uncertainty reduction as a preference (Black & Farias, 2000). Those with high levels of ambiguity reduction preferences are those that respond favorable to the idea of "defining the problem or market structure". Moderate levels are those that respond to "modify or redefine the problem or market structure". Those with low preference levels of ambiguity reduction prefer to "adopt the existing problem or market structure". Those three levels with uncertainty reduction have the corresponding orientations of "proactively seek ways to solve the problem", "react to other's attempt to solve problem", "maintain the status quo". These in combination fit nicely with Roger's five categories but are at the individual level. At the market level, an investigation of new businesses reported in popular entrepreneurial magazines like *Inc. and Entrepreneur* showed that the majority reported at this national level were oriented to preferring to deal with high levels of uncertainty across all levels of ambiguity (Black & Farias, 2005). Local organizations found from examining local newspapers were found in all levels of uncertainty reduction preferences and low to moderate levels of ambiguity reduction but rarely found in high levels of ambiguity reduction (Black & Farias, 2005).

Recognizing that many organizations that supported intrapreneurship were also larger national and international organizations, we expect that our expectations of leaders would more closely reflect those found in these larger organizations. Thus, we believe that leaders with higher levels of innovation will have high levels of uncertainty reduction but a variety of ambiguity reduction levels.

> **H2A)** *Leaders with high innovation scores will also prefer taking action in conditions of high uncertainty (high uncertainty reduction scores of 5 or greater).*

Alternatively, those new ventures reported in national magazines may have been chosen for their "radical" nature. In which case, there may be a pattern that more closely resembles those found in local publications. In this case, we expect that the main pattern would be a lack of high ambiguity reduction preferences.

> **H2B)** *Leaders with high innovation scores will have a pattern of preferring to take action in conditions of low to moderate levels of need for ambiguity reduction (average of low and moderate ambiguity reduction preference scores that are 5 or higher).*

METHODS & RESULTS

Sample

Leaders from a county government, the nursing division of a hospital, and from privately owned utilities in the southwestern part of the United States were surveyed from 1999 through 2001. There was a response rate of 84.69% with 83 of 98 solicited questionnaires returned.

Procedure

A pencil and paper questionnaire was given to selected participants to complete during work hours or an emailed link to the site where the questions are be located was used to distribute the questionnaires. Completed questionnaires and paper versions of declined to participate were gathered in a locked submission box located in the staff cafeteria areas of the larger organizations. The leaders of smaller organizations were emailed the link to the online questionnaire. Submissions were dropped directly into the database upon completion of a section of the questionnaire.

Variables

The main variables included in the model were measured with well established multi-item scales that exhibited good psychometric properties (Dennison, Hoojberg & Quinn, 1995; Black & Boal, 1997; Black & Farias, 2005). Responses to all items were made on 7-point Likert scales (1=strongly disagree to 7=strongly agree) or converted to a 1 to 7 scoring. This means that a neutral response was possible.

Leadership position. This questionnaire was only administered to those the organization had identified as being supervisors, managers or administrators.

Transformational Leaders. These leaders are defined as those with high leadership skills in the competing values framework of Mentoring and Facilitating (which include coaching behaviors). This will include all leaders with a score of 5 or better on either mentoring or facilitating scales.

Transactional Leaders. These leaders are defined as those with high leadership skills in the competing values framework of producer, director, coordinator and monitor. Again, given the tendency to award one's self with credit, the average score was above 5 so we used those who scored 1 standard deviation above the mean for each area. This resulted in 10 transactional leaders identified.

Innovation. This variable was measured by the innovation scale from the competing values framework. The scale has three subscales: leading change, leading innovation and implementing change.

Uncertainty reduction. This variable was measured by the entrepreneurial conation preference scale. It consists of the identification of the preference to handle three business issues with respect to simply solving well-understood issues at a project, strategic business unit, or company level.

Ambiguity Reduction. This variable was measured by the entrepreneurial conation preference scale. It consists of the identification of the preference to handle three business issues with respect to making sense of or engaging in business activities in spite of a lack of full specifications at a project, strategic business unit, or company level.

Descriptive Statistics

Table 1 shows basic statistical information about the variables. This particular sample has more people scoring high on transformational leadership skills than on transactional leadership skills either in

an absolute sense or in a relative sense. There appears to be sufficient variation to support additional analyses.

Table 1: Statistical Profile of Variables			
Variable	**Number of Responses**	**Mean**	**Std Dev**
Transformational Leadership Scores	87	5.44	0.86
Transactional Leaders Scores	87	5.07	1.11
Relative Transformational Leaders	75	5.47	1.05
Relative Transactional Leaders	12	5.33	1.87
Innovation	87	5.26	0.89
Uncertainty Reduction Preference	87	4.59	1.74
Ambiguity Reduction Preference	87	4.59	1.73

Hypothesis Testing

There will be more than one testing method used for the hypotheses. Each hypothesis and its testing method are presented next.

HYPOTHESIS 1. This hypothesis calls for looking at transactional leaders and transformational leaders and comparing their associated innovation scores. The innovation score for transactional leaders is proposed to be higher than the innovation score for transactional leaders. This will be tested in 2 ways. Those leaders with transactional scores above a 5 will be groups and the average of their innovation scores will be taken. This average will be compared to those leaders with transformational scores above a 5. These two innovation averages will then be compared using a t-test.

HYPOTHESIS 2A. In HYPOTHESIS 2A, we are looking to see if those with a high innovation scores also have high scores for high uncertainty reduction preferences. We begin by identifying all those with high innovation scores (i.e. a score 5 or higher) and look to see if the average score for high uncertainty reduction preference is also 5 or higher. We then look at the block of individuals with innovation scores less than 5 and determine if their uncertainty reduction preference score is also less than 5.

HYPOTHESIS 2B. In HYPOTHESIS 2B, we are looking to see if those with a high innovation scores also have high scores for high ambiguity reduction preferences. We begin by identifying all those with high innovation scores (i.e. a score 5 or higher) and look to see if the average score for high uncertainty reduction preference is also 5 or higher. We confirm this by then looking at the block of individuals with innovation scores less than 5 and determine if their uncertainty reduction preference score is also less than 5.

Results

HYPOTHESIS 1. The block of leaders with ability scores above 5 on transactional leader skill sets have mean score of 5.7 with a standard deviation of .49. There were 46 of these leaders. Their mean on innovation skills was 5.78 with a standard deviation of .5.

The block of leaders with ability scores above 5 on transformation leader skills have a mean score of 5.79 with a standard deviation of .55. There were sixty-three of these leaders. Their mean on innovation skills was 5.61 with a standard deviation of .57.

When a t-test is done that is single tailed and comparing two samples with unequal variance, we get a 0.11. This is just shy of the traditional cut off of .10. Thus there is an 89% chance that the two means are indeed different. We find weak support for Hypothesis 1.

HYPOTHESIS 2A. The results for the second set of hypothesis testing are found in Table 2. LIL stands for low innovation leaders and is information from the block of leaders with innovation scores less than 5. HIL stands for high innovation leaders and is from the block of leaders with innovation scores of 5 or greater. Note that for low innovation leaders conditions needing a moderate level of either uncertainty reduction or ambiguity reduction are preferred.

Table 2: Means and Standard Deviations by Block

	Conation								Leader Skill
	Average Low & Moderate	**ARLow**	**AR Mod**	**ARHigh**		**URLow**	**URMod**	**URHigh**	**Innovator**
LIL: Mean	5.08	4.77	5.25	4.66		4.75	5.32	4.70	4.01
LIL: S- Dev	1.38	1.79	1.49	1.76		1.99	1.44	1.79	1.17
HIL: Mean	4.39	4.03	4.74	4.74		4.22	4.01	5.29	5.71
HIL: S-Dev	1.16	1.82	1.29	1.61		1.77	1.46	1.59	0.50

For high innovation leaders, a high level of uncertainty reduction is preferred but either a high or moderate level of ambiguity reduction is desired over low levels. The preference for the moderate levels of ambiguity versus low levels is statistically different (t-test = .007 for single-tailed paired test). The preference for high levels of ambiguity versus low levels is also statistically different (t-test = .02 for single-tailed paired test). Now, we turn to the hypothesis testing.

The block of leaders with high innovation scores (those 5 or higher) have a mean innovation skill score of 5.71 with a standard deviation of .5. Their preference score for high levels of uncertainty reduction is 5.29. This provides partial support for HYPOTHESIS 2A.

Next, we examine the high level of uncertainty reduction preferences for those with low innovation scores. This block of leaders has a mean innovation skill score of 4.31 with a standard deviation of .75. Their average preference score for taking action in conditions requiring high levels of uncertainty reduction is 4.78. This also provides support for Hypothesis 2a.

We now look at the single-tailed t-test for these two means and get a t-test of .11. Again this is just shy of the .10 strong confidence of difference cutoff. This measure provides weak support for there being a difference in the means between the two groups. However, given this weak support for differences and because both groups of leaders provide support for HYPOTHESIS

2A, support is found for HYPOTHESIS 2A. Next, we look at HYPOTHESIS 2B which focuses on a leaders' orientation towards ambiguity.

HYPOTHESIS 2B. The same two blocks of leaders are used for this hypothesis test as for HYPOTHESIS 2A test. The average score for preferring the two preferences for using lower levels of ambiguity reduction skills is 4.39. This is below the 5 cut off point for high levels of preferences. The preference for using high levels of ambiguity reduction skills is 4.74 which is also below the 5 cut off for high preferences. This does not provide support for a choice among ambiguity preferences for those with high innovation skills. The other block of leaders must also be assessed.

For the block of leaders with lower innovation scores, the average score for preferring the two preferences for using lower levels of ambiguity reduction skills is 4.77. This is below the 5 cut off point for high levels of preferences. The preference for using high levels of ambiguity reduction skills is 4.62 which is also below the 5 cut off for high preferences. This does not provide support for a choice among ambiguity preferences for those with low innovation skills.

Since neither the high innovation skill leaders nor the low innovation skill leaders had a high preference for using ambiguity reduction skills in contexts that only need it at a low or moderate level and also did not show a strong preference for contexts where high levels of ambiguity reduction skills would be needed, HYPOTHESIS 2B is not supported. There doesn't appear to be any pattern of preference in dealing with ambiguity reduction based on innovation skill levels of leaders.

DISCUSSION & CONCLUSION

We began this paper by noting that some have found that innovation is lacking in US firms. We explored the link between innovation and transactional or transformation leadership behaviors. We found that those with high skill levels in transactional leadership behaviors were slightly more likely to have high levels of innovation leadership skills as suggested initially by Latta and Twigg, 2008. We also found that those with high innovation skill sets no matter if they were from a transactional perspective or a transformational perspective preferred taking action in high uncertainty conditions but really had no preference with respect to ambiguity reduction conditions.

When conditions for a firm are relatively known or knowable, leaders with high innovation skill sets are comfortable taking action. However, when those conditions become hypercompetitive or in startup conditions of a new industry, the managers with higher innovation levels in this study were not so eager to take action.

LIMITATIONS

This study reports on leaders from the southwestern part of the United State from industries either highly regulated or governmental in nature. It may be that this set of leaders are those that have these particular relationships between transaction and transformational leadership skills and innovation skills. It may also be that they are the only ones with relationships between the innovation skills and uncertainty reduction or ambiguity reduction preferences. Further research is needed to examine these current boundaries.

CONCLUSION

We found weak support for our first hypothesis that transactional leaders might have stronger innovation skills than transformational leaders. We found support for our hypothesis that leaders with strong innovation skills will also have high preferences to use uncertainty reduction in conditions of high uncertainty. We did not find support for a link between preference for ambiguity reduction use and high innovation skill levels.

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