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THE EFFECT OF LEADERSHIP AND COGNITIVE PROCESSING STYLES UPON PEER PERFORMANCE EVALUATION: IMPLICATION FOR THE UTILIZATION OF SIMULATIONS IN BUSINESS PEDAGOGY

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ABSTRACT

Educators who utilize simulations to enhance business pedagogy have long been concerned about the behavioral and cognitive styles of their students. This research project investigated the impact of leadership style and cognitive processing styles upon the peer evaluations received by team members who participated in a business simulation. This study found that those students who exhibited a democratic leadership style and a visual cognitive processing style received the highest performance peer ratings from their team members.

INTRODUCTION

Researchers have known for same time that particular aspects of thinking and personality that differ between people influence the manner in which they tackle business related situations. For example, in developing strategic plans, the roles of individuals along with their decision making styles and their judgments, will greatly influence how they prepare their plans for the future (Loveridge, 1979). Aspects of thinking and personality which have received a great deal of attention in the Management literature are leadership (Bennis and Nanus, 1985) and cognitive processing styles (Richardson, 1977).

These two particular behavioral and cognitive styles greatly impact the behaviors of today's executives. According to the Management literature, a democratic leadership style contributes positively to the success of an organization while a vivid imagination, the proclivity to think in terms of images rather than words, normally produces a greater level of creative decisions. In addition, there is more than ample evidence existing in the literature that states that these behavioral and cognitive styles can be enhanced through training and practice in the business management classroom.

The purpose of this piece of research was to gain a better understanding of the relationship of leadership and cognitive processing styles to business simulation performance. A discussion of the theoretical underpinnings of these two behavioral and cognitive processing styles are presented next followed by a presentation of the research project and its findings.

LEADERSHIP STYLES

There are many examples of where the difference between success and failure of a business organization has been directly attributed to the leadership style of its chief executive officer. Total organizational responsibilities perpetuate an unbounded tolerance for frustration largely because leaders place a high emphasis on results (Piotrowski and Armstrong, 1989). However, the effective leader realizes that accomplishing these results necessitates teamwork and in order to facilitate teamwork, the leader must be people orientated.

Thus, the importance of leadership styles to the growth and prosperity of an organization cannot be understated. Successful leaders must be effective change agents. They must be able to deal with the changing expectations of their constituents by moving their organizations from current to future states (Bennis & Nanus, 1985). The leadership style that effective leaders employ to accomplish this objective of change varies a great deal from leader to leader.

Leadership styles have been investigated in many different studies yielding a variety of typologies stating what is and what is not effective leadership behavior (Bass, 1981). However, with a fair degree of consistency, most studies show that effective leaders tend to employ a leadership style that encourages and allows employees to share visions and information and to participate in the decision-making process. In general, a participative or democratic leadership style tends to be found more often in successful organizations than a non--participative or autocratic style (Haire, Ghiselli, and Porter, 1966).

COGNITIVE PROCESSING STYLES

One of the major deficiencies which currently exists in the business management process is the lack of imagination (Steiner, Kunin, and Kunin, 1983; Wilson, 1981; Bennis, 1981). Thus, a strong visual processing capacity would have practical implications for the business management process. Although imagination means many things to many people, for purposes of this study, imagination is defined as divergent thinking, i.e., the ability to entertain many different and diverse ideas and concepts.

Imagination is considered to be one of the highest of mental functions (Rhodes, 1982). Many researchers accord creative greatness to imagination (Parnes, 1977; Arieti, 1976; Khatena, 1976; Leonard and Lindauer, 1973). In writing on the relationship of creativity to imagination, Leuner (1977) states that imagination is the basic element of the creative process. Like leadership styles, a capacity for visual processing differs in degree from individual to individual ranging from high to low (Rader and Telligun, 1981). The ability to translate stimuli into vivid images is indicative of a continuously rather than typologically distributed skill. On the high side, Wilson and Barber (1981) found that some individuals imagined images as vivid as reality in that they appear to experience what they fantasize in the same way that they experience reality.

Differences in the habitual modes that individuals employ in their visual processing capacity are

referred to as verbalizer-visualizer tendencies (Richardson, 1977). People who prefer to think in words are referred to as verbalizers while people who prefer to think in pictures or images are referred to as visualizers. While most people will commonly think in both modes of words and pictures, there is a strong tendency to rely on one mode more frequently than the other.

In general, those individuals who prefer to think in pictures possess a greater capacity for divergent thinking (Edwards and Wilkins, 1981). This capacity for greater divergent thinking helps to facilitate the generation of more novel and unique solutions to problems and decision making (Parrott, 1986). However, not everyone has this degree of vividness of imagination and unfortunately, the absence of vivid imagination does not lend itself to efficient processing (Stroksahl and Ascough, 1981) or to effective business management behavior. Individuals who possess a high capacity for visual processing, i.e., visualizers, are more effective in business management behavior.

From the literature, there appears to be more than ample evidence that persons possessing democratic leadership and visual cognitive processing styles should be more effective at business activities than persons possessing autocratic leadership and verbal cognitive processing styles. Therefore, the purpose of this research project was to determine what impact leadership styles and cognitive processing styles would have on team member performance ratings. To accomplish this the following two hypotheses were statistically tested:

HYPOTHESIS I: Those students with a democratic leadership style will receive higher team member performance ratings than those students with an autocratic leadership style.

HYPOTHESIS 2: Those students with a visualizer cognitive processing style will receive higher team member performance ratings than those students with a verbalizer cognitive processing style.

RESEARCH DESIGN
Sample Population

Data were collected from 108 graduate students seeking a Masters of Business Administration degree from a medium, South- eastern university. All students who enrolled in the sections of Business Policy and Planning took part in the research project. The students were almost equally divided into males and females with an average age of 34. The overwhelming majority of these students were full time employees occupying practicing manager positions.

The Simulation

The simulation employed in this research project is a modified version of the original Carnegie-Mellon game. It is one of the most complex simulations of business enterprises in a competitive industry known to exist today. It is designed to provide students with a compressed and integrative, but realistic experience in the management and operations of a medium sized, publicly held, multi-National Corporation. In this intensive, two-semester course, the students are exposed to the problems, uncertainties, stresses and opportunities, which arise in managing a company for a simulated period of two years.

The simulation program duplicates not only the actual manufacturing, marketing, and financial transactions encountered in competitive business operations, but also the internal problems of operating in a management group under conditions of limited time and resources, rewards and penalties, and high stress. The students who complete this Management simulation should possess a far higher level of skill in the management of organizations than could ever be acquired through traditional classroom work.

Independent Variables

Leadership styles were ascertained *from* utilizing the Management Practices Questionnaire (Haire, Ghiselli, and Porter, 1966). This questionnaire consists of statements designed to measure one's tendency to manage others along a continuum ranging from a democratic leadership style to an autocratic leadership style. Low scores are indicative of a democratic leadership style while higher scores indicate a tendency toward an autocratic leadership style. The visual cognitive processing style was ascertained from the visualizer/verbalizer instrument (Richardson, 1977). This instrument consists of statements indicating an individual's preference for either verbal or visual cognitive processing. High scares indicate a visual preference while low scores are indicative of a verbal preference.

Dependent Variable

At the end of the semester, the students were asked to rate the performance of their teammates during the simulation. Within each team, students assigned a rate of one to the team member who they felt contributed the best performance to the simulation activities, a rate of two to the team member they felt contributed the next best effort to the simulation activities, etc. The ratings were then collected from every member of the respective simulation teams and an overall average rating calculated for each of the 108 students.

Control f or the Demand Characteristic

In this type of research, a common cause of serious bias arises from respondents telling researchers the things the researchers seem to want to hear (Rosenthal, 1976). This "demand characteristic" poses a special threat when using students as subjects. Students love to play games and will try to "win" if they can figure out the objective of the exercise. To minimize the effects of any demand compliant responses, the Management Practices Questionnaire and the Verbalizer/Visualizer instrument were administered along with other "bogus pipeline" instruments (Rosnow and Davis, 1977). In addition, at no time was the true intent of the study revealed to the students

RESULTS

Analysis

The leadership style, autocratic or democratic, was determined for each student based upon responses to the Management Practices Questionnaire. The visual cognitive processing style of either visualizer or verbalizer was ascertained f or each student based upon responses recorded on the verbalizer/visualizer

instrument. This process is congruent with research projects utilizing these instruments. These variables were then compared with the peer ratings to see what effect, if any, leadership style and cognitive processing style would have on the peer rankings received by the students.

To test for any elements of significance in this model, an univariate analysis of variance was generated utilizing SASS' General Linear Model (GML) routine. This method was used instead of the one-way ANOVA routine because of unbalanced cell sizes.

Table 1 suggests that the visual cognitive processing style [visualizer/verbalizer] (p-value is less than 0.07) and the interaction effect of visual cognitive processing style and leadership style (p-value is less than 0.00) have a significant Impact on simulation performance peer evaluations.

Discussion

In many courses that involve either experiential or simulated pedagogical activities, peer performance evaluations are utilized in the course grading equation. Thus, the more educators know about what kinds of impact student behavioral and cognitive styles have on the peer evaluation process, the better able they are to structure their course to allow for more accurate determination of student performance. This study suggests that some individual behavioral and cognitive styles do effect the simulation performance evaluations received from team peers. To better understand these effects, the cell means and cell sizes corresponding to the univariate analysis *of* variance are presented in Table 2. Note that while the cells are not completely balanced the number of observations falling into each cell is very uniform, thus lending a high degree of integrity to the findings of this study. Those students with a democratic leadership style did not receive significantly higher (p-value is less than 0.17) peer evaluations (13.651 than those students with an autocratic leadership style (13.41). Thus HYPOTHESIS 1 cannot be supported.

Those students who possessed a visualizer cognitive processing style received significantly higher (p-value is less than 0.07) peer evaluations [13.68] than those students who had a verbalizer cognitive processing style (13.37). Thus HYPOTHESIS 2 can be supported.

The most significant findings (p-value is less than 0.00) of this study, which was not anticipated, was the interaction effect of the two variables. Those students who had a visualizer cognitive processing style and a democratic leadership style received the highest peer performance rating [14.04] while those students who also had democratic leadership style but possessed a verbalizer cognitive processing style received the lowest peer performance ratings [13.25].

The high ratings received by the democratic visualizers is consistent with the literature. Those individuals with people skills and a vivid imagination have demonstrated themselves as effective leaders. In this study, students possessing those qualities were perceived as being better performers. The findings that those students who possess low people skills and are lacking in imagination were perceived by their peers as less effective leaders is also of no surprise. However, the finding that leadership styles were not significantly different and that the interaction effect between the two variables was so significantly different came as quite a surprise.

Possible answers might lie in the fact that highly imaginative leaders are so revered that many other aspects of their leadership behavior are secondary in nature. In addition, even if a leader is people oriented, his or her lack of vision may adversely affect other's perception of that leader. Other possible answers may lie in some theoretical and/or methodological limitations to this study, which are currently unknown to the researchers.

While this study did not find significant findings with all of the elements in the model tested, the fact that behavioral and cognitive styles impact the outcomes of peer performance ratings in simulations is of great interest to educators who utilize simulations as training and development tools. Couple this knowledge with what is already known about the effects of prior training and gender differences (Wheatley, Anthony, and Maddox, 1987), it becomes evident that the variables which impact the results of a simulation outcome are as complex as the environmental variables that are designed into simulations. Just like the "real world" that simulations try to emulate, it might be necessary for educators to conduct some preliminary testing, training and selection. This process might be considered a prerequisite if teams are to be built in order to enhance the simulation "experience".

TABLE 1

ANALYSIS OF VARIANCE OF PEER EVALUATIONS
BY LEADERSHIP AND COGNITIVE PROCESSING STYLES

Source	Sum of Squares	Degrees of Freedom	F ratio	P ratio
Verbalizer/Visualizer	2.59	1	3.14	0.07
Leadership Style	1.56	1	1.89	.17
Verbal izer/visualizer by Leadership Style	5.92	1	7.16	0.00
Error	86.05	104		

TABLE 2

Cell Means

PEER EVALUATIONS BY LEADERSHIP STYLES

Democratic	Autocratic
13.65	13.41
n=55	n=53

PEER EVALUATIONS BY COGNITIVE PROCESSING STYLES

Verbalizer	Visualizer
13.37	13.68
n=5 I	n=57

PEER EVALUATIONS BY LEADERSHIP AND COGNITIVE PROCESSING STYLES

	Democratic	Autocratic
Verbalizer	13.25	13.48
	n=25	n=30
Visualizer	14.03	13.32
	n=26	n=27

CONCLUSION

The purpose of this study was to investigate the impact of leadership and cognitive processing styles upon peer performance evaluations received by students from their team members in a business simulation activity. The study, utilizing a large sample size and controlling for demand bias, was able to detect a significant impact of democratic leadership and visual cognitive processing styles upon high peer performance evaluations. Future studies, of this nature, should examine the impact of these behavioral and cognitive variables upon profitability measures, in longitudinal settings, and should investigate other types of team performance variables that take into account team synergism.

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