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LOCUS OF CONTROL AND PERFORMANCE IN A MANAGEMENT SIMULATION

Thomas L. Ruble
Indiana University

Reviews of numerous studies [3, 4, 6] indicate that individuals who view their behavioral outcomes as being determined by their own efforts (internals) are more effective in their goal-directed behavior than individuals who view their outcomes as being determined by outside forces (externals). Thus, it seems reasonable to expect internals to outperform externals in a management simulation. However, a recent study [1] found no relationship between a person's Locus of Control and his/ her team's performance in a simulation. This recent study raises questions regarding the possible relationship between individual characteristics (e.g., Locus of Control) and performance in a simulation. Since the study used team performance as a criterion, the results are undoubtedly confounded by a variety of team-related variables. For example, in group situations individuals are not equally (nor independently) responsible for the team's performance. Moreover, if each group had a range of scores on an individual difference variable (e. g., Locus of Control), the correlation of this variable with a single performance score should yield a coefficient approaching zero. Thus, the relationship between individual characteristics and team outcomes is tenuous at best.

Since most management simulations involve team performance, it seems appropriate to investigate the possible effects of Locus of Control as a team composition factor. Assuming that a management simulation is a relatively unstructured task requiring skillful participative decisions, research on Locus of Control [2, 4, 5, 6, 9] suggests the hypothesis that teams of internals should perform better than teams of externals. Thus, the present study investigated the performance of teams formed on the basis of the members' Locus of Control orientation. In addition, the study also examined the students' perceptions of the learning value of the game and their interest in the game.

METHOD

Rotter's [7] Locus of Control scale was administered to 104 students enrolled in three sections of a course in introductory management. The scores ranged from a low of 1 (internal) to a high of 19 with a median of 9. In each section of the course the Locus of Control scores were divided into three approximately equal classifications of internal, intermediate, and external. Table 1 indicates the classifications based on the Locus of Control scores. The classification scheme was not perfect as there were nine cases when a score classified as internal or external in one section was classified as intermediate in another section. For example, a score of 7 was classified as internal in two

Table 1

Classification of Locus of Control Scores by Section

	Classification		
Section	Internal	Intermediate	External
A	1-7 (11)	8-10 (6)	11-18 (11)
B	1-7 (14)	8-11 (10)	12-19 (12)
C	2-5 (13)	6-10 (15)	11-16 (12)

Note: Numbers in parentheses indicate the number of cases in each category.

sections while being classified as intermediate in the third section. However, the few instances of different classification were not considered to be a significant threat to the internal validity [2] of the study. Since the primary concern was a comparison of internals versus externals, the classification scheme used provided for better discrimination between high and low scores than a median-split classification scheme. Moreover, there were no instances when a score classified as internal in one section was also classified as external in another section.

Within each section, students classified as internals were randomly assigned to four-person teams. Externals were similarly assigned. In each section there was an equal number of internal and external teams. In section A, there were two teams of each category. In the remaining sections, there were three teams of each category. Thus, a total of eight internal and eight external teams were formed. Students classified as internals or externals that were not assigned to internal or external teams were combined with the intermediate group and randomly assigned to form heterogeneous teams.

The teams in each section competed in a business game for five decision periods. The simulation was patterned after OPERATION INTERLOCK [10]. Briefly, the simulation required the teams to use different types of information to make price and output decisions in two competitive markets coupled with investment decisions, source of funds decisions, sales promotion, and marketing research decisions. Upon completion of the five decision periods, teams were informed of their final profits (losses) and their relative standing in their section. The students then completed a questionnaire which included questions on their perceptions of the simulation as “interesting” and “value of the simulation as a learning experience.” The student reactions were assessed on five-point scales ranging from “very little” (1) to “very much” (5).

RESULTS

To test the research hypothesis, the profits (losses) and standings of internal teams were compared to those of external teams (the heterogeneous teams were not included in the statistical analysis but their performance fell between the internal and external teams). A ranking of the final profits (losses) is presented in Table 2.

Table 2

Financial Performance of Internal and External Teams

Profit	Rank	Composition	(Loss)	Rank	Composition
$1,033	1	Internal	$(169)	10	External
946	2	Internal	(249)	11	External
384	3	Internal	(308)	12	External
327	4	Internal	(379)	13	Internal
193	5	Internal	(385)	14	External
157	6	Internal	(518)	15	External
154	7	Internal	(535)	16	External
62	8	External			
12	9	External			

Note: 000 omitted from profits and losses

The data clearly indicate that internal teams had better profits than external teams. A Mann-Whitney U test found that this difference was significant ($p < .001$, one-tailed). However, one problem with this analysis is that teams from one section of the course are compared with teams from another section. Since the number of teams per section and section profits varied, the results may reflect some unknown biases. Another method of comparison would be to determine whether a team finished above or below the median in their own section. Analyzing the data in this manner, we find that seven of the eight internal teams finished above the median in their section while all eight external teams finished at or below the median. A Fisher's Exact test indicated that this difference was significant ($p < .005$, one-tailed). Thus, two different methods of analyzing the data provide support for the hypothesis that internal teams would perform better than external teams in a management simulation.

The post-game perceptions were analyzed by first considering the over-all reactions and then comparing the responses of high performers versus low performers. Teams performing above the median in profits or losses in their section were classified as high performers while teams performing below the median were classified as low performers. Two teams falling on the median were excluded from this analysis leaving 12 high performers and 12 low performers. On the whole, the post-game ratings provided support for the popular assertion that business games are interesting. The simulation received an average rating of 4.52 ($n = 85$) on a five-point scale assessing interest in the exercise. However, the rating of the learning value of the simulation fell to 4.22. The rating of interest in the simulation was significantly higher than the rating of learning value (t 2.68, $df = 84$, $p < .01$) suggesting that the students differentiated between interest and learning. The comparison of high performers with low performers yielded significant differences in their views of both interest and learning value. Compared to low performers, high performers rated the simulation as more interesting ($X = 4.81$ versus $X = 4.21$; $t = 3.38$, df 83, $p < .01$) and more valuable as a learning experience ($X = 4.60$ versus $X = 3.83$; $t = 3.66$, $df = 83$, $p < .001$). Thus, it appears that the reactions to the simulation were influenced by the performance of the teams.

DISCUSSION

The results of the present study indicate that team composition variables can have a strong effect on performance in a management simulation. This finding is important for users of business games as certain procedures for forming teams might contain built-in biases. For example, allowing students (players) to choose their own teams could lead to teams with different potential.

Contrary to a previous study [8], the present study found that post-game perceptions of the interest and learning value of the game were related to performance. Specifically, high performers rated the game as more interesting and of greater learning value. Clearly, these subjective ratings must be interpreted with caution as they could reflect a positive "halo effect" related to winning. However, despite the subjective nature of the ratings, game users should consider the implications of the different perceptions of high versus low performers. First, if the perceptions are reasonably valid, they suggest the need for additional attention to the learning needs of the low performers. For example, the game user may provide more extensive debriefing for low performers, emphasizing the learning value of their mistakes. Second, if the perceptions simply represent affective responses to winning or losing, one must question the pedagogical value of a competitive game that causes half of the students to react unfavorably. Rather than designing win-lose business games, game users may want to turn their attention to simulations that provide greater opportunities for all to win.

REFERENCES

1. Brenenstuhl, D. C., and Badgett, T. F. "Prediction of Academic Achievement in a Simulation Mode via Personality Constructs," Proceedings of the Fourth Annual Conference of the Association for Business Simulation and Experiential Learning, 1977, 223-230.

2. Campbell, D. T., and J. C. Stanley. Experimental and Quasi- Experimental Designs for Research, Chicago: Rand McNally, 1963.

3. Joe, V. C. "Review of the Internal-External Control Construct as a Personality Variable," Psychological Reports, Vol. 28, (1971), 619-640.

4. Lefcourt, H. M. Locus of Control: Current Trends in Theory and Research, Hillsdale, NJ: Lawrence Erlbaum Associates, 1976.

5. Naditch, M. P., and DeMaio, T. "Locus of Control and Competence," Journal of Personality, Vol. 43, 1975, 541-559.

6. Phares, E. J. Locus of Control: A Personality Determinant of Behavior, Morristown, NJ: General Learning Press, 1973.

7. Rotter, J. B. "Generalized Expectancies for Internal versus External Control of Reinforcement," Psychological Monographs, Vol. 80, 1966, Whole No. 609.

8. Rowland, K. M., and D. M. Gardner. "The Uses of Business Gaming in Education and Laboratory Research," Decision Sciences, Vol. 4, 1973, 268-283.

9. Ruble, T. L. "Effects of One's Locus of Control and the Opportunity to Participate in Planning," Organizational Behavior and Human Performance, Vol. 16, 1976, 63-73.

10. Zoll, A. A., 3rd. Dynamic Management Education, Reading, Mass.: Addison-Wesley, 1969.