IDENTIFYING POTENTIAL GAME PARTICIPANTS

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This paper describes some exploratory research relating personality to student reaction to a computerized management game. The basic premise underlying this research is that students react differently to different types of educational techniques. Anyone who has administered a management game has undoubtedly experienced this phenomena in that they have probably seen a wide spectrum of student response to the game. The purpose of this study is to explore the possibility that, that response can be predicted with personality measures. If it can be predicted, the administrator would have a helpful tool for the control of the educational experience. A variety of strategies becomes available such as controlling the structure of groups or eliminating undesirable players.

The study itself was quite simple. A management game in the area of production was played in two sections of a required junior level Production Management course. A total of 65 students participated. The classes were divided into teams of 4-5 players. Each team represented a firm in an industry and the team made the decisions for that firm. Each individual in the class was administered the California Psychological Inventory (CPI) which measures the following eighteen personality dimensions: Dominance (Do), Capacity for Status (Cs), Sociability (Sy), Social Presence (Sp), Self Acceptance (Sa), Sense of Well-being (Wb), Responsibility (Re), Socialization (So), Self-Control (Sc), Tolerance (To), Good Impression (Gi), Communality (Cm), Achievement via Conformance (Ac), Achievement via Independence (Al), Intellectual Efficiency (le), Psychological-Mindedness (Py), Flexibility (Fx), and Femininity (Fe). At the end of the game, each individual responded to the questionnaire indicated in Figure I.

While the measures of response are quite crude, they seemed sufficient for the purposes of the study. Developing better measures of response we believe is necessary to carrying out further investigation. Also, note that in no way were we attempting to measure the degree of learning that took place in the game. I'm not sure you could get people to even agree on what learning should take place, let alone measure it. Research that has attempted to measure learning in a game has not been greatly successful. The measures of response are subjective and related to the various feelings that individuals have towards the game. Question one relates directly to how much the person enjoyed the game. Question 2, 3, 4, and 6 all relate to how valuable the game was felt to be as part of the course. Question 5 examines how much control the individual felt he had on the results of the game. Question 7 seeks to determine if people were unhappy with the group process. Question 8 provides an overall measure of response to the game. As might be expected, these measures of response were all highly intercorrelated.

FIGURE I

		NAME				
GAME QUESTIONNAIRE		Strongly Agree				Strongly Disagree

1.	I enjoyed the game.	1	2	3	4	5
2.	I recommend the game be used in the future, given some minor changes.	1	2	3	4	5
3.	The game is relevant to the Business School curriculum.	1	2	3	4	5
4.	The game is a waste of time.	1	2	3	4	5
5.	Performance in the game is largely a matter of luck.	1	2	3	4	5
6.	The decisions in the game reflect typical manufacturing problems.	1	2	3	4	5
7.	It would have been better if each individual were his own firm.	1	2	3	4	5
8.	Give the game a letter grade from A to F.					
9.	On the reverse side of this paper write one or two paragraphs relating your feelings about the game. Include any suggestions regarding shortcomings, improvements, or things that you found particularly good or bad in the game.					

RESULTS

Since this was an exploratory study, our analysis took several forms. Our first attempt was to try to identify specific personality types that would respond favorably or unfavorably. Using factor analysis, the eighteen personality measures on the CPI test were condensed into three sets of variables. Using the loadings developed by the factor analysis, factor scores were developed for all individuals on the three sets of variables--then, through cluster analysis, different personality types were identified. There were eight different groupings with one outcast. Next an analysis of variance was run on the scores of each of the eight game response variables using the different personality types as treatments. The responses are summarized in Table I. No significant differences were found on any of the response variables between the different personality groups although the question on whether the game represented a real management problem and the grade given the course were nearly significant at the .10 level.

Table I
Analysis of Variance of 8 Personality Groups

Question	1	2	3	4	5	6	7	8
F Level	1.37	.52	1.05	1.23	.67	1.67	.40	1.66

An attempt was made to run a discriminant analysis to see if the personality variables would predict high and low score groups. On the variable grade the groups were divided on the median into two separate groups. One group contained all individuals who gave the game a grade of B+ or above. The other group contained all individuals who gave the group a grade of B or less. The model was not statistically significant and had an error rate of 33% when applied back to this data. The personality variables achievement via conformance, flexibility, capacity for status, and communality on a purely descriptive basis had the greatest value in the model. Another run was made by creating a third in-between group of all individuals that gave the game a grade of B. The high group then consisted of individuals that gave the game a grade of B+ or better; the middle group gave the game a grade of B; and the low group gave the game a grade of B- or lower. This model was also not statistically significant. It had an error rate of 36%. The personality variables in this model that had the greatest value on a descriptive basis were self control, femininity, achievement via conformance, and communality.

Spearman Rank correlations were computed between the eighteen personality measures and the eight measures of game response. A summary of the results (at the 1 level of significance) by each response follows.

1. The response variables concerning enjoyment of the game, waste of time, and recommending the game were all significantly related to the same personality variables-- dominance, capacity for status, sociability, communality, intellectual efficiency, and psychological-mindedness.

2. The response variable on relevance of the game was significantly related to the personality variables psychological mindedness, good impression, and intellectual efficiency.

3. The response variable concerning the question of how much the individual thought the results were a matter of luck was significantly related to the personality variables sense of wellbeing, responsibility, self-control, communality, psychological mindedness, and feminity.

4. The response variable concerning whether the individual thought the game represented a real management problem was significantly related to the personality variables communality, achievement via independence, and flexibility.

5.   The. response variable concerning the preference for one man teams was significantly related to the personality variable communality.

6.   The response variable Grade was significantly related to the response variables tolerance, communality, achievement via conformance, and flexibility.

CONCLUSIONS

The basic purpose of the study was to see if game response could be predicted from measures of personality. Distinct personality types seemed to offer very weak predictions at best. We believe this approach has promise and that the lack of positive results was due more to limitations in the response variable. The evidence on Spearman Rank correlations was more positive. Even though some of the correlations are certainly spurious with the large number of correlations we had to work with, some were consistent enough that they may well be reasonable predictors of game response. The personality variable communality showed up consistently in nearly every question as good predictor. The personality variables Dominance, Capacity-for-Status, Sociability, Intellectual Efficiency, and Psychological-mindedness were correlated with at least three or four of the response variable. Others, such as Flexibility, Achievement via Conformance, and Socialization were common enough to at least warrant further serious investigation.

Some qualifications of this study must be mentioned. One of our greatest reservations about the results is that the spread of response on most questions evaluating the game was small. For example, 82% of the respondents gave the game a grade of B or better. On the question of enjoyment, 65% indicated a positive response and only 9% were negative. Eighty eight per cent indicated a positive response on recommending the game. Ninety two per cent thought the game was relevant. Ninety four per cent thought the game was not a waste of time. The spread on the remaining questions is greater, but the degree of negative response was still small (a greater proportion were indifferent). Thus, a good bit of the results are tending to show differences in positive response rather than differences between positive and negative responses. This leads us to conclude that one area for further research before positive progress could be made would be development of more discriminating measures of game response.

Other predictors may be better. One good predictor we believe might be role expectations as it relates to the educational environment. The conditioning one has had throughout his educational life on what respective roles, responsibilities, and what constitutes education would seem to be a powerful force in determining how one reacts to a new and different educational technique.

The other consideration that would seem to deserve further investigation is the question of how to separate out the response to the game administrator. It is quite conceivable that a large part of the response to a game situation could be a result of the personality of the game administrator, his expectations of students, and how he administers the game. This part of game response should be accounted for ultimately although it is seemingly ignored in most research on educational gaming.

Our conclusions from this study is that personality variables may hold value in building a predictive model of game response by the potential participant. We believe such a model would be beneficial and we hope this work will stimulate others to investigate this area.