PREDICTION OF ACADEMIC ACHIEVEMENT IN A SIMULATION MODE VIA PERSONALITY CONSTRUCTS

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ABSTRACT

Locus of Control (Rotter, 1966) and Interpersonal Trust (Rotter, 1967) were used as predictors of academic achievement in a college level simulation course. Multiple criterion measures (including team performance, peer ratings, announced exams and unannounced quizzes) were used to assess the predictive accuracy of Locus of Control and Interpersonal Trust. Neither construction successfully discriminated between high and low performances on any of the multiple criterion. The findings of this research call to question the usage of either construct in an attempt to predict college level academic performance.

INTRODUCTION

Effective predictors of academic achievement have been sought by academicians for many years. Much of this effort has focused on Rotter's concept of Locus of Reinforcement Control (1966). Rotter gave definitions to two conflicting orientations: Internal Control of Reinforcement and External Control of Reinforcement.

Definitions Follow

"A perception of causal relationship need not be all or none, but can vary in degree. When reinforcement is perceived by the subject as following some action of his own, but not being entirely contingent upon his action; then, in our culture it is typically perceived as the result of luck, chance, or fate, as under the control of others or as unpredictable because of the great complexity of the forces surrounding him. When the event is interpreted in this way by an individual, we have labeled this a belief in external control. If the person perceives that the event is contingent upon his own behavior or his own relatively permanent characteristics, we have termed this a belief in internal control."

Thus, Internal Control refers to the perception that there is a relationship between what one does and what happens to him while External Control essentially refers to the perception that there is no such relationship. Many researchers have used the difference in perception between Internals and Externals as a basis for predicting differences in academic achievement (Brockhaus, 1975; Crandall, Katkovsky and Crandall, 1965; Eisenman and Platt, 1968; Hjelle, 1970; Massari and Rosenblum, 1972; McGhee and Crandall, 1968 and Reimanis, 1973 to cite a few examples). Massari and Rosenblum (1972) have

studied the relationship between Locus of Control and Interpersonal Trust in an academic environment using college students. Imber (1973) investigated the relationship of trust to academic performance in grade school children. Other studies have suggested the role that Interpersonal Trust plays in the retention of information (Gibb, 1961; Kelley and Ring, 1961; Loomis, 1959; and Mellinger, 1956).

Massari and Rosenblum (1972) established that the relationship between expectancies of Locus of Control, Interpersonal Trust, and academic achievement is rather complex. The current study was designed to **ex**tend the work of Massari and Rosenblum in an attempt to resolve a portion of the complexity. It was felt that academic achievement was a multidimensional concept and earlier studies tended to measure it unidimensionally. The present study attempts to relate multiple criterion measures of academic achievement to Locus of Control and Interpersonal Trust in college students.

Previous research suggested the following hypotheses:

1)   Neither Internal-External Locus of Control (I-E) as measured by Rotter (1966), nor Interpersonal Trust, (ITS) as measured by Rotter (1967) would be significantly related to intelligence test scores.

2)   I-E control would yield no significant differences or structured criteria, such as, announced course exams or announced quizzes.

3)   Internals would outperform Externals on unannounced pop quizzes.

4)   Internals would have a higher socio-economic status than Externals (Externals feel that they have little control over their reinforcements, a condition that frequently accompanies low socio-economic status).

5)   Internals expect higher grades than Externals, are older than Externals and have lower ITS scores than Externals.

6)   Individuals high in Interpersonal Trust will expect higher grades than individuals low in Interpersonal Trust.

METHOD

Subjects

Subjects were 104 college juniors and seniors from a large midwestern university. They constituted the total population of two classes within the College of Business. The subjects were not aware that they were taking part in an experiment. All of the variables were compiled or measured unobtrusively as a part of the regular regiment of the course. The classes that the subjects were enrolled in were 6 credit hour courses that consisted of a regular 3 hr. lecture-discussion organizational behavior segment and an innovative 3 hr. management simulation course. The subjects used INTOP as the vehicle for the simulation game.

Measures

Rotter's Internal-External Locus of Reinforcement Scale (I-E) was used to evaluate the I-E Dimension (Rotter, 1966). Rotter's Interpersonal Trust Scale (ITS) was used to measure the Trust Dimension (Rotter, 1967). Both of Rotter's scales are widely used and accepted as having construct validity.

Academic Achievement

Academic achievement was evaluated by a number of separate measures. These included two 100 point objective exams over text content from the lecture-discussion, 100 points in unannounced quizzes, grade in the course, two 25 point announced quizzes over the simulation game structure and rules, total team points in the simulation game run in the class, final team points in the simulation game, and peer ratings for the simulation performance.

Intelligence

College accumulative grade point and SAT Verbal and SAT Math scores were used as approximations of intelligence.

Demographic Data

The subjects were required to fill-out a brief demographic questionnaire the first week of the semester in only one of the classes. The questionnaire measured age, socio-economic status, and expected grade in the course with a five point Likert format.

Procedure

The I-E and ITS scales were administered to the subjects during class time as part of the discussion of the respective topics of Locus of Control and Interpersonal Trust. The academic achievement measures were available from the recordkeeping, regularly associated with a college course. The intelligence data were gathered by special permission of the Dean from the students' permanent files. The demographic data were collected at the first meeting of the class and were represented as providing general background data for the instructor.

Analysis

The analysis was performed in two independent phases. First, the subjects were dichotomized at the mean by their I-E scores with all subjects being included in the analysis. These two groups, one representing Internals and one representing Externals were then used in multiple Students' T-Tests for differences between means. The analysis was similar for Interpersonal Trust. Two groups were created by a mean split and these groups were used in Students' T-Tests for differences between means over the various dependent variables. Students' T-Tests were utilized in preference to correlation analysis because it was felt that the T-Tests were less likely to lead to erroneous conclusions.

Results

Table one gives summary statistics for each of the variables. The Students' T-Tests will be discussed individually for each dependent variable beginning with Internals versus Externals as the main grouping and then proceeding to students who scored high or low on the Interpersonal Trust Scale.

TABLE ONE
Means and Standard Deviations for Relevant Variables

	Mean	Standard Deviation	Sample Size
I-E	10.16	3.86	101
ITS	80.56	9.43	102
First 100 pt. Exam	71.73	10.53	104
Second 100 pt. Exam	76.22	9.34	104
Pop Quiz Totals	77.86	12.26	104
Grade in Course	2.90	0.74	104
Announced Quiz 1	15.39	1.95	104
Announced Quiz 2	16.89	4.42	104
Total Team points	311.64	73.82	104
Final Team Rank	6.01	3.17	104
Peer Ratings	66.43	8.93	104
Accumulative GPA	2.79	0.56	103
SAT Verbal	475.40	84.96	92
SAT Math	542.56	97.18	92
Age	20.82	1.67	56
Socio-Economic Status	3.92	0.89	49
Expected Grade in Course	3.41	0.50	54

Internal-External Locus of Control

Table two presents the summary statistics for the 16 T-Tests comparing Internals to Externals over each variable singly. Hypothesis one is strongly supported for Locus of Control as college accumulative GPA, SAT-Verbal and SAT-Math were all non-significant. Hypothesis two is strongly supported as none of the structured variables showed any significant differences between Internals and Externals. Hypothesis three receives no support as the Internals were not significantly different from the Externals over the unannounced quizzes. Hypothesis four was supported with Internals reporting higher socio-economic status. Hypothesis five received some support. Internals showed less trust than Externals (p=.O34) and Internals were not significantly different from Externals on age or expected grade. However, the means were in the appropriate direction on each of those variables.

TABLE TWO
Student T-Tests For Internals Versus Externals
Over The Dependent Measures

Dependent Variable		Sample Size	Group Mean	Group S.D.	T Value	D.F.	2-Tail Prob.
ITS	I	52	78.33	8.52	-2.15	97	.034*
	E	47	82.26	9.63			
First 100 pt. Exam	I	54	71.13	11.63	-.59	99	.558
	E	47	72.38	9.52			
Second 100 pt. Exam	I	54	75.89	10.14	-.45	99	.652
	E	47	76.72	8.07			
Pop Quiz Total	I	54	78.17	11.59	.44	99	.663
	E	47	77.09	13.29			
Grade in Course	I	54	2.85	.81	-.71	99	.478
	E	47	2.96	.66			
Announced Quiz 1	I	54	15.22	2.02	-.74	99	.463
	E	47	15.51	1.89			
Announced Quiz 2	I	54	16.70	4.25	-.31	99	.758
	E	47	16.98	4.70			
Total Team pts.	I	54	312.30	71.28	.04	99	.971
	E	47	311.74	79.51			
Final Team Rank	I	54	6.09	2.00	-.31	99	.757
	E	47	5.89	3.46			
Peer Ratings	I	54	66.07	9.06	-.74	99	.460
	E	47	67.39	8.81			
Accumulative GPA	I	54	2.79	.55	-.10	98	.917
	E	46	2.80	.57			
SAT Verbal	I	47	482.26	83.91	1.05	87	.298
	E	42	463.83	81.75			
SAT Math	I	47	544.83	110.44	.42	87	.674
	E	42	535.98	83.45			
Age	I	30	21.07	2.116	1.16	42	.254
	E	23	20.57	.945			
Socio-Economic Status	I	25	4.24	.66	2.38	44	.022*
	E	21	3.67	.97			
Expected Grade	I	28	3.46	.51	1.16	49	.253
	E	23	3.30	.47			

Interpersonal Trust

Table three presents the summary statistics for the 4 T-Tests comparing high trusters with low trusters. Hypothesis one is also strongly supported for the Interpersonal Trust data as college accumulative GPA, SAT-Verbal, and SAT-Math were all non-significant. Hypothesis six presents a problem as our data reveals a strong significant difference (p=.009) between the high and low trusters but in the direction opposite to that predicted. The low trusters expected higher grades than the high trusters.

TABLE THREE
Student T-Tests For High Scores On The
ITS Versus Low Scores Over The Dependent Measures

Dependent Variable			Sample Size	Group Mean	Group S.D.	T Value	D.F.	2-Tail Prob.
Accumulative GPA	High	ITS	48	2.79	.58	−.05	99	.961
	Low	ITS	53	2.80	.54			
SAT Verbal	High	ITS	44	470.20	83.63	−.57	88	.568
	Low	ITS	46	480.61	88.24			
SAT Math	High	ITS	44	551.48	104.65	.85	88	.400
	Low	ITS	46	533.98	85.81			
Expected Grade in Course	High	ITS	25	3.60	.50	2.71	51	.009*
	Low	ITS	28	3.25	.44			

CONCLUSION

The results of this study lead to the conclusion that Internal- External Locus of Reinforcement Control does not discriminate for the concept of academic achievement at the college level. The strong support for hypothesis one indicates that Locus of Control and Interpersonal Trust are independent of intelligence. This would imply that any impact from I-E or ITS would be in the area of motivation. As a post- hoc test of motivation, the absence rate was investigated for I-E and ITS.

The results of a median split T-Test for absences failed to show any significant difference between Internals and Externals (T=1.27; p=.208) or between high and low trusters (TO .89; p=.375). This finding tends to support the contention that I-E and ITS do not directly affect the academic achievement of college students. It is quite likely that any activity associated with the grading process at the collegiate level will be salient to both Internals and Externals. Thus the External may prepare equally diligently for both announced exams and for unannounced quizzes. It should be highlighted at this point

that all Students were aware that they would be having a fixed number of unannounced quizzes during the term. This awareness undoubtably had an impact upon the students during the term.

It should be noted in table two that Internals had significantly less Interpersonal Trust than Externals. This finding is contrary to Massari and Rosenblum's (1972) results.

While no hypotheses were presented in this study relative to a relationship between Locus of Control and Interpersonal Trust, it was implicitly accepted from past research that a positive relationship existed (Rotter, 1971 and Massari and Rosenblum, 1972).

This negative relationship between Internality and Interpersonal Trust might be an artifact of the times. The studies showing positive relationship were conducted prior to Watergate or the disclosure of widespread bribery of foreign officials by American companies. It is highly likely that these events had a differential effect upon Internals and Externals. Quite possibly the Internals in our society have become more skeptical as a result of our tarnished national image. This is an empirical question calling for more extensive investigation.

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