Developments In Business Simulation & Experiential Exercises, Volume 19, 1992

THE INFLUENCE OF MYERS-BRIGGS TYPE AND GROUP DYNAMICS FACTORS ON TOTAL ENTERPRISE PERFORMANCE

Jerry Gosenpud, University of Wisconsin-Whitewater
John Washbush, University of Wisconsin-Whitewater

ABSTRACT

This study was primarily concerned with the relative influence of individual personality and group dynamics factors on total enterprise performance. Specifically, it hypothesized that the personality characteristic Myers-Briggs type (MBT) does not predict TEL performance, that instead group dynamics variables such as group cohesion and degree of organization have a greater impact. In general, the results were inconclusive as to whether MBT influenced TE performance. However a stepwise multiple regression showed that group dynamics variables influenced performance, while MBT did not. Performance varied with the degree to which groups seemed alert, arranged and directed, the degree to which people felt close to their teammates and the degree to which they felt that their teammates contributed.

BACKGROUND

This study continues a series (Patz, 1990; Anderson and Lawton, 1991; Patz, Millman, and Driver, 1991; Washbush and Gosenpud, 1992) of efforts analyzing the influence of Myers-Briggs Personality Type (MBT) scores on performance in the TE. These studies have examined whether simulation players with "intuitive" information processing styles (Ns) and "thinking" decision making styles (Ts) perform better in TE simulations than players with other MBT processing and decision-making styles. In teams formed using unspecified criteria, Patz (1990) and Patz, Millman and Driver (1991) found that TE performance was greater for groups with a large percentage of players with an N or T dominated MBT profile than for groups with a smaller percentage. On the other hand with self-selected teams, Washbush and Gosenpud (1992) found no relationship between MBT dominance and TE performance, and Anderson and Lawton (1991) found no relationship between TE performance and MBT score when the simulation was played by individuals.

This study presumes that MBT score does not influence TE performance. This presumption results in part from research dealing with the relative influence of individual background factors (such as major and GPA) and group dynamics variables such as cohesion on performance in the simulation (Gosenpud and Washbush, 1991; Gosenpud and Miesing, 1992; Norris and Niebuhr, 1980). In all three of these studies, group dynamics factors proved to be significant predictors of game performance while individual background factors did not.

The present study also explores the relative influence of individual and group factors on TE performance. But instead of studying GPA and major as individual factors, this study focuses on MBT score. It presumes that if individual background factors such as CPA are ineffective predictors of performance when measured along with group dynamics factors, then personality indices will also be ineffective predictors.

In addition, the present study explores the possibility that MBT did not affect performance in some of the above studies because teams were mixtures of MBT types. Therefore in the present study an effort was made to create homogeneous teams, teams totally dominated by one MBT type.

Hypotheses

The hypotheses for this study are:

H1: The final performance of N dominated, T dominated or NT (or TN) combination teams will be no greater than that of other MBT types.

H2: When measured together, group dynamics factors will have a greater influence on TE performance than the MBT.

METHOD

Subjects

The subjects of this study were students (n = 119) enrolled in two sections of the required undergraduate Administrative Policy course and one section of an MBA graduate course in Business Policy at the University of Wisconsin-Whitewater. These students competed in five industries using the Micromatic (Scott and Strickland, 1985). All industries were identical with respect to decision factor weights, market growth, and evaluative criteria. The game was worth 20% of the course grade; 5% of the course grade was based on peer ratings of team contribution.

Variables

Myers-Briggs Theory

As described by Myers and McCaulley (1985), the Myers-Briggs Type Indicator (MBTI) is based on C. G. Jung's
Theory concerning individual personality type as reflected by perception, judgment and attitudes. The MBTI measures personality in terms of four indices:

Extroversion (E)-Introversion (I) Outer-world versus inner-world oriented

Sensing (S)-Intuition (N)
Conscious versus beyond-conscious perception Thinking (T)-Feeling (F)
Logical versus social-values judging

Judgment (J)-Perception (P)
Preference for use of a Judgment process versus preference for use of a Perceptual process

According to MBTI theory, a personality may be described by a pattern of preferences on each of the four indices. There are sixteen possible combinations or "types," for example, INTP. For each type, one process is dominant and a second serves as an auxiliary. Thus a person can be categorized in two ways, according to dominant type or according to dominant-auxiliary combination. N dominance is associated with INFJ, INTJ, ENFP, and ENTP types, T dominance is associated with ISTP, INTP, ESTJ, and ENTJ types, and the NT (or TN) combination would be associated with INTJ, ENTP, INTP and ENTJ. Patz (1990) has argued that teams composed of NT dominant types are advantageously suited for the impersonal, knowledge-based, analytic requirements of TE simulations. This is consistent with the statements of Myers and McCauley (1985, p. 35) that NT dominant people prefer intuition and thinking, focus attention on possibilities, use impersonal analysis, are logical' and ingenious, and apply their abilities in theoretical and technical developments.

Group Dynamics

A number of studies have found a positive relationship between group dynamics variables and performance in the TE simulation including studies by Gosenpud (1989), Gosenpud and Washbush (1991), Miesing and Preble (1985), Norris and Niebuhr (1980), Wolfe (1975), and Yantis and Nixon (1982). In the present study, three group dynamics factors were measured–cohesion organization, and motivation to participate in the team. All three were measured by answers to a 57-item adjective checklist asking the student to characterize the group. Some of the items a respondent could check were fun, sluggish, coordinated and confident. In addition, cohesion was measured a second way, a seven item peer appraisal form, which was utilized as part of the students' simulation grades. The seven items rated attendance, performance of responsibilities, contribution, cooperation, leadership, knowledge of the simulation, and work quality. The form was filled out by team members describing each other (but not themselves).

Performance

Simulation performance was computed using the normalized scoring routine contained in the Micromatic software. Scores were computed for each quarter of play and cumulatively. Three scoring factors were used: After-tax earnings (60%), return on sales (20%), and return on assets (20%).

Categorization of Groups

To the maximum extent possible, groups were created pure with respect to dominance and dominance-auxiliary combinations, however course section membership made that impossible. Team composition with respect to MBT dominance and dominant-auxiliary combinations emerged

please note that only 36 of the 39 teams that participated in the game are represented in the above two tables. One of the teams was as follows:

DOMINANT CODE	# OF 100% PURE TEAMS	# OF AT LEAST 67% PURE TEAMS
N	5	9
T	9	10
S	9	16
F	1	1
TOTAL	24	36

DOMINANT AUXILIARY CODE	# OF 100% PURE TEAMS	# OF AT LEAST 67% PURE TEAMS
NT	9	10
NF	1	3
ST	15	17
SF	4	6
TOTAL	29	36

less than 67% pure in terms of dominant an dominant/auxiliary code, and two teams (one with only one player) had enough previous simulation experience to disqualify them from analysis.

Procedure

Students received a briefing on the game, took the Myers-Briggs, were assigned to teams using Myers-Briggs scores, played one practice round, and then commenced graded play one quarter per week for ten quarters. They filled out the adjective checklist after the first, fourth, seventh and ninth quarters and the peer rating instrument as they completed the last decision. They were not told the basis for team building (although some guessed). All teams consisted of three members, except for one 4-person and one 1-person teams in one graduate industry, two 4-person teams in one undergraduate industry, and one 4-person team in another undergraduate industry.

RESULTS

Hypothesis 1 proposes that MBT score will not influence TE performance. Tables 1, 2 and 3 show results pertinent to that hypothesis. The end of game performance ranking of teams in the five industries by MBT dominant and dominant/auxiliary code is contained in Tables 1 and 2. For example in Table 1A, of the five teams that were pure "N", three finished third, two in an industry of seven teams and one in an industry of eight teams. Table 1 shows these ranking for only those teams that were 100% pure in terms of dominant code (Table 1A) or dominant/auxiliary code (Table 1B). Table 2 shows the ranking of all teams that were at least 67% pure with respect to MBT code (Table 2A for dominant and 2B for dominant/auxiliary).
These results are inconclusive as to whether MBT dominance and dominant/auxiliary combinations influenced TE

TABLE 1
PERFORMANCE RANKING 100% PURE TEAMS

A: DOMINANAT CODE

DOMINANT CODE	# OF PURE TEAMS	PLACED/# OF TEAMS IN INDUSTRY	MEAN PLACEMENT
N	5	3/7, 6/7, 3/8, 3/7, 1/7	.45
T	9	7/7, 4/7, 8/10, 2/7, 5/7, 1/8, 4/8, 2/7, 4/7	.53
S	9	7/8, 2/8, 6/10, 4/10, 5/10 7/7, 3/7, 4/7, 6/7	.61
F	1	1.5/10	.15

B: DOMINANT/AXILIARY CODE

DOM./ AUX CODE	# OF PURE TEAMS	PLACED/# OF TEAMS IN INDUSTRY	MEAN PLACEMENT
NT	9	3/7, 6/7, 7/7, 3/8, 1/8, 1.5/10, 4/8, 3/7, 7/7	.54
NF	1	1/7	.14
ST	15	2/7, 5/7, 7/8, 3/10, 4/10, 5/10, 8/10, 4/7, 6/7, 7/7, 2/7, 3/7, 4/7, 5/7, 6/7	.61
SF	4	6/10, 1.5/10, 6/7, 6/7	.62

TABLE 2
PERFORMANCE RANKING (AT LEAST 67% PURE TEAMS)

A: DOMINANT CODE

DOMINANT CODE	# OF TEAMS	PLACED/# OF TEAMS IN INDUSTRY	MEAN PLACEMENT
N	9	3/7, 6/7, 1.5/10, 3/8, 6/8 3/7, 1/7, 7/7, 1/	.48
T	10	7/7, 4/7, 1/8, 4/8, 9/10 8/10, 2/7, 4/7, 2/7, 5/7	.58
S	16	2/7, 5/7, 7/8, 2/8, 3/10, 4/10, 5/10, 6/10, 7/10, 10/10, 7/7, 6/7, 1/7, 3/7, 4/7, 6/7	.59
F	1	1.5/10	.15

B: DOMINANT/AUXILIARY CODE

DOMINANT AUX CODE	# OF TEAMS	PLACED/# OF TEAMS IN INDUSTRY	MEAN PLACEMENT
NT	10	3/7, 6/7, 7/7, 3/8, 1/8, 2/7, 1.5/10, 4/8, 3/7, 7/7	.52
NF	3	1/7, 6/8, 1/7	.35
ST	17	2/7, 5/7, 7/8, 3/10, 4/10, 5/10, 8/10, 4/7, 6/7, 7/7, 2/8 2/7, 3/7, 4/7, 5/7, 6/7, 9/10	.61
SF	6	6/10, 1.5/10, 6/7, 6/7, 7/10, 1/7	.55

performance ranking. There was some tendency for Ns, Fs and NFs to perform better than other MBT types, but frequencies are far too small for statistical significance to be reached. On the other hand, correlational results show that MBT does not influence TE performance. Table 3 displays correlations between MBT scale score for each individual on all MBT dimensions and cumulative TE performance after four selected quarters of the game. It shows that correlations between MBT score and performance were for the most part below [.10], suggesting at best a very weak relationship between Myers-Briggs type and simulation performance.

Hypothesis 2 suggests that group dynamics factors will show a greater affect on performance than the MBT, when regressed together. Table 4 shows the results of step-wise regressions with performance at the end of the game as the dependent variable and

TABLE 3
CORRELATIONS BETWEEN MYERS-BRIGGS AND SIMULATION PERFORMANCE

PERFORMANCE AT THE END OF:	MYERS - BRIGGS SCORES Extroversion/ Introversion	Sensing/ Intuition	Thinking/ Feeling	Judgement/ Perception
Qtr 10	-.14	.07	.21	.12
Qtr 13	.00	-.21	.05	-.03
Qtr 16	.06	-.10	-.07	-.07
Qtr 18	.05	-.06	-.10	-.12

Note: correlations over .19 significant at the .05 level

MBT scores and motivation, organization and cohesion scores from both the peer rating scale at the end of the game and adjective check list scores taken around quarter 15 as independent variables. These results indicate that as predicted group dynamics variables influence performance, while MBT did not. No MBT variable loaded significantly on performance. Performance varied with the degree to which groups seemed alert, arranged and directed, the

TABLE 4
MULTIPLE REGRESSION OF MBT SCORES MOTIVATION, ORGANIZATION AND COHESION ON PERFORMANCE

Multiple R	.654	F	8.16
Adjusted R Square	.376	p (F)	.00
		df	98

Variables in the Equation

VARIABLE	Beta	T	p(T)
Not frustrated	.286	3.49	.001
Not apathetic	.221	2.83	.006
Perceived contributng	.230	2.97	.004
Not lonesome	.182	2.33	.022
Alert	.198	2.50	.014
Not persistent	.192	2.44	.016
Not clear	.235	2.93	.004
Not inert	.186	2.40	.018
Arranged	.166	2.05	.043

degree to which people felt close to their teammates and the degree to which they felt that their teammates contributed.

It is possible that group dynamics variables loaded as significantly as they did on final performance because those variables were measured only three weeks before the end of the game when group dynamic scores reflected momentum towards finishing rather than realistic measures of motivation, organization or cohesion. To eliminate this potential interpretation, a second stepwise multiple regression was performed. This one included MBT scores and only group dynamics scores from the adjective checklist administered during the second week of the game as independent variables. Table 5 shows those results

Table 5 shows that even group dynamic variables measured very early in the game were better predictors of performance than MBTI scores. The results from Table 5 suggest that players who were comfortably active, explorative and informal early in the game performed better overall.

DISCUSSION

TABLE 5
MULTIPLE REGRESSION OF MBT SCORES AND MOTIVATION, ORGANIZATION AND COHESION SCORES (AT WEEK 2 OF THE GAME) ON PERFORMANCE

Multiple R	.442	F	6.14
Adjusted R Square	.164	p (F)	.002
		df	101

Variables in the Equation

VARIABLE	Beta	T	p(T)
Confused	.235	2.62	.010
Not idle	.279	3.11	.002
Not formal	.208	2.32	.022
Not persistent	.179	1.99	.049

This study adds support to the notion that dynamics of the team impacts performance on the simulation. The purpose of this study was not to focus on how team development affects team performance, but the fact is that in this study group dynamics variables predicted performance while other variables measured in this study including MBT and major did not. In particular, alert directed persistent groups performed better. This conclusion, based on one study, is tentative, and clearly more research on how group dynamics and team performance relate is in order.

One of the purposes of this study was to test whether "intuitive thinkers" (NTs), as measured by the Myers-Briggs, performed better on the simulation as hypothesized by Patz (1990). We hypothesized that they would not. The results were inconclusive. Intuitives did a little better than average, but "feelers" did even better. Of the dominant/auxiliary code combinations, intuitive feelers did the best, but there were only three of these out of 36. NTs did just about average. A very very tentative conclusion from this study's results is that MBT does not influence simulation performance, a conclusion contrary to the contentions of Patz (1990) and Patz, Millman and Driver (1991). Since this study's intention was to research the impact of MBTI on performance by forming groups that were pure as to MBT code, since its results were inconclusive with regard to MBTI influence, and since to gain conclusiveness would require many more groups pure as to MBT code than participated in this study; it probably makes sense not to use this study's methodology to study the relationship between MBTI and TE performance in the future.

END NOTES

1. Neither of these teams tried to win the competition. Both were instructed to "learn" and were graded accordingly.

2. TE = Total Enterprise simulation.

REFERENCES

Anderson, P.R. and Lawton, L. (1991) Personality types and total enterprise simulation performance Developments in Business Simulation & Experiential Exercises, 18, 1-4

Gosenpud, J. J. (1989) Prediction of simulation performance as it is affected by time. Simulation and Games, 20, 319-350

Gosenpud, J.J. & Miesing, P. (1992) The relative influence of several factors on simulation performance Simulation and Games (in press)

Gosenpud, J.J. & Washbush, J.B. (1991) Predicting simulation performance: differences between groups and individuals. Developments in Business Simulation & Experiential Exercises, 18, 44-48

Miesing, P. & Preble, J.F. (1985) Group processes and performance in a complex business simulation Small Group Behavior, 16, 325-338

Myers, I.B. & McCaulley, M.H. (1985) Manual: A Guide to the Development and Use of the Myers- Briggs Type Indicator. Palo Alto, CA: Consulting Psychologists Press.

Norris, D.R. & Niebuhr, R.E. (1980) Group variables and gaming success Simulation and Games, 11, 301-312

Patz, A.L. (1990) Group personality composition and total enterprise simulation performance Developments in Business Simulation & Experiential Exercises, 17, 132-137

Patz, A.L., Millman, J.F. & Driver, M.J. (1991) Career concepts and total enterprise simulation performance Developments in Business Simulation & Experiential Exercises, 18, 84-89

Scott, T.W. & Strickland, A.J. (1985) Micromatic: A Management Simulation. Boston: Houghton Mifflin.

Washbush, J.W. & Gosenpud, J.J. (1992) Personality and Group Performance in Total Enterprise Simulations under Editorial Review

Wolfe, J. (1975) Effective performance behaviors in a simulated policy and decision making environment Management Science, 21, 872-882

Yantis, B. & Nixon, J.B. (1982) Interpersonal compatibility effects on simulation game outcomes. Simulation and Games 13, 337-349.