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

PERSONALITY CHARACTERISTICS AND GROUP PERFORMANCE IN TOTAL ENTERPRISE SIMULATIONS

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ABSTRACT

This study was designed to test the proposition, advanced by Patz and others, that teams dominated by Myers-Briggs Type Indicator "thinking" and "intuiting" styles perform better in total enterprise simulation games. This study found no relation between such factors and simulation performance of groups of undergraduate business seniors.

BACKGROUND

The purpose of this study is to investigate whether certain personality factors, as defined by the Myers-Briggs Type Indicator (MBTI) are associated with performance success in competitive business simulation settings using total enterprise (TE) simulations. Patz (1990) and Patz, Milliman and Driver (1991) have suggested that total enterprise simulations are biased in favor of groups dominated with members possessing "intuitive" (N) information processing styles and "thinking" (T) decision making styles as measured by the MBTI. They have presented evidence that N and T (NT) dominant teams establish early leads and maintain leads in TE competition. On a contrary vein, Anderson and Lawton (1991) have presented evidence that, on an individual-play basis, N and T personalities do not perform in a systematically superior manner. This study explores NT-dominance bias on a team-play basis and presents evidence consistent with the findings of Anderson and Lawton and contrary to those of Patz, et al. To cross-confirm these findings, this study additionally finds no evidence of personality-dominance bias using Learning Style Inventory (LSI) measures analogous to MBTI N and T styles.

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 (5)-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. N dominance is associated with INFJ, INTJ, ENFP, and ENTP types. T dominance is associated with ISTP, INTP, ESTJ, and ENTJ types. 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.

LSI Theory

The Learning Style Inventory (LSI) (Kolb, 1976) identifies four basic learning modes:

Concrete Experience (CE)
Learning from feeling
Reflective Observation (RO)
Learning by watching and listening
Abstract Conceptualization (AC)
Learning by thinking
Active Experimentation (AE)
Learning by doing

Learning style is defined as a unique combination of these modes, and each individual has a unique learning style as:

Converger (AC and CE)--finds practical uses for ideas and theories; can solve problems and use solutions to solve problems; prefers technical tasks and problems to social and interpersonal Issues.

Diverger (CE and RO)--views concrete situations from many different points of view; observes situations rather than taking action; enjoys generating ideas; has broad cultural interest and likes to gather information.

Assimilator (AC and RO)--understands a wide range of information and puts it into concise, logical form; more interested in abstract ideas and concepts than people; prefers logical soundness to practical value.

Accommodator (CE and AE)--Enjoys carrying out plans and involvement in new and challenging experiences; tends to act on feelings rather than on logical analysis; often relies on people for information rather than on own technical analysis.

Myers and McCauley (1985, pp. 203-204) report research finding significant correlations between several LSI measures (RO and AC-CE) and MBTI N and T scores. These correlations suggest that, if team performance in TE simulations Is positively influenced by NT dominance, the LSI Assimilator style, which combines Abstract Conceptualization (AC) with Reflective Observation (RO), should correlate with TE performance.

RESEARCH DESIGN

Hypotheses

The purpose of this study was to examine the findings of Patz et al. that specific dominant cognitive styles and processes involved with analysis and decisions making are systematically related to performance In TE simulations. It seems reasonable to expect superior performance from groups dominated by people who can sense connections and systematically analyze details when making decisions in TE simulation environments characterized by compression of playing time and quantitative complexity.

The null hypotheses for this study are:

Hi: NT-dominant teams do not establish early performance leads.
H2: NT-dominant teams do not maintain leads, if established.
H3: NT-dominant teams do not lead at the end of play.

These additional hypotheses, using LSI measures, are stated for cross-confirmation purposes:

H4: Assimilator-dominant teams do not establish early performance leads.
H5: Assimilator-dominant teams do not maintain leads, if established.
H6: Assimilator-dominant teams do not lead at the end of play.

Subjects

The subjects of this study were students (n = 107) enrolled in three sections of the required undergraduate Administrative Policy course who competed in TE simulations using Micromatic (Scott and Strickland, 1985). Each class section contained a unique Micromatic industry. All industries were identical with respect to decision factor weights, market growth, and evaluative criteria.

Students received a class briefing on the game, played one practice round, and then commenced play for score over ten quarters. Two sections contained 12 three-person teams, and one section contained 5 four-person teams and 5 three-person teams. All students were senior business majors. At the beginning of play, students were informed that the game would end with the conclusion of quarter 18 (ten quarters of play); however they were advised that companies had to end play as "going concerns."

Formation and Categorization of Student Groups Students formed groups using self-selection. After the groups had formed, the instructor administered and examined scores from the MBTI and LSI. Group classifications were made as follows:

1) Degree of NT Dominance

Category	Percentage NT	Number of Groups
1	0	7
2	>0.00 to <=0.33	17
3	>0.33 to <=0.75	8
4	>0.75 to <=1.00	2

2) LSI learning style dominance (>= 50% of group members share style)

Category	LSI Style Dom.	Number of Groups
1	No Dominance	6
2	Accommodator	3
3	Diverger	2
4	Converger	9
5	Assimilator	14

Simulation Performance Measurement Simulation performance was computed using the normalized scoring routine contained in the Micromatic software. Scores were computed for each weekly round of play (simulation quarter) and cumulatively through the latest round.

Data Analysis Methods

Upon completion of data gathering, each hypothesis was statistically evaluated by means of one-way analysis of variance (ANOVA) using Minitab Release 7 software.

RESULTS

Group Comparability

A one way analysis of variance (ANOVA) was conducted on all quarterly and cumulative scores with industry (class section) as the independent variable. No significant differences between were found. Accordingly, data from the three class sections were pooled.

Hypotheses Tests

The first three hypotheses of this study stated that NT dominant teams do not establish, hold, and finish in leading positions. These hypotheses were tested by analyzing the results of one way Analysis of Variance (ANOVA) of quarterly and cumulative scores using NT dominance classification (above) as the independent variable. See Table 1.

The results of these analyses indicated no systematic relationship between the degree of NT dominance and group performance. Accordingly hypotheses 1 to 3 were accepted.

Hypotheses 4 to 6 stated that Assimilator-dominant teams do not establish, hold, and finish in leading positions. These hypotheses were tested by ANOVA of quarterly and cumulative scores using LSI style dominance classification (above) as the independent variable. See Table 2.

These results indicated no systematic relationship between group LSI learning style dominance and group performance. Accordingly, hypothesis 4 to 6 were accepted.

DISCUSSION

This study casts serious doubt on the idea that NT dominance is a significant influence on the performance of groups in TE simulations. The study explored NT dominance by degrees and found no significant association. Indeed, the data suggest that NT dominance and TE simulation performance may be somewhat inversely related. In addition, the study examined the influence of learning style dominance on simulation performance and found none.

These results are consistent with Anderson and Lawton's (1991) findings. Those authors found no relationship between MBTI scores and TE performance when the game was played by individuals. The present study found no relationship between MBTI scores and performance when the game was played in teams. Why Patz (1990) and his colleagues (1991) found clear and positive relationships between NT dominance and TE performance while Anderson and Lawton (1991) and the present author did not is far from clear. One hypothesis is that instructor style and method of game administration influence the relationship between personality type and performance. Very informal (and unsubstantiated) evidence supports this. Patz (1990) states that, in his studies at the University of Southern California, performance levels by team were stable over time--teams that established early leads maintained them. Here at Wisconsin-Whitewater, the norm is for Micromatic industries to be in greater flux. We commonly find that:

-Three to five different teams lead an industry at one time or another during a game
-A team near or leading at the halfway point is near last by the end of play
-A team in last place during the first third of the game finishes first or close to first

Table 1
Oneway Analysis of Variance
Quarterly and Cumulative Scores by NT Dominance

(df = 3,30; required alpha = .05)

Quarter	Perf. Scores	F	p	Sig.
9	Quarter	1.94	0.144	NS
	Cumulative	1.94	0.144	NS
10	Quarter	1.02	0.398	NS
	Cumulative	0.54	0.657	NS
11	Quarter	0.88	0.461	NS
	Cumulative	0.51	0.679	NS
12	Quarter	1.35	0.277	NS
	Cumulative	0.67	0.577	NS
13	Quarter	0.25	0.862	NS
	Cumulative	0.24	0.867	NS
14	Quarter	0.18	0.911	NS
	Cumulative	0.17	0.914	NS
15	Quarter	4.86	0.007	Sig. p<.01*
	Cumulative	1.37	0.270	NS
16	Quarter	5.55	0.004	Sig. p<.01*
	Cumulative	2.88	0.052	NS
17	Quarter	1.13	0.353	NS
	Cumulative	2.23	0.105	NS
18	Quarter	0.11	0.956	NS
	Cumulative	1.82	0.164	NS

* The significant F's in quarters 15 and 16 were attributable to the very poor performance of the two 100% NT teams.

Table 2
Oneway Analysis of Variance
Quarterly and Cumulative Scores by LSI Style Dominance

(df = 4,29; required alpha = .05)

Quarter	Perf. Scores	F	p	Sig.
9	Quarter	0.64	0.637	NS
	Cumulative	0.64	0.637	NS
10	Quarter	1.12	0.366	NS
	Cumulative	0.88	0.487	NS
11	Quarter	1.09	0.382	NS
	Cumulative	0.23	0.918	NS
12	Quarter	0.54	0.710	NS
	Cumulative	0.23	0.918	NS
13	Quarter	0.20	0.935	NS
	Cumulative	0.47	0.759	NS
14	Quarter	0.57	0.687	NS
	Cumulative	0.18	0.949	NS
15	Quarter	0.37	0.831	NS
	Cumulative	0.27	0.895	NS
16	Quarter	0.79	0.543	NS
	Cumulative	0.48	0.748	NS
17	Quarter	0.13	0.970	NS
	Cumulative	0.38	0.822	NS
18	Quarter	0.41	0.802	NS
	Cumulative	0.42	0.789	NS

It's hard to believe that these differences in game stability are caused by location. A more likely explanation is that we at Wisconsin-Whitewater administer the game differently or explain things differently. The effects of instructor style and style differences in game administration are therefore areas for future research.

That this study did not find a relationship between performance and personality type suggests that group performance is a product of a more complex mix of factors than examined in those studies, which provided the foundation for this investigation. Clearly, additional research on the variables influencing group performance remains a wide-open field of inquiry.

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