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DOMINANT PERSONALITY TYPES AND TOTAL ENTERPRISE SIMULATION PERFORMANCE: A FOLLOW-UP STUDY

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ABSTRACT

Patz (1990, 1992) presented evidence that total enterprise simulations are biased in favor of a particular personality type. This study directly tests Patz's hypotheses but uses individuals rather than groups to isolate the effects of personality type on simulation performance from that caused by group dynamics. No support for Patz's conclusions is found.

INTRODUCTION

The purpose of this study is to directly test Patz (1990. 1992) hypothesis that dominant personality type as measured by the Myers-Briggs Type Indicator is related to performance in a total enterprise (TE) simulation exercise. Based on his research, Patz concluded that TE simulations are biased in favor of Intuitive and Thinking (N and T) personality types. While Patz found that the degree of N and T dominance among team members was positively related to simulation performance, his analysis was complicated by the fact that his students participated in teams. No attempt was made to assess the influence of group dynamics on his results. Therefore, it is not possible to determine how much of the groups' simulation performance was a function of group dynamics rather than personality type.

This study an extension of earlier work by Anderson and Lawton (1990), eliminates the problem of group dynamics by having each individual student operate his or her won company in a total enterprise simulation. Anderson and Lawton (1990) conducted a partial replication of Patz's hypothesis and found evidence that contradicted his conclusions. While they examined individuals (rather than groups). Anderson and Lawton related simulation performance to the student's *relative* MBTI preferences rather than to his or her *dominant* personality type.

Two other studies, by Gosenpud and Washbush (1992) and Washbush (1992), more directly tested Patz's hypothesis concerning dominant personality types and found inconclusive or contradictory results. However, in both of these cases, groups were the unit of measure and hence the results were affected by group effects. In fact, the Gosenpud and Washbush (1992) study included measures of group dynamics. They found group dynamics affected performance on the simulation, but the effects of the MBTI dominant personality types were unclear. Washbush's results contradicted Patz's but no measures of group effects were reported.

Michael, Johnson Fleming, and Lynch (1992) explored the effects of personality type on simulation performance using the Type Differentiation Indicator (TDI) developed by Saunders (1987). The TDI provides 27 subscale measures, including five scales for each of the four dimensions measured by the MBTI (for 20 MBTI subscales). Michael et al. used teams of six, with an elected CEO, to manage the simulation companies. As did Anderson and Lawton (1990), Michael et al. measured *relative* MBTI preferences rather than the *dominant* personality type which was the focus of Patz' research. They found limited support for the contention that personality type is related to performance on a simulation. They attempted to relate performance to the personality types of individuals, a composite personality profile for the team and the personality of the team's CEO. Correlations between team performance and individual TDI scores 'were low or insignificant (page 6). The relationship between performance and the personality of the CEO was also weak. Only two of the twenty MBTI subscales showed a statistically significant relationship and *none* of the four MBTI dimensions (e.g.. thinking/feeling) were correlated with performance. The composite team personality profile showed the greatest number of significant relationships with performance. Six of the twenty MBTI subscales were significant and two of the dimensions of the MBTI were found to be related to performance. Based on their results, Michael. et al. concluded that .'. .team composite results suggest that the more successful teams were composed of more members who favor the intuitive and thinking functions (page 9).

Given the conflicting results among the various studies, this study was undertaken to provide a direct test of Patz's hypothesis using individuals rather than teams, thus eliminating the complications arising from group dynamics. As such, this research provides a clean test of the reliability of the hypothesis that total enterprise simulations are biased in favor of particular personality types.

Myers-Briggs Type Personality Theory

The Myers-Briggs Type Indicator (MBTI) instrument provides an assessment of an individuals preferences for processing information and decision making. The MBTI instrument measures an individual's preferences on four dichotomous scales:

Extraversion (E) versus Introversion (I)
Sensing (5) versus Intuition (N)
Thinking (T) versus Feeling (F)
Judging (J) versus Perceiving (P)

These four dichotomous dimensions translate into 16 basic personality types such as ENTJ or INFP. For each personality type a *dominant* and auxiliary personality pattern for information processing and decision making can be identified. These dominant and auxiliary types can be either sensing, intuitive, thinking, or feeling. A precise method for determining an individual's dominance type is described in Myers and Myers (1980).

Patz's research focused on the relationship between these *dominance* patterns (as opposed to the relative strength on each of the four dichotomous scales) and TE simulation performance. Patz (1990. 1992) hypothesized that TE simulations are biased in favor of N and T type dominant personalities. He presented evidence that N and T type dominant personalities consistently outperform other personality types on a TE simulation.

Patz cited Myers and McCaulley's (1985) description of N and T types as preferring to make judgments pursuing a possibility there is a 'technical, scientific, theoretical, or executive one, with the human element subordinated. They further contended that N and T types tend to be logical and ingenious. They are best in solving problems within their field of special interest the more intricate aspects of finance, or any sort of development or pioneering in technical or administrative areas" (Myers and McCaulley. 1985. Chapter 4 page 35).

Patz argued the N and T type characteristics described by Myers and McCaulley match those designed into total enterprise simulations. TE simulations require the application of technical, scientific, and theoretical knowledge presented in business program curriculum. Further, TE simulations put participants into the role of an administrator who

oversees the business functions of marketing, operations, and finance. Given this "fit" between the N and T type personality and TE simulations. Patz contends that simulation teams with a member who has a dominant N and T type personality will establish an early lead over other teams in a TE simulation. Patz also hypothesized these teams would maintain their lead throughout the simulation exercise.

Hypotheses

Based on Patz's earlier work, the following hypotheses were tested.

H1: Individuals with dominant N and T type personalities will out-perform all other dominant personality types over the first six decision periods of the simulation exercise.

H2: Individuals with dominant N and T type personalities will out-perform all other dominant personality types over the ten decision periods of the simulation exercise.

H3: Individuals with dominant N and T type personalities will out-perform all other dominant personality types over the last four decision periods of the simulation exercise.

RESEARCH METHODOLOGY

The Subjects and the Course

Subjects for the study were seniors in their final year of study at a medium-sized, private, midwestern university. All were members of one of two sections of a business policy course conducted using a total enterprise simulation (described below) as a major component of the course pedagogy. The profile of the student was that of a typical traditional college senior. All were majoring in various fields of business administration.

The Simulation

The simulation used was the same as that used by Patz (1990) in his study: *Micromatic: A Management Simulation* by Scott and Strickland (1985). *Micromatic* is a moderately complex simulation. Each decision set requires approximately 60 decisions in the areas of production, marketing, and finance. Each decision set represents a three-month period.

The Methodology

Students were first exposured to the simulation as a member of a group. This ensured that students developed a basic understanding of the simulation. After four decision periods students were required to manage a simulation company as an individual, beginning with the initial quarter of the simulation's operation. That is, the individually managed companies were not continuations of the group-managed companies. This resulted in 44 individually managed companies, one for every student involved. Because of software restrictions, these companies were organized into three separate industries: two industries of 15 companies each and one industry of 14 companies. The students were randomly assigned to one of the three industries. Competition among the firms was within each industry, not across industries. A total of 10 simulated quarters of operation were run.

Micromatic uses seven factors to determine current quarter and game-to-date rankings of company performance. These factors are sales revenues, net income, earnings per share, return on sales, return on assets, return on equity, and stock price. The percentage weights assigned to these factors were the same as in the Patz study: 10, 20, 10, 5, 25, 20, and 10, respectively. Results were standardized so that a comparison of performance across the three industries could be made. Performance of individually managed simulation companies counted for 25% of the student's grade for the course.

The Myers-Briggs Type Indicator instrument was administered to the students early in the semester. Feedback on the MBTI and their personality type was given at the end of the semester, after completion of the simulation exercise.

The current study directly tests Patz hypothesis that simulation exercises are biased in favor of dominant personality types. It improves upon the Patz study by having each simulation company managed by an individual, to eliminate the group effects involved in Patz's work. Also, the use of individuals as the unit of measure created a larger sample size; 44 versus 12 in the Patz study. Finally, the current study ran for 10 decision periods versus 8 conducted in the Patz study. The two extra periods should allow any bias in favor of a personality type to materialize, if they do exist.

RESULTS

Analysis of variance tests were conducted to measure the relationship between the students' Myers-Briggs dominant personality types and their *cumulative* performance on the TE simulation after six decisions, after ten decisions, and for the last four decisions. Analysis of the last four decisions was conducted to test whether lucky" performance early in the simulation exercise influenced overall results.

Table #1 shows the cumulative performance of the different dominant personality types after 6 decisions. The p-value of .557 indicates that after 6 decisions, no dominant personality type had significantly better performance than any other. This is in direct contradiction with the results found by Patz.

Table #1
Dominant Personality Type Versus Standardized TE Simulation Performance Scores After 6 Decisions

	Sample Size	Mean	Standard Deviation
Sensing (S)	8	.273	1.205
Intuition (N)	13	-.087	1.023
Thinking (T)	14	.145	.719
Feeling (F)	9	-.343	1.091

$p < .557$

Tables 2 and 3 also show that no significant difference exists on simulation performance between dominant personality types after 10 decisions had been completed nor over the last 4 decisions sets. Table 3 shows that even if initial poor performance had affected cumulative performance after 6 decisions and after 10 decisions, none of the dominant personality types was able to achieve a significant advantage over the last 4 quarters of operation. Not only did the p-values fail to approach significance but the direction was contrary to expectations. As can be seen in Tables 1 through 3, the sensing dominants scored higher than the Ns or Ts.

DISCUSSION AND CONCLUSIONS

Table #2
Dominant Personality Type Versus Standardized TE Simulation Performance Scores After 10 Decisions

	Sample Size	Mean	Standard Deviation
Sensing (S)	8	.387	1.225
Intuition (N)	13	-.026	.942
Thinking (T)	14	.113	.830
Feeling (F)	9	-.482	.963

$p < .310$

Table #3
Dominant Personality Type Versus Standardized TE Simulation Performance Scores Over Last 4 Decisions

	Sample Size	Mean	Standard Deviation
Sensing (S)	8	.323	1.122
Intuition (N)	13	.126	1.022
Thinking (T)	14	-.053	.923
Feeling (F)	9	-.388	.876

$p < .480$

Results of this study show no support for the hypothesis that total enterprise simulations are biased in favor of particular personality types. No significant differences exist on simulation performance between dominant personality types at any stage of the simulation's operation. No 'personality bias was found at the beginning, end, or over the duration of the simulation. As stated earlier, not only was there a lack of significant difference between personality types regarding simulation performance but the direction of the differences that did exist were contrary to those hypothesized by Patz.

There were differences between the methodology used in this study and that used by Patz that may explain the conflicting results. These include (1) the use of individuals rather than groups as the unit of measure, (2) the age and amount of business experience of the subjects, and (3) the subjects prior experience with a simulation exercise.

The focus on individuals rather than groups was the major methodological variation in this study's test of Patz hypotheses. In addition, the current study's subjects were typical, traditional college seniors. In the Patz study they were full-time employed, with an average of seven years of business experience. This study's subjects also had a four decision period introduction to the simulation. The Patz study does not report whether his subjects had any prior exposure to the simulation exercise.

Even with these differences, it would seem reasonable to assume that if the effect of personality type is as dominant at Patz suggests, there should be some signs of its influence regardless the inclusion of these variables. However, no measurable effect on performance related to personality type was found in this study. In fact, where group effects were eliminated, no support for the hypothesis was found. Given earlier research support for the importance of group effects on simulation performance reported here and in earlier research (e.g.. Wolfe and Box), and the lack of support for the influence of personality type when group effects are eliminated, it appears that group dynamics rather than personality type, may be a more fruitful area for future research.

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