Developments In Business Simulation & Experiential Exercises, Volume 17, 1990

EFFECTS OF COGNITIVE STYLES ON RESPONSES IN M IN-BASKET SIMULATION

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ABSTRACT

This study investigated the effects of cognitive styles on responses to a wide variety of organizational problems presented in an in-basket simulation. Cognitive styles were measured by the Myers-Briggs Type Indicator (MBTI). The MBTI has been used in pre- vious research with a variety of business simulations emphasizing functional decisions (i.e., marketing, production, finance). However, an in-basket simulation offers a different perspective since the focus is on interpersonal or supervisory issues such as communication styles or delegation. In this setting, the results yielded mixed support for the general proposition that cognitive styles would affect the perception of organizational problems and preferred actions in resolving the problems.

INTRODUCTION

There is a rich tradition of theory and research relating individual cognitive functioning to a variety of behavioral processes including problem solving, decision making, and experiential learning. Within this tradition, one very popular instrument for classifying individual cognitive styles has been the Myers-Briggs Type Indicator (MBTI) (Myers and McCaulley, 1985). The MBTI has been used extensively in research (cf. Hellriegel, Slocum, and Woodman, 1989; Myers and McCaulley, 1985) and experiential exercises (cf. Lewicki, et. al, 1988; Marcic, 1989; Mitroff and Mitroff, 1980). The MBTI also has been very popular in applied organizational settings (cf. Mitroff and Kilmann, 1975; Moore, 1987). Indeed, the MBTI may be the most widely used personality test in the United States with a recent estimate that over 1.5 million individuals completed the MBTI In 1986 alone (Moore, 1987).

Purpose of the Study

The purpose of this research was to investigate the role of cognitive styles in responding to a wide variety of organizational problems posed by an in- basket simulation. Previous research using the MBTI has investigated cognitive styles in different types of simulations such as marketing (Anderson and Anderson, 1981; Kerin and Slocum, 1981), production (Alavi and Henderson, 1981), mergers and acquisitions (Blaylock and Rees, 1984), and capital budgeting (Henderson and Nutt, 1980). However, in-basket exercises typically represent a set of decisions or learning issues that differ from other simulations that are content-based. In particular, the basket simulations tend to focus more on interpersonal issues than simulations focusing on marketing, production, or finance. Moreover, in-basket simulations also tend to emphasize skills in delegation and time management compared to the emphasis on functional decision making of other simulations. Thus, the present research adds to previous research relating cognitive styles to business simulations.

Cognitive Styles

The MBTI is based on a theory of psychological types developed originally by C. C. Jung in the 1920s (Jung, 1971). Because the MBTI/Jungian framework for classifying cognitive styles has been summarized often in the literature, we will present only a brief outline of the model in this paper (for further discussion see Hellriegel, Slocum, and Woodman, 1989; Myers and McCaulley, 1985; Taggart and Robey, 1981).

The MBTI measures four dimensions of behavioral preferences, which define an individuals psychological type. However, research on cognitive styles has focused on two of the dimensions most related to information processing: (1) Perception (information gathering), and (2) Judgment (information evaluation). Each dimension is composed of opposing mental functions. The functions of perception include Sensing (S) and Intuition (N). Sensing focuses on the immediate, concrete experience, the here-and-now. Individuals with a sensing orientation prefer to deal with facts, details, and the "bottom-linen. Intuition focuses on the future world of possibilities, going beyond the immediate facts to the meaning of the facts. Individuals with an intuitive orientation prefer to deal with ideas, concepts, and Innovative long-range thinking. The functions of judgment include Thinking (T) and Feeling (F). Thinking focuses on the use of analysis and logic to evaluate situations. Individuals with a thinking orientation prefer to solve problems systematically, objectively, and impersonally. Feeling focuses on the evaluation of situations by personal values and emotions. Individuals with a feeling orientation prefer to deal with problems spontaneously, subjectively, and personally.

The opposing functions on the two dimensions are combined to form four types representing differences in information processing: (1) ST (sensing/thinking),(2) SF (sensing/feeling), (3) NT (intuitive/thinking), and (4) NF (intuitive/feeling). These four types have been labeled variously as cognitive styles, problem-solving styles, decision-making styles, or management styles. In this paper, the term "cognitive styles' is used since this term seems to represent a more generic process than the other labels.

Research Issues

Research based on the MBTI has found that differences in cognitive styles may be related to the following: (1) the conceptualization of organizational problems (Cowan, 1987; Herden and Lyles, 1981), (2) the types of information preferred or considered useful by decision makers (Blaylock and Rees, 1984; Kerin and Slocum. 1981), (3) preferences for autocratic versus participatory decision-making methods (Schweiger and Jago, 1982), and (4) assessments of risk and capital expenditure decisions (Henderson and Nutt, 1980). However, we must be careful in generalizing from these results. For the most part, the studies have a number of limitations and the effects of cognitive styles typically have been quite small. Nevertheless, theory and research based on the MBTI/Jungian model suggests that cognitive styles affect the perceptions of organizational problems and the methods preferred for dealing with such problems.

In-basket Simulation

In-basket simulations typically provide a decision-maker with a wide array of organizational issues to consider in a short period of time. Thus, in-basket simulations seem to offer an excellent opportunity to see how cognitive styles affect a decision-maker's perceptions of and responses to organizational problems. This study used the Teletronics in-basket simulation (Silverman and Albert, 1988). The Teletronics simulation was designed as a vehicle for understanding and experiencing Mintzberg's findings relating to the nature of managerial work (Mintzberg, 1973). The organizational issues are presented so that participants may experience the variety, brevity, and fragmentation observed by Mintzberg. In addition, the in-basket items are designed to reflect opportunities to play all ten of the managerial roles conceptualized by Mintzberg.

Participants are placed in the position of Production Manager in Teletronics, Inc. Prior to the simulation exercise they familiarize themselves with background information about the company, its organization structure and the key people in the organization. During the simulation, In the role of Production Manager, participants are faced with an in-basket containing 15 items. All of the in-basket memos were designed to appear realistic including the Teletronics logo and letterhead. In the limited time provided (75 minutes) they must decide how to respond to each memo. Their responses then serve as a rich basis for examining their approach to managing and learning about what managers really do. It should be noted that although each participant plays the role of Production Manager, no manufacturing experience is required to benefit from this simulation. The generic managerial demands of the in-basket items are relevant to all management functions.

The in-basket items have been carefully designed to illustrate various management practices related to such issues as: (1) preparing subordinates for an upcoming change, (2) deciding on the relative appropriateness of making a decision oneself versus discussing alternatives with and/or getting information from other personnel, (3) playing a coaching role to improve a subordinate's performance, (4) determining what to do in order for effective implementation to occur, (5) getting subordinates committed to new objectives and proposals, and (6) managing conflict. Because participants have only 75 minutes in which to decide on responses to the wide variety of in-basket items, the exercise simulates the brevity and fragmentation associated with managerial work.

Hypotheses

Given the expectation that cognitive styles would affect perceptions of organizational problems and how to deal with those problems, we developed hypotheses ft three general areas: (1) judgments of the importance of each problem and its priority for action, (2) perceptions of patterns of interrelationships among the problems, and (3) preferences for actions in dealing with the problems. The possible actions included the use of memos, phone calls, or fate-to-face meetings with one or more individuals mentioned in each in-basket item. Within the general areas, we derived specific hypotheses as follows:

H-l. We expected the Judgment dimension of cognitive styles (TF) to be related to ratings of problem importance and priority for action. Specifically, Thinking types should rate technical problems as more important and assign higher priorities to these issues. In contrast, Feeling types should assign greater importance and priority to human problems.

H-2. We expected the Perception dimension of cognitive styles (SN) to be related to the perception of patterns of interrelationships among the 15 different in-basket items. Specifically, Intuitive types should perceive patterns or sees of issues in the problems presented by the in-basket items. In contrast, Sensing types should focus on each in-basket item as a separate issue.

H-3. We expected SF types to prefer more personal actions in dealing with the problems while NT types would prefer more distant or impersonal actions. Thus, SF types should emphasize face-to-fate meetings while NT types should emphasize the use of memos.

METHOD

The 43 subjects in this study were first year MBA students enrolled in two sections of an introductory management course. Each class met for 3 hours per week over a 15-week semester. The in-basket simulation was administered two-thirds of the way through the course, ensuring that students were already familiar with a wide range of management concepts and issues. They had completed an abbreviated version of the MBTI a number of weeks prior to the simulation and had discussed those results as part of a module on individual decision making. Participants were not informed that the decision-making module and the simulation results were going to be interrelated.

The week before the in-basket simulation, the participants were provided background information on Teletronics so that they could begin working on the in-baskets at the beginning of the next class. At the beginning of the simulation, participants were instructed to make brief notes regarding their basic approach to the in-basket items. In addition, they were asked to keep track of details (purpose, agenda, etc.) associated with their intended actions: memos, phone calls, and meetings (either one to one or group). They were told that as Production Manager, they had 75 minutes in which to respond to their in-baskets. After participants completed their in-baskets, they completed and turned in a post- simulation questionnaire which provided the data used in this study.

The first section of the questionnaire assessed actions taken in terms of total number of memos written, meetings planned, and phone calls planned. Meetings could be planned with either one or more than one persons.

The second section assessed the decision maker's rating of each of the 15 in-basket items in terms of (a) the degree to which it provided an important opportunity to impact the organization's effectiveness (5 point Likert scale) and (b) the degree of urgency in responding to the memo (3 point scale - extremely urgent, somewhat urgent and not very urgent).

The final section attempted to ascertain whether the decision-maker identified broader issues or patterns of problems among the memos. Participants were asked first to list up to 3 'broader issues or patterns' they recognized during the in-basket. They were then asked (1) whether they recognized and acted upon those

broader issues or patterns during the simulation, (2) recognized but did not act upon, or *(3)* whether their focus during the exercise was primarily on solving the issues raised by each individual item.

After completing the simulation exercise and the questionnaire the remainder of the class period involved a facilitated discussion of the in-basket experience. The discussion (paralleling the data collection) focused on actions taken, identification of items providing the greatest opportunity to impact the organization and identification of patterns. For each of these areas, data was collected using a show of hands and recorded for all to view. The recorded data then served as the basis for an extended discussion.

RESULTS

The data from the post-simulation questionnaire were analyzed with statistical programs from the SPSS-X package.

Judgments of Importance and Priority

To analyze the ratings of problem Importance and priorities for action, correlations were computed between the two cognitive style dimensions and the Set of ratings. Of the 60 possible correlation coefficients, only five were significant at $p < .05$. Of the five significant correlation's, only two were found for the TF dimension hypothesized to Influence ratings of importance and priority. It seems reasonable to conclude that for this particular Set of problems, judgments of importance and priority were not influenced by cognitive styles.

Perceptions of Patterns

To test the perceptions of underlying patterns in the problems, correlations were computed between the two cognitive style dimensions and the participant's self-reported recognition of patterns. The correlation coefficient for SN and pattern recognition was .39 ($p < .02$) indicating that Intuitive types reported the recognition of more patterns in the problem set. The correlation for if was not significant. This result is consistent with the expectations of Hypothesis 2. To further analyze the influence of the Intuitive style on perceptions of patterns, a content analysis was performed on the actual patterns listed by the participants. In this case, no differences were found for the SN dimension. Thus, support for Hypothesis 2 was mixed.

The content analysis of the patterns did reveal an interesting effect of the TF dimension. One of the major patterns listed by participants seemed to reflect a need for better teamwork between departments. The correlation between the TF dimension and the recognition of the teamwork pattern was .52 (p .001) indicating that Feeling types were more likely than Thinking types to recognize "teamwork" as a common problem cutting across several Issues.

Preferences for Action

To analyze the preferences for possible actions, 2 X *2* ANOVAs were performed with the number of memos, phone calls, and meetings serving as the dependent variables. To run the ANOVAs, each dimension was split at the median with the median store excluded. While this procedure reduced the sample size, we felt that this classification scheme offered the best contrast of the opposing types on each dimension. It is worth noting that the power of the statistical test was sacrificed by this procedure.

No differences were found for uses of memos and phone calls. However, a significant interaction of TF and SN was found for use of meetings. As predicted by Hypothesis 3, SF types called more meetings ($F - 5.43$, $p<.03$). Further analysis indicated that this effect was explained primarily by the preference for one-on-one meetings rather than meetings with two or more people. ANOVA indicated that SF types preferred more one-on-one meetings than other types ($F - 9.74$, $p< .005$) while ST types preferred less one-on-one meetings.

DISCUSSION AND CONCLUSIONS

In this section we will summarize and discuss the results of the research and consider some additional issues in using the simulation in a classroom setting.

Research Summary and Conclusions

The results provided mixed support for the general proposition that cognitive styles affect the perceptions of organizational problems and the methods preferred for dealing with such problems. First, there was no support for Hypothesis 1 that cognitive styles would affect judgments of the importance of different organizational problems and the priorities for dealing with those problems. Second, there was mixed support for Hypothesis 2 that Intuitive types would perceive problems in terms of broader patterns of issues. Consistent with Hypothesis 2, participants self-reports of perceived patterns was correlated significantly with an Intuitive style. However, a content analysis of the actual patterns identified did not provide additional support for Hypothesis 2. It may be that the significant correlation between the self-report on the post-simulation questionnaire and the store on the MBTI simply reflects a tendency for consistency of self-perceptions. It is possible also that the coding scheme for the content analysis was not adequate to detect an actual difference in perceptions. Further research is needed to clarify this issue. Third, there was mixed support for Hypothesis 3 that SF types would prefer more personal approaches in dealing with the set of problems while NT types would prefer less personal approaches. The expectation for SF types was supported by a significant tendency to prefer more one-on-one meetings. However, the expectation for NT types to prefer memos was not confirmed. Finally, it was found that Feeling types were more likely to identify teamwork as a pattern connecting several problems. While this result was not hypothesized, it is consistent with the rationale underlying the expectations for Hypothesis 1.

In general, it would appear that cognitive styles did play a role in influencing certain perceptions and action preferences in this in-basket simulation. Also, it would seem that the in-basket simulation offers opportunities for further research in this area by using different sets of organizational problems.

Teaching Issues: A Final Note

The emphasis on research in this paper should not overshadow the ultimate purpose of the in-basket simulation as a learning experience. The simulation was designed to facilitate experiential learning of managerial concepts. The addition of the MBTI enhances the learning potential of the simulation. Thus, teaching considerations deserve extra attention.

In classroom situations, we recommend that the Teletronics simulation be used after students have been introduced to some of the fundamental concepts and terminology of management; midway through the course would be ideal, after students have read about most of the management functions. If it is introduced too early in the semester, students may benefit by being introduced to the process of managing, but may not recognize as many issues as they might later in the course.

Prior to the simulation we typically assign and discuss readings describing Mintzberg's work (e.g., Silverman, 1988). This background enhances the learning opportunities in the simulation. There are a variety of alternative learning objectives available to instructors/trainers using the simulation. (Specific approaches to facilitating these various objectives are described in the instructor's manual that accompanies the in-basket exercise.) These objectives include (1) providing participants with a perspective on the communication styles (memos, phone calls, one-to-one meetings and small group meetings) available in responding to various organizational situations, (2) providing participants with an understanding of the wide variety of approaches that managers might take to the same situation, (3) providing participants with an opportunity to rethink their own approach as a manager to specific organizational situations, (4) assisting participants in recognizing the various roles they played as a manager during the simulation and (5) considering how different cognitive styles might affect a manager's perception of patterns and preferred courses of action in a wide variety of organizational situations.

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