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AN ANALYSIS OF THE EFFECTS OF JUNGIAN PROBLEM-SOLVING STYLE DIMENSIONS ON MARKETING DECISIONS

Carol H. Anderson. Southern Illinois University
Donald T. Anderson, Southern Illinois University

ABSTRACT

This study investigated possible relationships between Jungian problem-solving styles and selected variables involved in marketing decisions and their outcomes. Both individual and group performance criteria were examined for senior level students participating in a marketing simulation game. Formulation of company teams was based on individual problem-solving styles derived from the Myers-Briggs Type Indicator (MBTI) Form C. This research design differed from previous studies in this area by using a combination of styles and broader dimensions derived from the MBTI.

INTRODUCTION

Purpose of the Study

The purpose of this research was to investigate possible relationships between individual problem-solving style dimensions and selected factors integral to a marketing decision-making simulation. Problem-solving style dimensions, derived from Jung's theory of psychological types, were determined using the Myers-Briggs Type Instrument (MBTI), form C. The simulation was a dynamic business game which involved manipulation of financial resources, marketing variables, and operational assets under varying conditions of uncertainty. Participants in the study, regarded as marketing management surrogates, were organized into companies and industries competing for scarce economic resources. The design of the study thus emphasized individual and group behavior attributes in a highly competitive environment.

Background of the Study

Previous research on the importance of problem-solving style indicates that individual decision-making may be influenced by this personality characteristic. Kilman and Taylor (8) found that there was no one best problem-solving style. Mitroff and Kilman (10) concluded that effectiveness in dealing with specific kinds of problems varied with the dominant problem-solving styles of individuals that were studied. There is a consensus that persons with different problem-solving styles approach problems dif ferent1 : they focus on different aspects of problems, and hey propose different solutions. A primary component of management is judgment in designing the mix of resources that will best attain the objectives of the f: flu, and these judgments may be affected by the influence of problem- solving styles.

The cognitive and affective components of personality make it difficult to predict acceptance or rejection of environmental elements, the variety of ways people act and pact, the bases on which they reason, or the highly individual differences in the interests, values, and satisfactions that motivate them. Any attempt to sort individuals according to their style of solving problems, if it were to treat such a multitude of variables, would be exceedingly complex or it would have to be a value-free construct. The theory of psychological types developed by C.G. Jung (4) reduces the complexity in that it is relatively neutral in value connotation and permits differentiation of problem- solving styles as each individual functions in his own particular style in particular situations (8). As a result. Jung's theory of psychological types was adopted for this study because the personality types he postulated are relatively value-free and it "has the merit of unusual simplicity, and is not incompatible with most other approaches (11, p. 51).'

Jung's theory of psychological types provides a model for methodical investigation of the differences exhibited in the cognitive and affective components of individual behavior. There are tour dimensions to the psychological types that were embodied in the construct: sensation-intuition (SN), thinking-feeling (TF), judging-perceiving (JP), and extraversion-introversion (El). While these four orientations produce a matrix of 16 different personality types, the predominant approach in research to date has focused primarily upon four basic styles which are viewed as information processing and decision-making dispositions. The four styles are: sensation-thinking (ST), sensation-feeling (SF), intuition-thinking (NT), and intuition feeling (NF). Figure 1 depicts this Set of problem-solving styles.

FIGURE 1

PROBLEM-SOLVING STYLES

		JUDGMENT	
		Thinking (T)	Feeling (F)
PERCEPTION	Sensation (S)	Sensation-Thinking (ST)	Sensation-Feeling (SF)
	Intuition (N)	Intuition-Thinking (NT)	Intuition-Feeling (NF)

Individuals who fall in the ST style perceive primarily by sensation and rely on thinking in formulating judgments. They emphasize facts and details because such concrete evidence can be collected and verified directly by the senses. If an individual fits into the SF style, he also perceives by sensation, but prefers feeling for judgment purposes. The feeling component of this style interjects emphasis on the human side of problems. The NF person will prefer feeling for judgment purposes with its associated personal warmth characteristic, combined with a preference for intuition for perception. Rather than focus upon concrete situations, these individuals concentrate their energy upon new projects or new truths. The NT type of personality combines the intuitive characteristics wish a thinking orientation for judgment. These individuals tend to enjoy ill-defined positions which require abstract skills.

Numerous researchers have oriented their Studies toward the four basic styles. It is argued that the four 'Combinations of perception and judgment produce four different kinds of people, with characteristics that are the natural and necessary result of the way they perceive and the way they judge (11, p. 55)." In fact,

variances in behavior have been substantiated and findings indicate that individuals of the four Jungian types define, conceptualize, and solve complex problems quite differently (6; 7; 9). Recent applications have not been as convincing as earlier research. In a study of small business managers Hoy (3) focused on the relationships between their problem-solving styles and multiple measures of organizational effectiveness. His findings lead to the conclusion that there was no consistency in the relationships. Anderson (1) in a study of possible relationships between accountants' problem- solving styles and materiality decisions similarly found no significant or consistent patterns that would indicate the influence of problem-solving style on such decisions. These mixed results do not negate the value of this approach to the study of management behavior; instead, they identify a need to change the focus of study.

in addition to the four basic problem-solving styles (ST, SF, NT, and NF), two other dimensions play a significant role in the individuals' behavioral preference structure: judging-perceiving (JP) and extra- version-introversion (EI). The judging process, the basic way in which an individual reaches a decision, embraces both the thinking and feeling functions. The perceiving process, the way individuals take in data from the outside world, can be by either sensation or intuition. Although individuals may develop a preferred way of judging or perceiving, they can judge or perceive both ways at different times. None of the studies cited above used either the judging or perceiving dimensions in analyzing relationships.

Jung states that there are two classes based on predominant movement of libido interpreted as psychic energy, or the intensity of a psychic process (5). The two classes are termed extraversion and introversion (EI). Introversion is characterized by focus on the subject as the prime motivating factor with the object having secondary importance. The introverted type directs perception and judgment on ideas and concepts. This individual works best in reflection. Extraversion involves the positive movement of the subject's interest toward the object. According to Jung, the extravert thinks or feels himself or herself into the object. The extravert works best in action. Perception and judgment are directed toward people and things, the outside environment. Again, none of the previous research focused on either of these dimensions.

METHODOLOGY

Participants

The participants in this Study were 87 students enrolled in a capstone senior-level marketing policy course. They were regarded as surrogates for marketing managers of firms competing for scarce resources in terms of market share, return on investment, and other selected parameters generally regarded as measuring success In the management and operation of manufacturing businesses. Prior to initiation of any aspect of study. students were informed of the purpose of the study, and they were instructed that participation was voluntary. Coding systems were devised which insured anonymity and confidentiality for those who participated.

Organization for the Simulation

The MBTI, Form G, was administered to the 87 students to determine their individual problem-solving style dimensions according to the Jungian typologies. Within a framework of 20 companies and four industries, students were randomly assigned to companies according to three Criteria: (1) balanced representation of problem-solving style, (2) dominant representation of problem-solving style, and (3> mixed representation of problem-solving style. The selection process produced ten companies with all four problem-solving styles, seven companies with dominant problem-solving styles (five were all STs and two all NTs), and four companies had mixed representation of the styles.

The Simulation

The marketing management simulation, Compete, geared for use in upper level undergraduate or MBA level marketing courses was used in this study (2). The business environment involves a segment of the audio/visual industry with products including a videotape system, video games, and a CB radio. The simulation focuses on the firm's major marketing variables and company teams must make decisions within all major areas of the marketing mix, including production, price, promotion, and distribution decisions. Other decisions that are involved are market segmentation, research and development exploration, personnel management type decisions and the purchase of market information. The Compete simulation was conducted for 12 periods over six weeks. For each period the company management teams made a series of marketing decisions which were recorded for analysis. They also submitted written corporate objectives and annual reports assessing their operations.

DATA ANALYSIS

Introduction

Numerous Statistics were accumulated on each firm's performance during the 12 periods as indicators of the effectiveness and efficiency of each company's operations. Since this study sought only to identify relationships between dimensions of problem-solving styles and individual/group performance, the possible data was narrowed to three areas: (1) allocation of selected resources by companies, (2) a measure of overall profitability, and, (3) individual Course performance indicators. The research questions, variables, and statistical testing methodology for each of these areas are described in the following paragraphs.

Allocation of Resources

One of the principal objectives of the simulation was to give the students experience in managing operational resources, both financial and personnel. Decisions had to be made each period on marketing mix variables, expenditures for information search, and product improvement. These decisions were all group activities and were integral to each of the 20 companies that were Competing for scarce resources. The study was designed to answer the question as to the effect of problem-solving style on the decisions made in these areas: Was there a significant difference in the allocation of resources between companies that had a balance of problem-solving style representation as opposed to those companies that had a dominant problem-solving style membership Or a mixed style composition? Four dependent variables were selected for testing: salesforce size, advertising expenditures, research and development expenditures, and market research. A combination of SAS analysis of variance (ANOVA) and t-test procedures were employed in the analysis of relationships in this phase of the research.

Overall Profitability of Company Operation

There are a number of Outcome variables that might be used to measure overall performance of a company in a simulation, such as was used In this research. In the Compete game, equity, as represented by outstanding shares of capital stock, is held constant throughout all periods and therefore earnings per share is a representative number that is comparable across all companies. As a result, this summary measure of performance was used as the dependent variable to determine whether there was a difference between companies that were comprised of balanced problem-solving style individuals, and the other two classes of companies (dominant and mixed). As with the analysis of alocation of resources, SAS ANOVA and t-test procedures were employed to determine the degree of relationships that existed.

Individual Course Performance

The Individual indicators of performance in the simulation were the product of both independent work by the participants and group efforts on certain aspects of company performance. The research question addressed in this part of the study was whether there were significant differences in the Indicators of performance in the course between students with different problem- solving style dimensions. Five dependent variables were Selected for this analysis. Class participation and case grade represented individual performance; compete grade and peer evaluation were group activities; and course grade was a product of both individual and group efforts. The independent variables, indicating problem- solving style, were the continuous scores for the four principal dimensions: El, JP, SN, and TF. The SAS stepwise regression procedure was used to identify the best one, two, and three variable models to explain the relationships between the dependent and independent variables.

RESEARCH RESULTS

The analysis of each of the research questions is covered in this section.

Allocation of Resources

In the analysis of the allocation of resources by companies with balanced problem-solving styles and those with dominant or mixed problem-solving styles, a two phase approach was used. The first phase Involved analysis of variance (ANOVA). Where these results were significant, the C-test procedure was used to identify specifically where significant differences in means existed for each of the following dependent variables:
salesforce size, advertising expenditures, research and development expenditures, and market research. Results of the ANOVA and t-test procedures are shown in Table 1. The table gives the exact significance probabilities for those results that were significant at the 0.05 or higher level.

The ANOVA results were not significant for two of the four dependent variables, salesforce sine and market research. Therefore, it was not possible to conclude that problem-solving style made any difference in the way companies with different problem-solving style combinations allocated their resources.

TABLE I

ANOVA AND T-TEST RESULTS
FOR ALLOCATION OF RESOURCES

Dependent Variable	ANOVA	T-TESTS (H: $\bar{X}_1 \neq \bar{X}_2$) Balanced & ALL other Companies	Balanced & Dominant Companies	Balanced & Mixed Companies
Salesforce size	n.s.	--	--	--
Advertising Expense	.007	.002	.006	.006
Research & Development Expense	.0001	.0001	.0002	.0001
Market Research	n.s.	--	--	--

The ANOVA results for advertising and research and development expenditures indicated there was a significant difference in the allocation processes between the three categories of companies (balanced, dominant, **or** mixed problem-solving styles). The t-test procedure was used to further analyze differences indicated to be significant in manipulation of these variables. In comparing the paired means, as shown in Table 1, significant differences in each of the combinations tested, were found. These results were Insufficient to categorically argue that problem-solving style made a difference in the way the companies allocated their resources. A further inspection of the data revealed that the balanced companies were more conservative, generally, than the dominant and mixed companies. For example, the mean advertising expenditures for balanced companies was $3.82 million and for all other companies the mean was $7.32 million. The means for research and development expenditures were $5.53 million and $15.71 million respectively. The origin of this attitude of conservatism may be attributable to the personality characteristics of the company teams, but the data is too inconclusive to make such a claim at this stage of the investigation.

Overall Profitability of Company Operations

Analysis of earnings per share data was performed to determine whether significant differences existed in the profitability of companies with balanced problem-solving styles and those companies with dominant or mixed styles. AROVA results indicated no significant difference In earnings per share for any of these company comparisons. This finding was further supported by the fact that t- tests of the equality of means for these groups could not be rejected. The mean earnings per share for each of the groups revealed that the conservative approach adopted by the balanced companies impacted on their overall profitability; the means for the balanced, dominant, and mixed companies were $16.69, $19.94, and $20.85 respectively.

Individual Course Performance

The question addressed in regard to individual performance focused on the predictive capability of the different problem-solving style dimensions for student performance criteria. In analyzing the effect of problem-solving style dimensions on the dependent variables (compete grade, peer evaluation, case grade, class participation, and course grade), the SAS stepwise regression procedure was used to identify the best one, two, and three variable models. Results of this analysis are presented in Table 3.

TABLE 2

STEPWISE REGRESSION ANALYSIS OF
MODELS TO EXPLAIN INDIVIDUAL COURSE PERFORMANCE

Dependent Variable	VARIABLES IN EACH MODEL AND R^2		
	Best One Variable Model	Best Two Variable Model	Best Three Variable Model
Compete Grade	JP .09	JP, TF .14	JP, TF, SN .16
Case Grade	JP .09	EI, TF .14	JP, TF, EI .18
Class Participation	JP .11	JP, EI .16	JP, TF, EI .18
Course Grade	JP .14	JP, EI .23	JP, TF, EI .26

Note: All R^2 are significant at alpha = .05 or less.

In all cases, the best one-variable model indicated that the JP dimension explained more variance in performance than the other three dimensions. It is noteworthy that this same dimension was retained in both the best two-, and three-variable models, with the one exception of the two-variable model for case grade. In the two-, and three-variable models, there is a consistent pattern of dimensions retained in the various models. JP, EI, and TF were consistently retained with only minor exceptions. The SN dimension appears only once in any of the regression equations. Model R2 comparisons (12, p. 376) were made, using the resulting calculated F-ratio to determine whether either the two- or three-variable models were significantly better predictors than the one-variable model. No significant improvement in prediction was gained by adding any of the other dimensions to the JP dimension in the models. It can therefore be concluded that the JP dimension alone can explain as much variance in performance as JP combined with any of the other dimensions found to be significant.

The judging-perceiving (JP) dimension has received less attention in the literature than the four basic problem-solving styles (ST, SF, NT, NF) in determining how individuals reach a decision. The findings in this study indicate that for business problem-solving research, studies should also investigate the JP dimension more rigorously as a more inclusive predictor of problem solutions or outcomes. It will be recalled that the judging process includes reaching a decision through both the thinking and feeling functions. The perceiving process is used to take in data from the outside world either by sensation or intuition.

SUMMARY

Jung's theory of psychological types represents a framework For determining how individuals perceive objects and events and make judgments. This study used the problem-solving styles to see if they made a difference in allocation of resources or overall profitability of company operations, thus it mirrored research designs of previous work in this field. Then, a different methodological technique was employed in an effort to determine whether the dimensions, as measured by the MBTI, could be used as predictors of individual course outcomes. In addition to the parameters contained in the design of earlier studies, this latter technique considered the broader dimensions, judging-perceiving and extraversion-introversion, as well.

In this study, mixed results were observed. Two of four measures of resource allocation appeared to differ significantly between companies that had balanced problem-solving styles and those with dominant/mixed styles. No significant differences were found in overall profitability of company operations when the various categories of companies were compared with one another. Data inspection indicated that more conservative decisions were made by those teams with balanced problem-solving style representation.

In analyzing the indicators of course performance, the judging-perceiving dimensions appeared to explain more of the variance in course performance than any of the other dimensions when taken individually. On the basis of past studies, the sensation-intuition and thinking-feeling dimensions would be anticipated to have explained the majority of variance in these variables. According to Jung, individuals can be classified by psychological types, indicating their preferred attitudes and behaviors. However, a person is not frozen into a single category (SN or TF), and nay, in any given situation, perceive or judge differently from his or her normal preference. This ability to cross over types is significant because it implies that the broader judging-perceiving dimensions night be the overriding dimensions of importance. This appeared to be the true State of nature in the data analyzed in this research.

While the results of this study are somewhat inconclusive, there is some evidence to suggest that problem-solving styles may be valuable in explaining the decision-making process and the resulting outcomes in a marketing management context. This study suggests that data should also be analyzed along the JP and El dimensions as well when the MBTI is applied in business research efforts.

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