

The Effects of Personality Type on Choices Made in Strategic Decision Situations*

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ABSTRACT

Jung's personality-theory typology is used as a framework for exploring the effects of cognitive style on the type and radicalness of choices made in strategic decision situations. Extending the work of Haley and Stumpf [23], it is proposed that individuals with different personality-type preferences exhibit cognitive styles that are associated with specific biases in the pattern of choices they make. Through participation in an interactive behavioral simulation, 407 participants confronted over one hundred ill-structured decision situations and proposed whatever actions they perceived appropriate. The results support the hypothesized relationships that individuals with different personality-type preferences (i.e., sensing-thinking, intuition-thinking, sensing-feeling, and intuition-feeling) take patterns of actions that reflect specific biases (i.e., selective perception, positivity, social desirability, and reasoning-by-analogy, respectively). The implications of these findings for evaluating the likely effectiveness of strategic decisions and making senior-level staffing decisions are discussed.

Subject Areas: Information Processing, Organizational Behavior, and Simulation.

INTRODUCTION

Jung's [34] personality theory proposed that people develop preferences for the ways in which they perceive and judge data. Perceiving is the process of "becoming-aware of things or people or occurrences or ideas" [51, p. 51]. Judging is the process of "coming-to-conclusion about what has been perceived" [51, p. 51]. Preferences for different forms of perceiving and judging lead to differences in how people understand themselves and their environments. These personality-type preferences are suggestive of cognitive styles that may affect managerial information processing and choice [23] [50] [58] [74].

Research and theory in the areas of decision theory and social cognition suggest that numerous heuristics, or rules of thumb, are applied by individuals, particularly when confronting complex decision situations (for example, [30], [35], [37], [52], [65], and [66]). Since managers routinely confront complex, ill-structured situations that challenge their cognitive capabilities ([1] [38] [45] [62] [79] [82]), it is likely that managers simplify their representations and interpretations of the decision situation based on their cognitive style ([23] [25] [27] [28] [50] [54] [55] [56] [60] [63] [64] [74]).

The purpose of this research is to examine the relationships among different cognitive styles based on Jung's theory of personality-type preferences and the type, amount, and extreme nature (i.e., radicalness) of change required by choices made in strategic decision situations. Four hypotheses are developed to reflect theoretical and empirically observed linkages between four of Jung's personality-type preferences

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and four biases in managerial actions. While other relationships among Jung's sixteen personality-type preferences and various observed biases in decision making may exist, only those relationships which have been supported by previous writings are examined in this research (e.g., [23]).

The Jungian Personality Typology

Jung's personality theory proposed that people develop one of two dominant preferences for information used in perceiving their world: sensation or intuition. Sensation-dominant people prefer precise, specific data that is typically derived from their senses. In contrast, intuition-dominant people seek holistic information that reflects possibilities; the pattern of data is of more importance than the specific data points.

Jung [34] also proposed that people develop one of two dominant ways of judging information in order to reach decisions and take action: thinking or feeling. Thinking-dominant people stress logic in their reasoning; they generalize and abstract. Feeling-dominant people stress value judgments in their reasoning; they think of things in human terms and emphasize how others might respond.

Jung [34] argued that peoples' preferences for one of the two ways in which they perceive data, and one of the two ways in which they judge data, define four personality types: Sensing-Thinking (ST), Intuition-Thinking (NT), Sensing-Feeling (SF), and Intuition-Feeling (NF). Jung [34] viewed these personality types as dominant modes of expression. While people may exhibit all types of behaviors in their perceiving and judging activities [58], most people are believed to have preferred styles that they use more often, particularly in important, ill-structured decision situations [63] [74].

An underlying premise of Jung's typology is that one's behavioral preferences will persist across a variety of situations. Exactly when one's preferences will be reflected in one's behavior is a research question that arose due to the weak empirical findings in support of a cross-situational view of the effects of personality on behavior (e.g., [9]). Since much of the research reported on personality is based on student subjects performing artificial, experimental tasks, the weak findings may be attributable to the methodology used or subjects investigated.

This research was designed to explore the effects of personality-type preferences on cognitions and patterns of choices of managers involved in strategic decision situations. A large number of issues and options needed to be within the stimulus field of these managers to permit them ample opportunity to exercise their preferences in perceiving and judging information. It was necessary for the research context to be realistic and representative of the stimulus field typically experienced by managers—including the opportunity to interact with others and discuss issues before individually committing to courses of action. Strategic decisions in organizations typically involve groups; yet each individual perceives and judges information individually and develops a personal preference for some actions over other actions.

This study focuses on how different preferences for perceiving and judging information affect one's preferred course of action after one has had ample opportunity to interact and discuss issues, just as they would in actual strategic decision situations.

PERSONALITY TYPES, BIASES, AND ACTIONS

Haley and Stumpf [23] offered preliminary research data to support the proposition that managers with different personality types (ST, NT, SF, and NF) diagnose issues differently, which subsequently leads to systematic biases in the pattern of choices that they make. An extension of their proposition follows which relates personality type to the type and radicalness of change required by different choices.

Sensing-Thinking Type Managers

Nutt [54] noticed that STs perform best when they can impose models on a decision situation to specify the relevant data needed and provide formats for logical analysis. Others have recorded STs' preferences for quantitative, aggregate data, and their distaste for qualitative data [4] [28]. Nutt [55] contended that STs oversimplify and quantify decisions to give order and meaning to data; qualitative information adds uncertainty and disrupts the order of the previously defined situation [48]. New data, if incorporated into the analysis, may suggest that one make changes to the actions proposed. Thus, ST managers may exhibit selective perception biases by failing to incorporate new data that do not fit initial cues [12] [29] [77]. The failure to incorporate such data reduces the likelihood that the solutions generated will involve much change, thereby implicitly supporting actions that involve only incremental adjustments in the current state to get to the desired future state.

Selective perception tends to reflect excessive reliance on certain types of information and problem-solving methods. ST managers often use standard-operating procedures to solve problems [27]; these procedures identify the unusual aspects of the more innovative alternatives [55]. ST managers may reject novel or entrepreneurial solutions because prevailing systems fail to support them [3]. For example, Steinbruner [68] posited that decision makers may deal with non-preferential alternatives through inferences that the non-preferred alternatives are impossible or too radical for the organization to adopt. Other studies suggest that selective perception can result in the rejection of the more feasible alternatives due to premature closure on courses of action that do not require the generation of new knowledge. Simulation studies on capital-expansion projects demonstrated that STs are the most risk-averse personality type, rejecting most new ideas [28] [55]. Nutt [55] attributed STs' conservative postures to qualitative data that often fail to provide the analytic precision that STs desire.

Hypothesis 1: STs take actions which reflect selective perception biases more often than the other personality types. Such actions rarely involve radical change. STs' actions tend to be quick-fix solutions to problems, involve low levels of risk, and reflect standard operating procedures.

Intuition-Thinking Type Managers

NT managers tend to see patterns in structured data [55] [56] [64] and ignore cases that negate their beliefs [59]. They stress innovation, and seem to enjoy risk taking and discovery [48]. They may also resort to superficial activities that fail to indicate an idea's limits [55]. NT managers often persevere in their beliefs in spite of contradictory evidence.

NT managers' preferences for holistic information and their problem constructions which ignore disconfirming information, would seem to encourage positivity

biases. While positivity biases are similar to selective perception biases in that both involve selective use of information, positivity biases specifically involve the selective recall of positive, confirming information rather than negative, disconfirming information with respect to given alternatives [39]. Positivity biases are most easily accepted as being fair arguments in decision situations involving long-term opportunities where little specific data exist. In such situations, negative or disconfirming information can be discounted as conjecture; managers introducing such information may be viewed as blocking progress or not being fully committed to the management team.

NT managers favor open-ended situations; they enjoy moving from abstract needs and opportunities to creative responses [55]. By testing their ideas on hypothetical possibilities [55] [56], they may deny the importance of gaps between goals and outcomes, and cling to their preferences. For example, Nutt [55] argued that NTs tend to discount arguments based on principles different from their own. They fail to notice weaknesses in their proposed actions because they often disregard ideas and data that contradict them.

Hypothesis 2: NTs take actions which reflect positivity biases more often than other personality types. Such actions often involve a substantial amount of radical change. NTs tend to seek opportunities, focus on the positive aspects of the opportunity, and ignore the risks or threats involved in implementing the action.

Sensing-Feeling Type Managers

Slocum [64] found that SF change agents place substantial importance on people-oriented information; facts about people interest them more than facts about things [27]. Similarly, Nutt [55] noticed that SFs often suggest consultative, group-process approaches to issues; he argued that such approaches provide a way to reconcile facts that raised conflicting sentiments. A potential weakness of this style is that SF managers may appear to be more interested in promoting discussions about premises than in exploring the premises in detail.

Because SF managers place importance on interpersonal relations and social approval, they become more susceptible to social-desirability biases. Managers exhibit social-desirability biases in their actions when they do what they think other people would want them to do [80]. Nutt [55] proposed that it is SF managers acute need for acceptance by others that prompts them to promote others' ideas. Promoting others' ideas may well lead to moderate degrees of change for the decision maker if the ideas are accepted. However, such changes are likely to be of low risk and use the existing knowledge base since they reflect ideas already familiar to the system.

In a study of capital-expansion projects, Henderson and Nutt [28] found that SF managers were most likely to act when they expected support from their groups. Another study of capacity-expansion projects found that SFs' actions required members' consensus and endorsements: SFs co-opted members to make strategic acts look less risky [56]. Nutt [55] contended that SF managers, in their zeal to achieve consensus and acceptance, often restate their viewpoints to reflect the arguments used by others.

Hypothesis 3: SFs take actions which reflect social-desirability biases more often than the other personality types. Such actions would typically involve a moderate amount of change within the organization. SFs' actions tend to conform to socially accepted norms and values, yield social approval, and satisfy the wants of significant others.

Intuition-Feeling Type Managers

NFs often rely on relevant anecdotes, catchy symbols, and vivid imagery to make their points [47] [55] [56]. They often ignore traditional methods and standardized procedures in favor of novel solutions. Nutt [54] noted that NFs like ingenious and entrepreneurial solutions and often excel at poorly structured decision tasks. NFs attempt several dissimilar approaches on issues to see where each leads; several false starts, if followed by incubation periods, can lead to insights. This suggests that NF managers may be inclined to seek changes that are more radical for the organization.

Steinbruner [68] identified a simplifying process which NFs use to help them formulate new ideas: They develop analogies in order to draw inferences from simple, vivid situations to illustrate more complex ones. This process, referred to as reasoning-by-analogy, is often dominated by the use of images and metaphors [42]. Reasoning by analogies helps to reduce the perception of environmental uncertainties and can lead to creative solutions for problems that involve the organization-environment interface [21] [32]. When environmental uncertainty is perceived as moderate or low, NFs are likely to consider more radical actions since the outcomes of the actions are believed to be more predictable. However, this process can also lead to simplistic views of complex situations. NF managers may mistakenly think their problems are more simple and familiar than they really are.

Hypothesis 4: NFs take actions which reflect reasoning-by-analogy biases more often than other personality types. Such actions frequently involve substantial, more radical changes that affect the organization-environment interface. NFs' actions tend to be novel and are often based on analogies between the present situation and purportedly similar situations.

An empirical investigation of the above four hypotheses is described below.

METHODS

Choice of Research Setting

Studying the possible effects of personality types on managerial choices made in strategic decision situations required a setting where managers would be involved in realistic, management situations that provided them the opportunity to: (a) interact with others as they would in a typical business day, (b) seek, diagnose, and share information about a variety of issues, and (c) individually suggest or take actions that were strategic in nature [6] [41]. A laboratory setting was rejected as too artificial to generate meaningful results because external validity is central to our hypotheses [5] [7] [81]. A field study was rejected since the decision situations would vary greatly from subject to subject—it would not be possible to distinguish

the effects of personality type from the demand effects of the decision situation [18] [61]. Yet, the research required the realistic context and complexity of a field study.

The invention of large-scale behavioral simulations (such as Looking Glass Inc.) that are not computer games was a viable alternative for research on decision-making processes [16] [41] [69]; such simulations allow for control over the issues that participants face, but place them in a realistic setting that provides a research context with many of the desirable attributes of a field study [33] [71]. Large-scale behavioral simulations are in-basket based group exercises that place participants in the top management positions of a simulated company. Managers, as participants in such simulations, have reported that their approaches to issues, interactions with others regarding various issues, and subsequent preferences and choice behaviors were representative of them on their actual jobs [41]. Large-scale behavioral simulations are sufficiently complex and interactive to provide ample opportunity for complex issue diagnosis, group and individual problem solving, and decision making [17].

The growing use of behavioral simulations for executive development purposes permitted the research to be conducted without the managers becoming unduly sensitized to the research questions [20] [57]. Because the actions taken in the simulation and the collection of Myers-Briggs Type Indicator (MBTI) personality preferences were part of the training program, the results could be shared with participants after the simulation as part of an entire day of personal and interpersonal feedback.

In order to directly examine the usefulness of large-scale behavioral simulations as a tool for research on cognitive biases, Haley and Stumpf [23] conducted an observational study using the Metrobank simulation. The study involved tracking the way in which participants expressed their thoughts about select issues within Metrobank, and then examining the types of actions participants reported they would recommend in a post-simulation questionnaire [13] [16] [70]. The results of this pilot study supported several propositions regarding differences in the cognitive approaches and biases of managers with different personality preferences; it also confirmed the potential of large-scale behavioral simulations for the study of strategic decision processes.

The Metrobank Simulation

Metrobank, a commercial bank with \$1.5 billion in assets, involves twelve senior management positions across three levels of hierarchy and two major product-service areas (see Figure 1). Participants self-select a position in order to manage Metrobank and are provided with extensive background information on the financial services industry, Metrobank, and their self-selected role in Metrobank. After receiving this and additional information on current issues within Metrobank, participants are given ample time to digest the materials (generally 12 to 24 hours). They are then instructed to assume the roles of the top management team of Metrobank and to manage the company as they see fit for a period of nearly seven hours. They diagnose, define, and attend to the issues they have chosen in the simulation.

The issues in Metrobank are varied in both their content and in who has what information on each issue. For example, specific roles have information critical to the diagnosis and resolution of different issues. The Senior Vice President (SVP)

of Marketing in Metrobank has data on competitors, product pricing, promotions, and customers that are not necessarily available at the start of the simulation to all others. It is up to the SVP of Marketing to decide which information to share with whom. The SVP of Corporate Lending has information on current relationships with various corporate clients, new loan requests, and merger/acquisition possibilities (among other issues). It is up to the SVP of Corporate Lending to determine the priorities for the Corporate Lending Area, which information is most relevant, and what information to share with or withhold from others within Metrobank. Comparable, but distinct information is contained in the in-basket for the other 10 positions within Metrobank. Observational studies of participants indicate that individuals receiving the same in-basket materials for a particular role tend to seek, diagnose, and attend to different issues within that role.

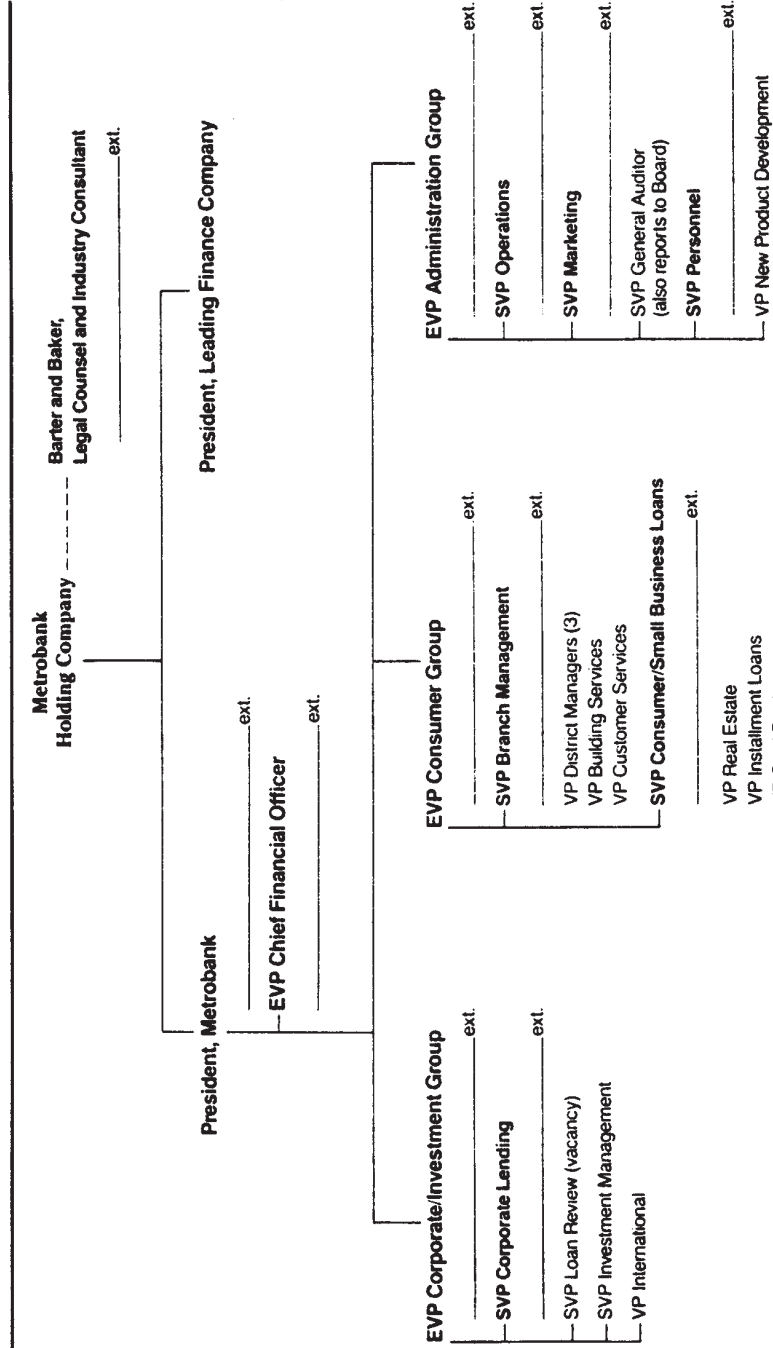
All issues within Metrobank were derived from actual business situations. The development of Metrobank and other behavioral simulations involves extensive interviewing of business people from many different organizations within the industry of the firm to be simulated [40]. These interview notes, sample in-baskets from job incumbents, corporate annual reports, industry research, etc., are used to develop a fictitious company. A draft of the simulation is then provided to a panel of industry experts (about ten people) for their review and comment.

A revised simulation is then reviewed by a separate panel of experts (six to ten individuals) to assist in the development of a scoring system. For Metrobank, a panel of seven industry experts was asked to identify possible actions based on the in-basket materials, and then to determine: (a) the likely financial impact one year after the action was taken, including any needed first-year capital, annual operating cost changes due to the action, and the likely changes in after-tax profits due to the action; (b) an index of the overall quality of the action that reflected the complexity and difficulty of the action along with a judgment as to the action's long-term benefits and costs; (c) the key roles within the simulation whose support would be desirable in recommending or taking such an action; and, (d) the number of key roles required to approve an action. These indices for each action were reviewed and discussed by the panel until consensus was reached. The possible actions and indices became part of the computer program and questionnaire that is used in research and training efforts employing the simulation [16] [26] [71] [73]. The subset of actions examined in this research along with the above indices are shown in the Appendix.

Participants

The study involves 41 uses (i.e., replications) of the Metrobank simulation with individuals from different organizations between November, 1985, and November, 1988, ($N=407$ total participants). The majority of the data are from: (1) middle to senior level managers attending a public offering of an executive development program focusing on strategic management ($n=192$); (2) new managerial employees hired into a fast-track management training program by a large national bank ($n=126$); (3) financial analysts and other financial specialists attending an executive MBA program ($n=64$); and, (4) the senior management of a mid-sized, regional bank ($n=35$). All participants were employed full time when they participated in a voluntary training program that lasted five or more days. The 117 different corporations which funded the participants represent a wide range of industries (banking,

Figure 1: Metrobank.



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 Stumpf, Mullen, Hartman, Dunbar, Berliner, 1983. All rights reserved.

utilities, manufacturing, high-technology, insurance, oil, chemicals). The average age of participants was 40.4 years (standard deviation = 7.9 years); the average number of years of work experience was 10.6 years (standard deviation = 6.2 years).

Measures

Jungian Typology of Personality Types. Personality-type preference data were collected as a routine part of the training program using the Myers-Briggs Type Indicator, Form F (MBTI-F). Several researchers have attested to the MBTI's validity and reliability [78]. Executives seem more willing to provide data on this instrument than on other psychological indicators [8] [49]. Scores for each dimension were used to identify each participants' personality-type preference: ST, NT, SF, or NF. When scores for a dimension fell within three points of the zero point, no categorization was made. Twelve people were dropped from the study because their MBTI data did not provide a clear index of their preferences. Within the study, there were 141 STs, 154 NTs, 32 SFs, and 68 NFs—a sample distribution that has a somewhat higher percentage of intuitive preferences than that found in a large sample of Myers-Briggs personality-type preferences of people in business occupations (56 percent here, 43 percent for 5,500 business people reported by Campbell and Van Velsor [8]).

Biases in Actions. Following Haley and Stumpf [23], it was possible to operationalize biases in the actions taken through examination of the pattern of decisions made by participants within the Metrobank simulation. Over one hundred different actions are possible within Metrobank that are systematically captured via a post-simulation questionnaire. Each of these actions can be discussed, proposed, deemed inappropriate, overlooked, or ignored by the participants; no actions are required as part of the simulation (in contrast to computer simulations where specific actions or decisions are required each period).

Prior to this research, and as part of Metrobank's use in training programs, the possible actions within Metrobank had been categorized by independent experts along several dimensions in addition to the scoring system evaluations mentioned above. One categorization scheme (often used as part of a business education [75]), was useful in examining the effects of cognitive biases; the possible actions were categorized as either actions that capitalize on strengths, actions which resolve problems, actions which take advantage of opportunities, actions which reduce threats, or actions that take advantage of opportunities and increase threats simultaneously. Actions which capitalize on strengths were defined as actions which took advantage of a current strength of the organization with respect to the issues being addressed. Actions which were resolving problems were those that helped to close the gap between where the organization currently perceived itself with respect to an issue and where it wanted to be with respect to the issue. Actions which took advantage of opportunities were those which directed the organization towards new possibilities for the future. Actions which reduced threats were actions that looked at what might go wrong in the future with respect to one or more past actions and reduced the likelihood of the threat materializing. Two faculty members who were also consultants to business in the area of strategic management were able to agree on the categorization of 87 percent of the actions; actions that were not categorized similarly by both experts are not considered in this study. The

criteria used by these experts to determine if an action reflected a cognitive bias are noted below. The categorization of actions by bias is summarized in the Appendix.

Actions suggestive of a selective perception bias were operationalized as the percentage of actions taken that were of a quick-fix and operational nature. Such actions reflected a low risk-taking tendency and followed standard-operating procedures. These actions were typically categorized as resolving problems.

Actions suggestive of a positivity bias were operationalized as the percentage of actions taken that were simultaneously seeking opportunities and increasing threats to the organization. Such actions reflect a heavy emphasis on the positive aspects of the action (i.e., the opportunity), while devoting little attention to the threat that could be created by the action.

Actions suggestive of a social desirability bias were operationalized as the percentage of actions taken that conformed to socially-acceptable business practices and would get social approval. Such actions tend to meet the various wants and needs of significant others rather than meeting the decision maker's needs per se. The significant others included employees, customers, and other stakeholders. These actions tended to focus on the future, often involving taking opportunities or reducing threats.

Actions suggestive of a reasoning-by-analogy bias were operationalized as the percentage of actions taken that were novel for Metrobank and based on a comparison of a Metrobank issue to the situation in some other organization that was purportedly similar to Metrobank. These actions required the participants to write in specific actions for eight different issue areas on the post-simulation questionnaire. Most of these actions focused on future possibilities for Metrobank; they were typically worded as opportunities that Metrobank should consider.

Validity of the Action Bias Measures

The possible actions within Metrobank were specifically examined to see if they met the criteria for any of the four operationalizations of an action bias. Two independent experts, who are both authors of Metrobank and have conducted over 28 training programs using Metrobank, concluded that 15 actions were suggestive of selective perception biases; 10 actions were suggestive of positivity biases; and, 15 actions were suggestive of social desirability biases. Write-in actions that indicated an innovative approach to an issue, particularly those that made a comparison of Metrobank to some other organization, were suggestive of a reasoning-by-analogy bias. The Appendix displays the actions as categorized to reflect each bias; the 11 write-in actions shown for the reasoning-by-analogy bias were each mentioned two or more times; 26 additional write-in actions were mentioned once.

In addition to a description of each possible action, the Appendix contains the item number and each action used on the questionnaire (note that the items used were located throughout the questionnaire), and four scoring indices: the estimated after tax profits (or loss) that Metrobank would experience after one year as a result of that action being taken, a quality index for each action, a list of the roles in Metrobank that are considered key to taking each action, and the number of key decision makers required for an individual action to be considered an organizational action. These scoring indices, which are an integral part of the Metrobank simulation, are fully documented in the Metrobank training materials [26] [72].

As a way to explore the validity of the experts' choices of actions to represent each bias, the scoring indices used in Metrobank can be examined separately for

the actions categorized as being suggestive of selective perception, positivity, and social desirability biases (reasoning-by-analogy actions are write-in actions which have not been assessed along the standard indices). Actions categorized as suggestive of selective perception biases (i.e., actions which reflect quick fix solutions to operational problems, involve low risk, and rely on standard procedures to identify solutions) were expected to: (a) have higher short-term after-tax profit implications than the actions reflective of other biases due to their quick-fix, problem-solving character, (b) have a mid-level quality index due to their simpler, short-term, more tactical focus, (c) involve fewer managers as key decision makers in the resolution of the issue due to the operational nature of the problems addressed, and (d) require a smaller number of key decision makers to approve an action.

In contrast, actions categorized as suggestive of positivity biases (i.e., actions which reflect a focus on the positive information of an opportunity while ignoring negative information and possible threats) were expected to: (a) have lower after-tax profits than actions suggestive of other biases due to some of the actions taken not working out as planned, (b) have a wide range of quality scores as some of the threats are likely to materialize, (c) involve more managers as key decision makers as the actions involve taking opportunities that could affect the long-term viability of the enterprise, and (d) require a larger number of key decision makers to approve an action.

Actions categorized as suggestive of social desirability biases (i.e., actions which tend to conform to socially accepted norms and values, yield social approval, and satisfy the wants of significant others) were expected to have Metrobank scoring indices that are somewhere in-between the levels of the indices for the other biases with one exception: the quality assessment of these actions is likely to be high because of the socially desirable nature of the actions.

Descriptive statistics and multiple regression analyses using dummy coding for the bias variable were generated to make the above comparisons (see Table 1). The median inter-correlation among the four scoring indices was low (median $r = -.12$), with the strongest correlation between the number of key decision makers (KDM) and the number of KDM needed ($r = .54$). The Metrobank action scoring indices exhibited substantial independence for the subset of actions used in this research.

The descriptive statistics and results of the multiple regression analyses are generally consistent with the above predictions. The mean after-tax profit for the actions suggestive of a selective perception bias were highest (\$330,000 per action) and after-tax profit implications for the positivity actions were lowest (an average \$90,000 loss per action). Using the dummy coding method for nominal independent variables (see [10]), the after tax profits for actions suggestive of positivity and social desirability biases were significantly lower than the after-tax profits for actions suggestive of selective perception bias ($p \leq .01$). The selective perception category was chosen as the referent group in the dummy coding scheme because sensing-thinking managers are believed to be the largest subgroup of business people [8]. It is also the most familiar type of bias in the literature and would therefore be a meaningful comparison group.

The highest quality index was observed for actions suggestive of social desirability bias, and the greatest variance in quality indices was for actions suggestive of positivity bias, as predicted. While the regression of quality on the bias variables

Table 1: Metrobank action scoring indice means, standard deviations, and regression results for cognitive biases.

Cognitive Bias	Metrobank Action Characteristics			
	After Tax Profits (in \$ millions)	Quality (-10 to 10)	Number of Key Decision Makers (KDM)	Number of KDM Needed
Selective Perception	.33 (.37)	2.4 (1.24)	3.4 (1.18)	2.1 (.59)
Positivity	-.09** (.37)	.9 (3.67)	5.0** (.47)	3.0** (.41)
Social Desirability	.01** (.20)	3.0 (1.25)	3.3 (.88)	2.2 (.41)
<i>R</i>	.51**	.38*	.63**	.62**

* $p \leq .05$ ** $p \leq .01$

Notes: Standard deviations are in parentheses. The multiple *R*'s reflect the dummy coding of the three biases as two variables with selective perception as the referent variable, $df=2,37$. The significance level indicated on the means is based on a comparison of the asterisked mean to the referent group mean.

did result in an overall significant result ($R=.38, p \leq .05$), neither of the comparisons tested by the dummy coding scheme were significant.

As predicted, the remaining two Metrobank characteristics (KDMs and KDM Needed) were highest for the actions suggestive of a positivity bias, and they were significantly higher than the actions suggestive of selective perception bias ($p \leq .01$). These results, shown in Table 1, provide some evidence of the validity of the judgments made by the experts in categorizing actions to the three cognitive bias conditions.

Attributes of Actions Reflecting Different Biases

The usefulness of this research depends heavily on demonstrating that the Metrobank issues and possible actions are representative of the types of issues and actions that managers confront and take in actual organizations. A relatively new area of research and theory has begun to explore differences in the types and radicalness of change caused by the actions of senior managers. Do the Metrobank possible actions vary in their focus and in their radicalness of change in the ways predicted by theory?

As part of a separate study, Dutton and Ginsberg [15] analyzed the focus and radicalness of change for each possible action within Metrobank. Six of the dimensions developed by Dutton and Ginsberg [15] are germane to this research. Two of the dimensions focus on the objects to be changed: (1) the target object of change being internal structures and processes [19], and (2) the target object of change being the organization's environments [11] [19] [44]. Four dimensions address the amount of change: (1) the costs in terms of the resources required to affect or accomplish the change [14] [22] [53], (2) the speed or time interval over

which the change takes place [43] [67], (3) the scope of the change in terms of the knowledge required to enact and sustain it [14] [53] [76], and (4) the extent to which the change is entrepreneurial and risky compared to conservative and incremental [2] [36] [46] [67].

These six dimensions were operationalized by Dutton and Ginsberg [15] as follows: (1) the extent to which an action attempts to modify internal structures and processes such as internal operations or procedures (1 = not at all, 3 = to a moderate amount, 5 = to a great extent), (2) the extent to which an action attempts to modify the organization's environment such as changing customer behaviors, suppliers, or government regulations (1 = not at all, 3 = to a moderate extent, 5 = to a great extent), (3) the total cost to the organization of implementing an action including human, financial, physical, and informational resources (1 = very low, 3 = moderate, 5 = very high), (4) the length of time it will take to implement the action (1 = less than 6 months, 3 = over 1 year to 3 years, 5 = more than 5 years), (5) the amount of new knowledge that will be required to implement the action (1 = none at all, 3 = a moderate amount, 5 = a great amount), and (6) the extent to which the action was entrepreneurial (1 = not at all, 3 = to a moderate extent, 5 = to a great extent).

Two independent raters assessed each of the possible actions in Metrobank on each of the six dimensions. The percentage of actions that received the same rating from both raters were as follows: modify internal structures, 47 percent; modify the organization's environment, 59 percent; total cost, 52 percent; time, 56 percent; knowledge, 69 percent; and entrepreneurial, 61 percent. For the subset of actions used in this research that are shown in the Appendix, the agreement percentages were: 65, 68, 71, 62, 67, and 71 percent, respectively. The median inter-correlation among these dimensions for the sample of 51 items used in this research was .60. Due to this high inter-correlation, it seemed parsimonious to combine the dimensions that had the highest intercorrelations. The latter four dimensions, which addressed different aspects of the amount of change, were summed into a single index of the amount of change (coefficient alpha = .92). This reduced the median inter-correlation to .11 for the three dimensions (modify internal structures, modify environment, and amount of change).

Based on Hypothesis 1, actions suggestive of a selective perception bias are likely to be lower on the focus and amount of change dimensions than the other biases. Since selective perception biases are hypothesized to lead managers to take actions that are addressing operational, quick-fix types of problems, it follows that such actions would be relatively low in their ability to modify the internal structures or the environments of the organization. Their costs would also be modest, as would the amount of time and new knowledge needed to implement them when compared to actions involving more strategic, long-term issues. Finally, actions suggestive of selective perception bias are not likely to be particularly entrepreneurial as they are dealing with known problems which have apparent solutions within the current operating systems.

Based on Hypothesis 2, actions suggestive of positivity bias are likely to be higher on the focus and total magnitude of change dimensions than the other biases. Since actions suggestive of positivity bias are hypothesized to lead managers to take actions that weight positive information and opportunities more heavily than negative information and threats, it follows that such actions are likely to modify internal structures and/or the environments of the organization. Their costs are

likely to be substantial, as would be the time and knowledge needed to implement them compared to actions involving solutions to operating problems that only have short-term implications. These actions are likely to be more entrepreneurial as they involve trying new things that involve greater risk than other actions.

Based on Hypothesis 3, actions suggestive of social desirability bias are likely to have more moderate indices than those actions suggestive of positivity bias with the exception of their ability to modify internal structures and the organization's environments. Socially desirable actions attempt to modify the internal structures to fit existing external demands. Their radicalness of change index for modifying internal structures is expected to be high, while their radicalness of change index for modifying the external environment is expected to be low.

Based on Hypothesis 4, actions suggestive of reasoning-by-analogy bias are likely to be high on the modify environment and total magnitude of change dimensions, but low on modifying internal structures. The actions suggestive of reasoning-by-analogy processes are often novel; they are likely to involve changes that would require shifts in environmental factors (such as customer acceptance of new product lines). Their costs are likely to be substantial, as is the time and knowledge required to make the change compared to actions involving less novel changes. These actions are also likely to be seen as entrepreneurial because they involve actions not previously considered by the organization.

Descriptive statistics and multiple regression analyses using dummy coding for the bias variable were conducted to explore the relationships among the actions suggestive of the four decisional biases and the three dimensions of the focus and radicalness of change. As shown in Table 2, the results hypothesized were generally observed: there are significant and meaningful differences in the focus and total magnitude of change aspects of the actions which were suggestive of the four different biases (multiple R 's of .73, .80, and .85; $p \leq .01$). Specifically, for the modify internal structures dimension, the actions suggestive of positivity and social desirability biases were hypothesized and observed to be significantly higher than the actions suggestive of selective perception and reasoning-by-analogy biases. For the modify environment dimension, actions suggestive of positivity and reasoning-by-analogy biases were hypothesized and observed to be significantly higher than the actions suggestive of selective perception and social desirability biases. Actions suggestive of selective perception bias were hypothesized and observed to be significantly lower in the total magnitude of change dimension than the actions suggestive of the other three biases.

Given this support for the categorization of Metrobank actions into categories suggestive of the four cognitive biases, it is appropriate to explore the relationship between personality-type preferences (ST, NT, SF, NF) and the actions taken by participants in their management of the simulated company.

RESULTS

The number of actions taken suggestive of the four cognitive biases for each personality-type preference are presented in Table 3. These results support three of the four hypotheses: (1) STs were not observed to take actions suggestive of selective perception bias significantly more often than other personality types ($\eta^2 = .08$, not significant). (2) NTs took significantly more actions that were suggestive of a positivity bias than the other personality types ($\eta^2 = .40$, $p \leq .001$). (3) SFs took

Table 2: Metrobank action radicalness means, standard deviations, and regression results for the cognitive biases.

Cognitive Bias	Metrobank Action Radicalness		
	Modify Internal Structures	Modify Environment	Amount of Change
Selective Perception	2.07 (.26)	1.27 (.59)	6.07 (1.39)
Positivity	3.60** (1.08)	2.60** (.84)	12.3** (2.71)
Social Desirability	3.13** (.92)	1.27 (.46)	7.80* (1.94)
Reasoning-By-Analogy	1.55 (.69)	3.27** (.79)	14.4** (2.69)
<i>R</i>	.73**	.80**	.85**

* $p \leq .05$ ** $p \leq .01$

Notes: Standard deviations are in parentheses. The multiple R 's reflect the dummy coding of the four biases as three variables with selective perception as the referent variable. $df=3,47$. The significance level indicated on the means is based on a comparison of the asterisked mean to the referent group mean.

significantly more actions suggestive of a social desirability bias than the other personality types ($\eta^2=.19$, $p \leq .01$). (4) NFs took significantly more actions suggestive of a reasoning-by-analogy bias than the other personality types ($\eta^2=.48$, $p \leq .001$).

The means reported in Table 3 indicate that NTs take about two times the number of actions suggestive of a positivity bias compared to non-NTs; and NFs take about three times the number of actions suggestive of reasoning-by-analogy bias compared to non-NFs. In contrast, the difference in number of actions taken suggestive of biases for individuals with a sensing personality-type preference (STs and SFs) do not vary substantially from the number of actions taken suggestive of biases for individuals with an intuitive personality-type preference (NTs and NFs).

In addition to testing each hypothesis based on the number of actions taken suggestive of a cognitive bias, it is important to examine whether or not each hypothesis was supported by the percentage of the actions taken by each individual after controlling for situational differences attributable to their Metrobank role. As noted in the Appendix, different roles are central to different issues. All participants do not have equal interest in, nor access to, every issue. It was possible, due to the 41 replications of Metrobank, to assess the effect of the Metrobank roles on the pattern of actions individuals preferred. This was done by creating ten dummy coded variables to capture the eleven Metrobank roles. These variables were entered into a multiple regression analysis as a set, prior to entering the personality-type preference information. The results of the analysis are presented in Table 4.

The effect of role on the actions taken was significant for each cognitive bias. The percentage of variance accounted for by role (as noted by role R^2 in Table 4)

Table 3: The number of actions taken suggestive of four cognitive biases by Myers-Briggs personality type preference.

Myers-Briggs Personality Type Preference	Mean Number of Actions Taken Suggestive of Each Cognitive Bias			
	Selective Perception (Max.=15)	Positivity (Max.=10)	Social Desirability (Max.=15)	Reasoning-By-Analogy (Max.=8)
STs (n=141)	6.2 (2.4)	2.2* (1.6)	4.9 (2.4)	1.0* (1.4)
NTs (n=154)	5.8 (2.6)	3.5** (1.9)	5.0 (2.4)	1.1* (1.5)
SFs (n=32)	6.0 (2.0)	1.7* (1.1)	6.4** (2.2)	1.3 (1.7)
NFs (n=68)	5.7 (2.5)	1.9* (1.2)	4.6 (2.4)	3.4** (2.3)
<i>F</i>	.93	25.1	4.7	38.2
<i>Eta</i>	.08	.40**	.19*	.48**

* $p \leq .01$

** $p \leq .001$

Notes: Standard deviations are in parentheses, $df=3, 391$. The significance level indicated on the number of actions taken suggestive of each cognitive bias is based on a comparison of the asterisked mean to the grand mean across all personality type preferences. The maximum number of actions taken suggestive of each of the four cognitive biases is a function of the list of possible actions presented to participants after the simulation. *Eta* is a measure of the strength of a relationship [10].

was 11 percent for actions suggestive of selective perception biases, 4 percent for positivity biases, 9 percent for social desirability biases, and 8 percent for reasoning-by-analogy biases. While these results were significant ($p \leq .01$), there was no apparent pattern of roles which accounted for the majority of this variance.

The results of the personality-type preferences on patterns of actions supported each of the four hypotheses even after controlling for role-related situational effects. STs took more actions suggestive of a selective perception bias than other personality types ($pR=.38$); NTs, a positivity bias ($pR=.46$); SFs, a social desirability bias ($pR=.34$); and NFs, a reasoning-by-analogy bias ($pR=.52$). This pattern of results, including a comparison of mean percentages, parallels that shown in Table 3. In addition, the total percentages of actions taken suggestive of all biases were nearly equal for each personality-type preference (STs, 49.3 percent; NTs, 52.1 percent; SFs, 47.2 percent; NFs, 53.4 percent). Individuals with different personality-type preferences were not observed to be differentially disposed to cognitive biases in their actions.

DISCUSSION AND IMPLICATIONS

The results generally support the proposed relationships between personality-type preferences and the pattern of choices made in strategic decision situations. The pattern of choices made by individuals reflected their predispositions and the

Table 4: The mean percentage of actions taken suggestive of four cognitive biases by Myers-Briggs personality-type preference controlling for Metrobank role differences.

Mean Percentage of Actions Taken Suggestive of Each Cognitive Bias				
Myers-Briggs Personality Type Preference	Selective Perception	Positivity	Social Desirability	Reasoning-By-Analogy
Role R^2	.11**	.04*	.09**	.08**
ST ($n=141$)	21.6* (7.0)	6.9* (4.6)	16.6 (6.5)	4.2* (8.2)
NT ($n=154$)	18.7* (6.6)	12.6** (8.1)	16.2 (5.8)	4.6* (8.7)
SF ($n=32$)	18.3 (6.0)	5.1* (3.4)	19.9* (7.8)	3.9 (5.2)
NF ($n=68$)	19.9 (11.0)	5.8** (3.6)	15.3* (6.7)	12.4** (8.6)
pR	.38**	.46**	.34*	.52**

* $p \leq .01$

** $p \leq .001$

Notes: Standard deviations are in parentheses, $df=3, 391$. The significance level indicated on the mean percentage of actions taken suggestive of each cognitive bias is based on a comparison of the asterisked mean to the grand mean across all personality type preferences. pR signifies a partial correlation.

biases contained in those predispositions. As Haley and Stumpf [23] suggested, these biases may stem from the cognitive trails etched in the minds of individuals based on years of thinking which has been affected by one's personality-type preferences. Specifically, sensing-thinking preference managers were observed to take a greater percentage of actions suggestive of selective perception biases; intuitive-thinking preference managers were observed to take more, and a greater percentage of, actions suggestive of positivity biases; sensing-feeling preference managers were observed to take more, and a greater percentage of, actions suggestive of social desirability biases; and, intuitive-feeling preference managers were observed to take more, and a greater percentage of, actions suggestive of reasoning-by-analogy biases.

These results, as indicated by the numbers and percentages shown in Tables 3 and 4, do not suggest that any of the personality types will exhibit the same bias in all or even most of their actions. Rather, personality-type preferences seem to reflect a way of thinking that carries with it a greater susceptibility to specific biases. Much of the research done on biases in decision making has focused on how a particular decision is made by different individuals, or on the logical errors made in major political decisions which are suggestive of the decision makers' limited information processing abilities. The questionable utility of the results of such studies is not surprising [31]. Yet, it is often through identifying specific incidences of bias that we begin to explore the extent to which a bias is systematic. While people are not likely to exhibit the same bias all of the time, they may exhibit

a particular bias a modest percentage of the time—and they may exhibit many different biases. Specific situational differences and the way information is presented did account for some of the biases observed. Decision support systems and management information systems that assume consistency in behavior are unlikely to adequately reflect the variability which exists in decision-maker cognitive processes and thereby fail to provide decision support or management information that actually improves the quality of the decision reached.

Patterns of Actions

The 51 actions examined in this study varied on dimensions which were linked to different cognitive biases. Actions suggestive of selective perception biases rarely involved radical change, had greater short-term financial benefits, and generally involved fewer people in the discussion or approval of the actions. Actions suggestive of positivity biases generally involved more radical change, had greater variation and risk associated with the financial and quality aspects of the actions, and involved more people in the discussion and approval of the actions. Actions suggestive of social desirability biases involved a substantial amount of change for the internal structures of the organization (but not the environment), were generally of higher quality in terms of the organization being responsive to its stakeholders, and generally involved fewer people in the discussion and approval of the actions. Actions suggestive of reasoning-by-analogy biases were generally the most radical actions and involved attempts to change the organization's environment.

It appears that the study of action attributes, coupled with an examination of various individual (personality type, personal values, background) and/or organizational factors (such as business strategy, degree of diversification, firm size, succession patterns), could improve our understanding of strategic leadership [24]. Managers may be diagnosing issues and setting their priorities based on their views of potential actions rather than other factors more germane to the organization.

Implications

Managers take many actions suggestive of cognitive biases, and there is some tendency for managers with a specific personality-type preference to take more actions suggestive of some biases than others. This latter decrement to effective decision making could be reduced by accurate diagnosis of the decision situation followed by asking people with different personality types to address each issue to minimize the risk of any particular bias materializing. Alternatively, individual managers could develop sufficient sensitivity to their predisposed style and guard against the bias by exhibiting flexibility in the style used in a specific situation. They would be able to switch to ST, NT, SF, or NF styles as the situation required [58]. The most effective managers would be able to diagnose and understand differences in decision situations and involve other managers with styles that were the least susceptible to bias and/or modify their cognitive style to complement the situation. However, these ideal decision-making approaches may not be practical or feasible. Managers may not have clarity on their own styles, and/or understand the strengths and limitations of that style. Managers may not know the style of other managers; forming a decision-making group composed of managers with different personality-type preferences may not be possible.

While attending to questions of the composition of the group to address strategic decision situations is important, a more vital area to address may be the ongoing, nonlinear, and iterative process that is typical of such situations. Are the kinds of questions raised throughout the decision-making process encouraging the decision makers to think through the potential biases suggested by their personality type? For example, to reduce their tendency to exhibit selective perception, managers might frequently ask themselves (or be asked by others): "What other areas might be considered?" and "How might other units view this?" The positivity biases exhibited most frequently by NTs might be reduced through thoughtful answers to the questions: "What can go wrong?" and "What is the down-side of this action?" Social desirability biases observed most frequently in the actions of SFs might be reduced by looking for solutions that simultaneously answer the two questions: "What do we want?" and "What do the significant stakeholders want?" Reasoning-by-analogy biases exhibited most frequently by NFs might be reduced by simply challenging the analogies: "Is this a complete analogy?" or "What are the limits of the analogy in our present situation?"

The value of these diagnostic questions is that they can be asked independent of the actual composition of a decision-making group. For the results observed here to be replicated in other settings, it is essential to develop a sensitivity in managers to raise these questions and to actively explore possible answers. One way to develop such sensitivity is to educate managers on various cognitive biases as well as provide them feedback on their styles and the implications of those styles. Such information could benefit managers by sensitizing them to their predisposed biases in decision making and by identifying appropriate and erroneous tactics to improve the quality of their decisions.

FUTURE RESEARCH

While this study involved a sizable and heterogeneous sample, it relied on the decisions made in a simulation. The realism, complexity, and flexibility provided to participants in the simulation does argue for the study's external validity, as does the participants' self-report that they behaved in the simulation much as they do on the job. But, the question remains open if these managers really behave in a similar way in strategic decision-making situations. Field research is needed to further our understanding of the generalizability of these results. A difficult challenge in designing such field studies will be to capture the pattern of actions each manager takes as opposed to a single action or small sample of actions.

An alternative avenue of research is to replicate this study with other realistic simulations. While it is likely that a simulation creates some artifacts in the decision processes used, it seems less likely that all simulations will generate the same artifacts [71]. The control gained by the researcher in using simulations would seem to allow more precise and valid inferences than are possible in field research settings [16]. The growing use of simulations and wide-spread use of the Myers-Briggs Type Indicator in management development programs, suggest that such studies are viable.

A third area of investigation suggested by the research design is the extent to which people may exhibit different biases as a function of their role or position. Since participants self-selected their positions in the simulation, their information processing preferences may have affected their choice of role. Would information

processing biases be more prevalent for people in positions similar or contrary to the roles that reflected their information processing preferences? For example, are intuitive-thinking preference individuals more susceptible to positivity biases when in positions with job demands that are consistent with their cognitive style? If the bias becomes more prevalent, how might it be overcome?

A fourth area of investigation that would build on these findings is strategic issue diagnosis throughout the decision-making process—not just in the diagnosis that takes place during the issue identification phase. Understanding the strategic issue diagnosis occurring throughout the decision-making process is essential to overcoming the limitations of one's style. We must continue to identify the critical questions and train managers to frequently ask these questions if the practice of strategic leadership is to progress. [Received: May 8, 1990. Accepted: October 18, 1990.]

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APPENDIX

Possible Metrobank Actions and Scoring Indices

Item	Description	After Tax Profits (in \$ millions)	Quality	Key Decision Makers (KDMs) ^a	KDM Needed
A. Actions Which Reflect Selective Perception Biases					
Ic	Purchase new card processing equipment.	1.4	2	1, 2, 8, 9	2
Id	Subcontract some data processing activity.	.3	4	1, 2, 8, 9	2
Ih	Make the linkage of card products accounts to savings/checking accounts a top priority.	.2	2	5, 8, 9	2
Ii	Quickly attend to the HIMA and ATM operations complaints.	.2	2	5, 6, 8, 9	2
Ij	Purchase software programs from outside vendors.	.1	2	2, 3, 4, 5, 8, 9	1
Iic	Cross-sell bank products to Metrobank credit card customers.	.6	3	5, 6, 7, 8, 10	3
Iif	Investigate corporate lending services to clients.	.3	3	1, 3, 4	2
III	Design separate marketing approaches for the North, Central, and South Districts.	.1	5	6, 7, 10	2
IIIId	Curtail the use of outside employment agencies without prior approval.	.0	1	8, 11	2
IIIg	Cancel or postpone some of the planned training programs and introduce others where needed.	.2	1	8, 11	2
IVh	Lend \$250,000 to Starfield College.	0	1	3, 4	1
IVi	Revise the small business loan review policy to reduce the workload in Loan Review.	0	4	3, 7	2
IVj	Discuss ways to reduce the probability of having to seek Fed Funds.	.3	2	1, 2, 3, 5	3
Vj	Institute checking account minimum balances and service charges.	.5	3	2, 5, 6, 10	3
VIIg	Buy data processing support.	.7	1	1, 8, 9	2
B. Actions Which Reflect Positivity Biases					
IIIi	Join and actively market Metrobank Pass travelers checks.	-4	-2	1, 2, 4, 10	3

Item	Description	After Tax Profits (in \$ millions)	Quality	Key Decision Makers (KDMs) ^a	KDM Needed
IIk	Pursue the high net worth customer market.	.2	3	1, 2, 5, 6, 7, 10	3
IVk	Pursue the West Coast Realty loan of \$10 million.	.2	3	1, 2, 3, 4, 5, 8	3
Vi	Add 20 or more ATMs for \$3 million.	.2	-5	1, 2, 5, 6, 8, 9	3
Vm	Renovate a South District branch to handle high net worth customers.	.0	2	1, 2, 5, 6, 7, 8	3
Vn	Fight unionization through an in-branch information campaign.	-.1	-2	1, 5, 6, 8, 11	2
VIb	Change LFC's name to reflect Metrobank ownership for \$2.3 million.	-1.0	6	1, 2, 3, 5, 8	3
VIIj	Actively market securities brokerage services via Investcorp.	.0	5	1, 2, 3, 5, 8	3
VIIIb	Purchase the Compucor software company.	.0	2	1, 2, 3, 5, 8, 9	3
VIIIc	Merge with the Hunter National Bank.	.0	-3	1, 2, 3, 5, 8, 11	4
C. Actions Which Reflect Social Desirability Biases					
If	Take action consistent with joining STAR ATM network.	.1	2	2, 5, 8, 9	2
Ik	Hire additional programmers and systems analysts.	.2	3	2, 8, 9, 11	2
In	Not phase out passbooks for savings accounts.	.1	3	1, 5, 6	2
IIId	Pilot test one or more life events products.	.3	3	5, 6, 8, 10	3
IIh	Investigate ways to enhance Metrobanks image (e.g., sponsoring public events).	-.2	4	1, 8, 10	2
IIIb	Actively recruit women and minorities for corporate lending positions.	-.3	4	3, 4, 11	2
IIIi	Raise the salary of tellers and clerical workers to be at or above the industry average.	-.2	3	2, 5, 6, 8, 11	3
IIIj	Attract, select and promote women and minorities to eliminate the appearance of discrimination within 2 to 3 years.	-.3	5	3, 5, 8, 11	3
IIIk	Increase salaries for operations and data processing personnel.	-.1	3	8, 9, 11	2

Item	Description	After Tax Profits (in \$ millions)	Quality	Key Decision Makers (KDMs) ^a	KDM Needed
III _m	Alter the mandatory two consecutive week vacation policy for non-audited jobs.	.0	2	8, 11	2
IV _l	Give existing clients more service and seek more of their business (e.g., Marquart, RTO).	.2	5	3, 4	2
IV _m	Train industry specialists to improve corporate lending service.	.1	2	1, 3, 4, 10	2
V _e	Emphasize service to customers to reduce complaints.	.3	3	5, 6, 7	2
V _g	Not raise the annual fee for Metrobank Pass and Supercards.	.0	0	5, 7, 10	2
VI _i	Study the feasibility of personnel transfers between Metrobank and its subsidiary, LFC.	.0	3	1, 8, 11	2

D. Actions Which Reflect Reasoning By Analogy Biases

Io	Do what data processing companies do by expanding card processing capacity several fold and selling excess capacity to select others.
IIn	Direct market consumer products to Metrobank cardholders (like American Express).
IIo	Offer a preferred credit card like Preferred Visa.
III _n	Offer training programs to the public like the American Bankers Association.
IV _n	Seek large corporate deposit accounts like Bankers Trust.
IVo	Create a business and professional unit separate from the consumer branch system.
Vo	Upgrade branch appearance and become more like a retailer such as Macy's.
V _p	Buy a mortgage bank as Citibank has done.
VI _k	Expand LFC nationally.
VII _m	Affiliate with a discount broker to offer discount brokerage services as Sears has done.
VIII _r	Seek out ailing S&Ls for possible acquisition.

^a1=President, 2=Chief Financial Officer, 3=EVP Corporate/Investment Group, 4=SVP Corporate Lending, 5=EVP Consumer Group, 6=SVP Branch Banking, 7=SVP Consumer/Small Business Loans, 8=EVP Administration Group, 9=SVP Operations, 10=SVP Marketing, 11=SVP Personnel

Note: Approximately half of the possible actions tallied in the Metrobank questionnaire reflect a particular bias. Four indices for each action are noted: (1) the after-tax profits likely to materialize in one year due to this action being taken (in millions of dollars); (2) the quality of this action as judged by industry experts on a scale of -10 to +10; (3) the roles in the simulation that were viewed by industry experts as key to the decision in question; and (4) the number of these key decision makers who must approve of an action before it would be considered taken.