

Investigating Value-based Decision Bias and Mediation:

DO YOU DO AS YOU THINK?

Individual perspectives reflect one's innate value structure and have direct bearing on how one examines problems, classifies information, and makes decisions. The results of this study indicate that when an information system forces decision makers to consider the perspectives of others, their own performance deviates from their personal set of values.

Few would argue that today's executives utilize information systems extensively to manage their organizations. Successful executives also try to gather information from different sources in order to corroborate information they already possess and to obtain different views on an issue. Currently there is little, if any, proactive information systems-based support for this process. Imagine, though, an information systems environment capable of helping an executive to assimilate the multiple perspectives that exist both inside and outside of the organization.

For instance, imagine a city council wrestling with the problem of where to locate a homeless shelter. Some council members advocate locating the shelter in town, where it will be easier for homeless peo-

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ple who want to live within walking distance of their jobs. However, some council members argue the typical homeless person needs training to be ready to take a job. These council members advocate locating the shelter near a large vocational training facility, where they can walk to the training they need. Still other council members argue that many homeless people cannot be expected to learn in their current physical and mental condition. They advocate locating the shelter near an in-town hospital, where the homeless can easily receive medical treatment that many of them need so they will be physically and mentally able to acquire job skills training. In-town business people argue against locating the shelter near businesses out of fear of a possible decline in customer traffic. Suburban citizens argue against locating the shelter in the suburbs from fear of declining property values.

In this hypothetical scenario, the proponents of various shelter locations likely value different things. Those advocating easy access to job opportunities probably value the economic benefit of low-cost labor. Those advocating medical treatment probably value physical and mental health. Those advocating availability of education probably value the benefits that education brings to the educated. Some citizens are likely to value their personal assets over the greater social good. All of these perspectives lead to reasonable arguments for where to locate a homeless shelter. Some of them also present reasonable approaches to simultaneously reducing the number of homeless. That is, increased work opportunities, increased education, and increased access to medical care are all factors that would undoubtedly improve the plight of many homeless people.

Such differences in perspectives are not limited to decisions involving public administration. High-volume discount stores operate in an environment where one perspective describes them as providers of low-cost goods and another perspective describes them as destroyers of small businesses. Apparel manufacturers operate in an environment where one perspective describes them as providers of high-quality clothing and another perspective describes them as sweatshop managers. Professional sports organizations are in the business of athletics to some and entertainment to others. In many cases, executives are expected to manage their businesses in light of the different perspectives held by customers, employees, shareholders, and the general public. In this article, we outline how an information system environment might be designed to assist decision makers in considering different perspectives, how we tested its effectiveness, and how systems with these features might be used in the future.

People often have very different ideas about how to solve problems, particularly complex problems that involve judgment. These differences often originate in different views, or perspectives, that people have of the world. A perspective is a lens through which the world is viewed. As such, it provides both a way of seeing and a way of not seeing. Consequently, a broader appreciation of different perspectives may enable decision makers to recognize objectives that may not have been so evident when first confronting a situation. A perspective is constructed from one's experiences, values, and beliefs. Broadening a decision maker's perspective provides a basis for more productive information gathering, better communication, and enhanced mental models, which may ultimately lead to development of better alternatives from which to choose a solution. Looking at a problem from a different perspective may even alter the problem space from one where the central issue is "How can we fix this?" to one that includes considerations such as "Is this what really needs fixing?"

The ability to see the big picture is often marred by the strengths of one's individual values, particularly as they relate to the problem at hand. Because individual values are deep-seated, they often form the basis for decision bias—that is, the inability to expand the lens through which one observes the world. This myopia leads to inefficiencies in information collection and assessment, as well as the effectiveness of interpersonal and group communication.

The word "value" has taken on many meanings. We define individual values to mean deeply held beliefs on the following dimensions: society, religion, power, aesthetics, theory, and pragmatism. Like Eduard Spranger [8], we believe these dimensions are not exclusive of each other, but complementary. A person may be both religious and socially oriented, but that is not to say the person does not support a political agenda or appreciate the power of a mathematical theorem. Most people, however, do have one or two value dimensions they favor most, and any one of these dimensions may take precedence in a specific context. Collectively, these six dimensions create an individual's value profile.

A STUDY OF COMPUTER-SUPPORTED VALUE-BASED DECISION MAKING

An experiment was conducted to assess the impact of an information system designed to support multiple perspective consideration. The subjects used in this study were undergraduate students at a major Southwestern U.S. university. They were chosen because they are not likely to have extensive experience with distributing funding to community-based

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programs (the context of the decision domain supported by the information system), therefore approximating an organizational decision maker facing a difficult task. Further, the task required them to respond according to their own values. Studies of various value instruments indicate that values can be assessed early in an individual's development and that value-based instruments are reliable for individuals at the high-school level or above and do not discriminate based on age. Therefore, it is reasonable to believe the results of this study will generalize to other populations.

The subjects were recruited from undergraduate business and non-business classes, ranged in age from 19 to 22, and were distributed across all classifications (freshman to senior). Business students comprised 61% of the sample; 39% of the sample was male. Once seated in the laboratory, the subjects were randomly assigned to a decision support system (DSS) with a value debias component, or to an identical DSS with no such component.

The decision domain (task) involved the disbursement of funds between two sets of six community-based programs, each of which corresponds to one of the six core values of an individual's value profile (society, religion, power, aesthetics, theory, and pragmatism). In this task, subjects must allocate \$500,000 among the programs; they may allocate as little or as much as they like to any program. The only constraint is that all of the money must be allocated. These tasks have been validated and shown to accurately map each program to the six personal values. The subject's individual value profile was measured using an instrument designed to elicit such information and based on the same value profile structure [1]. Each group performed the tasks in succession; in the case of the treatment group, the DSS debiasing component was active between the two sets of tasks.

The DSS debiasing component itself is based on the theory of Value-Focused Thinking (VFT). Ralph

Keeney introduces the concept of VFT in [5] by making a distinction between alternative-focused thinking and value-focused thinking. In alternative-focused thinking, an individual first focuses on developing alternative solutions to a problem, and then on choosing the best alternative. In value-focused thinking, the individual focuses on the desired state (that is, terminal values), and then on the path that will achieve the desired state (instrumental values).

A major element of value-focused thinking is the translation of terminal and instrumental values into fundamental and means objectives. Fundamental objectives are those the decision maker views as a successful outcome; means objectives are those that support achievement of the fundamental objective. Among the methods suggested for identifying objectives (for example, developing a wish list and articulating goals), using a wide range of perspectives is highly encouraged. Each stakeholder is likely to participate in the discussion from a unique perspective. Any interchange of ideas, therefore, allows many perspectives to be represented. It is also important to encourage individual participants to attempt to look at the problem through the lens of another perspective. This can be accomplished by having each participant complete a series of questions regarding the current decision domain from a number of other perspectives. In this study, the DSS debiasing component forced participants to articulate both good and bad points of a given problem or alternative, thus forcing consideration of at least two perspectives.

As was expected, both the control group and the treatment group performed in accordance with their value profile on the first (pre-treatment) task. That is, their distribution of funds correlated strongly with their value profile. Specifically, the value that was rated most highly over both groups was the religious value; accordingly, the religious-based community program received the most funding. Conversely, the aesthetic value ranked poorly and the aesthetic-based

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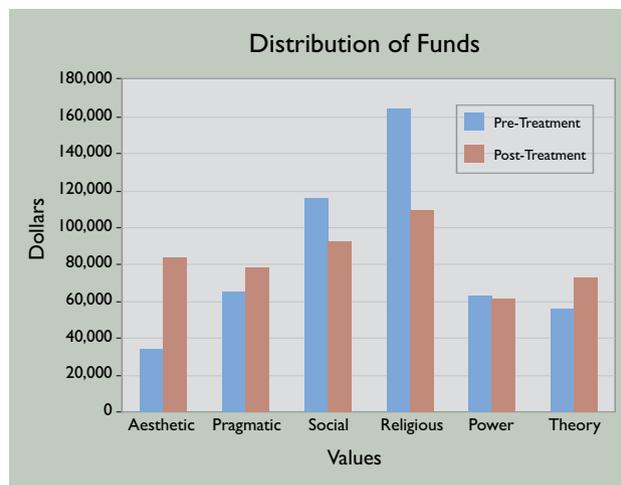
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community program received little funding.

However, the results for the second (post-treatment) task were striking. While the control group continued to show strong correlation between their value profile and their funds distribution, the treatment group deviated substantially both from their average value profile and their actions on the first task. This shows that the DSS debiasing component worked for this decision context. That is, when asked to look at the decision context through the lens of another (in this case, opposing views), the decision maker moved away from their value profile and mediated their distributions such that their distribution profile for the second task is flatter than that of the first task. The accompanying figure shows the results of the distributions for the group that experienced the debiasing component.

While it is obvious from the figure that a change occurred, it is also apparent that not all of the values in the profile were fully mediated. For instance, in both tasks the religious program received the largest share of the available funding. This is not surprising given that this university recently was named the most conservative campus in the U.S. and the religious value was most highly ranked. It is also likely the result in this instance may be largely attributable to social norms. Indeed, social norms may also explain why the two social programs received the second highest funding, although the post-treatment task shows less disparity between the religious and social programs. Therefore, while the treatment did

not fully debias the decision maker, it certainly had an impact on their actions. For instance, there is a large difference in disbursements to the aesthetics-based program in the post-treatment task, as well as noticeable differences in the theory-based and pragmatic-based programs.



Pre- and post-treatment funds distribution.

apply to specific issues and that people can experience conflict among their various values. Argyris and Schoen [3] suggest there is often a difference between an individual's stated position of action (espoused theory), and that individual's actions (theory-in-use).

As seen in the hypothetical example at the beginning of this article, various stakeholders in complex problem situations will likely have different value profiles. Value conflicts are a natural outcome of an organization made up of diverse members. Kiranne [6] defines organizational culture as the management of organizational values and the conflicts those values create. Schein [7] considers organizational culture to be a system of shared values and beliefs that interact

DISCUSSION

The complexity of values and value profiles are such that one may not be able to describe explicitly how one's values influence one's responses. Alvarez and Brehm [2] argue that survey respondents may not be able to identify which value they hold is relevant to specific survey question answers. They also argue that people may be uncertain how their values

with organizational members to create norms of behavior.

Value conflicts also have a role in person-organization fit. Recent research on that topic shows the need for organizations to create value continuity with members—that is, the best person/organization fit occurs when the organization's values and the individual's values are not in irresolvable conflict. When conflict is minor and can be mediated, the process may lead to organizational learning and problem solving by expanding organizational memory with additional perspectives made possible by the synthesizing of conflicting perspectives. If, on the other hand, individual values are in constant conflict with organizational values, it may be indicative of a breakdown of organizational socialization processes.

The primary finding of this research is that value-based actions can be manipulated through information systems designs that mediate the effect of value bias, even in value-intensive applications. These results have interesting practical implications for organizations, despite the analysis having been performed on an individual level. In particular, previous research has suggested the individual differences caused in part by value structures may be too complex to be managed effectively in system design, but must be acknowledged as antecedents for the outcome of technological endeavors such as MIS acceptance and success. This research, however, suggests it is possible, through a system component such as that developed here, to change the behavior of decision makers at least for a specific decision domain.

Supporting a decision maker's consideration of multiple perspectives will, at least temporarily, broaden their perspective base and will result in that individual considering a greater number of perspectives during that decision task. Broadened perspective bases have practical benefits to an organization. For instance, the ability to consider a decision domain from a wide perspective has been shown to increase innovation, creativity, and adaptability. These factors become crucial in decision domains of complex problems, particularly socially oriented ones. An organization can utilize support systems designed in this manner to create, accumulate, and manage knowledge critical to its core competencies.

Consideration of multiple perspectives also allows an individual to perceive and process information that may not have been considered useful under a narrower lens, which is an antecedent to organizational learning. For instance, Hine and Goul [4] discuss interpretive organizational learning. This is a process where individuals develop their own perspective of the decision domain, discuss and share those perspectives

with others in the organization, and work toward an organizational perspective for interpretation of information. During the interpretive learning phase, information deemed useful and the knowledge that results are incorporated into organizational memory, which then expands not only with new information and knowledge, but also with additional perspectives. When these perspectives are incorporated into organizational memory, they become available for other decision domains.

Because many value conflicts arise during decision-making tasks, particularly those with an emotional element (for example, labor negotiations, social responsibility discussions), and because decision-making tasks in organizations rely on organizational memory stored in information systems, it seems logical to suggest that one area in which value-conflict mediation may reasonably be introduced is as a component in a DSS. It is unlikely that information systems will be used less to support decision making in the future; it is time to begin creating more proactive decision support components into DSS. 

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