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Framing effects: An analytic–holistic perspective

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ABSTRACT

Under what conditions, why, and for whom are framing effects most likely? In this paper, we build on the existing literature (e.g., Chaiken, 1987; Epstein, Lipson, Holstein, & Huh, 1992; Evans & Over, 1996; Fiske & Neuberg, 1990; Payne, Bettman, & Johnson, 1988; Simon, 1956; Sloman, 1996; Stanovich & West, 2000), in providing answers to these questions. We hypothesized that individuals who engage a decision task with an analytic/systematic versus holistic/heuristic processing style are especially insensitive to the influence of framing effects. Therefore, we predicted that the way in which a decision is framed should have a relatively weak influence on those who were either induced (Experiment 1) or predisposed (Experiment 2) to adopt a predominantly analytic/systematic versus holistic/heuristic processing style. The results of both experiments supported this position.

Over the last few decades, there has been considerable interest in examining how the framing of a decision task influences the types of decisions that people make. Framing effects refer to ‘‘the finding that decision makers respond differently to different but objectively equivalent descriptions of the same problem’’ (Kuhberger, 1998, p. 150). Research has examined both the theoretical components of framing (e.g., Fagley & Miller, 1990; Tversky & Kahneman, 1981) as well as its application for a variety of different areas including medical decisions (e.g., O’Connor, Pennie, & Dales, 1996), monetary decisions (e.g., Fagley & Miller, 1997), and taxes (e.g., Highhouse & Paese, 1996).

Predictions concerning framing are typically derived from prospect theory. According to prospect theory (Kahneman & Tversky, 1979, 1984; Tversky & Kahneman, 1981), the decision making process is dichotomous, consisting of two phases. The initial phase involves editing of the available options. This initial phase is characterized by the simplification and reorganization of the available options. The options are first coded as gains or losses, relative to a neutral reference point. They are then broken down into a simpler form and given an individuating code to produce streamlined versions of the original options.

The subsequent phase involves evaluation of the edited options. In this phase, the subjective values and the weighted probabilities for each of the options are evaluated in light of the prior editing phase. The subjective values and probabilities are then integrated into a single value and contrasted relative to each other.

Framing effects in the evaluation phase are depicted by the S-shaped value function. The shape of this function is concave for gains and convex for losses. This depicts prospect theory’s prediction of risk-aversion for gains and risk-seeking for losses. That is, an individual in the concave curve should prefer 100 dollars for certain rather than a 50/50 chance to win 200 or win nothing. An individual in the convex curve should prefer a 50/50 chance to lose 200 dollars rather than losing 100 dollars for certain.

Although there are several different types of framing manipulations (see Levin, Schneider, & Gaeth, 1998); the most widely tested example involves the Asian disease problem (e.g., Tversky & Kahneman, 1981). In the Asian disease problem the same basic message is used in both the gain and loss frames. Participants are told that

the US is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. They are then presented with two options to combat the disease, and asked to choose between them. When framed in terms of gains, the two options consist of: 200 people will be saved for certain (risk-free option) contrasted with a 1/3 chance that 600 people will be saved and a 2/3 chance that no one will be saved (risk-seeking option). When framed in terms of losses, the two options consist of: 400 people will die for certain (risk-free option) contrasted with a 1/3 chance that no one will die and a 2/3 chance that 600 people will die (risk-seeking option). As a variety of different studies have shown (see Kuhberger, 1998 for review), participants tend to choose the risk-safe option (200 saved for certain) when the problem is framed in terms of gains and the risky option (1/3 chance that no one will die and a 2/3 chance that 600 will die) when the problem is framed in terms of losses.

The propensity for decision-makers to choose risk-averse options, when Asian disease type problems are framed in terms of gains, and risk-seeking options when framed in terms of losses, is inconsistent with the rational predictions of expected utility theory (e.g., Von Neumann & Morgenstern, 1944). According to this view, the way in which the decision is framed should not change the expected utility of either the risk-seeking or risk-averse options. If, because of a person's utility function, the risk-averse option is chosen in the gains condition, this option should also be chosen in the losses condition; conversely, if the risk-seeking option is chosen in the gains condition, it should also be chosen in the losses condition.

Recent reviews of framing (e.g., Kuhberger, 1998; Levin et al., 1998) have concluded that although there is a moderately strong framing effect for manipulations that follow the Asian disease paradigm, framing effects are not always obtained (e.g., Bless, Betsch, & Franzen, 1998; Highhouse & Paese, 1996; O'Connor et al., 1996). Therefore, a key question is under what conditions, and for whom are framing effects most likely (Fagley & Miller, 1990; Kuhberger, 1998; Levin et al., 1998; Stanovich & West, 2000).

Framing and a dual-route analysis

Recently, Stanovich and West (2000) have used the general assumptions of a family of dual-process theories of reasoning (e.g., Epstein et al., 1992; Evans & Over,

1996; Sloman, 1996) to explain why some individuals behave in a maximizing/rational way whereas others do not. They propose that, although the exact properties of these dual-process accounts are not always identical, there are several conceptual similarities that constitute a common class of assumptions. These views all assume that there are two different processing routes and that each route leads to different types of construals. One route (system 1 in Stanovich and West's terminology) is relatively automatic and holistic and leads to an automatic contextualization of problems whereas the other route (system 2) involves a more controlled and analytic processing style and serves to decontextualize and depersonalize problems. Rather than just engaging in a discreet analysis of the information, individuals who use a holistic processing style rely on contextual cues that allow them to rely upon internal representations of the problem. This, in turn, allows them to make inferences about the issue or task without detailed scrutiny of the material. This type of processing should be especially sensitive to contextual cues, such as how the problem is framed.

Stanovich and West (2000) argue that individuals with a high level of analytic intelligence are more likely to engage in system 2 processing, and that, at times, individuals with especially high levels of cognitive ability will have the requisite computational ability to override the influences of system 1. These individuals are able to abstract difficult problems into canonical representations that are devoid of context, thereby freeing them from mistakes that result from the erroneous use of nonrelevant information, such as the way the problem is framed. Individuals engaging a task with this type of analysis initially perform a discreet analysis on each of the options within the task. Accordingly, the analysis of each alternative should then be aggregated and the option with the greatest numeric potentiation should be systematically chosen. This type of analysis, when applied to a decision task containing options of equal values, should yield similar results, independent of the framing of the task.

Stanovich and West (2000) use their model to explain why several authors (e.g., Johnson-Laird, 1999; Johnson-Laird & Byrne, 1993) propose that the way in which perceivers search for a model is not governed by an ordered system of principles. Building on their system 1/ system 2 distinction, Stanovich and West (2000) conclude that some of the variability in perceivers' search activities can be accounted for by considering individual variations

in cognitive ability and task construals (see also Stanovich & West, 1999). They suggest that the search process appears to not be determined by an organized system because individuals differ, for example, in their propensity to use different cognitive processing styles, such as system 1 and system 2 styles of thought, as well as in their tendencies toward cognitive closure/structure (e.g., Kruglanski, 1989; Neuberg & Newsom, 1993). Therefore, each individual's style of epistemic regulation may be relatively consistent, despite the existence of inter-individual variability in cognitive styles.
In their analysis, Stanovich and West (2000) concentrate on individual differences in intellectual/cognitive abilities and not on how contextual and cognitive style differences impact the likelihood and strength of framing effects. Their distinction, however, between system 1 and 2 processing is consistent with several social psychological approaches (e.g., Chaiken, 1987; Epstein et al., 1992; Fiske & Neuberg, 1990; Petty & Cacioppo, 1986) that have been used to examine how contextual and cognitive style differences influence an individual's processing style and ultimately social judgment. Consequently, these models are especially relevant to the question examined in the present paper; namely how are framing effects influenced by contextual and cognitive style differences.

To answer this question, we use the central assumptions of Chaiken's (1987) systematic/heuristic dual-process model as well as previous theorizing that implicates cognitive effort in the decision process (e.g., Payne et al., 1988; Simon, 1956). Because holistic/heuristic processing is less effortful than analytic/systematic processing, cognitive, and motivational factors influence the use of these two processing styles (e.g., Chaiken, 1987). Holistic/heuristic processing normally occurs when an individual has low levels of motivation or ability whereas, because analytic/systematic processing is significantly more effortful than holistic/heuristic processing, it only occurs when individuals are both willing (having sufficient motivation) and able (having sufficient capacity and capability) to perform the task at hand. Therefore, in situations where cognitive ability is not constrained, motivational factors, such as the personal relevance of the decision task, emerge as the determining cause for effort allocation. Specifically, as the relevance of the decision increases, so too does the amount of effort that an individual is willing to expend on the decision task; and as the amount of task-related effort increases, so too does the likelihood of analytic/systematic processing.

Overview of Experiments 1 and 2

In Experiment 1, we manipulated the self-relevance of the decision context to alter individuals' willingness to expend resources (cognitive effort) on the decision task. We expected individuals to adopt a predominately analytical style of thinking when they worked on a personally relevant decision task whereas we expected them to adopt a predominantly holistic/heuristic style when the decision task was personally irrelevant. Consequently, framing effects should be especially weak when participants work on a self-relevant task but not when they work on a personally irrelevant one. In Experiment 2, we took advantage of the fact that there are individual differences in the use of analytical/systematic versus holistic/heuristic processing (e.g., Zenhausern, 1978) by comparing the decisions of individuals who were predisposed to use either an analytic or holistic style of thinking. Converging evidence for a holistic/analytical analysis of framing will be obtained, if, across both experiments, we observe weaker gain/loss framing effects when individuals engaged in an analytic as opposed to a holistic style of thinking.

EXPERIMENT 1

In a classic study testing implications of the heuristicsystematic model, Liberman and Chaiken (1996) induced perceivers to engage in either a primarily analytical/ systematic or a primarily heuristic/holistic processing mode by manipulating the relevance of a task designed to measure attitudes. Perceivers engaged in analytic/systematic processing when the task was self-relevant whereas they engaged in heuristic/holistic processing when it was not. In much the same way that perceivers were induced to engage in an analytic processing style when they worked on a highly self-relevant task, they should also be induced to engage in an analytic analysis of a decision problem when the correctness of the problem is highly relevant to the outcomes that they may receive. In this situation, perceivers are involved because the effectiveness of their decision-making ability is tied to important personal outcomes (e.g., Johnson & Eagly, 1989). In such contexts, decision-makers should undertake a computational analysis of the options within the decision problem itself, and their decisions should be relatively insensitive to the way in which the decision is framed. Therefore, in this situation, decision-makers may respond in a way that is

consistent with the predictions of expected utility theory and framing effects may not be observed.

In contrast, when the outcome of a decision-task is irrelevant to perceivers, they should engage in a primarily holistic analysis of the decision problem. Rather than predominantly focusing on a detailed analysis of the information, perceivers should be heavily influenced by contextual cues, such as the way in which the problem is framed; as a result, they should respond differently to problems framed in terms of gains as opposed to those framed in terms of losses. Consequently, in this situation, perceivers' decisions should not conform to the predictions of rational/maximizing models, such as expected utility theory. Rather, they should conform to framing models, such as prospect theory. Experiment 1 was designed to test these predictions.

Method

Participants and design

One-hundred ninety six female undergraduates from the University of North Carolina at Greensboro received credit toward a class requirement for their participation in this study. Participants were run in groups containing an average of approximately seven persons; within each session, we randomly assigned each participant to one of the four experimental conditions. The experiment consisted of a 2 (high or low task relevance) x 2 (framing gains/losses) between subjects design.

Procedure

Participants were initially informed that the purpose of this experiment was to obtain their opinion regarding a particular situation. They were then told that they would be provided with further information on the front page of the booklet, that they should take their time in carefully reading through all of the materials, and that after making their decision, they should turn all of the materials face down on the desk in front of them. Each participant was then presented with typed stimulus materials containing the relevance manipulation followed by the Asian disease problem framed as either gains or losses.1

Relevance manipulation

We manipulated the relevance of the Asian disease problem in a manner consistent with Liberman and Chaiken (1996). Participants read that (low-relevance manipulation in brackets) ‘‘The University of North Carolina at Greensboro’s committee on academic policy is in the process of preparing recommendations concerning undergraduate policy changes as part of a program of academic reevaluation for the 2002 academic term.’’

Among the changes being recommended for immediate [long term] implementation next year [10 years from now] is the imposition of a requirement that ‘‘all seniors take an additional mandatory class in thinking and decision-making.’’ This class would add an additional 3 credit hours to each programs required number of hours. Participants were also told that ‘‘a passing grade would be required if the student was to graduate. If approved, the mandatory class would be adopted by the university during the Spring 2002 [2012] academic term. Thus, all [no] current students at UNCG would be personally affected by this policy change.’’

Participants then read that, ‘‘as part of the committee’s research on this potential policy change we would like you to evaluate the situation on the following page.’’ Participants were then confronted with the traditional Asian disease problem (Tversky & Kahneman, 1981) framed either as gains or losses and were asked to choose between the risk-averse and risk-seeking options.

Results and discussion: Experiment 1

We expected the relevance of the task (high or low) to interact with the way in which the decision was framed. In the high relevance condition, we expected participants to use an effortful analytic/systematic processing style and be relatively insensitive to framing effects—their decision would be largely unaffected by the gain/loss framing manipulation. In the low relevance condition, however, participants were expected to engage in a relatively automatic, holistic, processing style and be especially sensitive to the way in which the decision was framed. Therefore, we expected participants to be inclined to choose the risk-averse option when the problem was framed in terms of gains and the risk-seeking option when it was framed in terms of losses.
To test these predictions, we performed a 2 (high/low

relevance) x 2 (gain/loss framing) nominal logistic X^2 analysis on participants' decisions. The results of our analysis, as may be seen in Table 1, revealed a main effect for framing $X^2(1, N = 196) = 8.75$, $p < .01$. This effect, however, was qualified by the predicted relevance x framing interaction, $X^2(1, N = 196) = 4.18$, $p < .05$. This interaction suggests that participants' responses to the gain/loss framing manipulation depended upon the relevance of the task. To decompose this interaction, we performed a nominal logistic X^2 analysis of participants' decisions in each of the two relevance conditions.

Table 1
Number of risk-avoidant and risk-seeking choices as a function of task relevance and framing

Framing:	Choices			
	Risk-avoidant		Risk-seeking	
	N	% total	*N*	% total
High relevance				
Gains	32	64	18	36
Losses	27	57	20	43
Low relevance				
Gains	36	73	13	27
Losses	19	38	31	62

According to our predictions, participants, in the high relevance condition, should engage the information with an analytic processing style and, as a result, they should be relatively insensitive to the way in which the decision was framed. As expected, a nominal logistic X^2 analysis of participants' decisions in the high relevance condition did not reveal a framing main effect, $X^2(1, N = 97) = 0.44$, $p > .5$.

A framing effect, however, was expected in the low relevance condition. Consistent with this expectation, a nominal logistic X2 analysis revealed a gain/loss framing effect, $X^2(1, N = 99) = 12$, $p < .01$. Participants, in the gains condition, demonstrated a preference for risk averse options $X^2(1, N = 49) = 10.8$, $p < .01$ whereas participants, in the losses condition, demonstrated an opposite pattern—a preference for the risk-seeking option, $X^2(1, N = 50) = 2.9$, $p < .09$.

In sum, the results of Experiment 1 demonstrated a Relevance x gain/loss framing interaction. When the task was highly relevant, individuals engaged in an effortful, analytic, processing style and were relatively insensitive to the way in which the decision was framed. When the task was not especially relevant, however, individuals engaged in a relatively automatic, holistic, processing style, and their decisions were sensitive to the way in which the decision was framed.

EXPERIMENT 2

In Experiment 1, we followed Liberman and Chaiken's lead by manipulating the relevance of the task in order to induce participants into using either a predominantly analytic/systematic or holistic/heuristic processing style. In doing so, we were able to test the notion that individuals who use a primarily holistic style of thinking are sensitive to the effects of framing whereas those who use a predominantly analytic style are not. In Experiment 2, we did not manipulate relevance; rather, we took advantage of the fact that some individuals are predisposed toward an analytic versus holistic style of thinking. From the present analysis, it follows that the decision patterns of individuals who have a tendency to be analytic in thought should be conceptually similar to the ones displayed by individuals who were induced to adopt an analytic style; it also follows from our analysis that the decision patterns of individuals who have a tendency to be holistic in thought should be conceptually similar to the ones displayed by individuals who were induced to adopt a primarily holistic processing style.

Method

Participants and design

Three hundred seventy-eight female undergraduate students participated in this study as partial fulfillment of a course requirement. Participants were run in groups containing approximately 10 participants; within each group session, we randomly assigned each participant to one of two framing (gains/losses) conditions.

Procedure

Preference test. Participants were first presented with the Zenhausern (1978) preference test (PT). The PT is an index of cognitive style consisting of 20 items. Ten of the items address cognitions that are consistent with an analytic style (e.g., are you logical?) whereas the remaining 10 items address cognitions that are consistent with a holistic/imaginal style of thinking (e.g., do you like teaching or explaining by visual presentation?). A preference for analytic cognitions indicates a reliance on an analytic style of thinking whereas preference for holistic cognitions indicates a reliance on a holistic style.

Several studies have supported the validity, test–retest reliability and internal consistency of the Zenhausern (1978) test (e.g., Morton, 2001; Russo et al., 2001; Thompson & Mueller, 1984; Zenhausern & Nickel, 1979). Concerning the validity of the test, Zenhausern and Nickel (1979) found that participants who had a PT determined holistic style were better at the holistic task of maze learning than those with a PT determined preference for an analytic style; and Russo et al. found that students' affective states were influenced by the match between their PT determined cognitive styles and the type of instruction that they received. Students in the Russo et al. study who had an analytic style were more depressed when they attended a holistic oriented school whereas those who had a holistic style were more depressed when they attended an analytic oriented school. Therefore, this measure has been validated across several different contexts. After participants completed the Zenhausern preference test, they were presented with the classic Asian disease problem (Tversky & Kahneman, 1981), framed as either gains or losses.

Results and discussion: Experiment 2

Scores on the Zenhausern preference task were calculated by subtracting the 10 holistic based items from the 10 analytic based items. Relatively high scores indicate that perceivers have a preference for an analytic style of thinking whereas relatively low scores indicate a preference for a holistic style. To test our prediction that analytic thinkers would be relatively insensitive to framing effects, we divided participants into analytic (top half of sample) or holistic thinkers (bottom half) and performed a 2 (top half/bottomhalf) x 2 (gain/loss framing) nominal logistic X^2 analysis. The results of this analysis revealed a

main effect for framing, $X^2(1, N = 378) = 24.8$, $p < .001$. This effect, however was qualified by a preferred thinking style (top half/bottom half) x gain/loss framing interaction $X^2(1, N = 378) = 4.9$, $p < .05$. As may be seen from Table 2, although participants chose the risk-averse option in the gains framing condition, $X^2(1, N = 189) = 49.8$, $p < .001$ and the risk-seeking option in the loss framing condition, $X^2(1, N = 189) = 36.5$, $p < .001$, the preferred thinking style x framing interaction indicated that this effect was most pronounced for holistic thinkers. Further evidence for our perspective should be found if we compare the top 25% and bottom 25% of our sample population—the decisions of participants who adopt a relative extreme analytic thinking style (top 25% of our sample) with those who adopt a relatively extreme holistic thinking style (bottom 25% of our sample). With this subsample (N = 189), we should again obtain a preferred thinking style x gain/loss framing interaction. Participants who use a chronically extreme analytic style should be less sensitive to framing effects than those who use a chronically extreme holistic style.

Table 2
Number of risk-avoidant and risk-seeking choices as a function of analytic/holistic preference and framing

Framing:	Choices			
	Risk-avoidant		Risk-seeking	
	N	% total	*N*	% total
Analytic: Top half				
Gains	74	74	26	26
Losses	33	37	56	63
Holistic: Bottom half				
Gains	69	78	20	22
Losses	20	20	80	80
Analytic: Top 25%				
Gains	29	66	15	34
Losses	25	49	26	51
Holistic: Bottom 25%				
Gains	33	73	12	27
Losses	12	24	37	76

A nominal logistic X^2 analysis of the decisions of participants in the top and bottom 25% of our sample revealed a main effect for framing $X^2(1, N = 189) = 19.35$, $p < .001$. as well as a significant preferred thinking style x gain/loss framing interaction, $X^2(1, N = 189) = 5.13$, $p < .05$. This interaction was due to the fact that the gain/

loss frame had a significant impact on the decisions of participants who used a holistic style (bottom 25%), $X^2(1, N = 94) = 20.4$, $p < .001$, whereas it had only a marginal impact on the decisions of those who used an analytical thinking style (top 25%), $X^2(1, N = 95) = 2.7$ $p > .09$.

The results of this study suggest that individuals' general thinking style plays an important role in their decision-making preferences. As predicted, framing effects were stronger for holistic than for analytic style thinkers.

GENERAL DISCUSSION

Under what conditions, why, and for whom are framing effects most likely? In this paper, we build on the existing literature (e.g., Chaiken, 1987; Epstein et al., 1992; Evans & Over, 1996; Fiske & Neuberg, 1990; Payne et al., 1988; Simon, 1956; Sloman, 1996; Stanovich & West, 2000) in providing answers to these questions. Individuals who used a predominantly holistic processing style were especially likely to be influenced by the way in which the decision was framed whereas those who used a predominantly analytical style were not. In Experiment 1, we used self-relevance to induce individuals into using a holistic or analytical processing style whereas, in Experiment 2, we compared the decisions of individuals who were predisposed toward either an analytic or holistic processing style. Across both experiments, we found that, when individuals used a predominantly holistic/heuristic style, they were influenced by the way in which the decision was framed, and their responses conformed to predictions derived from prospect theory (e.g., Kahneman & Tversky, 1979). However, when individuals used a predominantly analytic/ systematic processing style, they were either insensitive (Experiment 1) or relatively insensitive (Experiment 2) to the influence of our framing manipulations. These data support our idea that the responses of analytic style thinkers are more likely to conform to predictions derived from expected utility theory (e.g., Von Neumann & Morgenstern, 1944) than those of holistic/heuristic style thinkers.

Integrative utility of a holistic/analytic distinction

There are a number of findings that may be understood via a holistic/analytic account. Stanovich and West (2000) discussed how the results of some of these studies can be understood by considering how individual variations in

ability can influence the use of holistic and analytic processing. We will discuss ways in which other studies can be understood by considering how variations in the context and a decision-makers_ individualistic cognitive style can influence the use of these two different processes, thereby influencing the strength and likelihood of framing effects. Medical decision-making is an area of research in which motivational influences are seen. Some studies in this area have shown support for prospect theory (e.g., McNeil, Weichselbaum, & Pauker, 1978), others have not (e.g., O'Connor, Boyd, Warde, Stolbach, & Till, 1987; Siminoff & Fetting, 1989), whereas still others have reported mixed results (e.g., Christiansen, 1991). One common distinction among these studies is whether the medical decision problem is a vignette study presented as possible options or whether the decision problem involves personally relevant, real-life situations, that the person is facing.

When the decision is not relevant, research has generally provided support for prospect theory and the influence of framing. For example, McNeil, Pauker, Sox, and Tversky (1982) examined framing effects of a decision task involving operable lung cancer. The participants (physicians, patients, and graduate students) in this study did not have lung cancer, nor were they being treated for life threatening medical problems. The researchers found that the framing of the problem, either as survival rates or mortality rates, influenced the type of therapy (surgery/risk-seeking or radiation/risk-avoidant) that was chosen. Conceptually similar results were obtained by Eraker and Sox (1981). In contrast, several studies indicate that framing effects are not observed when the decision has consequences to the decision-maker. For example, an experimental study by O'Connor et al. (1996) found that, for patients who were actually in the position of receiving a vaccination injection, decisions about receiving the vaccine were not affected by whether the alternatives were framed with potential benefits (percentage who remain free of the flu) or potential negative occurrences (percentage who acquire the flu). Another study by Siminoff and Fetting (1989) examined 100 breast cancer patients and found that the physicians' presentation of the alternatives—positively (e.g., survival rates) or negatively (e.g., negative outcomes)—had no effect on the patients' decision about high versus low-risk treatment. The importance of relevance is also seen in a recent study by Krishnamurthy, Carter, and Blair (2001) in which they compared the medical decisions of students who had the disease in question to those who did not. As would be

expected from a holistic/analytic perspective, the decisions of patients who did not have the disease were affected by the researchers' goal framing manipulation whereas those who did have the disease were not.

Further evidence for the influence of processing styles on framing effects comes from research by Bless et al. (1998). These researchers manipulated the focus of the context in which a problem was presented and found that participants' decisions were relatively insensitive to framing effects when the problem was presented in a statistical context. Because it is reasonable to suspect that a statistical context induced perceivers to engage in an analytic processing mode, participants_' was framed. In a similar vein, the amount of time that decision-makers have to solve a problem should also influence their use of processing styles. For example, because individuals working under a time constraint are less able to carry out the requisite cognitive abilities involved in analytic processing, we would expect time pressured decision-makers to be especially sensitive to the way a problem is framed. Consistent with this reasoning, Takemura (1994) found that individuals who were forced to take relatively large amounts of time thinking about a problem were less sensitive to the way in which the problem was framed relative to those who worked under time constraint.

Summary

We predicted that the way in which a decision is framed should have a relatively weak influence on those who were either induced (Experiment 1) or predisposed (Experiment 2) to adopt a predominantly analytic/systematic versus holistic/heuristic processing style. The results of both experiments supported these predictions.

NOTES

1. The Asian disease problem used in this study was the same as that used by Tversky and Kahneman (1981) for approximately half (102) of our participants. African disease was substituted for Asian disease for approximately half of our participants (94). We instituted this change to test the generality of our findings. Specifically, to observe whether geographic origins might influence our results. We entered origin of disease (Asian or African) into a Post-hoc analysis and the results revealed no difference between the two versions $X^2(1, N = 196) = 0.02$, $p > .8$. Further, only 6 of our participants receiving the African disease version were African Americans and all were included within our analysis. Therefore we collapsed across this variable.

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