

The Distortion of Information during Decisions

J. EDWARD RUSSO, VICTORIA HUSTED MEDVEC, AND MARGARET G. MELOY

Johnson Graduate School of Management, Cornell University

During a decision might a preexisting preference lead to the distortion of new information in favor of the preferred alternative? An experiment that furnished one alternative with a prior preference found such predecisional distortion. It was also found that in the absence of any initial preference, a developing preference for one alternative led to the distortion of new information so as to favor that leading alternative. The distortion from both sources, preexisting and developing preferences, exceeded the postdecisional distortion from cognitive dissonance reduction. © 1996

Academic Press, Inc.

THE DISTORTION OF INFORMATION DURING DECISIONS

It is widely known that after a decision is made, people distort information in favor of the chosen alternative in order to reduce cognitive dissonance (Elliot & Devine, 1994; Fazio & Cooper, 1983; Festinger, 1957; Frey, 1986; Zanna & Cooper, 1976). People seek information that confirms their choice and depreciate encountered information that opposes it (Festinger, 1957). In this paper, we examine whether a parallel type of distortion occurs predecisionally. That is, do people distort the information they receive prior to choosing an alternative?

What might cause people to distort information predecisionally? The motivation for reducing postdecisional cognitive dissonance is the desire to reduce the aversive state caused by holding inconsistent cognitions. Any such motivation should be weaker predecisionally, when those cognitions are incomplete, tentative, and labile (Gibbs, 1994; Lathrop, 1993). Furthermore, it is commonly presumed that individuals evaluate predecisional information in an unbiased fashion. Frey (1986) asserts, "Prior to a decision, people

should be relatively unbiased in their seeking and evaluation of information" (p. 44). See also Beckmann and Gollwitzer (1987, p. 259).

This presumed absence of predecisional distortion is not universal, however. Montgomery (1983) suggests that decision makers attempt to restructure information prior to choice in order to make the leading alternative dominate or nearly dominate all other options. They might accomplish this, for example, by devaluing the importance of attributes on which the leading alternative is inferior. In addition, Svenson's (1992) differentiation-consolidation theory not only accepts but relies upon predecisional distortion of information. The task of decision making is viewed as, first, differentiating among the alternatives on the basis of personal preference so as to identify the one that is superior, at least tentatively. This differentiation is followed by a consolidation process in which information is reconsidered and distorted so as to support that superior alternative. Although the differentiation-consolidation process can be entirely predecisional, most of Svenson's empirical work on consolidation has examined postdecisional processing (Svenson & Benthorn, 1992; Svenson, Rayo, Andersen, Sandberg, & Svahlin, 1994).

There also exists a substantial, if scattered, body of work offering empirical support for the predecisional distortion of information. These studies include examinations of predecisional distortion in the specific contexts of impression formation (Seta & Hayes, 1994; Steers & Shaw, 1993; Thompson, Roman, Moskowitz, Chaiken, & Bargh, 1994), medical decision making (White, Wearing, & Hill, 1994), and situations with high conflict (Janis & Mann, 1977; Mann, Janis, & Chaplin, 1969), as well as investigations of the impact of advertising on the evaluation of product information (Hoch & Ha, 1986). Additionally, the research examining the determinants of distorted information processing has focused on personality traits (Beckmann & Kuhl, 1984; Lambert & Durand, 1977). Finally, Shafir (1993) demonstrates that the process of choosing the best alternative differs from that of rejecting inferior ones. In a choice task, the emphasis on the advantages of the chosen alternative (as opposed to the disadvan-

Current affiliation of Victoria H. Medvec: Kellogg Graduate School of Management, Northwestern University. Correspondence and reprint requests should be addressed to J. Edward Russo, Johnson Graduate School of Management, Cornell University, Ithaca, NY 14853-4201.

tages of the inferior alternatives in a rejection task) are compatible with a predecisional distortion. By dwelling on the advantages of the leading alternative, decision makers may distort its value upward.

The goal of the current study was to test for predecisional distortion of information in a relatively common decision making task. We specifically sought to determine whether prior preferences facilitate such distortion. For instance, one might reasonably expect that in a purchase decision, an experience-based preference for one brand would influence the current choice. In other words, it is logical to expect that individuals may be more likely to buy a brand that they have purchased before and been pleased with, than to purchase another brand. However, does a preexisting preference influence the evaluation of new information? In particular, should an established preference prompt the distortion of new information to support it?

The normative status of predecisional distortion is unclear. On the one hand, past experience and knowledge may be necessary to interpret and evaluate new information. Thus, the impact of a particular piece of information may be different with and without past experience. On the other hand, it would seem to be suboptimal for a preexisting preference to motivate a self-serving distortion of new information. The boundary between legitimate interpretation and illegitimate distortion is fuzzy. This boundary has been drawn explicitly in such formal models for integrating new information into prior knowledge as cognitive algebra (Anderson, 1981) and Bayesian updating. However, these formal frameworks either treat prior knowledge as independent of new information or pay a high price in computational complexity—interaction terms in cognitive algebra and conditional probabilities in Bayesian updating. In the study described below, we attempt to avoid the unclear normative status of predecisional distortion by establishing a predecisional preference that is logically independent of new information.

In general, the goal of the current study is to determine whether individuals distort information prior to making a decision. More specifically, the study investigates whether such predecisional distortion occurs in a binary choice task and whether a preexisting preference for one of the alternatives elicits this distortion. We hypothesized that individuals with a preexisting preference would distort information to favor their preferred alternative.

METHOD

Rationale

To test our hypothesis of predecisional distortion in a relatively general situation, we conducted a preferen-

tial choice study in which individuals were given the task of choosing one of two alternatives according to personal tastes. We attempted to create a predecisional preference that would be logically independent of the information provided about the two alternatives. In this way, any effect of the created preference on the new information could be interpreted as illegitimate distortion. To enable a larger range of distortion to appear, the information provided about the alternatives was designed to be relatively neutral or nondiagnostic with respect to which alternative was favored. If the information had clearly supported one alternative, there would have been less room for distortion.

In the binary preferential choice task used in this study, participants were presented with information in the form of attributes. Each attribute covered both alternatives. After seeing each attribute, participants could stop and announce their choice or continue on to the next attribute. Participants were also asked to rate each attribute on how strongly it favored one alternative or the other. These attribute evaluations were used to assess distortion. Specifically, the attribute evaluations of those participants who were asked to make a choice between the two alternatives (choice group) were compared to those evaluations made by participants who reviewed the same attribution information but never used this information to choose between the two alternatives (no choice control group). Distortion should have appeared as a difference between the two groups' attribute evaluations in the direction of the choice group's preexisting preference.

Stimuli

Two sets of stimuli were used, restaurants and inns, with five attributes for each. The attributes describing the restaurants were a guidebook's description, a second guidebook's numerical ratings, the availability of music for dancing, vegetarian dishes on the menu, and the first guidebook's comments on the vegetarian selections. For inns the attributes were price range, facilities, view and grounds, its restaurant's menu, and quality of bathrooms. To create attributes that did not clearly favor either alternative a narrative format was adopted that roughly balanced subattributes favoring one alternative with different subattributes favoring the other alternative. For example, the core information in the first inn attribute (price range) included: "The price range for doubles at the Lakeshore Landing is \$75 to \$110, while doubles at the Lake Isle Inn run from \$80 to \$110. A full breakfast is included with the room rate at the Lake Isle Inn. The rates for Lakeshore Landing do not include breakfast, but a continental breakfast will be delivered to the room for an extra cost

of \$5.00 per person.” These descriptions were modeled on information available in promotional brochures and guidebooks for local restaurants and inns.

To ensure the neutrality of all of the attributes each description was pretested and rewritten as needed. We accepted an attribute as sufficiently nondiagnostic when its mean evaluation on a -3 to $+3$ scale of diagnosticity (described below) was no greater than 1 in absolute value.

Experimental Manipulation

To examine whether a preexisting preference would lead individuals to distort new information in favor of their preferred option it was essential to establish a preference that was logically independent of the subsequent product attributes. To accomplish this we “endowed” one of the options via the introductory paragraphs that set the context for the choice. For example, when selecting a restaurant, participants were first told that they had won a radio contest and their prize was a dinner at one of two restaurants, the Windsor or the Squire, whichever they preferred. To create the endowment, one restaurant owner was said to have contributed a free dinner for two to a charity raffle that the participant had helped to organize a year earlier. For the inns, one of the innkeepers previously had helped to secure accommodations for the participant’s parents during a weekend when all of the local hostels were booked. The generosity of the restaurateur and the kindness of the innkeeper should have been irrelevant to the subsequent attributes. The endowment was counterbalanced across the two alternatives.

Participants in a control condition received no endowment, but otherwise performed the same choice task. By contrasting the endowed and unendowed participants’ evaluations of the attribute information, the hypothesized effect of the irrelevant endowment could be assessed. Participants made two choices, one between the two restaurants and one between the two inns. They were randomly assigned to either the endowed or unendowed conditions for the first choice (restaurant or inn, counterbalanced) and then assigned to the opposite condition for the second choice. Thus, a participant who received an endowment for the inn decision received no endowment in the restaurant choice.

A second control group made no choice at all, but only evaluated each of the five attributes for both the restaurants and the inns. The ratings from this no-choice control condition served as a manipulation check for the neutrality of the attribute information. This condition also provided an additional safeguard. Although the evaluations in both control conditions, un-

endowed and no choice, should have yielded undistorted estimates of the information’s diagnostic value, this could be checked by comparing the unendowed and no-choice results.

Participants

Participants were 119 Cornell University students, all of whom received extra course credit for their involvement. Fifty-eight participants made choices. In total, 28 participants received the restaurant endowment and 30 the inn endowment. The remaining 61 participants were assigned to the no-choice control condition, where the need for precise estimates of each attribute’s deviation from neutrality dictated a larger sample size.

Procedure

The entire task was implemented on a personal computer. Small groups of participants worked individually and privately at one of several terminals. After initial instructions and an opportunity to ask clarifying questions, participants began the task by reading the cover story for restaurants or inns. Those in the endowed condition also read the endowment narrative. Individuals were then asked whether they were ready to make a choice or wished to proceed “to read some additional information about the two restaurants [inns].” To check whether the endowment was accepted, both the endowed and unendowed groups were asked how much they wanted each alternative to be “the option that you finally select.” They made a separate rating for each alternative on a 7-point scale ranging from “Have no preference” (1) to “Definitely want to select” (7). The difference between these two ratings in favor of the endowed alternative measured the acceptance of the endowment. Zero acceptance signaled a failure of the endowment in the endowed condition and confirmed the absence of any preexisting preference in the unendowed condition.

Participants who chose to obtain more information then proceeded to the first attribute. After reading it, participants were asked to rate the attribute information on a scale from 1 (“Strongly favors [Alternative A]”) to 7 (“Strongly favors [Alternative B]”). Participants were subsequently asked whether they were ready to make a choice or desired additional attribute information. They were shown subsequent attributes, always in the same order, until they decided to stop. At this point they were asked to report their selection and to indicate how certain they were that their choice was the correct one. Participants rated their certainty on a scale ranging from 50 (“very uncertain/complete toss-up”) to 100 (“very certain/no doubt in my mind”).

If fewer than five attributes had been acquired prior to the choice, the remaining attributes were shown and participants were asked to evaluate them on the same scale as the predecisional attributes. Participants' evaluations of those attributes viewed after the choice enabled an estimate of the distortion attributable to the postdecisional reduction of cognitive dissonance. After completing the first choice and rating all five attributes, participants moved on to the second choice.

RESULTS

Manipulation Checks

Neutrality of attributes. The ratings of the no-choice control condition were used to check the neutrality of the attribute information. The ratings on the 1 to 7 scale were transformed to a -3 to $+3$ scale so that 0 signified "no preference." We applied the same criterion for an acceptably neutral attribute that was used during their pretesting and revision, namely an absolute mean rating no greater than 1.

For both the restaurants and the inns, all 5 attributes passed this criterion for neutrality. Specifically, the 10 attributes' mean rating by participants in the no-choice control condition ranged between $-.83$ and $+.84$.

For the restaurant data, the five deviations from perfect neutrality were not systematic. That is, across the five attributes, there was no tendency for the information to favor one alternative over the other. Unexpectedly, however, four of the five inn deviations favored one alternative. For inns, the mean signed deviation from neutrality over five attributes equaled $.53$, whereas for restaurants it was $-.17$. Note that the sign only indicates which alternative was favored. Because of the inns' systematic deviation from neutrality, data from the two categories were analyzed separately. Although unplanned, this difference offered an opportunity to contrast a less neutral, and perhaps more typical, set of attributes (for inns) with one closer to our neutral ideal (for restaurants).

Acceptance of the endowment. Acceptance of the endowment was measured as the difference between how much a participant wanted each alternative "to be the option that you finally select." In the endowed condition, we expected the difference to favor the endowed alternative. In the unendowed condition, we expected this difference to be zero.

Acceptance exceeded zero for all but four endowed participants, two for restaurants and two for inns. These four individuals were excluded from the analyses since, in effect, they were not endowed with a preexisting preference. For all other participants in the en-

dowed condition, the acceptance level ranged between 1 and 5, with a median of 3. For unendowed participants, the acceptance level was zero for all but one individual. Because there existed a prior preference for one alternative over the other, that participant was excluded from further analysis.

Endowment's effect on choice. As a final check of the acceptance of the endowment, we examined whether participants chose the endowed alternative. For restaurants, 24 of 26 did so, while 19 of 28 selected the endowed inn. Both proportions were significantly greater than chance; exact binomial $p < .05$ for both. Note, however, that the proportion of endowment-aligned choices for inns (.68) was significantly lower than the proportion (.92) for restaurants, $t(54) = 2.34$, $p < .05$. This difference in endowment-aligned choice was consistent with the difference in the neutrality ratings, which showed the attributes to consistently favor one inn over the other.

Predecisional Distortion

Distortion was measured by the difference between the endowed (and unendowed) groups' attribute evaluations and those of the no-choice control condition. Although all of the evaluations of the no-choice control group were close to zero, none was exactly zero. These no choice evaluations provided the best estimate of the true diagnostic value of the information itself, and subtracting them from the endowed (and unendowed) ratings yielded the estimates of distortion.

The test for distortion associated with the endowment had to be confined to the first attribute. Only for Attribute 1 was there no possibility that prior attribute information would interact with or merely dilute the influence of the endowment. In addition, the assessment of any endowment-based distortion was complicated by the freedom of participants to stop whenever they wished. Consider participants' reasoning about when to stop seeking more information and pick one alternative. They could be assumed to stop when they had attained sufficient confidence that one alternative was superior. After Attribute 2, this confidence was based on the joint effect of the endowment and all past attribute information, namely Attributes 1 and 2. Those endowed subjects who sought Attribute 2 were likely to have had a lower effect of endowment than those who stopped after Attribute 1. Otherwise, they would have stopped earlier. In sum, optional stopping should have left in the analysis only participants with weaker endowment effects.

The impact of the endowment on Attribute 1 should have been manifest as a distortion in the direction of

the endowed alternative. For restaurants, the mean endowment-oriented distortion was .51. Compared to a null hypothesis of zero distortion, this value was statistically significant, $t(21) = 1.72$, one-sided $p < .05$. For inns, there was a marginally significant distortion; mean = .31, $t(24) = 1.47$, one-sided $p < .10$. Thus, Attribute 1 was distorted to favor the endowed alternative for both restaurants and inns, though only marginally for the latter. A preexisting preference seemed to have caused individuals to evaluate information in a biased fashion.

For completeness, we checked whether unendowed participants distorted Attribute 1, which they should not have. Neither mean estimated distortion, .005 for restaurants and .11 for inns, differed significantly from zero, one-sided $p > .30$ for both.

Cognitive dissonance as a benchmark. How should the magnitude of the distortion caused by the endowment have been interpreted? A useful benchmark was the observed level of postdecisional distortion from the reduction of cognitive dissonance. Recall that all participants who stopped and chose one alternative prior to the fifth and last attribute were still required to review and evaluate the remaining attributes. The mean postdecisional distortion in favor of the chosen alternative was .27 for restaurants, $t(107) = 2.26$, one-sided $p < .05$, and .14 for inns, $t(90) = 0.89$, one-sided $p > .10$.¹ As before, the effect for inns was smaller, presumably because the information itself was more diagnostic and left less room for distortion.

For both product categories, the predecisional distortion roughly doubled the familiar postdecisional distortion, .51 versus .27 for restaurants and .31 versus .14 for inns, respectively. Thus, the observed predecisional distortion was not only statistically reliable, if only marginally so for inns, but was also substantial relative to the familiar standard of dissonance-based distortion.

Further Analysis of Distortion

Any endowment-based distortion of attributes after the first should have been attenuated for the two reasons given above, namely the dilution of the endowment by subsequent information and biased self-selection of participants through optional stopping. Nonetheless, it was possible to test for such distortion in

¹ Participants who required fewer attributes before deciding contributed more observations to the postdecisional mean. To check for bias from a few heavily represented participants, a postdecisional mean distortion was calculated for each participant. Then these means were averaged to compute a second estimate of the postdecisional distortion to which each participant contributed equally. These means were .28 for restaurants and .11 for inns.

Attribute 2 by comparing the ratings of Attribute 2 for endowed participants with those from the unendowed group (which should have removed the effect of Attribute 1). Nonsignificant but positive distortions were found for the endowed group's ratings of Attribute 2 for both restaurants and inns. However, another finding was far more important. Attribute 2's information evaluations for the unendowed participants exhibited a substantial, unexpected distortion in favor of the alternative preferred on Attribute 1; the mean of this distortion was .65 for restaurants ($t(14) = 1.98$, one-sided $p < .05$) and .20 for inns ($t(15) = .74$, one-sided $p > .20$). This result meant that the tentative preference for one alternative that developed from the perceived diagnosticity of Attribute 1 led to the distortion of Attribute 2, reliably for restaurants and possibly for inns as well. Thus, predecisional distortion appeared to have two sources, a preexisting preference created by the endowment and a developing preference derived from information already reviewed.

How should the impact of a developing preference, separate from any preexisting preference or endowment, have varied across all attributes after the first? We hypothesized that a greater distortion should have followed from a greater developing preference. Similarly, a greater developing preference should have followed from a greater cumulative impact of received information to favor one alternative. We created a cumulative measure by summing each individual's predecisional information evaluations (on the -3 to $+3$ scale) for all attributes evaluated prior to the current one. For example, the distortion of Attribute 4 was estimated to be proportional to the sum of the three previous attribute evaluations. In general, cumulative preference _{i} = $\sum_{k=1}^{i-1}$ evaluation _{k} , for $i > 1$. As cumulative preference increased, so should have the observed distortion. Further, for a cumulative preference of zero there should have been no distortion.

To test this hypothesis we regressed the observed distortion (of the unendowed group only) on cumulative preference. The estimated slopes were .34 for restaurants and .23 for inns, one-sided $p < .001$ for both. These slopes may be interpreted as follows: For each additional unit of cumulative preference for one alternative over the other (on the -3 to $+3$ scale), distortion in favor of the leading alternative increased by .34 units for restaurants and .23 for inns. Note that the greater diagnosticity (i.e., deviation from neutrality) of the inn attributes seemed to have reduced the distortion from a developing preference.

To communicate the pattern of results more fully we plotted in Fig. 1 the mean distortions as a function of cumulative preference. This predictive statistic seldom

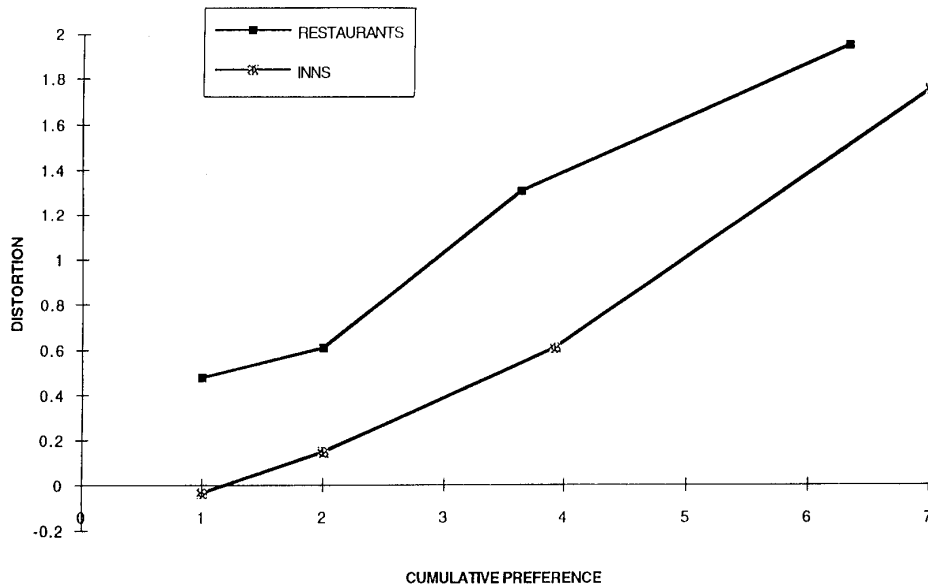


FIG. 1. Distortion of new attribution information as a function of the magnitude of the cumulative preference for the leading alternative. Cumulative preference is the sum of the attribute information ratings for all previous attributes. To increase stability of estimates, mean distortions were computed for cumulative preference: 1, 2, 3-5, and 6-9. For the latter two ranges, the mean cumulative preference was used as the abscissa, not the midpoint of the range.

attained large values because participants usually stopped and chose one alternative when their preference reached some critical level. To obtain adequate sample sizes, we aggregated all cumulative preferences from 3 to 5 and again from 6 to 9. We plotted the corresponding distortions at the observed mean cumulative preference, 3.6 and 6.3 for restaurants and 3.9 and 7.0 for inns, rather than the respective midpoints of their ranges, 4.0 and 7.5. Since the mean cumulative preference was 1.33 for restaurants and 1.06 for inns, the typical impact of *predecisional distortion* was .45 for restaurants (i.e., $1.33 \times .34$) and .24 for inns. These levels could be compared to the estimated distortion due to cognitive dissonance, .27 for restaurants and .14 for inns. Both values of *predecisional distortion* exceeded the distortion attributable to cognitive dissonance.

DISCUSSION

The original goal of the present work was to determine whether an established preference for one alternative in a preferential choice task might lead to the distortion of new information about the alternatives. Such distortion was found, and exceeded that from the well-known postdecisional reduction of cognitive dissonance. What we did not anticipate was the appearance of distortion in the complete absence of a preexisting preference. Yet just such distortion occurred when a

leaning toward one alternative developed. Furthermore, the magnitude of this distortion increased in proportion to the strength of the developing preference for one alternative. This distortion from a developing preference also exceeded the distortion attributable to postdecisional dissonance reduction.

Our findings might be seen as an addition to the literature on the confirmation bias in which a current belief or a desired conclusion leads to (a) a search for confirming rather than opposing evidence or (b) an overly confirming interpretation of the available evidence (Abelson & Levi, 1985; Klayman, in press). In addition to a current belief or a desired conclusion, our study's results suggest that a third source of the confirmation bias is a preference for one of the options. More importantly, the weakest form of a preference, namely a developing preference in the absence of any established preference, can serve as an antecedent to the confirmation bias.

Causes of Predecisional Distortion

What causes the type of *predecisional distortion* observed in this study? At this early stage in understanding *predecisional distortion*, we shall not try to distinguish between the origins of distortion due to a prior, established preference and that due to a developing preference. Instead, we consider several possible causes of the distortion of information during a decision

without regard to whether a current preference for one alternative emerged from initial neutrality or was influenced by a prior preference as well.

Two potential psychological mechanisms may account for this distortion: (a) the desire to maintain consistency and (b) the desire to reduce effort. Furthermore, both of these may be partitioned into at least two distinct subclasses.

The desire to maintain consistency may involve both an ego defensive component and a preference for a "consistent world."

Ego defense. Distortion of current information may be caused by decision makers' wish to support their prior conclusions. The desired consistency with, for example, a tentative choice provides ego support. It says that the decision makers were correct in their earlier judgment ("I was right all along"). Such ego defense includes both the private and public sources of preference for consistency discussed by Cialdini, Trost, & Newsom (1995).

A consistent world. Individuals may distort current information so that it is consistent with past information, thereby supporting the view that the world is consistent and predictable, rather than chaotic and uncertain (Kruglanski, 1980; Cialdini *et al.*, 1995). We doubt that this desire for a consistent world played a major role in our hypothetical choice between two restaurants or two inns. Nonetheless, it should be acknowledged as a source of the drive for consistency that is different from defending one's prior judgments.

Likewise, the goal of reducing effort may be achieved in two ways, each of which can lead to distortion. The distortion of attribute information may allow one to make a decision more quickly or may facilitate the integration of information into the decision process.

Finish sooner. Distortion of current information may accelerate the cumulative preference for one alternative's exceeding some threshold for stopping, thereby saving further effort (Aschenbrenner, Albert, & Schmalhofer, 1984; Saad & Russo, 1996). That is, if reducing effort is a goal of the decision process (along with choosing the better alternative), then distortion can be viewed as part of a trade-off between effort and accuracy (Payne & Johnson, 1985; Payne, Bettman, & Johnson, 1993).

Easier integration of new information. Distorting current information may make it easier to integrate this new information (Hoch & Ha, 1986). For instance, a new attribute that runs counter to the leading alternative might cause an effortful reevaluation of which alternative is better. In contrast, information consis-

tent with the current preference may be easier to integrate. This may occur simply because consistent information is less likely to be farther from the current judgment. For instance, if the current opinion amounts to a 60% confidence in favor of Alternative A, then the most extreme information in favor of Alternative A is more consistent with that current opinion and may require less effort to integrate than the most extreme information favoring Alternative B.

An additional question about the source of distortion is worth considering. Are individuals aware that they are distorting information? We presume that they are not, yet cannot help but wonder whether there is not some suspicion that distortion is taking place. The question of self-awareness may be especially relevant to amelioration. The interventions needed to reduce distortion may be different depending on whether people are already aware of it or not.

Generality of Information Distortion

The distortion of information has been observed in a single task, preferential choice. Might it occur more generally and, if so, what characterizes the other tasks where we might expect it? Preferential choice requires the resolution of conflicting preferences (as different attributes favor different alternatives) to determine a net preference for one alternative. Such tasks are made difficult by the uncertainty of the preferences themselves. For instance, how subjectively valuable is saving \$5 on a restaurant meal versus having live background music? If we view a choice like the ones performed in our study as an attempt to discriminate between two alternatives (Svenson, 1992), then uncertainty of our own preferences makes it difficult to know when we have achieved sufficient discrimination, or when one alternative is far enough ahead to stop and choose it. In such tasks, labile preferences, including the distortion of information, may aid individuals in achieving a sufficient distinction in preference between the two alternatives (Lathrop, 1993).

Preferential choice can be contrasted with the task of solving well-structured problems. Here, the difficulty is often generating candidate solutions or paths to a solution, but solutions themselves are easily recognizable (e.g., Maier, 1958, p. 180). In such well-structured tasks, distortion of information may neither reduce effort nor help problem solvers reach a solution more quickly. Indeed, if the information itself is tightly structured, self-serving distortion may be nearly impossible. Thus, the kinds of tasks susceptible to information distortion may be those that are more loosely structured both in the nature of the information and the clarity of the criterion for a successful solution.

Limitations of the Present Work

Several limitations of this initial study and their impact on the generality of our findings should be acknowledged. Most obviously, the study was designed to test for the impact of a preexisting rather than a developing preference on the distortion of new information. In practice, this meant that the diagnosticity of the attributes was not systematically varied and the number of attributes was limited to five. It seems especially important for future investigation to examine whether distortion occurs with nonneutral or diagnostic information. We expect that less distortion will occur when the information is more diagnostic, and offer as preliminary evidence the generally smaller effects of distortion observed in our study for inns.

Our test of developing distortion assumed that cumulative preference predicted its magnitude. This theoretical claim needs a stronger test, especially one that uses a direct measure of subjective cumulative preference rather than approximating it with the sum of prior attribute evaluations (Saad, 1994; Saad & Russo, 1995).

The current research has shown that predecisional distortion can substantially impact the decision process. The magnitude of the observed distortion generated either by a preestablished preference or by a developing preference was larger than the postdecisional distortion generated by cognitive dissonance reduction. The present research demonstrates that this predecisional distortion can affect individuals' evaluations of information and their subsequent choices. This finding seems relevant to many domains of preferential choice, including purchase decisions and hiring decisions.

REFERENCES

- Abelson, R. P., & Levi, A. (1985). Decision-making and decision theory. In G. Lindzey & E. Aronson (Eds.), *The handbook of social psychology* (3rd ed., Vol. 1). New York: Random House.
- Anderson, N. H. (1981). *Foundations of information integration theory*. New York: Academic Press.
- Aschenbrenner, K. M., Albert, D., & Schmalhofer, F. (1984). Stochastic choice heuristics. *Acta Psychologica*, 56, 153–166.
- Beckmann, J., & Gollwitzer, P. M. (1987). Deliberative versus implemental states of mind: The issue of impartiality in predecisional and postdecisional information processing. *Social Cognition*, 5(3), 259–279.
- Beckmann, J., & Kuhl, J. (1984). Alerting information to gain action control: Functional aspects of human information processing in decision making. *Journal of Research in Personality*, 18, 224–237.
- Cialdini, R. B., Trost, M. R., & Newsom, J. T. (1995). Preference for consistency: The development of a valid measure and the discovery of surprising behavioral implications. *Journal of Personality and Social Psychology*, 69(2), 318–328.
- Elliot, A. J., & Devine, P. G. (1994). On the motivational nature of cognitive dissonance. *Journal of Personality and Social Psychology*, 67(3), 382–394.
- Fazio, R. H., & Cooper, J. (1983). Arousal in the dissonance process. In J. T. Cacioppo & R. E. Petty (Eds.), *Social Psychophysiology* (pp. 122–152). New York: Guilford Press.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Palo Alto, CA: Stanford Univ. Press.
- Frey, D. (1986). Recent research on selective exposure to information. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology*, (pp. 41–80). New York: Academic Press.
- Gibbs, B. J. (1994). *Consumer as accommodator: Experimental evidence for the self-manipulation of tastes* (Research Paper No. 1239). Palo Alto, CA: Stanford University.
- Hoch, S. J., & Ha, Y.-W. (1986). Consumer learning: Advertising and the ambiguity of product experience. *Journal of Consumer Research*, 13, 221–233.
- Janis, I. L., & Mann, L. (1977). *Decision making: A psychological analysis of conflict, choice and commitment*. New York: The Free Press.
- Klayman, J. (1995). Varieties of confirmation bias. In J. R. Busemeyer, R. Hastie, & D. L. Medin (Eds.), *Decision making from the perspective of cognitive psychology*, (pp. 385–418). New York: Academic Press.
- Kruglanski, A. W. (1980). Lay epistemologie process and content. *Psychological Review*, 87, 70–87.
- Lambert, Z. V., & Durand, R. M. (1977). Purchase information acquisition and cognitive style. *The Journal of Psychology*, 97, 3–13.
- Lathrop, E. Scott. (1993). *From statements to solution: The role of attribute value lability in decision making*. Unpublished doctoral dissertation, Cornell University, Ithaca, NY.
- Maier, N. R. F. (1958). *The appraisal interview: Objectives, methods, and skills*. New York: John Wiley.
- Mann, L., Janis, I. L., & Chaplin, R. (1969). The effects of anticipation of forthcoming information on predecisional processes. *Journal of Personality and Social Psychology*, 11, 10–16.
- Montgomery, H. (1983). Decision rules and the search for dominance structure: Towards a process model of decision making. In P. Humphreys, O. Svenson, & A. Vari (Eds.), *Analyzing and aiding decision processes*. Amsterdam: North-Holland.
- Payne, J. W., & Johnson, E. J. (1985). Effort and accuracy in choice. *Management Science*, 31, 394–414.
- Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). *The adaptive decision maker*. Cambridge: Cambridge Univ. Press.
- Saad, G. (1994). *The adaptive use of stopping policies in sequential consumer choice*. Unpublished doctoral dissertation, Cornell University, Ithaca, NY.
- Saad, G., & Russo, J. E. (1995). *Stopping criteria in sequential choice*. Working paper, Concordia University, March 1996.
- Seta, C. E., & Hayes, N. (1994). The influence of impression formation goals on the accuracy of social memory. *Personality and Social Psychology Bulletin*, 20, 93–101.
- Shafir, E. (1993). Choosing versus rejecting: Why some options are both better and worse than others. *Memory & Cognition*, 21, 546–556.
- Steers, W. N., & Shaw, J. I. (1993). Information search and impression formation. *Journal of Social Behavior and Personality*, 8, 323–334.
- Svenson, O. (1992). Differentiation and consolidation theory of human decision making: A frame of reference for the study of pre- and postdecision processes. *Acta Psychologica*, 80, 143–168.

- Svenson, O., & Benthorn, L. J. (1992). Consolidation processes in decision making: Postdecision changes in attractiveness of alternatives. *Journal of Economic Psychology*, 13, 315–327.
- Svenson, O., Rayo, A. O., Andersen, M., Sandberg, A., & Svahlin, I. (1994). Postdecision consolidation, as a function of the instructions to the decision maker and of the decision problem. *Acta Psychologica*, 87, 181–197.
- Thompson, E. P., Roman, R. J., Moskowitz, G. B., Chaiken, S., & Bargh, J. A. (1994). Accuracy motivation attenuates covert priming: The systematic reprocessing of social information. *Journal of Personality and Social Psychology*, 66, 474–489.
- White, V. M., Wearing, A. J., & Hill, D. J. (1994). Is the conflict model of decision making applicable to the decision to be screened for cervical cancer? *Journal of Behavioral Decision Making*, 7, 57–72.
- Zanna, M. P., & Cooper, J. (1976). Dissonance and the attribution process. In J. H. Harvey, W. I. Ickes, & R. F. Kidd (Eds.), *New directions in attribution research* (Vol. 1, pp. 199–217). Hillsdale, NJ: Erlbaum.

Received: June 23, 1995