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ORDER EFFECTS IN CONSUMER JUDGMENT, CHOICE, AND MEMORY: THE ROLE OF INITIAL PROCESSING GOALS

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ABSTRACT

Consumer information processing is a dynamic process that unfolds over time as information is encountered. However, little research exists on the effects of order of presentation on consumer judgment, choice, and memory. A new procedure was developed to permit the detection of order effects in choice as well as in judgment. The results revealed that strong primacy effects in judgment and choice occur when consumers do not expect a final evaluation or choice task. When the choice task is anticipated, however, these primacy effects are eliminated. The results also indicate that the relationship between judgment and memory depends on the pattern of order effects observed in judgment and memory.

PRIMACY AND RECENCY EFFECTS

The order in which information is encountered has a strong impact on judgments of products. Sometimes information appearing early in a sequence has a stronger effect on judgment than does subsequent information (a primacy effect), whereas at other times, later items dominate earlier items (a recency effect). Although a rather extensive literature exists on order effects (for reviews see Anderson 1981, 1982; Dreben, Fiske, and Hastie 1979; Einhorn and Hogarth 1987; Jones and Goethals 1972; Lichtenstein and Srull 1987; Wyer 1974; Wyer and Carlston 1979), it is still difficult to predict whether primacy or recency will occur in a given situation.

The present experiment differs from previous research in several ways: (1) we focused on judgments of products rather than on judgments of people, (2) a two-object paradigm was employed, (3) recall and judgment were measured in a choice context instead of an impression formation context, and (4) order effects were investigated in choice as well as in judgment. Moreover, the present study is a continuation of a program of research on context effects in judgment and choice (Kardes, Herr, and Marlino 1989).

Jones and Goethals (1972) suggest that judgment primacy effects are likely when new information is integrated with previously encountered information. When this continuous, online, judgment-updating process occurs, earlier information is likely to color the way subsequent information is interpreted (the change-in-meaning hypothesis). Judgment recency effects, on the other hand, are likely when new information is processed independently from earlier information (and when an attention decrement over time is unlikely). Hence, when consumers are motivated to integrate information to form a coherent overall impression of a product (an impression set), judgment primacy should occur. In contrast, when the information integration process is disrupted by instructions to memorize information (a memory set), judgment recency should occur.

It is unclear how a choice set should influence order effects in judgment. Choice processing is complex because it often involves integration and differentiation (Tetlock and Kim 1987). Consumers often integrate information within alternatives and differentiate (e.g., compare and contrast) information between alternatives. Tetlock's (1989) program of research has shown that when people reason about political issues in a cognitively complex fashion, they are less likely to exhibit overconfidence and other judgmental biases (e.g., Kahneman, Slovic, and Tversky 1982; Nisbett and Ross 1980). If a choice set encourages cognitively complex reasoning, and if complex reasoning reduces the magnitude of judgmental biases, then primacy and recency effects in judgment might also be diminished when choice processing occurs.

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THE RELATIONSHIP BETWEEN JUDGMENT AND MEMORY

Although primacy or recency tend to occur in judgment, primacy and recency tend to occur in recall (Anderson and Hubert 1963, Dreben et al. 1979, Lichtenstein and Srull 1987). Early items are memorable due to greater levels of rehearsal (Rundus 1971), middle items are poorly recalled, and later items area readily recalled if they are still active in working memory (Wyer and Srull 1986). When judgment order effects differ from recall order effects, weak judgment-recall relationships should be observed. Weak relationships are likely when online processing leads to separate evaluation-based and attribute-based representations in memory; strong relationships are likely when judgments are computed on the basis of information retrieved from memory (Hastie and Park 1986; Lichtenstein and Srull 1985, 1987). However, Chattopadhyay and Alba (1988) argue that weak judgment-recall relationships are not observed when sensitive judgment and recall measures are taken in a choice setting. Moreover, they obtained data inconsistent with the two-process model. We examined the judgment-recall relationship using both an unweighted recall index and the Chattopadhyay and Alba weighted recall index.

METHOD

Pretest

Twenty-four undergraduates rated the attractiveness of 28 features of 14-inch color televisions on a scale from 1 (Extremely bad) to 10 (Extremely good). These features were described as features of 14-inch color TVs in general and were not associated with any one particular brand. The attributes were presented on less than two pages in the questionnaire to minimize order effects. Two sets of 14 attributes (seven favorable and seven unfavorable) were selected to represent Brands A and B in the main experiment. Brand B ($M = 5.53$) was significantly superior to Brand A ($M = 5.21$), $t(23) = 4.00$, $p < .001$. Henceforth, Brand A will be referred to as the inferior brand and Brand B will be referred to as the superior brand.

Procedure

An independent sample of 84 undergraduates participated in the main experiment. Subjects received a booklet containing instructions, attribute descriptions, and measures. Half of the subjects were told that their task was to choose between the two brands (choice set) and half were instructed to memorize the attributes for the two brands (memory set). The attribute information and measures were the same for all subjects.

Each page of the booklet contained descriptions of one inferior brand attribute and one superior brand attribute. Order of presentation was held constant across subjects and subjects were asked to evaluate each attribute on a semantic differential scale ranging from 1 (Extremely bad) to 10 (Extremely good). Subjects rated each attribute after each description before proceeding to the next page.

The early attributes were favorable for the inferior brand and unfavorable for the superior brand. Thus, if primacy effects were found, subjects would actually prefer the inferior brand over the superior brand. Again, this effect should be found in memory-set but not in choice-set conditions even though all subjects received the same information presented in the same order. Favorable (+) and unfavorable (-) attributes were presented in the following order:

Inferior brand: + + + + - + - - + + - - - -

Superior brand: - - - + - - + + - + _ + + +

Imbalanced sequences were used to prevent subjects from detecting the relationship between the two brands. Nevertheless, the favorable-to-unfavorable (inferior brand) and the unfavorable-to-favorable (superior brand) sequences were preserved. This design enables us to examine order effects in choice as well as in judgment.

After completing the attribute ratings, overall evaluative judgments of the two brands were assessed on scales ranging from 1 (Extremely bad) to 10 (Extremely good). Finally, all subjects were asked to choose between the two brands and to freely recall as many attributes as possible.

RESULTS

Order Effects In Judgment

Attitudinal judgments as a function of initial processing goals and brand are presented in Table 1. A 2 (choice or memory set) x 2 (inferior or superior brand) analysis of variance, with one between subjects factor (Set) and one within-subjects factor (Brand), was performed on brand attitudes. This analysis yielded a significant Brand main effect, $F(1, 82) = 17.89$, $p < .001$, and a significant Set X Brand interaction, $F(1, 82) = 8.16$, $p < .005$. The set main effect was not significant ($F < 1$). Simple effect tests were used to interpret the Set X Brand interaction while controlling for the compounding of alpha. As Table 1 indicates, in choice set conditions, subjects tended to evaluate the inferior brand more favorably than the superior brand (Ms = 6.37 vs. 6.07), but this tendency was nonsignificant ($F < 1$). In memory set conditions, however, more favorable brand attitudes were formed towards the inferior brand than towards the superior brand (Ms = 6.98 vs. 5.47), $F(1, 82) = 25.72$, $p < .001$. Even though all subjects received the exact same information presented in the same order, primacy effects were found when subjects were motivated to memorize attribute information but not when they were motivated to select one alternative. Thus, consistent with the hypothesis that cognitively complex reasoning reduces the magnitude of judgmental biases, judgment primacy effects were eliminated in choice set conditions.

Order Effects In Choice

The probability of choosing the inferior brand was .61 in choice set conditions and .81 in memory set conditions. The observed choice probability did not differ from chance in choice choice set conditions, chi-square = 1.98, ns. In contrast, a strong primacy effect in choice occurred in memory set conditions, chi-square = 16.96, $p < .001$. Primacy effects in judgment and in choice are diminished when choice Processing occurs.

Order Effects In Memory

The proportion of attributes correctly recalled as a function of initial processing objectives and serial position is presented in Table 2. Serial position was divided into three categories: the first three items, the middle eight items, and the last three items. As Table 2 indicates, primacy and recency effects in recall were observed across brands and across set conditions. Recall was poorest for the middle items, as predicted.

The Judgment-Recall Relationship

Previous research has shown that the relationship between judgment and recall depends on the manner of judgment formation (Hastie and Park 1986, Lichtenstein and Srull 1985, 1987). When evaluations are formed on-line as judgment-relevant information is acquired, overall evaluations and the specific attribute information used to form overall evaluations are stored independently in memory. Consequently, under these conditions, judgment and recall are not necessarily related. In contrast, when evaluations are formed after information acquisition, the attribute information that is retrieved from memory serves as a direct input for evaluative judgments.

When recall serves as a direct input for judgment, a strong judgment-recall relationship should be observed.

TABLE 1

BRAND ATTITUDES

TABLE 2

PROBABILITY OF RECALL

However, Chattopadhyay and Alba (1988) provide recent empirical evidence that is inconsistent with this model. They maintain that a strong relationship between judgment and recall is always obtained when sufficiently sensitive measures are used. Hastie and Park (1986) and Lichtenstein and Srull (1985, 1987) used the "preferential recall index" (PRI), which is the ratio of the number of positive attributes recalled divided into the number of positive and negative attributes recalled: Pl(P+N). Chattopadhyay and Alba (1988) used the more sensitive Luce (1959) index, which is similar to the PRI except that each attribute recalled is weighted by its evaluative rating. Hence, the Luce index contains information about degree of positivity and degree of negativity rather than a simple tally of the number of positive and negative features recalled. Both indices were employed in the present study.

Judgment-recall correlation coefficients as a function of initial processing goals, brand, and recall index are presented in Table 3. As Table 3 indicates, judgment-recall relationships tended to be stronger in memory set than in choice set conditions. No significant correlations between judgment and recall were found for the superior brand. For the inferior brand, a stronger judgment-recall correlation tended to occur in memory set ($r = .33$, $p < .03$) than in choice set ($r = .25$, $p = .12$) conditions when the PRI was used. When the Luce index was used, a somewhat stronger relationship was found in memory set ($r = .31$, $p < .04$) than in choice set ($r = .28$, $p < .08$) conditions.

A correlation coefficient between two measures is greatly reduced when the variability in the two measures is not equivalent. To determine if range restriction can account for the observed pattern of coefficients (see Table 3), standard deviations were examined. Standard deviations in the judgment and recall measures as a function of processing objectives, brand, and index are presented in Table 4. As Table 4 indicates, standard deviations tended to be lower in the recall than in the judgment measures. However, this pattern was consistent across set conditions, brands, and indices. Although a restriction in range partially contributed to the overall low levels of correlation that were observed, range restriction cannot account for the pattern of coefficients found across set conditions. brands. and indices.

TABLE 3

JUDGEMENT-RECALL CORRELATIONS

TABLE 4

STANDARD DEVIATIONS

DISCUSSION

Several interesting findings emerged from the present study. First of all, strong judgment primacy effects were found in memory set conditions, but these effects disappeared in choice set

conditions. Secondly, primacy effects were observed in choice as well as in judgment when subjects' initial processing goal was to memorize attribute information. However, primacy effects vanished in choice set conditions. Finally, different patterns of serial position effects occurred in judgment than in recall. As a consequence, relatively weak relationships were found between judgment and recall even when the sensitive Luce recall index was employed.

Initial processing goals clearly influence the manner in which information is interpreted and used by consumers. Extensive research has shown that people are often "cognitive misers," and little effort goes into examining, analyzing, and using relevant information (e.g., Alba and Hutchinson 1987; Cialdini 1988; Langer, Blank, and Chanowitz 1978; Petty and Caciopppo 1986). Under these circumstances, important information is often overlooked or underutilized and people are susceptible to a variety of judgmental biases (Kahnman et al. 1982, Nisbett and Ross 1980). In contrast, when involvement is high as opposed to low, more cognitive effort is allocated to analyzing information and the magnitude of these biases tends to be reduced. However, an increase in effort does not always guarantee an increase in accuracy in judgment (Fischhoff 1982, Kruglanski (1989), Kruglanski and Freund 1983) or in choice (Klein and Yadav 1989; Payne, Bettman, and Johnson 1988).

The results indicate that attribute information is more extensively analyzed in choice set than in memory set conditions. When consumers have an initial processing objective of choosing between two brands, relatively complex comparison and reasoning processes occur. As a consequence, primacy effects, and perhaps other biases as well, are reduced. In contrast, when consumers have an initial processing goal of memorizing attribute information and later receive a surprise choice task, primacy effects occur in judgment and in choice. Hence, the timing of goals is critical. Primacy effects are reduced when a choice set is operating prior to information acquisition (an initial processing goal), but not when consumers switch to a choice set after information acquisition (a final processing goal). This finding suggests that a choice set can prevent biases but cannot reverse them.

We also tested diverging predictions about the effects of a memory set on sequential information processing. Jones and Goethals' (1972) model predicts that judgment recency effects should occur in memory set conditions (because the integration process is disrupted), whereas Lichtenstein and Srull's (1987) model predicts that judgment primacy effects should occur in memory set conditions. When recalled attribute information is used as a direct input for judgment, primacy effects in memory should lead to primacy effects in judgment. This is precisely what we found.

Finally, the present study addressed an inconsistency in the literature on the relationship between judgment and memory. Hastie and Park (1986) and Lichtenstein and Srull (1985, 1987) argue that weak relationships between judgment and memory should occur in impression set conditions, whereas strong relationships should occur in memory set conditions. Chattopadhyay and Alba (1988) maintain that a strong relationship between judgment and memory should always occur and that measurement problems are primarily responsible for low correlations. The present data are more consistent with the former model, even though the sensitive Luce recall index was used in a choice context. Judgment and recall should not always be strongly related. When different patterns of order effects occur in judgment versus recall, low judgment-recall correlations should be observed. On the other hand, when similar patterns of order effects occur in judgment and recall, strong relationships should be more likely.

In conclusion, the present study demonstrates that initial processing objectives play an important role in determining how information is interpreted and used over time. By influencing the manner in which information is processed, goals affect judgment, choice, memory, and the relationships between these constructs. A clearer understanding of these complex relationships can be achieved only by integrating motivation and cognition.

REFERENCES

Alba, Joseph W. and J. Wesley Hutchinson (1987), "Dimensions of Consumer Expertise," Journal of Consumer Research, 13 (March), 411-454.

Anderson, Norman H. (1981), Foundations of Information Integration Theory, New York: Academic Press.

Anderson, Norman H. (1982), Methods of Information Integration Theory, New York: Academic Press.

Anderson, Norman H. and Stephen Hubert, (1963), "Effects of Concomitant Verbal Recall on Order Effects in Personality Impression Formation," Journal of Verbal Learning and Verbal Behavior, 2 (December), 379-391.

Chattopadhyay, Amitava and Joseph W. Alba (1988), "The Situational Importance of Recall and Inference in Consumer Decision Making," Journal of Consumer Research, 15 (June), 1-12.

Cialdini, Robert B. (1988), Influence: Science and Practice, Glenview, IL: Scott, Foresman and Company.

Dreben, Elizabeth K., Susan T. Fiske, and Reid Hastie (1979), "The Independence of Evaluative and Item Information: Impression and Recall Order Effects in Behavior-Based Impression Formation" Journal of Personality and Social Psychology, 37 (October), 1758-1768.

Einhorn, Hillel J. and Robin M. Hogarth (1987), "Adaptation and Inertia in Belief Updating: The Contrast-Inertia Model," unpublished manuscript.

Fischhoff, Baruch (1982), "Debiasing," in Judgment under Uncertainty: Heuristics and Biases, eds. Daniel Kahneman, Paul Slovic, and Amos Tversky, New York: Cambridge University Press, 422-444.

Hastie, Reid and Bernadette Park (1986), 'The Relationship Between Memory and Judgment Depends on Whether the Judgment Task is Memory-Based or On-Line," Psychological Review, 93 (June), 258-268.

Jones, Edward E. and George R. Goethals (1972), "Order Effects in Impression Formation: Attribution Context and the Nature of the Entity," in Attribution: Perceiving the Causes of Behavior, eds. Edward E. Jones et al., Morristown, NJ: General Learning Press, 27-46.

Kahneman, Daniel, Paul Slovic, and Amos Tversky (1982), Judgment under Uncertainty: Heuristics and Biases, New York: Cambridge University Press.

Kardes, Frank R., Paul M. Herr, and Deborah Marlino (1989), "Some New Light on Substitution and Attraction Effects," in Advances in Consumer Research, Vol 16, ed. Thomas K. Srull, Provo, UT: Association for Consumer Research, 203-208.

Klein, Noreen M. and Manjit S. Yadav (1989), "Context Effects on Effort and Accuracy in Choice: An Enquiry into Adaptive Decision Making," Journal of Consumer Research, 15 (March), 411 -421.

Kruglanski, Arie W. (1989), Lay Epistemics and H man Knowledge: Cognitive and Motivational Bases, New York: Plenum.

Kruglanski, Arie W. and Tallie Freund (1983), "The Freezing and Unfreezing of Lay Inferences: Effects on Impressional Primacy, Ethnic Stereotyping, and Numerical Anchoring," Journal of Experimental Social Psychology, 19 (September), 448468.

Langer, Ellen J., Arthur Blank, and Benzion Chanowitz (1978), "The Mindlessness of Ostensibly Thoughtful Action: The Role of 'Placebic' Information in Interpersonal Interaction," Journal of Personality and Social Psychology, 36 (June), 635-642.

Lichtenstein, Meryl and Thomas K. Srull (1985), "Conceptual and Methodological Issues in Examining the Relationship Between Consumer Memory and Judgment," in Psychological Processes and Advertising Effects: Theory, Research, and Application, eds. Linda F. Alwitt and Andrew A. Mitchell, Hillsdale, NJ: Lawrence Erlbaum Associates, 66-75.

Lichtenstein, Meryl and Thomas K. Srull (1987), "Processing Objectives as a Determinant of the Relationship between Recall and Judgment," Journal of Experimental Social Psychology, 23 (March), 93-118.

Luce, R. Duncan (1959), Individual Choice Behavior, New York: Wiley.

Nisbett, Richard and Lee Ross (1980), Human Inference: Strategies and Shortcomings of Social Judgment, Englewood Cliffs, NJ: Prentice-Hall.

Payne, John W., James R. Bettman, and Eric J. Johnson (1988), "Adaptive Strategy Selection in Decision Making," Journal of Experimental Psychology: Learning, Memory, and Cognition, 14 (July), 534-552.

Petty, Richard E. and John T. Cacioppo (1986), 'The Elaboration Likelihood Model of Persuasion," in Advances in Experimental Social Psychology, Vol. 19, ed. Leonard Berkowitz, New York: Academic Press, 123-205.

Rundus, Dewey (1971), "Analysis of Rehearsal Processes in Free Recall," Journal of Experimental Psychology, 89 (July), 63-77.

Tetlock, Philip E. (1989), "Structure and Function in Political Belief Systems," in Attitude Structure and Function, eds. Anthony R. Pratkanis, Steven J. Breckler, and Anthony G. Greenwald, Hillsdale, NJ: Lawrence Erlbaum Associates, 129-151.

Tetlock, Philip E. and Jae Il Kim (1987), "Accountability and Judgment Processes in a Personality Prediction Task," Journal of Personality and Social Psychology, 52 (April), 700-709.

Wyer, Robert S. (1974), Cognitive Organization and Change: An Information-Processing Approach, Potomac, MD: Lawrence Erlbaum Associates.

Wyer, Robert S. and Donal E. Carlston (1979), Social Cognition, Inference, and Attribution, Hillsdale, NJ: Lawrence Erlbaum Associates.

Wyer, Robert S. and Thomas K. Srull (1986), "Human Cognition in its Social Context," Psychological Review, 93 (July), 322-359.
