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# Product Familiarity and Learning New Information

ERIC J. JOHNSON  
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Does product familiarity improve shoppers' ability to learn new product information? We examine an earlier study which indicated that greater familiarity increased learning during a new purchase decision. Our reanalysis confirms that the effect depends strongly upon decision strategy. Familiarity facilitates learning when consumers rate each alternative, but when consumers are instructed to choose one alternative, an "inverted u" relationship between familiarity and learning results. Our new analyses also show that consumers familiar with the product category demonstrate stronger brand organization for the new information.

During the last decade it has become increasingly clear that a decision maker's current knowledge of a topic affects the processing of new, topic-related information. In consumer behavior, knowledge of a product class—or product familiarity—has been a feature of both traditional (Hansen 1972; Howard 1977; Howard and Sheth 1969) and more recent information processing theories of consumer choice (Bettman 1979). Similarly, the impact of knowledge of a problem domain—or expertise—has been explored in many cognitive and social domains (see Chi, Glaser, and Rees 1981 for a review of the former, and Ostrom, Pryor, and Simpson 1981; Fiske, Kinder, and Larter 1983 for examples of the latter). Familiarity has been the focus of recent empirical work in consumer research that examines information acquisition (Bettman and Park 1980b), reactions to advertising (Anderson and Jolson 1980; Edell and Mitchell 1978; Marks and Olson 1981), and the choice of decision rules by consumers (Park 1976). The current paper has two goals:

- ▶ To clarify the mechanisms underlying familiarity effects in consumer choice.
- ▶ To demonstrate the impact of familiarity upon consumers' ability to search—and subsequently to learn—new information.

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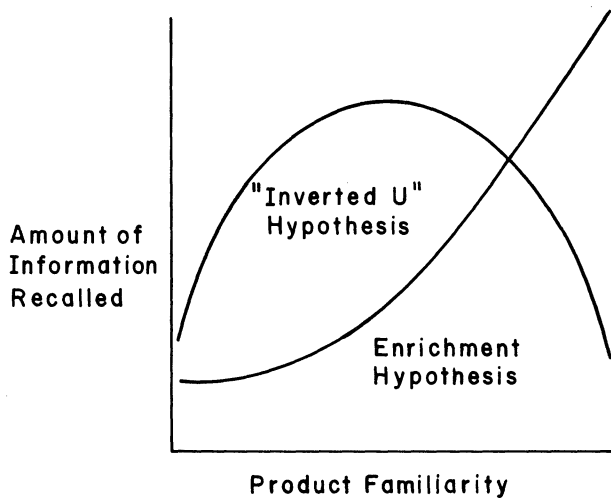
In a previous paper (Johnson and Russo 1981) we examined two plausible but conflicting hypotheses describing the relationship between learning and information acquisition. The first, which we term the "enrichment" hypothesis, suggests that existing knowledge facilitates the learning of new information. A classic example is provided by the chess research of Chase and Simon (1973). In their study, both chess masters and novices viewed actual chess positions for five seconds. The chess masters' ability to recall these positions was superior to the novices' recall. With random patterns of chess pieces, however, the masters' recall was no better than that of the novices. Thus prior knowledge of the domain facilitated learning—a "rich get richer" relationship which would generate data similar to the exponential curve in Figure A.

The second hypothesis suggests that prior knowledge has an "inverted u" effect, as shown in Figure A. Here, in contrast with the enrichment hypothesis, highly familiar consumers may search less than those who are moderately familiar. Bettman and Park (1980a) found such a pattern in consumers' acquisition of information about microwave ovens, and Miyake and Norman (1979) found that the number of questions asked about a new domain has an inverted u relationship with familiarity with similar domains. Although both studies describe external information search, this inverted u hypothesis can be extended to describe the amount of knowledge remembered after search, predicting a curvilinear relationship between existing product knowledge and the amount of new information learned about a product class.

How can we reconcile the different predictions made by the enrichment hypothesis and by the inverted u hypothesis? Familiarity with a product class could have several different results, each of which might affect consumers' information processing skills in a different way. Familiarity gives experienced consumers several advantages over consumers

FIGURE A

ALTERNATIVE THEORETICAL RELATIONSHIPS BETWEEN PRODUCT FAMILIARITY AND LEARNING



new to a product class. The first and most obvious is superior knowledge of existing alternatives. Highly familiar consumers—say, those with extensive knowledge of automobiles—will be more likely to know specific facts about existing alternatives, such as the gas mileage of a Volkswagen Rabbit. As suggested by Bettman and Park (1980a), we expect knowledge to decrease search for highly familiar consumers when they are considering existing alternatives.

A second distinct advantage of familiarity concerns search of new alternatives: more familiar consumers, like the chess masters in Chase and Simon's studies, may develop knowledge about the plausible relationships among elements of a product class. Consumers who are familiar with autos, for example, may come to expect certain relationships between engine size, gas mileage, interior room, and acceleration. This knowledge allows familiar consumers to encode information about new alternatives more efficiently and, as suggested by the enrichment hypothesis, causes an increase in learning. In addition to Chase and Simon's chess experiments, experts' superior ability to encode new information has been demonstrated in many domains, including baseball (Voss, Vesonder, and Spilich 1980), computer programming (Jeffries et al. 1981), and electronics (Egan and Schwartz 1979).

A third advantage of familiarity concerns the processing of both novel and existing products. In many domains, a key facet of expertise is the ability to select relevant information while ignoring information irrelevant to the task at hand (Larkin et al. 1980; Johnson 1983). More familiar consumers may use their knowledge of the product class to limit their attention to information which is important to choice. At the same time, their superior encoding skills may be offset by their superior ability to separate relevant from irrelevant information: when the external environment contains irrelevant information, experts may search—and

therefore remember—less of the externally available information.

To summarize, we have suggested three skills that develop from increased familiarity with a product class, each having consequences for the relationship between familiarity and learning:

1. Familiar consumers possess superior knowledge of existing products, which should decrease search of extant alternatives.
2. Familiar consumers possess a superior ability to encode new information, which may increase search and learning for new alternatives.
3. Familiar consumers can pay attention to relevant information and ignore irrelevant information: when faced with information that is irrelevant or redundant, such consumers may use their knowledge of the product class to ignore unimportant information, performing a more selective search of available information.

It is possible to isolate these types of familiarity effect by considering decision tasks that make different demands upon these three skills. For example, familiarity effects arising from choices among new alternatives and existing alternatives might differ: existing alternatives require the use of familiar consumers' existing knowledge, while new alternatives make use of their superior encoding skills, and an increase in the information available for new alternatives might cause them to rely upon their superior ability to select relevant information. Thus the impact of familiarity may depend critically upon the relative importance of these three skills. Understanding the relationship between familiarity and learning new information, in particular, requires a focus on the relative importance of superior encoding skills versus superior information selection skills. We illustrate this by examining two similar tasks that we believe will produce different relationships between familiarity and learning.

### CHOICE VS. JUDGMENT

To clarify the role of task characteristics in mediating familiarity effects, consider two tasks often associated with measurement of consumer preferences: a *choice task* (choosing one alternative from a set), and a *judgment task* (constructing an overall evaluation of an alternative). Many investigators (Bettman and Park 1980b; Johnson and Russo 1978; Wright and Barbour 1977) report evidence that the choice processes used by consumers are phased, combining two decision procedures—such as elimination by aspects and additive utility—to make a choice. With such a rule, some alternatives are usually eliminated quickly on the basis of one or two inferior values and not examined further. Search using phased rules is usually quite selective, and consumers consequently have less knowledge of these eliminated brands (Biehal and Chakravarti 1982; Johnson and Russo, 1978).

Judgment, in contrast, requires a rating of each product on a scale of overall preference. This requires that overall judgments be made for each alternative. As in a linear com-

pensatory strategy, we would expect the same amount of information to be examined for each alternative (Payne 1976). Since no alternative can be eliminated and the same attributes are examined for each alternative, the judgment task limits the usefulness of information selection skills.

These two tasks may well induce different strategies that emphasize different skills of familiar consumers. When asked to judge the alternatives, subjects must construct an overall judgment for each alternative and consequently may consider similar information for each alternative (Payne 1976). Here the superior encoding ability of more familiar consumers should dominate, producing a monotonic relationship between familiarity and learning. The choice task instructions are less constraining, leaving the decision maker free to select both strategy and information. Here the information selection skills of the most experienced consumers may dominate their superior encoding ability, producing a decrease in external search and subsequent learning. Thus in the judgment task the superior encoding skills of highly familiar consumers should prevail, producing an enrichment effect. In choice, a highly familiar consumer's ability to select information should come into play, causing a decrease in learning new information that conforms to the inverted u hypothesis.

Incidentally, this distinction between choice tasks and judgment tasks is also found in the behavioral decision literature. As Einhorn and Hogarth (1981) point out, compensatory processes are not necessary for psychological models of choice. The process-tracing evidence both in behavioral decision theory (Payne 1976) and in consumer behavior (Bettman and Zins 1977; Lussier and Olshavsky 1979) suggests that the use of compensatory strategies is limited to situations with few alternatives. However, other research suggests that unfamiliar consumers may make greater use of additive compensatory-decision rules (Park 1976).

## OVERVIEW

To summarize, this research concerns prior knowledge of a product class and its effect upon consumers' learning of new information. The literature suggests two alternative hypotheses:

1. An enrichment hypothesis, which suggests that greater prior knowledge leads to more extensive learning of new information.
2. The inverted u hypothesis, which suggests that higher levels of familiarity result in reduced search and less learning.

We suggest that the first hypothesis may reflect familiar consumers' superior encoding, while the latter reflects highly familiar consumers' ability to eliminate useless or redundant information. We explore these two hypotheses across two tasks: a choice task that allows subjects considerable freedom in their selection of decision processes, and a judgment instruction designed to promote compensatory processing.

The present experiment used a brand  $\times$  attribute display of information abstracted from an actual advertisement. This contained new information about subcompact cars that had just become available at the beginning of the model year. Subjects who differed in their familiarity with automobiles were asked to evaluate the cars using only the information presented. Afterwards, they were surprised with instructions to recall this information. These recall protocols provided us with evidence of the role of prior knowledge in learning (remembering) new product knowledge. The recall protocols can also be analyzed to explore the effect of familiarity on the content and organization of this new knowledge.

There were two limitations of our theoretical analysis and experiment. First, we treated familiarity as synonymous with knowledge about a domain (such as a class of products). For a consumer, this knowledge can come from many sources and is not necessarily correlated with usage. Although learning can occur during the purchase and use of a product, other sources (such as advertising and word-of-mouth) can create familiarity without direct experience. In this study, therefore, we described familiarity as knowledge of the product class and not necessarily as usage experience.

Second, there are many ways to learn about a product class, and no one study can examine them all. We limited ourselves to one type of learning: the acquisition of new knowledge that occurs during purchase decisions. This approach has two advantages: (1) there is evidence that important parts of consumers' product knowledge come from this source (Wright 1975; Johnson and Russo 1978), and (2) the nature of information learned during purchase decisions gives us some insight into the relationship between familiarity and the processes used to make the decision.

## METHOD

### Subjects

The participants were 55 Master's students in business who completed the task as part of a classroom demonstration during the first meeting of a consumer behavior course. Although we selected the product category—new subcompact cars—because it was of substantial interest to this group, the results from this convenience sample may not generalize to other populations, especially to those with different distributions of product familiarity.

### Stimulus

An edited portion of a newspaper advertisement placed by General Motors' Oldsmobile Division served as the brand  $\times$  attribute matrix. It compared eight small imported cars on 11 attributes. Further details are available in Johnson and Russo (1981).

Using actual products presents a greater possibility that the recall protocols might be contaminated by intrusions from prior knowledge. This brand  $\times$  attribute matrix, however, presented obscure variants of relatively common au-

tos, specifying nonstandard engines, transmissions, and so on. This minimized the problem of separating knowledge acquired prior to the experiment from our dependent measures of knowledge acquired through making a decision. Moreover, pretesting showed that even knowledgeable consumers had difficulty generating the matrix if they had not seen it, and that they were unable to construct much of it accurately. The advantage of this procedure is that it allowed us to present even expert consumers with information that they did not know, while maintaining the meaningful patterns present among the attributes in the product class.

### Procedure

Subjects were run in a single group and assigned randomly to task conditions. Each group received one of the two sets of task instructions, which asked them to rate each alternative (the judgment condition), or to choose one from the set (the choice condition). Further details are provided in Johnson and Russo (1981).

Upon completion of their tasks (typically within 5 minutes), both groups completed a "demographic questionnaire" that prevented retention of the product information in short-term memory and provided a self-rating of product familiarity. Subjects noted their previous knowledge of automobiles, compared to the rest of the population, on a five-point scale and reported their usage experience in the product class.<sup>1</sup>

Afterwards, subjects turned the page and read the instructions for an unexpected written recall task. They were asked to "not only include the information you were given, but also *any other judgments or comparisons you can remember.*" These instructions encouraged complete recall, including tentative judgments about the products made during the course of the decision. When they had finished, subjects were asked to report which car they preferred and any past experience they had with the eight automobiles used for the task.

### Analysis

We measured familiarity with the product category using subjects' self-reports on the scale described above. Self-ratings below 3 were classified in the low familiarity group, those between 3 and 4 in the moderate familiarity group, and those above 4 in the high familiarity group. These integer values used to create the familiarity groups resulted in unequal cell sizes (16, 27, and 12 subjects in the low, medium, and high familiarity conditions, respectively). The two task instructions—judgment versus choice—along with the three levels of familiarity created a 2 × 3 factorial design with unequal cell sizes.

<sup>1</sup>Validity of the measure is a problem if the self-report actually measures some other construct that would explain these results. Although this measure has apparent face validity, there is one plausible alternative construct: motivation or interest in the product class. We address this alternative in a later section.

## RESULTS

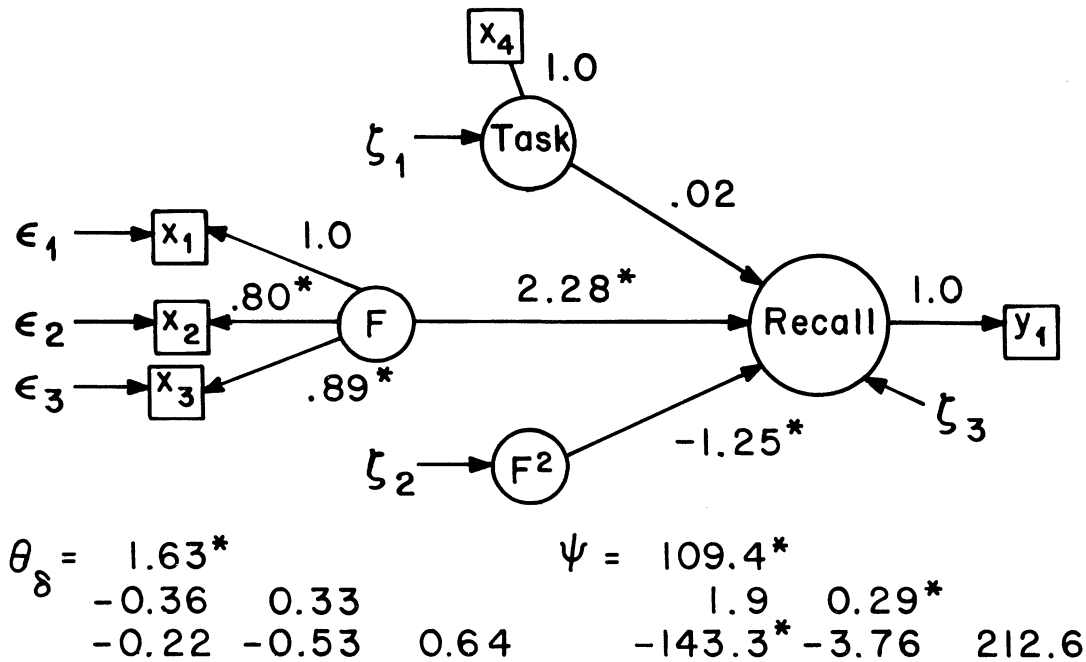
### Familiarity

We can consider the possible relationship between familiarity and learning by examining the total amount of knowledge recalled as a function of familiarity. Previous analyses (Johnson and Russo 1981) showed the expected interaction between familiarity and the evaluation task. For judgment, the enrichment effect was large and consistent: the mean number of statements recalled was 11.6 for the low familiarity group, 14.4 for those of moderate familiarity, and 28.6 for those high in product familiarity. The choice condition, in contrast, revealed a large and reliable inverted u relationship: consumers who had been asked to make choices recalled an average of 12.3, 19.3, and 15.7 statements in the low, medium, and high familiarity groups, respectively. An ANOVA confirmed the significance of the interaction, and a priori contrasts demonstrated that both the linear effect in judgment and the inverted u effect in choice were statistically significant.

This same pattern is shown by a new structural equation analysis that has two additional advantages: (1) it uses the multiple measures of familiarity collected in this study, and (2) it does not depend upon arbitrary cutoffs to determine the level of familiarity. In this analysis, familiarity is measured by the self-report scale described above and by two other self-report measures of experience: the reported number of cars in this product class owned by the respondent, and the number that s/he had ridden in. In addition to the latent construct, familiarity, the structural model included the effect of task, which we assumed was measured without error. Since the hypothesized effect of familiarity in the choice condition was nonlinear, we need to operationalize some nonlinear form of the unobservable construct of familiarity. An obvious candidate is the square of the construct, which could be operationalized by imposing constraints across the measurement models for familiarity, operationalizing the inverted u effect. However, the available algorithms commonly used for the estimation of structural equation models such as LISREL do not allow us to impose the necessary constraints. We therefore calculated the nonlinear effect of familiarity externally to the estimation of the structural equation. We imposed the necessary constraints by using the coefficients calculated for the linear component of familiarity, which were then substituted in the calculation of the nonlinear effect. We iterated this estimation process until stable sets of coefficients emerged.<sup>2</sup> Because we expected the nonlinear, inverted u effect of familiarity only in the choice condition, we set the value of the nonlinear effect to zero for the observations from the judgment group.

<sup>2</sup>This process can yield liberal significance tests, however, because it assumes that there is no error in the measurement of the nonlinear effect of familiarity. Estimation of a model using the appropriate constraints with a nonlinear estimation procedure (HOTZTRAN, Avery and Hotz 1983) yielded similar results.

FIGURE B  
STRUCTURAL EQUATION MODEL OF THE RELATIONSHIP BETWEEN FAMILIARITY AND LEARNING



NOTE:  $x_1$  = Number of cars ridden    F = Familiarity  
 $x_2$  = Number of cars owned     $F^2$  = Inverted u familiarity effect  
 $x_3$  = Self-report of familiarity    \* = Effect significant at  $p < 0.05$

Figure B displays the model and the estimated coefficients. The coefficients conform to the results of the simple ANOVA, showing a significant positive linear relationship between familiarity and recall and a significant negative relationship between the square of the familiarity construct and recall. The coefficient for task is not significant. One of the three measures of familiarity—the number of cars driven—is scaled to a unit variance. The remaining two measures show a strong relationship to the underlying construct of familiarity.

Overall, the model provides a reasonable fit to the data:  $\chi^2$  (4 df) = 3.22,  $p > 0.50$ . To further explore competing models of the data we compared:

1.  $M_0$ , a null model that estimated all variances and covariances between the observed variables but no measurement or structural parameters,
2.  $M_1$ , a model that estimated all but one parameter of the model shown in Figure B, setting the nonlinear effect of familiarity to zero, and
3.  $M_2$ , the full model displayed in Figure B.

Since these models are nested, we can calculate both incremental indices of fit and tests of the significance of the improvements due to the added parameters (Bentler and Bonett 1980). The normed index of fit— $\Delta_{0,2}$ —is quite reasonable (0.957), while the model lacking the nonlinear ef-

fect shows considerable lack of fit:  $\Delta_{0,1} = 0.360$ . The addition of the nonlinear effect of familiarity shows that the increase in fit between  $M_1$  and  $M_2$  is significant:  $\chi^2$  (1 df) = 43.78,  $p < 0.001$ . Thus the structural equation analysis tells a story that is similar to the ANOVA, suggesting that the enrichment hypothesis describes information recalled after a judgment but not the recall of consumers who have made choices.

### Choice versus Judgment

Why does familiarity have such a different effect upon judgment and choice tasks? We suspect that the answer lies in the different cognitive processes underlying choice and judgment. Specifically, we suspect that a choice task allows the use of phased decision rules that eliminate alternatives and thus cause more to be known about the brand that is eventually chosen. In a judgment task, such elimination is problematic, so we expect search and subsequent recall to be about equal for all alternatives.

Although we did not collect data examining this issue in the main experiment, there is process-tracing evidence consistent with this speculation (Johnson and Meyer 1984). Specifically, this evidence indicates that the verbal protocols generated during choice differ from those generated during judgments in three ways:

1. Choice protocols contain relatively more statements eliminating alternatives.
2. Choice protocols contain relatively fewer statements that evaluate alternatives.
3. Choice protocols demonstrate a one-sidedness effect—that is, they show that much more attention is paid to the alternative eventually chosen.

We conducted a small pilot study with the current stimuli to examine the possibility that similar differences in strategy may underlie the familiarity  $\times$  task interaction. Ten undergraduates generated concurrent verbal reports: half performed the choice task from the current experiment, and half performed the judgment task. An analysis of these reports, using a coding scheme similar to that employed by Johnson and Meyer (1984), shows similar differences between choice and judgment tasks:

1. The choice protocols contained elimination statements (8 percent of all statements), while the judgment protocols contained none.
2. The judgment protocols consisted largely of statements coded as evaluations (44 percent), while these statements represented only 7 percent of the protocols generated in the choice task.
3. The choice condition shows a similar one-sidedness of search: 27 percent of all statements refer to the most preferred alternative, whereas the judgment condition subjects mentioned the most preferred alternative in only 9 percent of their statements.

Although the groups are small, all three differences are significant: Mann-Whitney  $U = 3, 0, 2, p < 0.05, 0.01,$  and  $0.05,$  respectively. Thus this independent pretest indicates that the two sets of task instructions used in this experiment may well have produced markedly different sets of cognitive processes: choice appears to be characterized by elimination and “one-sided” search, while judgment appears to imply more evaluation and a more balanced pattern of search.

These apparent processing differences help explain differences in the information recalled in each task condition which we had previously observed in Johnson and Russo (1981). We examined the recall protocols for evidence of one-sidedness by counting the number of statements that referred to the automobile most preferred by each subject. We found that 35 percent of all statements in the choice task referred to the chosen automobile, while only 18 percent of the statements in the judgment task mentioned the most preferred car. Both values are significantly greater than the 12.5 percent expected by chance ( $p < 0.001$ ).

We also examined these proportions in each task and level of familiarity. The judgment condition showed no statistically significant effect of familiarity: the proportion of statements referring to the chosen alternative was 0.13, 0.23, and 0.12 for the low, medium, and high levels of familiarity, respectively. However, the choice task showed an increase in one-sidedness that was particularly large for highly familiar consumers: for the low and medium famil-

ilarity consumers, 0.32 and 0.27 of all statements referred to the chosen brand, while 0.54 of the high familiarity group's statements referred to the car that they had chosen. An ANOVA confirmed the task  $\times$  level interaction:  $F(2,49) = 5.82, p < 0.01$ . A priori comparisons confirmed the reliability of increases in the choice condition,  $F(1,49) = 11.20, p < 0.005$ , and found no effect in the judgment condition. This supports the hypothesis that consumers in the choice condition use decision rules that eliminate alternatives. It also suggests that the most familiar consumers may use choice rules that are particularly one-sided. In contrast, the judgment condition provides little evidence of selective memory.

## Organization

While we have concentrated on the amount of knowledge retained by consumers, recall protocols also allow us to make tentative inferences concerning the organization of this knowledge in memory. This organization can be identified, in part, by the order of statements in the recall protocols. If memory is based upon brand organization, we expect all the facts about a brand to be clustered together in recall. Attribute organization occurs when information about many brands is clustered around one attribute. An index of organization can be constructed by counting all transitions between statements and dividing them into three groups: those that share the same brand, those that share the same attribute, and those that contain neither the same brand nor the same attribute. These are called brand, attribute, or neutral transitions, respectively (Johnson and Russo 1978). The proportion of brand transitions for each cell is listed in the Table.

These data clearly show a large effect of familiarity upon organization: as familiarity increases, acquired knowledge shows increasing brand-based organization. This effect is significant— $F(2,49) = 7.84, p < 0.001$ —while the effect of task and the interaction are not— $F(1,49) = 2.16$  and  $F(2,49) = 1.79, p > 0.15$  for both. The proportion of attribute-based transitions shows a similar decrease. In sum, the organization data present a clear picture: more familiarity results in more brand organization.

## Controls for Prior Knowledge

Our analysis rests on the assumption that these recall protocols contain relatively few facts known before the experiment. This neglects the possibility that because they have more prior knowledge of these autos, more familiar consumers may include this knowledge in their recall, artificially raising their total for newly acquired knowledge. This explanation cannot account for the more interesting results—i.e., the observed interaction between familiarity and task instructions and the decreased recall of experienced subjects in the choice conditions—but extensive recall of prior knowledge would affect the interpretation of these results.

Although we cannot conclusively show that no prior knowledge was recalled, we examined these protocols for

**TABLE**  
PROPORTION BRAND TRANSITIONS

	Low familiarity	Moderate familiarity	High familiarity	Mean
Choice	.26	.54	.58	.46
Judgment	.21	.31	.69	.36
Mean	.24	.41	.63	.27

inaccurate recall, which could have been due in part to recalled prior knowledge, since the autos were often obscure variants of a manufacturer's line and the matrix contained some attributes that were not well publicized (EPA estimates of trunk capacity, for example). In addition, none of the recall protocols referred to brands or attributes that were not mentioned in the original matrix. Pretesting confirmed that even knowledgeable consumers had great difficulty completing most of the array if they had not seen the matrix beforehand. This suggests that reconstruction from prior knowledge should not be as accurate as knowledge acquired from the display.

A rater who was blind to our hypotheses scored the brand attribute values in the protocols for accuracy. A strict criterion for accuracy was that values of all verbal descriptions be recalled exactly and that all numerical attributes be recalled within 2 percent of their correct value. Analysis using this strict criterion showed that:

- The proportion of inaccurate recall (0.37) did not vary with either familiarity or task condition ( $p > 0.20$ ).
- Inclusion of the number of inaccurate statements as a covariate did not substantially change the significance of the results in the reported analysis of variance.

These results strongly suggest that the knowledge recalled by our subjects was acquired from the display and did not represent prior knowledge of the presented values.

An alternative explanation for these results concerns motivational differences among the groups. The pattern of results for any one group is easily explained from a motivational perspective. For example, more interested and motivated subjects might learn more information about the product class, yielding the data consistent with the enrichment hypothesis seen in the judgment task. It is not clear, however, why this would cause a decrease in search in the choice task condition. We suggest that the decrease comes not from disinterest in the product class, but from knowledge that further search would not lead to a better choice. Any alternative explanation of these effects needs to account for: (1) the increase in recall with familiarity in the judgment task, (2) the equivalent inverted u pattern in the choice task, and (3) the one-sidedness observed in choice but not in judgment. These phenomena suggest that the information processing explanation may be a more parsimonious account for these results, but that further research seems warranted. Further research would also be needed to

determine whether the differences in recall we observed are due to encoding or to retrieval. Like most researchers who have examined recall as a function of familiarity or expertise, we assume that differences in recall are due to differences in encoding. However, additional research would be necessary to study differences in experts' and novices' strategies for recall in similar tasks.

## DISCUSSION

Our three levels of familiarity can be seen as three snapshots portraying stages in the development of an "expert" consumer—one knowledgeable about the product category. We can trace this development by comparing the changes across the conditions. Concentrating on the judgment task, we see that prior knowledge enhances a consumer's ability to encode and remember new information. In addition to this increased encoding ability, more familiar consumers develop more brand organization for new knowledge. This is consistent with a number of views of learning which suggest that acquiring new knowledge also entails developing unitized knowledge structures (see Hayes-Roth 1977 for a particularly appropriate example). Whether we call these units frames, scripts, schemata, or simply chunks does not matter. The evidence clearly indicates the development of an integrated unit of storage and suggests that this unit is the brand.

The results from the choice task demonstrate that something else is also happening. Evidently, experienced consumers use their knowledge of the product class to limit their search. In the real world outside of this experiment, this decrease could be due to prior knowledge of information presented in the environment (Bettman and Park 1980). In this experiment, however, the knowledge presented was not available even to experienced consumers, indicating that presence of the knowledge in memory was not responsible for reduced search. Rather, it appears that, along with their increase in encoding ability, experienced consumers develop knowledge of efficient decision procedures. For example, experienced consumers would ignore the attribute "cruising range," since they realize that it is simply the product of fuel capacity and estimated miles per gallon. This procedural knowledge appears to be a major advantage that experienced consumers bring to decision tasks.<sup>3</sup>

## IMPLICATIONS

These results really have two separate stories to tell: one about differences among decision tasks, and the other about the effect of familiarity. Each has implications for broader

<sup>3</sup>Interestingly, Punj and Staelin (1983) did not find an inverted u relationship using self-reports of knowledge made by actual car purchasers. This could be due to the limited range of familiarity among their subjects, all of whom had purchased cars within six months prior to the study. Thus more research reconciling the results of field and laboratory studies of information search seems warranted.



areas within consumer behavior. We will discuss the implications of task differences for the estimation of choice models and then turn to familiarity, discussing the implications of the current findings for information provision.

### Choice versus Judgment

Our data suggest that *choosing* one alternative from a set can invoke different psychological processes than *judging* alternatives, which are presumably evaluated one at a time. In choice, the memory data are consistent with the use of elimination-based strategies, while judgment seems to result in different, more compensatory processing. However, most models of consumer preferences appear to equate the two.

For example, decision decomposition techniques, such as conjoint analysis, estimate attribute importance by asking consumers to judge or rank alternative products. The weights derived from these one-at-a-time judgments are then used to predict consumers' selections in a real-world choice task. The picture of attribute usage that emerges in this experiment is quite different for these two tasks.

This raises several interesting issues. What happens, for example, when choice strategies eliminate alternatives? According to our data, elimination does not seem commonplace in one-at-a-time judgments. This implies that weights estimated using judgments may not have a clear relationship to attribute usage in choice. Although this does not argue against the usefulness of decomposition models, which have been shown to be useful predictors of choice, these results may help delineate their limits. Recent results reported by Huber and Czajka (1982) illustrate the point. They showed that two different tasks—binary choice and one-at-a-time judgments—yielded slightly different rank orderings of attribute importance. Since elimination-based strategies appear to be more common in choice tasks with greater than two alternatives (Payne 1976), it may be that disagreement between tasks is a more important problem with larger choice sets. There are other ways of measuring preferences, such as ranking, and a process analysis of the influence of task upon decomposition models is published elsewhere in this issue (Johnson and Meyer 1984).

### Familiarity

The other story to be told concerns the effect of familiarity. This research, along with related findings, has several implications for both public and private providers of product information. First, our findings suggest that familiarity provides a useful segmentation technique. Communication should match the technical complexity of its intended audience. Recent research on responses to advertising confirms this: Edell and Mitchell (1978) show that highly familiar consumers report more cognitive responses when presented with technical advertising, and Anderson and Jolson (1980) demonstrate that technical ads create the greatest increase in purchase intentions for purchasers who have considerable experience with the product, while a non-

technical ad is most effective for those with no experience. One special class of experienced consumers consists of industrial purchasers and professional buyers, who must be considered "expert" consumers. Our data suggest that, barring time pressure, highly technical appeals containing much information might be effective for this unique segment.

Second, our results emphasize the importance of learning procedures for making decisions. *Consumer Reports* is often cited as the classic instance of a brand  $\times$  attribute display. The text accompanying the display is often not mentioned, but is an excellent example of the kind of procedural knowledge available to experienced consumers: it identifies important attributes, describes the range of values for attributes, and suggests reasonable levels for cutoffs. The impact of this information in helping naïve consumers make better decisions may be as great as the effect of the brand  $\times$  attribute display. This raises the possibility of *procedural education*, in which similar descriptions act as effective supplements to the brand  $\times$  attribute matrix. Procedural education is a technique that is open to advertisers as well as to those who wish to improve decisionmaking through public policy.

This suggests a third and final implication. Since publication of the work on information overload by Jacoby and colleagues (Jacoby, Speller, and Berning 1974; Jacoby, Speller, and Kohn 1974), a major controversy in consumer behavior research has concerned the amount of information provided to consumers. When faced with a large number of attributes and limited processing capacity, both experienced and naïve consumers consider a subset of the available information (Bettman and Kakkar 1977; Payne 1976). Our results suggest that experienced consumers should be better able to select attributes that are predictive of product performance, which should, in turn, result in better decisions. The implication for the provision of information to naïve consumers is clear: presentations should be limited to the attributes most relevant to preference judgments. Additional information, particularly when it is nondiagnostic of product performance, could cause deterioration in the quality of choice.

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