FACULTY WORKING PAPER 92-0175

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Abstract

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Past literature has typically conceptualized expertise as an all-or-none proposition, in which consumers have been classified as either experts or novices. This paper conceptualizes expertise in consumer choice as a multi-stage process. Two knowledge components, product familiarity and knowledge of choice strategies, are identified to classify consumers into four different stages of expertise. Consumer choice behavior in terms of objective and perceived choice quality are examined in these four stages. Results suggest that strategy knowledge is more useful than product familiarity for making good quality choices. However, product familiarity is valued more by consumers while assessing their choice performance.

Consumer choice is an important element of consumer decision making. In many instances, consumer choice involves the purchase of items that have been purchased before. In a repetitive choice situation, consumers try to simplify their choice processes by utilizing choice strategies that have proven successful in previous choice situations. Howard and Sheth (1968) call this behavior the "psychology of simplification." According to Howard and Sheth, consumers progress from an "extensive problem solving" stage through a "limited problem solving" stage to a "routinized response" stage as they make more and more choices in a product category. This progression implies that consumers acquire some kind of knowledge that helps them simplify their choice process.

Consumer knowledge and its acquisition has received much attention in the past literature (see Alba and Hutchinson (1987) for a review). The general approach in past studies has been to classify consumers into two distinct categories - experts and novices (see for example, Beattie 1983; Sujan 1985). The assumption has been that experts have access to a larger knowledge base than novices. Therefore, in the repetitive choice situation discussed above, acquisition of a knowledge base enables consumers to progress from novices to experts, which in turn allows them to move from an extensive problem solving stage to a more routinized response stage.

Howard and Sheth's conceptualization of a 'limited problem solving' stage suggests that consumers pass through intermediate stages as they become experts. Previous research on the acquisition of expertise has paid less attention to how consumers behave in these intermediate stages, and has tended to focus more on ascertaining the differences in consumer behavior between the initial and the final stage.

This research focuses on the intermediate stages. Specifically, it deals with the issue of characterizing the nature of consumer

knowledge in these intermediate stages. In, doing so, it identifies two components of consumer knowledge that are useful in classifying consumers into different stages. Further, the research also studies how each component of knowledge influences consumers' choice and perceptions of choice quality.

To address the above issues, this research builds upon past research in consumer behavior and psychology on expertise in choice making and problem solving. In the following sections of this paper, a theory-based rationale is presented for examining two components of expertise that are relevant for making a choice: familiarity with the product category, and knowledge of a choice strategy for integrating and evaluating information about brands. Empirical assessments of the effects of these two components on objective and perceived quality of consumer choice are obtained with two studies. These studies are described, their results are presented and their implications for consumer behavior are discussed.

BACKGROUND

In their model of consumer knowledge, Alba and Hutchinson (1987) distinguish between two types of knowledge: familiarity and expertise. They define familiarity as "the number of product-related experiences that have been accumulated by the consumer." Expertise, which includes familiarity, is defined as "the ability to perform product-related tasks successfully" (Alba and Hutchinson (1987) p. 411). According to Alba and Hutchinson, expertise is comprised of both product information and the procedural skills necessary to utilize the product information. Moreover, increased familiarity with a particular product category has a direct impact upon the ability to utilize the information; in short, familiarity with the product and the ability to make successful choices are intertwined.

The view of expertise as, at least in part, a function of familiarity with the product category has received support from several

studies. In fact, much of the literature has focused upon the effects of knowledge of product-specific information, such as knowledge about relevant attributes and the values typically associated with them, on choice. While some studies in this area have looked at the effects of product knowledge on information search (Bettman and Park 1980; Brucks 1985; Srull 1983), others have examined the effects of product knowledge on the evaluation processes (Sujan 1985).

These above studies have shown important effects of product knowledge on consumer behavior. For example, Sujan (1985) considered the impact of familiarity with product information not only on consumer choices, but also on the choice strategies used by expert and novice consumers. She demonstrated that consumers with more familiarity with a product category exhibited bigger differences than novices in the types of strategies, category-based or piecemeal, that they used when faced with information that either matched or mismatched the stored information.

Beattie's (1983) model proposed that experts, with their complex knowledge structures, would judge a brand's similarity to an ideal brand differently than would novices. According to Beattie, experts would processes differences as well as similarities on each attribute between the presented brand and a perceived ideal. Novices, however, would process only similarities. The differences in processing were proposed to account for differences in choices made by experts and novices.

The research by Sujan and Beattie is indicative of a general view that it is the information and its structure in long-term memory that is the determinant of consumer expertise (Bettman 1986). However, although product familiarity is undoubtedly useful in the development of choice skill, it is not necessarily the sole contributor to the development of such skill. For example, consumers may abstract general choice strategies which can be transferred from one product category to another. To understand this, consider a choice situation. There are

typically two tasks associated with a choice situation. One task is the extraction of relevant information about products from the environment. The other task is the application of a particular choice strategy to the product information, and the selection of the product that offers the highest utility to the consumer. These two tasks need not be sequential. In some situations, consumers may select a choice strategy before acquiring the product information, using the strategy as a template for guiding information acquisition (Bettman and Kakkar 1977; Lussier and Olshavsky 1979). In other situations, consumers may acquire the product information before selecting an evaluative strategy (Biehal and Chakravarti 1982). Sometimes the two tasks may occur simultaneously, as when consumers construct strategies at the time of information evaluation (Bettman and Zins 1977).

The implications of task separation for developing consumer expertise are important. For example, in some situations consumers are passively exposed to product information without a goal for encoding information (e.g., exposure to advertisements). Some of the information may be unintentionally encoded in long term memory (Gordon and Holyoak 1983). Consequently, over a period of time consumers can become familiar with the products in a particular category without necessarily becoming experts in utilizing the information effectively to make good quality choices. Alternatively, consumers may develop a choice strategy while making a choice in one product category that can be transferred while making a choice in another category. Thus, consumers can have familiarity without having the procedural skill of a choice strategy, or vice versa.

That strategies for making choices can be developed and used independently of product-specific information is supported by research on problem-solving abilities in psychology. Anzai and Simon (1979) develop a theory of "learning by doing," in which they argue that people learn which strategies are most appropriate for problem solving in a

particular domain by a process of trial and error. Anzai and Simon draw a clear distinction between prior knowledge (such as familiarity with the problem representation) and the processes used to solve the problem (described as the general learning capabilities of their model). This would imply that one can learn a strategy in one domain, and then retain knowledge of that strategy for use in a different domain. Anzai and Simon refer to this type of strategy as one that is "task independent." This depiction is consistent with earlier work by Newell and Simon (1972), who describe two main elements of problems and their solution: the representation of information and the method used to process it. The method can be specified independently of task information.

Chi, Glaser and Rees (1981) also describe expertise as consisting of two components: a body of usable information and procedural skill. They suggest that what distinguishes experts from novices in any domain is that experts have the ability to convert knowledge of fundamental principles (as in physics problems) into procedures for problem solving. That is, a large amount of product specific information does not automatically make someone an expert. Information may be useless unless the consumer knows how to utilize it.

In summary, past research on expertise and consumer knowledge suggests two key items for examination: 1) that expertise may consist of at least two different components, i.e., product familiarity and knowledge of choice strategies, and 2) that expertise is not an all-or-none proposition; it may exist in stages. The first aspect is related to the second, in that a consumer who possesses one of the two components is likely to be more of an expert than a consumer who possesses neither. Further, the two components are independent in that a consumer can possess one in the absence of the other.

This view of consumer knowledge is represented in Figure 1. Consumers who have both familiarity with the product category and know an appropriate choice strategy can be classified as Experts. Consumers

who have neither product familiarity nor knowledge of choice strategies can be classified as Novices. Consumers who have product familiarity but not knowledge of choice strategies can be classified as "Amateurs." Consumers with knowledge of choice strategies but not product familiarity can be classified as "Theorists."[1] This framework extends previous research, in which consumers have typically been classified into one of two categories: experts or novices. We propose that the inclusion of two intermediate stages between those of novice and expert captures a broader range of expertise. In this approach, expertise is a conceptualized as a multi-stage process involving different knowledge components, rather than as a simple all-or-none proposition.

		PRODUCT FAMILIARITY	
		No	**Yes**
KNOWLEDGE OF CHOICE STRATEGIES	**No**	Novices	Amateurs
	Yes	Theorists	Experts

Figure 1

There are two key aspects of knowledge acquisition that are worthy of attention. One is the existence of knowledge in consumers and the other is the recognition of the existence of this knowledge by consumers. En route to becoming experts, consumers not only develop a knowledge base, but they also become aware of this growing knowledge base, which makes them more confident of their decisions. Part of becoming an expert is this growing awareness of improved ability and familiarity.

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[1]The authors thank Professor John Carroll of MIT for suggesting the terminology "Amateurs" and "Theorists."

While the existence of a knowledge base would, no doubt, manifest itself in superior choices, it is the awareness of the knowledge that would result in confidence in the quality of the choice. Thus, there are really two key issues - the objective choice quality and the consumers' perceived choice quality. Both issues are examined in this research.

The key contribution of this paper lies in the identification and exploration of these intermediate stages. It is important to note that consumers need not necessarily progress through these four stages sequentially. Some consumers may start out as Novices, become Amateurs and then become Experts. Others may become Theorists before becoming Experts. While the 'route to expertise' is, no doubt, an important topic of enquiry, the questions tackled in this study relate more to the systematic differences between consumers who are in the different stages. The differences, if any, are explored with particular reference to consumers' objective choice quality as well their perceived choice quality.

HYPOTHESES

In this section, hypotheses about the influence of product familiarity and knowledge of choice strategy, both singly and together, are developed in terms of objective and perceived choice quality. Objective choice quality is an objective measure of how good the chosen brand is, compared with other brands. Perceived choice quality refers to the consumers' perceptions about the quality of their choice.

Objective Choice Quality

Psychology research in expertise suggests that experts have greater access to stronger methods (i.e., procedures or strategies) for solving problems than novices, who rely on weaker methods (Langley, Simon, Bradshaw and Zytgow 1987; Sweller, Mawer and Ward 1983). For example, in physics problem-solving, these stronger methods make use of

axioms or fundamental principles to solve problems (Chi, et al. 1981; Larkin, et al. 1980). Novices use weaker methods, such as relying on superficial aspects of the problem, to guide solution attempts. These weaker methods often lead to incorrect solutions. Extending the idea of weak and strong methods to a consumer choice setting, it can be argued that a consumer who has knowledge of an appropriate strategy (a strong method) for integrating and evaluating product information will tend to make better brand choices than a consumer without such strategy knowledge. In the classification presented in Figure 1, Theorists and Experts have knowledge of choice strategies whereas Amateurs and Novices do not. Therefore, despite product familiarity, Amateurs, who do not have knowledge of choice strategies, will have to construct an appropriate strategy, unlike Theorists or Experts, who simply have to retrieve an appropriate choice strategy. Therefore, we expect that Theorists and Experts will exhibit superior objective choice performance compared to Novices or Amateurs.

It should be noted, however, that work on implicit learning (e.g., Gordon and Holyoak 1983) indicates that people *do* internalize information about patterns and structure of information while passively attending to information, and that they may use this information to abstract strategies for later use. Therefore, it is possible that Amateurs, while attending to product information, may unconsciously abstract choice strategies. Thus, Amateurs may have an advantage over Novices in their ability to organize information. More formally, we hypothesize,

> *Hypothesis 1: The objective choice quality will follow the sequence: Experts > Theorists > Amateurs > Novices.*

This hypothesis essentially states that Experts will perform the best, followed by Theorists, then by Amateurs, and finally by Novices.

Perceived Choice Quality

As noted earlier, consumers' perceived choice quality may depend on the degree of their perceived self-expertise. In general, the greater the degree of perceived self-expertise, the higher the estimate of perceived choice quality. In other words, consumers who consider themselves more expert will tend to rate their performance more highly than those who consider themselves less expert (Arkes, Dawes and Christensen 1986).

Consumers can assess the degree of their self-expertise by looking at either external or internal indicators of expertise. The external indicators might be task-oriented, such as the quality of the choice or the method used in making the choice. Internal indicators might be person-oriented, such as the recognition that one possesses procedural skills for performing a task. In general, external indicators would be useful where the correctness or incorrectness of the outcome or process is unambiguous, as in situations where feedback is immediately available. In most consumer situations, however, outcome feedback may not so easily available. In these situations, consumers may have to rely either on internal indicators, such as the recognition that they possess choice skills, or on process feedback, such as the effort expended in making the choice.

There is some evidence that the internal indicators may be difficult to assess. Studies have shown that people who internalize procedural knowledge through practice at a task may not be aware or able to articulate that they possess such knowledge (Lewicki 1986; Lewicki, Hill and Bizot 1988). Procedural knowledge, such as choice strategy knowledge, is usually encoded at a deeper level than product familiarity and may not be easily recognized. In contrast, people are more likely to be aware that they possess product familiarity, as this awareness may be more accessible than awareness of knowledge of choice strategies. Therefore, Amateurs, who have product familiarity, are expected to see

themselves as being more expert than Theorists. Because perceived self-expertise may influence perceptions of performance, we hypothesize,

> *Hypothesis 2: The perceived choice quality will follow the sequence: Experts > Amateurs > Theorists > Novices.*

Note that the sequences in Hypotheses 1 and 2 are different. In both cases, Experts are expected to have the highest choice quality and Novices the lowest. The interesting difference lies in the predictions about Amateurs and Theorists. Theorists are expected to perform objectively better than Amateurs, but Amateurs are expected to perceive their performance to be higher than that by Theorists.

To summarize the expectations about performance, we believe that subjects with strategy knowledge, i.e., Theorists and Experts, will outperform subjects without strategy knowledge, i.e., Amateurs and Novices. However, in terms of how subjects believe they perform, we expect that subjects with familiarity will overestimate their performance, placing greater value on familiarity than is warranted by objective performance (i.e., choice quality). In addition, when only one of the two components of expertise is present, we expect that strategy knowledge will prove more valuable than familiarity for objective choice quality, that is, Theorists will outperform Amateurs. At the same time, we expect that perceived estimates will be reversed; Amateurs will perceive their performance more highly than Theorists.

Performance Estimation Error Index

In addition to actual and perceived performance, a performance estimation error index can be developed to reflect the mismatch between objective and perceived choice quality. This measure is constructed by subtracting objective choice quality from perceived choice quality (Arkes, Dawes, et al. 1986). The performance estimation error index is a measure of consumer overconfidence. A index value greater than zero implies overconfidence in performance, whereas an index value less than zero implies underconfidence. Following the general arguments outlined

earlier, we expect Amateurs to overestimate and Theorists to underestimate the quality of their choice.

Hypothesis 3: The performance estimation error, as measured by the difference between the perceived and objective performance, will follow the form: Amateurs > Theorists. While for Amateurs, perceived choice quality will be greater than objective choice quality, for Theorists, the pattern will be reversed.

We do not make any formal predictions about the behavior of Experts and Novices; however, we will examine their responses to see how they compare with observed behaviors of subjects in the other categories. We expect to find that Experts, who presumably have the greatest awareness of the knowledge they possess, should be most accurate at predicting their performance.

METHOD

The hypotheses were tested in two studies. In both studies, subjects were undergraduates at a major midwestern university. All subjects received extra course credit for participating in the studies. Fifty-one subjects participated in the first study and ninety-seven participated in the second study.

Experiment One

Design. In the first study, two independent variables were manipulated between-subjects: 1) product familiarity, and 2) knowledge of a choice strategy. The study consisted of a training phase with five training choice or judgment problems and a test phase with one choice problem. The training phase was designed to enable subjects to acquire product familiarity and/or knowledge of choice strategies. Problems consisted of four brands, each described by the same four attributes, and were displayed as brand/attribute matrices. There were four treatment conditions, each corresponding to a cell of the matrix in Figure 1.

Independent variables. To manipulate product familiarity, one-half of the subjects were trained in the same category, laptop computers, for both the training and the test phase. The remaining subjects were

trained in one product category, microwave ovens, and then shown a completely different product category, laptop computers, for the test phase. The rationale behind this manipulation is that the subjects who have multiple exposures to the product category will develop familiarity with the relevant attributes and their values, both in terms of ranges and typicality (Coupey and Nakamoto 1988).

The manipulation of strategy knowledge was accomplished through a goal manipulation. One-half of the subjects were asked to examine information in the brand sets in the training phase with a goal of choosing the best overall brand in each set. The remaining subjects were asked to complete a judgment task in the training phase. These subjects compared pairs of brands to assess similarity. In the test phase, all subjects were directed to choose the best overall brand. Figure 2 is a schematic representation of the task. The assumption underlying the manipulation of strategy knowledge was that subjects who have multiple opportunities to achieve a specific goal will abstract a procedure, or choice strategy, appropriate for reaching the goal (Anzai and Simon 1979). It was expected that subjects given the judgment task in the training phase would have less knowledge of an appropriate choice strategy for the final test problem. Therefore, the objective choice quality of these subjects, relative to that of subjects who had practiced making choices in the test phase, was expected to be inferior.

Figure 2 about here

Regardless of the condition, all problems were constructed to be comparable in the number of brands and attributes. Each problem had four brands and four attributes. For microwave ovens, the attributes used were interior capacity, number of power levels, wattage, and length of warranty. For laptop computers, the attributes used were weight, number of programs, internal memory, and external memory.

Dependent measures. Two primary dependent measures were obtained: a measure of objective choice quality and a measure of perceived choice quality. The measure of objective choice quality was the rank of the subject's selected brand from the four brands in the final test problem. The brands were ranked from the best to the worst using a weighted-adding rule. The weights for the attributes were obtained from each subject at the end of the test phase. The index was computed by multiplying the subject's weights with the levels of the attribute, for all attributes of a brand. These products were then summed across each brand to obtain the total brand value. The brand with the highest index value was ranked 1, and the brand with the lowest value was ranked 4. Therefore, a lower index value indicated a superior performance level.

The perceived choice quality was simply the subject's own estimate of the rank for his or her chosen brand. Subjects were asked to check the statement that they felt reflected their choice quality: "I chose the best brand," "I chose the second best brand," etc. Again, a lower value indicated a superior assessment of performance.

In addition to the objective and perceived choice quality, two other dependent measures were obtained on nine-point scale ratings. One of the measures related to outcome performance was subjects' confidence with the final choice. The other measure related to process performance was subjects' satisfaction with the process used to make the choice.

Results.

Objective Choice Quality (Hypothesis 1). The results showed that the objective measure of choice quality was directionally consistent with hypothesis 1. Novices did worst, with a mean rank of 2.42 (range of 1(best) to 4(worst)), while Amateurs did slightly better with a mean rank of 2.31. Theorists (mean=1.7) were better than Amateurs, but marginally worse than Experts (mean=1.69). A two-way analysis of variance with strategy knowledge and product knowledge as factors revealed a significant main effect of strategy knowledge ($F_{(1,50)} = 6.64$;

$p<0.01$). Subjects who made choice decisions in the training phase outperformed subjects who made judgment decisions in the training phase (means ranks of 1.7 and 2.36 respectively). There was no significant effect of product familiarity ($F_{(1,50)} = 0.04$; $p<0.83$), or for the strategy knowledge and product familiarity interaction ($F_{(1,50)} = 0.03$; $p<0.85$). However, because there was an a priori theoretical basis for expecting that the cell means would differ in a predicted pattern (Winer, 1971, p. 384), a statistical contrast of the means for Amateurs and Theorists was performed. The contrast was significant ($t_{(50)} = 1.66$; $p<0.01$), suggesting that prior knowledge of a strategy for making a choice may be more helpful in making good quality choices than prior knowledge about product features. This supported the premise that it is essentially strategy knowledge that results in superior performance.

Perceived Choice Quality (Hypothesis 2). The results for the perceived choice quality show that the pattern is the reverse of that found for objective choice quality; highest estimates of performance were given by Novices (mean=1.25). Amateurs were next (mean=1.56), followed by Theorists (mean=1.6). Experts gave the lowest estimates (mean=2.00).

A two-way analysis of variance with strategy knowledge and product familiarity as the factors revealed a significant effect of strategy knowledge ($F_{(1,50)} = 4.86$; $p<0.03$); subjects with strategy knowledge (mean=1.83) perceived their performance more negatively than those with no strategy knowledge (mean=1.43). There was also a significant main effect of product familiarity ($F_{(1,50)} = 4.0$; $p<0.05$); subjects with product knowledge assessed their performance more negatively (mean=1.76) than those without product knowledge (mean=1.41). The interaction between strategy knowledge and product familiarity was not significant ($F_{(1,50)} = 0.06$; $p<0.81$). The contrast between the means for Amateurs and Theorists was also not significant.

Performance Estimation Error (Hypothesis 3). An index of performance estimation error was estimated by subtracting perceived choice quality

ranks from objective choice quality ranks[2]. Recall that in this index, values greater than zero indicate overconfidence, and values less than zero indicate underconfidence. From the index it appears that Novices were most overconfident (mean=1.17), while Experts were actually underconfident (mean=-0.31). As hypothesized, Amateurs (mean=0.75) were more overconfident than Theorists (mean=0.1). Theorists were closest to predicting their performance levels accurately.

A two-way analysis of variance with strategy and product knowledge as the between-subject factors revealed a significant main effect of strategy knowledge ($F_{(1,50)} = 13.06$; $p<0.0007$). The mean performance estimation error index for subjects without strategy knowledge was 0.93, compared with -0.13 for subjects with strategy knowledge. There was no significant effect of product knowledge ($F_{(1,50)} = 1.97$, $p<0.16$).

The interaction effect of strategy knowledge and product knowledge was not significant ($F_{(1,50)} = 0.0002$; $p<0.99$). Thus, while the results provided directional support for Hypothesis 3, they were not statistically significant. The contrast between the means of Amateurs and Theorists, tested despite the non-significant overall F-value, was only marginally significant ($t_{(50)} = 1.55$; $p<0.12$).

The objective and perceived choice quality as well as the performance estimation errors for Study 1 are summarized by cells in Figure 3.

Figure 3 about here

Subjects' Satisfaction and Confidence Ratings

Analysis of the process-related ratings of satisfaction with the procedure obtained on nine-point rating scales revealed a marginally

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[2]Note that this measure is actually the negative of the overconfidence measure defined by Arkes et al. This was done to account for the fact that the performance indices in this study were ranks, where a higher value indicated a lower level of performance. By taking the negative of the Arkes et al. definition, we ensured that a higher performance estimation error reflected more overconfidence.

significant main effect of strategy knowledge ($F_{(1,50)}$ = 2.74; p<0.10); subjects with strategy knowledge were less satisfied (mean=5.02) than subjects without strategy knowledge (mean=5.75). However, there was no difference in satisfaction with the process between subjects in the familiarity and no familiarity conditions ($F_{(1,50)}$ = 2.0; p<0.17). The interaction of product familiarity and strategy knowledge was also not significant ($F_{(1,50)}$ = 2.18; p<0.14).

The outcome-related ratings on confidence with the choice showed no significant differences for strategy knowledge ($F_{(1,50)}$ = 2.35; p<0.13), product familiarity ($F_{(1,50)}$ = 0.08; p<0.77), or their interaction ($F_{(1,50)}$ = 0.23; p<0.63).

Discussion.

These results support the proposition that subjects possess two distinct types of knowledge, product familiarity and knowledge of choice strategies. Procedural knowledge, or being able to use a known choice strategy, appears to be more useful in making good choices than product familiarity. Subjects with product knowledge have a small advantage over subjects who have neither strategy nor product knowledge. Moreover, having strategy knowledge, even in the absence of product familiarity, is still more beneficial than just having only product familiarity.

At least two different rationales, one theoretical and the other procedural, may explain this finding. First, subjects with strategy knowledge may have used information more consistently than subjects without strategy knowledge. This may have led to more compensatory processing of attribute values, thereby resulting in better objective choice quality. Subjects without strategy knowledge may not have been able to use, or even to construct, a compensatory strategy very well. In essence, this rationale assumes that subjects with only product familiarity, i.e., Amateurs and Novices, either chose randomly, without a strategy, or that they attempted to construct strategies on-the-spot.

If the latter assumption is true, then the constructed strategies were not as optimal for making choices as the strategies abstracted previously from multiple choice episodes. This was the rationale which resulted in hypothesis 1. An alternative explanation can also be constructed as described below.

The second possible rationale for why Theorists outperformed Amateurs may lie in the experiment procedure. All of the stimuli were presented as brand/attribute matrices. This format may have facilitated the use of a compensatory strategy that promoted better choices more than it helped subjects learn and organize product information. One benefit of product knowledge in developing expertise is that it may help the consumer to structure information (Beattie 1983), in effect, to construct a useful representation of information. One limitation of this study was that the manipulation of product knowledge did not enable examination of this facet of expertise.

In general, the differences between objective performance in the four cells were small. Although the cell means follow the predicted pattern for objective performance, we cannot unequivocally state that the observed differences are systematic and would not change with changes to the manipulations or the inclusion of additional controls. For example, Novices and Amateurs might have developed a choice strategy during the final test phase. Because no time limit was imposed during the test phase, subjects may have tried different methods for evaluating brands, perhaps using process feedback, such as effort (Creyer, Bettman, and Payne 1989), as a guide, until an acceptable strategy was developed. Thus, having unlimited time to try out strategies may have enabled Amateurs and Novices to acquire some of the procedural skills presumed to be available only to Theorists and Experts. This may explain why observed differences between the cells were small.

The ratings on perceptions of performance, i.e., confidence and satisfaction, showed that subjects who had strategy knowledge were less

satisfied with the process used to make the choice than those who did not have strategy knowledge. However, the differences between the strategy and no-strategy groups were not significant as far as the confidence with the outcome was concerned. Further, there were no differences in both satisfaction with the process and confidence in the outcome between the product familiarity and no-familiarity conditions. These findings are important because they point to differences in the way subjects assessed the process and the outcome. As noted earlier, subjects might use external or internal indicators to evaluate their performance. Because no outcome feedback, such as choice quality, was given, subjects had no external indicators of outcome performance. In addition, there were probably no internal indicators of outcome performance for the subjects. This may explain the finding that there was no difference on confidence between the strategy and no-strategy conditions. However, in the case of satisfaction with the process, while there were no external indicators in the form of feedback, subjects may have found it easier to rely on internal indicators. Subjects with the strategy knowledge may not have recognized that they had a useful strategy gained through repeated exposures. Work on implicit learning (e.g., Reber 1976) suggests that knowledge--as of a strategy--and ability to use that knowledge, may often precede awareness of the knowledge and the ability to verbalize it. It is interesting to note that subjects with no strategy knowledge were significantly more satisfied than those with strategy knowledge. This finding warrants further investigation.

A second study was designed to examine the role of awareness on perceived choice quality, and to address the limitations discussed earlier. To this end, changes were made to the manipulations of familiarity and strategy knowledge, the format of the stimuli, and the procedure used to collect the data.

Experiment Two

Design. As in the first study, the independent variables of product familiarity and strategy knowledge were manipulated, resulting again in four treatment conditions. However, in order to address the limitations of the first study described above, and to assess the impact of awareness of a knowledge component on choice behavior, both manipulations were altered as described below.

Independent variables. The familiarity manipulation was changed primarily in two ways. First, unlike the previous study, subjects did not develop product familiarity through prior repeated exposure to brands in the product category. Second, the brand/attribute training format was discarded. Instead, to provide a more stringent assessment of the benefits of strategy and product familiarity, a new test format was designed to examine how familiarity aids consumers in organizing information for making a choice. Subjects in the familiarity condition received a one page description of the product category, laptop computers. Without referring to specific brands, the page detailed which attributes were relevant for making good choices, and the usual ranges and most typical values of these attributes. Six attributes were used: memory, battery life, weight, disk speed, screen quality, and whether the laptop had a monitor port. Information about which attributes were not diagnostic was also provided. For example, statements such as, "Weight of the laptop computer is also important, but because all laptops tend to weigh pretty much the same amount, this information is not helpful in making a good choice," were included. Subjects in the no-familiarity condition were given a page of information of the same length and complexity, but for microwave ovens. In both conditions, the test phase required subjects to make a choice among laptop computers.

The second change to the familiarity manipulation occurred in the presentation of the test stimulus. Rather than presenting brands in

matrix form, the information was presented in paragraph form, one paragraph per brand. This presentation better reflects the way information about products is encountered in many purchase decisions, both in terms of the sequential, brand-by-brand, nature of information availability, and in terms of the structure of the information about attributes and their values.

In order to assess the impact of awareness of choice strategy knowledge on objective and perceived choice quality, the strategy knowledge manipulation was also changed. One-half of the subjects (in the strategy knowledge condition) were trained in the use of a choice strategy that they were told would result in the selection of the best overall brand, if used correctly. Thus, it was expected that they would be aware that they possessed a choice strategy. The remaining subjects (in the no-strategy condition) were given no training.

Subjects in the strategy knowledge condition were taught to use a simple compensatory choice strategy. The strategy consisted of the following steps. First, subjects had to rank order the brands on each attribute from 1 (the best) to 4 (the worst). Then, subjects were asked to sum the ranks across the brands. The brand with the lowest total score was the best brand. This strategy was selected because of its intuitive appeal and simplicity (Coupey 1990); moreover, because the strategy is compensatory, it is a reasonably optimal method for making a choice. The test stimulus was constructed so that one brand was always the clear winner under this strategy. In addition, it was ensured that the brand rankings obtained with this strategy would be the same as those obtained using the more complex weighted-adding strategy.

A time limit was also imposed on all subjects. The time limit was introduced to reduce the possibility that subjects in the no-strategy condition had sufficient time to construct a strategy during the test phase. The time limit was determined in a pretest by obtaining an average of the response times for subjects adept in the use of the

summed ranks strategy. The average, two and one-half minutes, was used as a cut-off time in all conditions. Subjects were not told that there was any time constraint before they started on the experiment. When the time ran out, subjects were asked to make a choice immediately and the experiment was ended.

Results.

Objective Choice Quality (Hypothesis 1). The performance pattern largely mirrored that observed in Study 1; Novices performed worst (mean=2.96), followed by Amateurs (mean =2.76), and then Theorists (mean=1.56). Experts (mean=1.5) outperformed subjects in all the other cells.

A two-way analysis of variance with strategy knowledge and product familiarity as the factors revealed a significant effect for strategy knowledge ($F_{(1,96)} = 34.46$; $p<0.0001$). Subjects who were taught the strategy significantly outperformed those who were not taught the strategy (mean choice ranks were 1.53 and 2.86 respectively). However, no significant effect was obtained for product familiarity ($F_{(1,96)} = 0.34$; $p<0.56$).

The interaction effect of strategy knowledge and product familiarity was also not significant ($F_{(1,96)} = 0.08$; $p<0.76$). However, because differences between cells were hypothesized a priori, a contrast test between the cell means of Amateurs and Theorists was performed. The test showed that the difference in objective choice quality was significant ($t_{(96)} = 3.71$; $p<0.003$), thereby providing support for hypothesis 1.

Perceived Choice Quality (Hypothesis 2). A two-way analysis of variance was performed to assess the effects of strategy and product familiarity on self-assessment of performance. The effect of strategy knowledge was significant ($F_{(1,96)} = 3.99$; $p<0.04$). Subjects with strategy knowledge made better quality choices than subjects with no strategy knowledge (means were 1.32 and 1.50 respectively).

There was no significant effect of product familiarity ($F_{(1,96)}$ = 0.08; p<0.78), but the interaction effect of strategy and product familiarity was marginally significant ($F_{(1,96)}$ = 3.14; p<0.08). The pattern of means was roughly the reverse of that observed in study 1: this time, Novices ranked their performance lowest (mean=1.6), followed by Amateurs (mean=1.4). Contrary to the predictions, Theorists ranked their performance more highly than Experts (means were 1.26 and 1.38 respectively). However, a contrast test of the difference between Amateurs and Theorists was not significant ($F_{(1,38)}$ = 0.88; p<0.38).

Performance Estimation Error (Hypothesis 3). The results were fairly consistent with those obtained in Study 1 and provided support for hypothesis 3. Novices and Amateurs, with means of 1.36 each, were most overconfident about their performance. As predicted, Theorists (mean =0.30) were less overconfident than Amateurs. Experts were the least overconfident (mean=0.12).

The interaction effect of strategy knowledge and product familiarity was not significant ($F_{(1,81)}$ = 0.52; p<0.47). The contrast between the means for Amateurs and Theorists, however, was significant ($t_{(96)}$ = 2.93; p<0.004).

A two-way analysis of variance revealed a significant effect of strategy knowledge ($F_{(1,96)}$ = 20.38; p<0.0001). The mean for subjects without strategy knowledge was 1.36, compared with 0.21 for subjects with strategy knowledge. Subjects without strategy knowledge were overconfident whereas those with strategy knowledge were less overconfident. Product familiarity did not have a significant effect on overconfidence ($F_{(1.96)}$ = 0.12; p<0.72).

Subjects' Satisfaction and Confidence Ratings The ratings on the outcome-related subjective ratings on confidence with the choice did not show any significant differences for strategy knowledge ($F_{(1,96)}$ = 1.88; p<0.17), or for product familiarity ($F_{(1,96)}$ = 1.88; p<0.17). There was a significant crossover interaction effect of strategy and product

familiarity ($F_{(1,96)}$ = 5.06; p<0.02). Theorists expressed the highest confidence in the quality of their outcomes (mean=6.80). The differences among the subjects in the other three cells were very small (Novices=5.48; Amateurs=5.80; Experts=5.48). Once again, however, a contrast of the difference between Amateurs and Theorists was significant ($t_{(96)}$ = 1.93; p<0.05). It must be noted that Theorists were the most confident in this study, whereas in Study 1, they were the least confident. This may be explained by the emphasis on awareness of strategy knowledge in Study 2.

Analysis of the process-related ratings of satisfaction obtained on nine-point rating scales provided results similar to those obtained in Study 1. Despite the difference in confidence ratings between Study 1 and Study 2, awareness of an appropriate strategy apparently did little to increase procedural satisfaction; the effect of strategy was not significant ($F_{(1,96)}$ = 0.79, p<0.38). The means for those with strategy knowledge and those without were 5.9 and 6.3 respectively. There was also no significant difference in satisfaction ratings between subjects in the familiarity and no-familiarity conditions ($F_{(1,96)}$ = 0.06; p<0.81). The interaction effect of strategy knowledge and product familiarity was marginally significant ($F_{(1,96)}$ = 2.56; p<0.11).

These results are summarized in Figure 4.

Figure 4 about here

Discussion.

As in the first study, strategy knowledge appears more beneficial for making good choices than product familiarity. In both studies, Theorists outperformed Amateurs.

Making subjects aware of an appropriate strategy rule for making a choice has an effect on perceived performance, rather than on objective performance. In the first study, subjects without an opportunity to develop a strategy rated their performance more highly than those with

an opportunity, in the second study the pattern reverses; subjects trained in the use of a strategy use rated their performance more highly than those not trained.

The results of the Performance Estimation Error index suggest that one effect of strategy awareness is to make subjects better able to judge their choice performance. Subjects without the strategy training, and, presumably, without the heightened level of strategy awareness, tended to be significantly less able to predict their performance and tended to be more overconfident than their counterparts.

The results of the ratings of satisfaction suggest that as in the first study, subjects in this study with strategy knowledge are less satisfied than their counterparts. Given the boost in confidence observed from Study 1 to Study 2, this finding is surprising. One possible explanation is that although subjects knew and used the strategy because they were told it was appropriate, they still felt that there were better methods for making the choice. That subjects still used the strategy, however, is interesting from an application-oriented perspective, described in the following section.

GENERAL DISCUSSION

General summary

These studies reveal a broader view of consumer expertise than has been previously recognized. In this paper, expertise has been conceptualized as a multi-stage process in which consumers can have varying levels of expertise. This contrasts with previous approaches where consumers have been classified as either experts or novices. In order to clarify the nature of consumer knowledge in these stages, two knowledge components were described and examined.

Product familiarity was defined as knowledge specific to the product category in which a choice is being made. This includes knowledge about attributes relevant for making a choice, and the usual ranges and most typical values of these attributes. Product familiarity

is task-specific knowledge that is relevant only to choices being made in a specific product category.

Strategy knowledge was defined as task-general knowledge. This type of knowledge essentially consists of general choice rules that consumers can apply to a particular choice situation. An example of strategy knowledge is knowledge of a rule such as a weighted adding rule. Strategy knowledge can be applied to choice in any product category.

The two knowledge components were used to classify subjects into four cells. A consumer with no product familiarity and no strategy knowledge was classified as a Novice, one with product familiarity but no strategy knowledge was classified as an Amateur, one with strategy knowledge, but no product familiarity was classified as a Theorist, and a consumer with both product familiarity and strategy knowledge was classified as an Expert.

Two studies were conducted to assess the validity of this conceptualization. The two studies compared objective and perceived choice quality across the four groups above during a choice task. The findings were generally consistent with the hypotheses. Strategy knowledge led to superior objective choice quality whereas product familiarity led to superior perceived choice quality. Interestingly, Novices, who tended to objectively perform the worst, also tended to perceive their performance as being the best. It appears that one aspect of expertise is the development of a more realistic assessment of one's performance. This was demonstrated by the performance estimation error index.

The analysis of the performance estimation error index, obtained by subtracting subjective performance from objective performance, showed that, in both studies, Amateurs tended to be more overconfident than Theorists. A possible explanation for this finding may lie in the accessibility of the knowledge component. Product familiarity may be

more accessible than strategy knowledge, which is more deeply encoded. Some support for this finding was also obtained from confidence scale ratings. The confidence ratings flipped in the two studies. Subjects with strategy knowledge were more confident than those without in Study 2, whereas the result was reversed in Study 1. A main difference between the two studies was that, in Study 2, subjects were explicitly taught a rule and were made aware of their possession of the rule. This suggests that awareness of rule knowledge may have a positive impact on confidence in the choice outcome.

Limitations

In interpreting the results of these studies, the following limitations must be noted. The experiments forced subjects into four cells. This, while an advance over past studies, is still a somewhat simplified representation of how expertise most likely develops in reality. In reality, expertise is likely to be a continuum, rather than a multi-stage process. However, in our opinion, this limitation of simplifying reality is more than offset by the gain in experimental manageability obtained by classifying consumers into four cells. It must be noted that this artificial framework is more a convenience for research purposes than a veridical depiction of consumer knowledge acquisition.

Another limitation stems from the experimental nature of the study. The manipulation of strategy knowledge was achieved in Study 1 by exposing subjects to five choice situations and in Study 2 by teaching subjects a choice strategy. In reality, consumers probably abstract strategies by a combination of the two methods, i.e., by making repetitive choices and learning choice strategies from others. Moreover, consumers in real life probably have a repertoire of choice strategies with a mega-strategy, sensitive to situational constraints (e.g. time pressure), that tells them when to use which choice strategy.

CONCLUSIONS

Despite the limitations inherent in almost any experimental evaluation of consumer behavior, several valuable conclusions may be drawn from this research. First, consumer expertise is more than an all-or-none proposition. By recognizing that there are intermediate stages of expertise, marketers can tailor their communication of product offerings to consumers in each of the four stages described in this research.

An important application of this research is in the area of market segmentation. The basic principle behind market segmentation has been the notion that consumers can be classified into different segments on the basis of their demand schedules (Smith 1956), and that managers can increase their overall market performance by targeting different strategies to different segments. This approach has essentially concerned itself with identifying differences in consumer responses across different segments. Less attention has been paid to understanding why differences between segments may exist.

The current study makes an important contribution to explaining why differences between consumers may exist. Essentially, we argue that consumer responses may differ depending on the stage of expertise to which consumers belong. Consumers who are knowledgeable about choice strategies might be best influenced by detailed information about brand attributes, whereas consumers who do not have knowledge of choice strategies might best be influenced by being provided evaluative criteria. Thus, in addition to creating distinct segments, using knowledge components as a basis of segmentation also provides reasons for differences in consumer responses across segments.

In addition, the finding that Theorists and Experts do not tend to overestimate their performance (and may even underestimate it) indicates that marketers can promote higher levels of product satisfaction by

making consumers in the Theorists and Experts segments aware of their choice making abilities.

There are also implications of this research for public policy makers. For example, consider the finding that objective and perceived performance are inversely related unless consumers are aware of their knowledge. The potential for unsatisfactory consumption experiences can be reduced by making consumers in the Novice and Amateur segments aware that they are likely to overestimate the quality of their choices. Educating consumers about the components of good decision-making, and how to recognize the possession of those components, may eliminate many negative product experiences.

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STUDY 1: SCHEMATIC REPRESENTATION

		NOVICES	AMATEURS	THEORISTS	EXPERTS
TRAINING PHASE	**Product Category**	Microwave ovens	Laptop computers	Microwave ovens	Laptop computers
	Task	Judge similarity of brand pairs	Judge similarity of brand pairs	Choose the best brand	Choose the best brand
TEST PHASE	**Product Category**	Laptop computers	Laptop computers	Laptop computers	Laptop computers
	Task	Choose the best brand	Choose the best brand	Choose the best brand	Choose the best brand

Figure 2

STUDY ONE RESULTS

STRATEGY KNOWLEDGE	PRODUCT FAMILIARITY: No	PRODUCT FAMILIARITY: Yes
No	NOVICES 1 N=12 OBJECTIVE: 2.42 PERCEIVED: 1.25 OBJ-PERC: 1.27	2 AMATEURS N=16 OBJECTIVE: 2.31 PERCEIVED: 1.56 OBJ-PERC: 0.75
Yes	THEORISTS 3 N=10 OBJECTIVE: 1.70 PERCEIVED: 1.60 OBJ-PERC: 0.10	4 EXPERTS N=13 OBJECTIVE: 1.69 PERCEIVED: 2.00 OBJ-PERC: -0.31

Figure 3

STUDY TWO RESULTS

STRATEGY KNOWLEDGE	PRODUCT FAMILIARITY: No	PRODUCT FAMILIARITY: Yes
No	NOVICES 1 N=25 OBJECTIVE: 2.96 PERCEIVED: 1.60 OBJ-PERC: 1.36	2 AMATEURS N=25 OBJECTIVE: 2.76 PERCEIVED: 1.40 OBJ-PERC: 1.36
Yes	THEORISTS 3 N=23 OBJECTIVE: 1.56 PERCEIVED: 1.26 OBJ-PERC: 0.30	4 EXPERTS N=24 OBJECTIVE: 1.50 PERCEIVED: 1.38 OBJ-PERC: 0.12

Figure 4