Effect of Product Familiarity on Consumer Decision Making∶ A Longitudinal− Experimental Study of New Product Purchases*
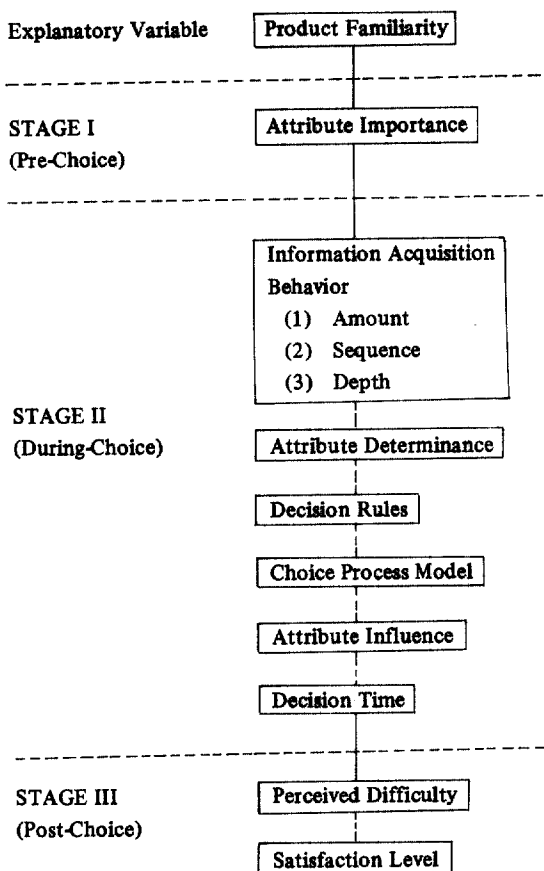
Young-Shin Sung

Korea University

The effect of product familiarity on the dynamic aspect of consumer decision making is investigated in terms of Consumer Information Processing System(CIPS). The familiarity of a new product was investigated by actual experiences in a longitudinal study. The existence of various types of multiphase choice process was found in addition to the commonly assumed type of two phase process. An attempt to describe these choice process models and the decision rules in terms of several factors of CIPS was made.

The central focus of the information processing perspective is on viewing consumer as cognitively active problem solvers, and on understanding the strategies and plans used in decision making, that is typically in product purchases and choices among brands. Relying heavily on cognitive psychology, research on CIPS has revolved around information search, information acquisition, encoding, storage, retrieval, integration, and processes used in the choice of heuristics, the rules of thumb a consumer might use (Kassarjian, 1982). For example, there has been research on the effect of prioir knowledge and experience with a product on consumer choice processes. Research has also attempted to identify the precise nature of

choice processes. However, the need for future investigation in this area is evidenced by the fact that findings in many cases are equivocal. Moreover, research so far has not considered the various factors simultaneously in a single empirical study. The primary purpose of this study was to explore the effects of increasing level of familiarity with a product upon several elements of consumer choice behavior, using an information processing approach. Further, a choice case was treated as a three step procedure in order to understand choice behavior as a dynamic process (see Figure 1), and several choice related variables were measured in each stage and interpreted in relation to product familiarity.

Stage I is concerned with attribute importances measured prior to choice process. Stage II involves a consideration of those variables which describe the events occuring during the

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Explanatory Variable → Product Familiarity

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STAGE I
(Pre-Choice) → Attribute Importance

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Information Acquisition
Behavior
(1) Amount
(2) Sequence
(3) Depth

STAGE II
(During-Choice) → Attribute Determinance

Decision Rules

Choice Process Model

Attribute Influence

Decision Time

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STAGE III
(Post-Choice) → Perceived Difficulty

Satisfaction Level

FIGURE 1. THREE STEP PARADIGM FOR THE RESEARCH OF CHOICE PROCESS

Note: The transition from one variable to the next shown with a dotted line within a stage does not imply a direct causal relationship between them.

choice process and lead to a decision: attribute determinance, information acquisition behavior in terms of amount, sequence, and content, decision rules, choice process model, decision time, and attribute influence. Finally, Stage III examines variables which are psychological end products of the entire choice process: perceived difficulty and level of satisfaction.

METHOD

1. SUBJECTS

Testing was conducted during the Winter

The subjects were 110 German psychology students at the University of Hamburg, who had no prior knowledge and experience with the test product. One hundred and two subjects (42 male and 60 female) completed the entire experiment.

2. TEST PRODUCT

Since the major purpose of this study was to increase the level of product familiarity by means of repeated experiences, and to observe the effect of increased familiarity on the decision making process in a longitudinal design, a product class called "Ramyun" was chosen as the test product.

Thirty five brands of Ramyun imported from Korea, Japan, Taiwan, and Thailand were used in the entire experiment. These had 13 different flavours, different price levels (1.00 to 1.70 DM) and different net weights (55g to 150g), and had information and instructions in German or English on packages. Of these, seven brands with differences in taste, price, net weight, or manufacturer were selected weekly, and given as choice alternatives. Seven alternatives were selected, so that each brand would have a priori both favorable and unfavorable characteristics, while the subjects would be confronted with a conflict situation, since they would have to choose one among seven given brands.

3. APPARATUS

To stimulate a consumer's informational environment, a specially designed "information display board" (IDB) was constructed. This board (about 100 by 110cm) allowed for a 7-attribute by 7-brand matrix display of package information. Seven brands—identified by letter A through G—appeared as an alphabetical row across the top, while the seven information dimensions—ingredients, flavoring, manufactur-

ing country, cooking directions, brand name, net weight, and price—appeared as an alphabetically ordered column down the left hand side. Each cell in the matrix (i.e., one of the 49 possible combinations of a brand with a dimension) contained actual information as it was described on the package. In detail, the information board consisted of 49 envelops attached to it, the envelops containing 7.5 x 10.5cm cards labeled with the alphabetical name of a brand and the relevant attribute. The physical removal of a card from the IDB apparatus constituted an "acquisition event". Subjects were permitted to look at only one card at a time, and were required to place all cards on the collection tray after they had been read. If subjects later wished to refer back to information from a card previously chosen, they had to select a duplicate card from the same envelope in the IDB (each cell contained five identical cards).

4. PROCEDURE AND TASKS

After receiving brief information about the test product, "Ramyun", the subjects were also told that they were required to choose one package of Ramyun, to cook the chosen brand at home, and to complete a questionnaire about their degree of satisfaction with the chosen brand after trying it.

Subjects were first required to fill out a questionnaire covering areas such as demographic information, familiarity with the test product, or importance of attributes when choosing a brand of this product. They were next involved in a simulated shopping situation. They were introduced to the IDB, told its purpose and operation, and were instructed to purchase one brand of Ramyun from among those displayed on the IDB. They were told to take as much or as little time as they wanted, and to acquire as much or as little information as they would in a "real life" purchasing situation. In using IDB, they

could start at and move to any of the displayed information cards. When subjects indicated that they understood the nature of the choice task they were told to begin, and the experimenter activated a concealed timer. Decision time—defined from the moment at which a card was first touched to the point at which the subject announced a purchase decision—was recorded.

Upon completing the IDB task, subjects were instructed to talk about what was going through their mind when they first took these cards. This verbal report was tape recorded with the subjects' consent. The experimenter recorded the information cards in the order chosen from the display after completion of the verbalization task. This search record provides the basis for statements regarding "which", "how much", and "in what order" information was acquired prior to choice decision. Following the prompted protocol, only the subjects who had an "elimination stage" were given a questionnaire, which assessed the size of evoked set*, degree of influence of each attribute on the formation of an evoked set, and task difficulty experienced in the "elimination stage". The last questionnaire was answered by all subjects and dealt with the final choice of one brand from either all the brands or from the acceptable ones only. Subjects indicated the letter of the chosen brand, degree of influence of each attribute on the choice of the best brand, and task difficulty experienced in the "choice stage". After completing the last task, subjects were given the chosen brand of Ramyun and a small questionnaire assessing the level of satisfaction with the chosen brand on each attribute on a seven-point scale. Subjects were asked to fill out this ques-

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* Evoked set was operationally defined as consisting of the group of the brands that the subject accepted at the end of the Evaluation Phase for further consideration in the next phase.

tionnaire after tasting the chosen brand, and to bring it with them the following week. This procedure was repeated for five weeks, and each week subjects were confronted with different alternatives in the IDB from those of the previous week. The item designed to measure the level of product familiarity was, however, assessed only twice, that is, at the beginning and end of the entire experiment.

DATA ANALYSIS

Because each of 102 subjects made five separate decisions in five weeks, there were 5 x 102 = 510 choice cases. Each choice case offered three categories of data—data from self reported questionnaires, quantitative data from the IDB task, and qualitative data from the prompted protocols. Depth of information acquisition refers to the amount of information acquired from IDB during the decision process. In this study, this variable was operationalized as the total number of information values acquired, the number of different brands consulted, the number of different attributes considered. With regard to the content (type) of information acquisition, that is, the specific nature of the information acquired, the total number of information values chosen from a given attribute, the percent of search devoted on a given information attribute, and the rank-order of attributes considered was measured. The data on sequence of information cards chosen from the IDB in this study were analyzed and classified using the method of "analysis of transition" following the criteria by Capon and Burke (1980).

Many studies have found evidence for "two phase decisions", in which an initial phase of eliminating unacceptable alternatives is followed by a secondary choice phase comparing the remaining alternatives in more detail. In addition to these two phases, the "elimination phase" and the "choice phase", several different phases with different function and mechanism were found by pilot testing of the verbal protocols. That is, when a single phase choice is not possible, or when consumers do not want to make a single phase choice, they enter the realm of a variety of multiple phases of decision making. A choice is made as the consequence of a combination of the following seven phases:

1. Orientation Phase (O) : Consumers have little or no prior knowledge and experience with the test product, and thus first collect information unsystematically. No relationships can be found among the chosen information cards.

2. Evaluation Phase (E) : Applying one choice strategy, consumers evaluate and compare nearly all the alternatives given in the IDB. In case the consumer selects one among them as the best brand after the Evaluation Phase, the choice process results in single phase decision making. But when the consumer considers one or more brand(s) to be acceptable—"one candidate" or an "Evoked Set"— and will not decide rapidly but further examine the alternative(s), the next phase will be followed.

3. Check Phase (C) : In this phase the consumer further evaluates the "One candidate" selected in the Evaluation Phase on the basis of several new attributes, which were not dealt with during the Evaluation Phase, and checks whether the brand really is the best one. This is done in one of the following three ways.
   1) Absolute Check (Ca) — The consumer considers only "the candidate" on new attributes, and as long as the alternative is acceptable on these attributes, it is chosen as the best brand.
   2) Comparative Check (Cc) — The consumer compares "the candidate" with other brands, which were chosen not by inten-

tion but by chance, on new attributes.

3) Absolute + Comparative Check (Ca+c) —
The process in the Check Phase takes place
in a mixed form.

4. Comparison Phase (Cp) : Whereas consumers
mainly consider "one candidate" in the Check
Phase, in the Comparison Phase they compare
several acceptable brands, an "Evoked Set",
on new attributes, which were not dealt with
in the Evaluation Phase. At the beginning of
this phase, all brands in the "Evoked Set"
are competitive, and the consumer selects one
of them as the best brand after comparison
on new attributes.

5. Control Phase (Ct) : Immediately prior to
selection of the best brand, consumers are not
sure about their decision. Thus they again
compare the almost chosen brand with one
or more brand(s) eliminated in the progress
of the choice process, and then check its
best quality.

6. Reconfirmation Phase (Rc) : Immediately
before selection of the best brand, consumers
are not sure of their decision. Thus they again
seek information about this brand on several
attributes, which had already been considered
in the course of the choice process, but do not
seek this information for other brands.

7. X Phase (X) : After the final choice of the
best brand, consumers select some new in-
formation, which had not been considered
in the choice process. This information has
no influence on the decision, but is conisider-
ed "out of curiosity", "Simply for the sake of
knowing it", or "without any definite pur-
pose".

As a result of the pilot analysis of verbal
protocols, an outline of the consumer informa-
tion processing paradigm was developed, and this
is depicted in Figure 2. According to this para-
digm, which explains how information is pro-
cessed in each stage of a choice, the entire

information processing process can be divided
into five stages.

A choice case could be classified into one of
three basic MODELs and one of nine SUB-
MODELs according to the nature of the informa-
tion porcessing in each stage of a choice. For the
categorization of the decision rule used in each
phase, specific instructions describing the defini-
tion and criteria for eight decision rules were
given to the judges. These decision rules—the
Conjunctive Rule, "consider all" type (CONJ-
ALL), the Conjunctive Rule, "choose the first"
type (CONJ-FIRST), the Maximizing Number
of Attributes with the Greater Attractiveness
Rule, "attributewise" (MAXI-ATT), the Maxi-
mizing Number of Attributes with the Greater
Attractiveness Rule, "alternativewise" (MAXI-
ALT), the Elimination-by-Aspects Rule (EBA),
the Elimination-by-Aspects Rule, "compensa-
tory" type (EBA-COMP), the Lexicographic
Rule (LEX), and the Lexicographic Rule, "com-
pensatory" type (LEX-COMP)—could be charac-
terized by the following five properties:

The first characteristic concerns whether the
consumer processes information by attribute
(CPA) or by brand (CPB). The second characte-
ristic deals with the percentage of available
information scanned for each alternative in a
choice set, that is, whether a consumer seeks a
constant or variable amount of information
across the alternatives considered. Thirdly, it
was considered whether consumers evaluate one
brand at a time and make a binary decision as
to whether or not the brand is worthy of choice
or future consideration, that is, "whenever it
comes along", or whether they evaluate and
compare all brands at a single point of a time,
that is, "all at once". The fourth characteristic
deals with whether a decision rule functions in
a compensatory way or not. The compensatory
relationship is essentially one in which a surplus
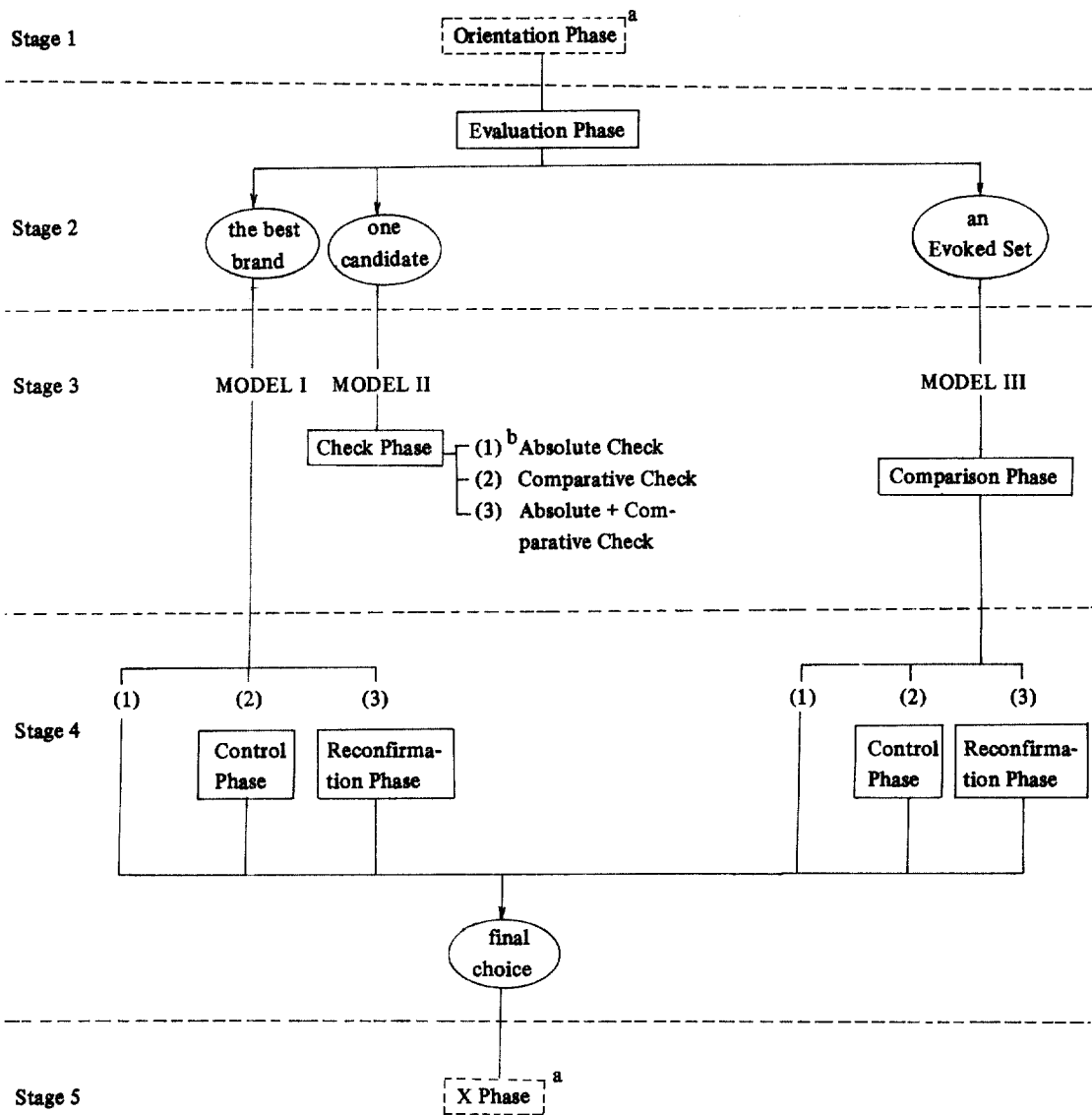on one attribute of an alternative compensates

FIGURE 2. A PARADIGM OF THE CONSUMER INFORMATION PROCESSING

[a]The two phases shown with dotted lines are occasionally found in a choice case.
[b]The Arabic numerals in parentheses denote the SUBMODELS.

for a shortage on another attribute. Finally, as the fifth characteristic of decision rules the question was considered of whether the consumer sets up minimal values, cutoff levels, that a brand must necessarily fulfil on the relevant attributes, or not.

The criterion used for agreement among judges for a protocol was that all three judges for that case identified the same categories in MODEL, SUBMODEL, and decision rules used in each phase. Using this criterion 396 protocols, or 77.6 percent, produced agreement among the judges. The remaining protocols were analysed in discussions among the experi-

menter and the three judges.

RESULTS OF THE STUDY

1. CHECK ON PRODUCT FAMILIARITY

It was found that the subjects' familiarity with the test product in the last week (M=3.64) was significantly higher than in the first week (M=1.12), (t=7.32, p<.0001). Hence, it was concluded that the subjects' familiarity with the test product increased with experience of product usage.

2. CHOICE PROCESS MODEL

MODEL III was more frequently used (43.9% across all week) than MODEL I (27.1%) or MODEL II (29.0%). The Chi-square value for these differences was highly significant (χ^2 = 26.07, df = 2, p<.001). In detail, in 196 choice cases (out of 224 cases carried out according to MODEL III) subjects formed an "Evoked Set" in the Evaluation Phase and selected the best brand out of this set in the Comparison Phase. In the case of MODEL II, the process in the Check Phase took place more often in the form of the "Absolute Check" (112 out of 148 cases) as compared to the "Comparative Check" (5 cases) or the "Absolute + Comparative Check" (31 cases). In the case of the MODEL I process, SUBMODEL [1] was more frequently applied as compared to the other two submodels; The best brand was chosen immediately after evaluating all alternatives in 118 choice cases.

Use of Control Phase (MODEL I-[2] and MODEL III-[2] and the Reconfirmation Phase (MODEL I-[3] and MODEL III-[3] was more limited overall: 26 and 22 cases respectively. Next, the Orientation Phase was found in 14 choice cases in week 1, and in 2 cases in week 2. As expected, subjects had this phase only at the beginning of the experiment. In contrast, the X Phase was found in a similar proportion of choice cases each week: 16 cases on the average.

In order to test the effect of product familiarity on the use of choice process models, a Chi-square analysis was conducted using the data on the distribution of the three models. The Chi-square value was not significant, indicating that despite increase in levle of product familiarity the number of subjects using a specific choice process model did not change significantly. Because it seemed that each week a similar proportion of subjects used each model for the choice of one brand, the question was examined whether this proportion is composed of the same subjects or different subjects. Contingency coefficients for the frequency of subjects using the same model in two successive weeks were calculated (C ranged from .54 to .70). From these results, it can be concluded that the proportion of subjects using a model to process information for the choice of one brand was not influenced by their product experience and familiarity. This finding seems to indicate the existence of interindividual differences in consumer choice processing patterns and the consistency of these patterns over time.

3. FORM OF PROCESSING

The sequences were classified into patterns using the "analysis of transition types" as attribute processing (CPA), brand processing (CPB), mixed attribute/brand processing (MIXED), and random processing (R). CPA ranged from 36 to 54% of all sequences, CPB from 11 to 18%, MIXED from 26 to 33%, and random processing from 4 to 8% across the five weeks, indicating a higher use of CPA than CPB overall (χ^2 = 218.7, df = 2, p< .001). It seemed that the frequency of subjects using CPB or MIXED increased slightly, and the frequency of subjects using CPA decreased slightly, if not linearly, over time. Chi-square tests for this result were, how-

ever, not significant, indicating no effect of product familiarity on the pattern of information acquisition sequence. Finally, Contingency coefficients for the frequency of subjects using the same form of processing in two successive weeks were calculated, in order to examine whether subjects processed information by using the same form of processing each week or changed their form of processing (C ranged from .59 to .63). Although more than half of all subjects processed information using the same form in each pair of adjoining weeks, there was a tendency towards a decrease in the frequency of such subjects, implying that the subjects might have had a specific strategy in the sequence of acquiring and processing information, but that this may well have changed with the increase inproduct familiarity.

In summary, an evident tendency towards more processing by attribute than by brand was found across all choice cases, which is fairly consistent with the widely accepted assumption that consumers prefer using attribute processing. A mixed pattern of these two forms of processing was also favorable applied as was attribute processing. Further these frequency distributions did not change significantly over time, possibly indicating the existence of individual differences in the sequence of information acquisition in decision making.

4. DECISION RULES

Across all weeks LEX was the most used strategy (54.5% of all choice cases), followed by MAXI−ATT (20.2%), EBA (12.7%), CONJ (8.6%), and MAXI-ALT (3.9%), in that order. The results show that subjects seemed to prefer the attributewise processing strategies (LEX, MAXI-ATT, and EBA) to the alternativewise processing strategies (CONJ and MAXI-ALT) in evaluating all brands available in the IDB. To examine the effect of product familiarity

on the use of decision rules in the Evaluation Phase, a Chi-square analysis for the aggregate pattern was carried out, using all choice cases. The Chi-square value was significant, indicating that the frequency of usage of the five strategies—CONJ, MAXI-ALT, EBA, LEX, and MAXI-ATT—differed over the five weeks ($\chi^2 = 41.6$, df = 16, p<.001). The use of EBA and LEX strategies increased over time, whereas the use of CONJ and MAXI-ATT strategies decreased. The MAXI-ATT strategy was used to almost the same degree throughout the five weeks. The distribution of strategies used in the selection of the best brand from an "Evoked Set" was very different from the distribution of strategies used in the evaluation of all alternatives available. In the Comparison Phase MAXI-ATT was most frequently used across all weeks (64.6% of all choices by MODEL III), followed by MAXI-ALT (26.0%) and LEX (7.6%). The CONJ and EBA strategies were seldom used in this phase. These results indicate that nearly all subjects in the group using MODEL III compared the brands in the "Evoked Set" using compensatory strategies, MAXI-ATT and MAXI-ALT. A slight tendency towards an increase in the use of MAXI-ATT and toward a decrease in the use of MAXI-ALT and LEX over time was observed. However, the Chi-square value was not significant ($\chi^2=20.45$, df=16). In spite of the change over time in the use of decision rules in the Evaluation Phase, many subjects seemed to use the same decision rules in two successive weeks. The frequencies of subjects who used the same strategies in the Evaluation Phase in two successive weeks and the Contingency coefficients for these data were calculated. The results show that a substantial proportion of subjects (from 55% to 78%) reapplied the same strategies used in the previous week, and that this tendency increased slightly over time (C ranged .60 to .83). Next,

the Contingency coefficients for the frequency of subjects who reapplied the same strategies in the Comparison Phase in each pair of adjoining weeks were also calculated using the subjects in the MODEL III group. These results indicate that a moderate proportion of subjects compared the brands in the "Evoked Set", reapplying the same strategy used for the same purpose in the previous week (C ranged .59 to .70).

In summary, the common notion that decision rules aimed at eliminating alternatives tend to be used in the early phases, whereas others are used in the later phase was supported in the present study. The usage of decision rules in the course of the choice process was different for choice stages: LEX and MAXI-ATT were more likely to be used for the evaluation of all alternatives available in that order across all subjects, while MAXI-ATT and MAXI-ALT were preferred by the subjects in the MODEL III group in comparing a few brands for the final choice. Furthermore, there was a growing tendency over time for subjects to prefer "simple" rules (i.e.,

rules that require only simple calculations in evaluating values on one attrubute, e. g., LEX and EBA) and avoid applying more complex rules (e. g., MAXI-ATT and CONJ) in the Evaluation Phase.

5. AMOUNT OF INFORMATION ACQUISITION

The average amount of information cards selected across all subjects in the first week was 27.39 (see Table 1). With the increase in product familiarity, subjects gradually needed fewer information cards for their choice. However, the pattern of change in the amount of information acquired does not seem to be simple: A slight increase was shown in the fourth week. To examine in detail the form of the relationship between product familiarity and amount of information selected a trend analysis for repeated observation was carried out using the multivariate analysis of variance procedure (MANOVA) in the SPSS program package (Nie et al., 1975).

The change in the total number of informa-

TABLE 1. AMOUNT OF INFORMATION ACQUISITION EACH WEEK AND RESULTS OF MANOVA (TREND ANALYSIS)

Time Period	Total Number of Info. Cards Selected	Total Number of Brands Consulted	Total Number of Attributes Considered
Week 1	27.39 (3.85)[a]	6.88	5.65
Week 2	21.59 (2.27)	6.86	5.19
Week 3	19.61 (1.52)	6.69	5.30
Week 4	19.94 (2.24)	6.83	4.93
Week 5	18.46 (1.37)	6.87	4.83
Results of MANOVA	$F = 25.58$, $p < .01$	$F = 1.13$, n.s.	$F = 11.11$, $p < .01$
Trends:			
Linear	$t = -7.31, P < .01$		$t = -4.86, p < .001$
Quadratic	$t = 3.65, p < .001$		$t = 0.67, n.s.$
Cubic	$t = -2.94, p < .005$		$t = -1.03, n.s.$
Quartic	$t = -0.66, n.s.$		$t = 3.17, p < .005$

a) Mean number of information cards selected repeatedly in parentheses.

tion cards selected and in the total number of attributes considered followed a constant pattern over time: As subjects became more familiar with the product under study, the amount of information acquired decreased linearly each week, with the exception of an increase in the middle of the experiment. The "learning hypothesis" that high familiarity with a product leads to knowledge, which, in turn, negatively influences the acquisition of information for a choice of this product was supported in the present study.

The slight increase both in the number of information cards selected and in the number of brands consulted in week 4 can be explained in terms of "variety seeking" behavior. Variety seeking is commonly defined as "the desire for a new and novel stimulus" (Hoyer & Ridgway, 1984, p.115), which in the context of the present study would be an exploratory choice behavior.

6. DECISION TIME

The decision time, measured as total time needed for the choice of one brand among the alternatives given in the IDB decreased significantly with subjects' increasing product familiarity: This decline was linear, with a tendency for the decrease to flatten out (see Table 2). The mean time devoted to each card also decreased linearly over five weeks. The results aggregated over all subjects could be interpreted as indicating that subjects required less time to process each unit of information and, hence, to reach the choice of one brand among alternatives given, as they became more familiar with the test product.

7. CHOICE CRITERIA

Under the label of choice criteria, attribute importance, usage, and influence were measured before, during, and after the decision process

TABLE 2. DECISION TIME EACH WEEK AND RESULTS OF MANOVA (TREND ANALYSIS)

Time Period	Time Taken (seconds)	Time per Card (seconds)
Week 1	145.5	9.70
Week 2	195.6	9.50
Week 3	162.8	8.90
Week 4	146.9	7.67
Week 5	133.3	7.51
Results of MANOVA	$F = 45.09$ $p < .01$	$F = 13.41$ $p < .01$
Trends:		
Linear	$t = -10.68, p < .01$	$t = -5.95, p < .001$
Quadratic	$t = 2.88, p < .01$	n.s.
Cubic	n.s.	n.s.
Quartic	n.s.	n.s.

Note: Data for 22 subjects were not included in this analysis because they were incomplete or inaccurately measured.

TABLE 3. INTERCORRELATION MATRIX OF VERBALLY AND BEHAVIORALLY MEASURED CHOICE CRITERIA (RANK-ORDER)

	Influence (Evaluation Phase)	Influence (Comparison Phase)	Order of Selection
Importance Influence	.79	.68	.76
Influence (Evaluation Phase)		.44	.82
Influence (Comparison Phase)			.72

respectively. The subjects' choice criteria defined in terms of these measures changed over time, although not strikingly, which may have been due to learning as a result of repeated experience. The pattern of change in this variable appeared to be relatively similar in terms of these measures (see Table 3).

8. CHOICE PROCESS MODEL AND FORM OF INFORMATION PROCESSING

The form of information processing employed in the Evaluation Phase was derived from the characteristics of the decision rule used in this phase, and classified into CPA (MAXI-ATT, LEX, and EBA rules) or CPB (CONJ and MAXI-ALT rules). Further, the form of processing used in the Check Phase (MODEL II) was classified according to the detailed pattern of checking method: Tha Absolute Check was classified into CPB, the Comparative Check into CPA, and the Absolute and Comparative Check into MIXED processing.

As a result of the application of different rules during different stages of a decision process, the form of information processing changed as the process continued. Further, the pattern of change was different according to the choice process model. In early phases, CPA was exclusively used to evaluate all alternatives and select one or more acceptable brands (MODEL II and MODEL III), whereas CPB was also used to a certain extent in choosing the best brand immediately after the evaluation process (MODEL I). Next, the number of acceptable brands seemed to play an important role in determining information processing patterns in later phases: CPB was more used in considering the single acceptable brand in detail (MODEL II), whereas CPA was more used in comparing the several acceptable brands in an "Evoked Set" (MODEL III).

9. CHOICE PROCESS MODEL AND DECISION RULES

The usage of the decision rule in evaluating all the alternatives given in the IDB was different across the three choice process models ($\chi^2 = 92.9$, df=8, p<.001). The majority of the subjects applied the LEX rule to evaluated all the alternatives and select one or more acceptable

brand(s) (MODEL II and MODEL III), whereas the CONJ and MAXI-ATT rules were also frequently used to add to LEX in choosing the best brand immediately after evaluating all the brands (MODEL I). Further, the subjects who applied a multiphase choice process (MODEL III) changed their strategy during the course of the choice process. They used the LEX rule most frequently to evaluate all the alternatives and screen out the unacceptable ones, whereas for the selection of the best brand in the later phase of the choice process the MAXI-ATT rule was most frequently used. Hence it could be concluded that different subjects applied different decision rules for the same purpose (i. e., the Evaluation Phase), and that identical subjects applied different rules for different purposes within a single decision situation (i. e., the MODEL III group).

10. CHOICE PROCESS MODEL AND OTHER VARIABLES

The relationship between the choice process model and other variables—amount of information acquisition, decision time, perceived difficulty, level of satisfaction with the chosen brand, and the number of choice criteria used during the choice process—was examined.

The subjects in the MODEL III group selected the most information cards and considered the most brands and attributes. Interestingly, the subjects in the MODEL II group examined more brands and atrributes by means of fewer information cards than the MODEL I group. This may be due to the fact that a higher proportion of the subjects in the MODEL I group used compensatory rules (MAXI-ALT and MAXI-ATT), whose application requires a great deal of information, than the subjects in the MODEL II group. This was discussed on the section on the usage of decision rules for three groups. Further the subjects needed a greater amount of information in selecting one brand from an "Evoked Set"

(MODEL III) than in checking the "one candidate" (MODEL II). Next, the subjects in the MODEL III group had more choice criteria in terms of the determinant attributes, required more decision time, and perceived the choice process to be more difficult than those in the other groups. Differences were also found among the three groups in the order of attributes considered in each phase.

11. FORM OF INFORMATION PROCESSING AND OTHER VARIABLES

The relationship between the form of information processing classified by the analysis of "transition types" and other variables—amount of information acquisition, decision time, perceived difficulty, satisfaction level, and the number of choice criteria—was examined. A consistent pattern seems to emerge: Subjects using the CPB form seemed to engage in the most explicit processing, MIXED subjects in an intermediate amount, and CPA subjects in a lesser amount. The CPA subjects tended to consider more brands, and the CPB subjects tended to examine more attributes. Further, the CPB group found the choice task most difficult, and the MIXED group considered more attributes to be important in choice. No significant difference in decision time and level of satisfaction with the chosen brand was found among the three groups.

12. DECISION RULES AND OTHER VARIABLES

The mean values for amount of information acquisition, decision time, perceived difficulty, level of satisfaction, and number of choice criteria were calculated for each of the five decision rules (in the aggregated pattern) used in the Evaluation Phase. Next, the mean values of the amount of information acquisition, number of brands in the "Evoked Set", decision time,

perceived difficulty, level of satisfaction and number of choice criteria were also calculated, separately for the five decision rules used in the Comparison Phase for subjects applying the MODEL III choice process.

Although the results of the study were somewhat different according to the choice phase in which a decision rule was applied, the overall results indicated a relatively consistent pattern. Subjects considering more attributes to be important for the choice tended to use "noncompensatory" rules in evaluating all the alternatives, and to use "compensatory" rules in comparing the "Evoked Set". Subjects using "compensatory" rules required more information and time for their choices and found the choice process more difficult than those applying "noncompensatory" rules. Further, subjects with larger "Evoked Set" tended to use "noncompensatory" rules, whereas those with fewer brands to compare applied "compensatory" rules. It would be concluded that "compensatory" rules require larger amount of cognitive effort than "noncompensatory" rules, and that subjects prefered the latter choice heuristics when faced with complex choice situations.

DISCUSSION

One major finding from this study was the evidence for existence of various types of multiphase choice process. In addition to the commonly assumed type of two phase process, according to which available alternatives are first reduced to an "Evoked Set" (two or more acceptable brands) from which a final choice is made, several other types were found. Among those three models described, MODEL III was more frequently applied than others, and this tendency did not change despite subjects' increasing familiarity with the test product. In addi-

tion, the tendency towards more processing by attribute (CPA) or by a combination of brand/attribute than by brand (CPB) did not change over time either. One possible interpretation for the consistency in the choice process model in terms of phased decision making and in the sequence of information acquisition may be found in interindividual differences. Another possible explanation may be the task structure in this study, which would be more conductive to attribute processing than many real world brand choice situations. In actual brand choices, more processing by brands may be used, because of the way supermarket shelves are organized.

In addition, the decision rules used in the choice process was different not only for early and later phases, but also for the choice process models. Subjects applying the MODEL III process tended to start with an attribute based noncompensatory rule (LEX or EBA), turning to an either attribute based or brand based compensatory rule (MAXI-ATT or MAXI-ALT) as the choice process progressed. Although the subjects in the MODEL II group also showed a preference for the attribute based noncompensatory rule in selecting an acceptable brand (LEX or EBA), they checked its quality mainly by using brand processing. By contrast, subjects who used one phase decision making applied the LEX, MAXI-ATT, and CONJ rules to almost the same degree. The common notion that "simple" rules tend to be used more by consumers with little prior knowledge and experience, while more "complex" rules are asociated with greater experience (cf. Park, 1976; Bettman & Park, 1980; Raju & Reilly, 1980) appears to be plausible and logical. However, findings on the pattern of change in the use of decision rules seem to show quite the reverse. The overall results from this study seem consistently to indicate that rules based on attribute processing and/or noncompensatory processing require less

cognitive effort than brand based and/or compensatory based ones. The would imply that MAXI-ALT, MAXI-ATT, and CONJ rules are examples of "complex" rules, with the reverse true for LEX and EBA. A tendency towards a decrease in the use of the first kind of rules and an increase in the use of the latter kind over time was found in the present study, suggesting that consumers tend to apply a less cognitively demanding rule in the choice process, as they become more familiar with a product.

One important finding related to the decision rule used in this study may be the evidence for the existence of "noncompensatory" rules with "compensatory" aspects. To illustrate more specifically, in the case of LEX and EBA rules some subjects used these rules based on compensatory processing. Another interesting finding of this study concerns two versions of the CONJ rule; CONJ-ALL type vs. CONJ-FIRST type. in using the CONJ-ALL type of rule, subjects accept all the alternatives which pass all of the cutoffs set up for each of important dimensions. By contrast, subjects applying the CONJ-FIRST version complete their choice tasks by choosing the first satisfactory brand.

The general assumption that increased learning on the part of the consumer allows for considerable decrease in necessity for search (cf. Howard, 1977; Bettman, 1979) was supported in this study. The amount of information acquisition in terms of the total number of information cards selected for a choice decreased linearly over time, with a tendency for the decrease to flatten out. The same pattern was found for the effect of product familiarity on time required to make a choice.

Attempts to explain and describe the ways in which subjects acquire and process information and make a choice in terms of other relevant variables were made. Since information acquisition and evaluation process are complecatedly

intertwined with processes of deciding among alternatives, that is, choice and acquisition processes can go on simultaneously, the results from this study showed a relatively consistent pattern.

Although the findings reported here are consistent with a number of proposed theoretical frameworks, several methodological issues require elaboration. First, sometimes subjects could not talk about in detail what had been going through their mind during the decision process because of the lapse of time. Second, the structure of information presentation seemed to make it easy for the subjects to process by attribute rather than by brand. Third, although new alternatives were given in the IDB each week, since subjects carried out the same task each week for five weeks, the question arises whether there were any "learning" effect on the rusults in general. Fourth, the use of students as subjects may have affected the external validity of the study. Last but not least, problems involved in the analysis of prompted protocols must be discussed. Although very high interjudge agreement on the analysis of protocols in terms of the choice process model and the decision rule was reported, they were difficult to analyse formally.

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