Constructive Processes in Consumer Choice

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The degree to which consumers use rules or heuristics which have already been developed and stored in memory versus the degree to which consumers construct the rules they use on the spot, during the actual course of alternative selection, is examined. Detailed verbal protocol data from two consumers are analyzed. The results show substantial problems with such protocol data. Implications of the results for consumer choice theories are also considered.

Consumer choice heuristics have been the object of a great deal of study in recent years. This research has tended to have a narrow focus on the particular ways in which data is combined in comparing alternatives (e.g., studies of linear compensatory rules, conjunctive rules, or lexicographic rules). There is another dimension of choice, however, that has seen virtually no theorizing or empirical research. One can characterize not only the particular choice heuristics used, but also how those heuristics are implemented, or carried out. One distinction relating to how choice rules can be implemented is the focus of this study. That distinction concerns the degree to which consumers use rules or heuristics which have been already developed and stored in memory versus the degree to which consumers construct the rules they use on the spot, during the actual course of selecting an alternative. This paper has three major purposes in examining this distinction:

1. To introduce some new theoretical notions about how choice processes are carried out, namely the use of stored rules and the use of constructive processes, and to briefly review the relevant literature;

2. To consider what data collection methods might be used to examine these notions empirically;

3. To perform an exploratory study which might provide both some initial empirical and substantive insights into these notions and also some insights into the adequacy of the methodology used.

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These three purposes provide an outline for the remainder of the paper. The stored rule and constructive notions are detailed next, followed by a review of the literature relevant to these areas. Then various methods for studying these notions are considered, and a particular method chosen. Finally, an exploratory study is described, and conclusions about both the phenomena and the methodology used are considered.

STORED RULE VS. CONSTRUCTIVE PROCESSES IN CARRYING OUT CHOICE

Characterization of Stored Rule and Constructive Processes

As just noted, consumers can carry out or implement choice processes in different ways. One distinction which seems relevant is the way in which specific choice heuristics are used. There are two basic characterizations which can be described. One characterization is that the consumer has a set of rules or heuristics which are already stored in memory, and these rules are called forth in their entirety when needed and directly applied. This might be called a *stored rule* mechanism for carrying out choice. The second characterization is that heuristics are developed at the time of choice, i.e., rules are constructed as the consumer goes along rather than being merely recalled and applied. This second notion can be called a *constructive* mechanism. Each of these two mechanisms is now considered in more detail.

The Stored Rule Mechanism. The assumptions underlying the stored rule concept imply that consumers have available a repertoire of strategies in

memory, and control processes which in effect call these strategies when needed, much in the same manner as a computer program uses subroutines. Thus, the rule to be used is already built, exists in complete form in memory, and is directly implemented to choose the best alternative. Some calculation or processing may go on while actually implementing the preexisting rule, but this rule is not changed or built up. It is retrieved in its entirety and applied.

There are two main variations in this use of stored rules. In the first, the consumer has previously made a particular choice, and merely wishes to repeat that choice. Thus, brand, package, size, etc., have already been settled upon, and the only question is whether the chosen alternative is available or not. That is, the rule used is of the form, "buy Brand X." We call this use of stored rules *preprocessed choice*. In the second case, the consumer uses a heuristic which is already existing in memory, but which requires some further processing to apply, e.g., "buy the cheapest" or "choose the brand with the highest protein content." In this case the rule is known, but the alternative to be selected is not. This is called an *analytic implementation process*.

The Constructive Mechanism. The basic notion behind the constructive mechanism for carrying out choice is the notion that the heuristic used is developed at the actual time of choice. The consumer is seen as making up the rule as he or she goes along. The heuristics are constructed using fragments or elements of rules stored in memory. These fragments or elements may be beliefs about alternatives; evaluations; simple rules of thumb involving subsets of beliefs (e.g., "compare these products on Attribute A to see if they differ very much"); rules for integrating beliefs (e.g., "count how many attributes Alternative X is best on" or "average these ratings"); rules for assigning weights (e.g., "if performance is comparable across brands, weight price heavily"); or perhaps even computational rules. Using such component pieces, the consumer constructs a rule for selecting an alternative. Presumably, the specific elements or rule fragments used will be a function of what is available in the particular choice situation and how easy various pieces of information are to process. Thus, a "compare prices" element may not be used if unit prices are not given and different brands have different-sized packages.

The basic idea behind the distinction between the stored rule and constructive notions is that, in some cases, completed heuristics or rules are not already available in memory, but must be built up from subparts. Rather than retrieving in total some preexisting rule, the consumer constructs, or synthesizes, the heuristic used. In the constructive process, the consumer "constructs" the decision rule at the moment he or she has to use it. The consumer may have only a very general plan for constructing a heuristic in some

particular situation. Thus, the heuristics constructed will, in general, vary from one situation to the next.

As examples of these methods for carrying out choice, consider possible types of processing for a decision about breakfast cereals. If an analytic implementation process were used a housewife might have a preexisting rule of "choose the brand of cereal with the highest protein level," and must determine which cereal in fact has the highest level. In the case of preprocessed choice, the consumer would already know Brand X had the highest protein, and would simply choose Brand X. With a constructive choice process, the consumer might develop the highest protein rule on the spot, developing a rationale for this rule after considering other possibilities.

The Use of Stored Rule and Constructive Mechanisms. In this section we consider under what conditions each type of mechanism is likely to be used. One is not "true" and the other "false;" rather, both the stored rule and constructive mechanisms are used in carrying out choices. The type of situations in which each is used will tend to differ, however. Constructive mechanisms will tend to be used when consumers have little experience with a particular choice, or when choice is difficult. Thus, when a choice is made for the first time, or when a changed situation is encountered, construction of heuristics will be seen most often. Under these conditions, the heuristic will be built up using information available in the specific choice environment.

If the consumer has had prior experience with a particular choice, elements of heuristics may exist in memory, and if used over time such elements may become organized into an overall rule. In effect, elements may be "chunked" into an overall rule. In this sense, use of stored rules is seen to be the result of habituation in the choice process. At any point in time, therefore, a particular consumer will be engaged in both construction for some choices and usage of stored rules for other choices, the extent of each being largely determined by the degree of experience with the various choices under consideration.

Significance of the Distinction. One might legitimately ask at this point why the distinction between use of stored rule and constructive processes matters; why should one care about these two methods? The answer is basically that different factors will influence the consumer depending upon which of these methods is used, and this has implications for how to provide information to consumers.

For example, if constructive methods are being used, the consumer is doing a good deal of processing in the store. This implies that information presented in the store may have more impact than that presented outside the store. Thus marketers or public policy makers who wish to present information to consumers may

need to use package information or other in-store displays if constructive processes are being used, rather than relying on out-of-store methods like radio, television, or print advertising. Thus, in-store methods might be used most where consumers have little prior experience with a choice. If stored rules are being used, out-of-store methods may be useful. In general, use of constructive processes means that situational factors will have a greater impact on the resulting choice.

A second reason for the importance of the distinction is that marketers or policy makers may wish to change the heuristics used by consumers. That is in addition to attempting to change the specific beliefs or evaluations held, there may be situations in which one wishes to change the actual heuristics used for comparing alternatives; to advocate use of a certain rule, for example. Wright and Barbour (1975) note that this strategy, although potentially effective, has not been applied to any extent in practice. Our discussion implies that attempts to advocate or change rules may be most effective when rules are being constructed or built up rather than when they are being simply recalled and applied. Thus, when constructive processes are used in situations where there is little prior experience, attempts to influence the heuristics used are likely to be most effective.

Previous Research

Now we consider previous research relevant to these notions, both in psychology and in consumer research.

Research in Psychology. A good deal of psychological research on these mechanisms has focused on memory phenomena. In particular, researchers have examined whether items are retrieved from memory as completed units, or whether remembering an item is in some sense constructive. Bartlett (1932) was among the first to argue that memory retrieval was in many cases a constructive process, particularly for unfamiliar material. Bartlett presented stories to his subjects, and had the subjects repeat these stories from memory. He argued, based on these studies, that humans reconstruct prior events based on their understanding of them, rather than directly arousing some already existing "memory" in its entirety. More recently, Neisser (1967) has argued in some detail that perception and memory processes are essentially constructive in nature.

Recent work in memory for stories and sentences has supported these conclusions. Subjects were presented with stories or sentences to read in these studies. Later, these subjects were given several sentences, some of which had been used in the earlier material and some of which had not, and were asked whether they had seen these sentences previously. The most interesting aspect of the results is that typically the subjects reported having previously seen sentences which were consistent with what was read earlier, but which had not actually been presented. Thus it appears that subjects remember meaning, but not necessarily exact wording. Humans remember the basic ideas presented to them, rather than the actual form of the information used to present those ideas, and they use these basic ideas to guide reconstruction of the information.[1]

These results imply, therefore, that individuals do have some basic elements, possibly quite general, in memory which are used to construct or build up recollections of previous events. Presumably, this type of construction process could also be used to develop heuristics for comparing alternatives. Note again that this research considers situations where unfamiliar material is being presented. For very familiar material, verbatim memory or simple recall of an existing "memory" might be expected.

Research in Consumer Behavior. There has been virtually no consideration in consumer choice on how choice rules are implemented. Rather, most research on choice seems to have implicitly assumed a stored rule approach. For example, a typical study of choice rules might examine the degree to which a linear rule, a conjunctive rule, or a lexicographic rule might predict the choices made by a consumer. These rules are simply defined by the researcher and applied, perhaps using some beliefs and evaluations supplied by the consumer as inputs. The implicit assumption seems to be, therefore, that the consumer likewise simply recalls the entire rule and applies it.

Nakanishi was one of the first consumer researchers to attack this notion, particularly with regard to studies of decision nets. He noted the difficulties arising from "the conception of decision nets as fixed programs rigidly followed by the subject during a purchase decision" (1974, p. 77). In particular, he argued that the types of decision nets depicted in Bettman's work (1970) were far too complex for subjects to have memorized in their entirety and applied. Rather, he argued, subjects must construct such nets as they proceed. This theoretical argument is the only direct work using constructive notions in the consumer research literature.

The closest which previous work in consumer research has come to examining different modes of implementing choice are the works by several authors which note that consumers pass through stages in their choice processes (e.g., Robinson, Faris, and Wind 1967; Howard and Sheth 1969; Hansen 1972). For example, Howard and Sheth distinguish stages of

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[1] For an overview of this literature, see Cofer (1973). For specific studies, see Gomulicki (1956), Sachs (1967), Jarvella (1971), Bransford and Franks (1971), Franks and Bransford (1971), Bransford, Barclay, and Franks (1972), Zangwill (1972), Loftus (1975), Prawat, Cancelli, and Cook (1976), Thorndyke (1977), and Mandler and Johnson (1977).

routinized response behavior, limited problem solving, and extensive problem solving. These notions roughly correspond to the distinctions between preprocessed choice, analytic implementation processes, and constructive processes discussed here. However, note that the mechanisms proposed in this paper are more detailed and more narrowly focused than the Howard-Sheth notions. This paper deals with how heuristics are developed and carried out, and focuses on the extent to which rules are built up as the consumer goes along. This is a more detailed view than simply the extent of processing carried out, although the two are related, presumably. Thus the current notions consider the *type* of processing undertaken in more detail than past research, rather than focusing on the *amount* of processing.

Methods for Studying Stored Rule and Constructive Processes

The phenomena discussed here are fairly detailed, and will be observable only if the actual processes undertaken by a consumer in making a choice are examined. This argues for the use of some method for observing actual processes, as opposed to just observing outcomes. If observation of process is desired, certain methods are more applicable than others. Bettman (1977) discusses the major methods for actually observing choice processes. The most relevant process methods discussed are information monitoring, analysis of eye movements, and use of protocol collection. Correlational approaches are rejected because processing is typically not observed.[2]

Information monitoring and eye movement approaches are useful for examining the sequence of information examined by the consumer in making a choice. However, these methods provide little insight into how consumers are using what is stored in memory, and as noted before this is a crucial element for determining how consumers are carrying out choice heuristics—whether rules are recalled and applied, whether elements are used to build more complex heuristics, etc.

Protocol methods therefore seem to be the best available technique for studying the phenomenon. Protocols are obtained by having the consumer think out loud while in the process of actually making choices. Such data potentially allow a great deal of information to be collected on how consumers use memory, whether rules are built up on the spot, and so on. Also, the actual choice process is observed. Finally, protocol methods provide some of the most detailed data obtainable on choice.

The next section considers an exploratory study using the protocol method to examine the use of stored rule and constructive processes by consumers. The purposes of the exploratory study are two-fold:

▶ To obtain some initial empirical findings on the use of stored rule and constructive processes; and, equally important,
▶ To analyze the effectiveness of the protocol methodology for exploring these phenomena.

AN EXPLORATORY STUDY

Method

Data were obtained by gathering protocols from consumers while they shopped. Then judges were given these protocol data and attempted to categorize the data by the nature of the processing used.

The data utilized were the verbal protocol data described in Bettman (1970). Detailed think-aloud protocols were collected over a period of several months for the grocery shopping choices of two consumers, labeled C_1 and C_4 in the earlier study; they were collected in the store as the consumers made their choices.[3]

The protocol data were then broken down into individual "episodes;" each episode representing a particular choice. This process proved to be quite difficult, as many choices were often complexly intertwined in the protocols, and in some instances it was not clear whether a choice was really being made. The decision was made to use a broad definition of episode and to include as many episodes as possible in the sample. In total, 102 episodes were developed for C_1 and 70 for C_4.[4] The 172 episodes were then mixed, so that the episodes for each consumer did not all appear together. Since a pilot study had shown that the items required a good deal of time to judge, the total set of episodes was divided into two subsets of 86 items.

Fourteen judges, faculty members and doctoral candidates at UCLA (including the authors as two of

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[2] See Bettman (1977) for a more detailed discussion of each method.

[3] Since knowledge of characteristics of these consumers may aid in interpreting later results, brief descriptions are in order. Consumer C_1 had training in mathematics and her husband had recently finished medical school. Her decisions were for the most part based on price, although she let the family's five children have some of their favorites. Consumer C_4 was younger and newly married, with no children. She and her husband were both elementary school teachers. Neither had much prior shopping experience, and C_4 liked to use what others had tried and told her about. Her husband had very strong preferences, which also influenced her choices.

[4] In the original study, C_1 made 226 choices, of which 87 were able to be coded, and C_4 made 70 choices, of which 50 were coded. Thus essentially all of C_4's choices were translated into episodes but less than half of C_1's choices were. This may reflect the difficulty C_1 experienced in verbalizing as she shopped; many choices were made without accompanying verbal protocol data. Also, C_1's verbalizations were characterized by more intertwining of decisions than C_4's.

EXHIBIT 1

EPISODE CATEGORIES USED BY JUDGES

A. *Constructive consumer*: The consumer reports engaging in the construction of a decision rule. This can include reports elicited by the experimenter's request to verbalize what was going on.

B. *Constructive experimenter*: The consumer exhibits constructive behavior, but *mainly* in response to some specific question used by the experimenter. This does *not* include simple experimenter instructions to verbalize, but rather questions that are more clearly directive.

C. *Analytic implementation of a rule*: The consumer is just making calculations or doing some processing to *implement* a decision rule that was already determined.

D. *Preprocessed choice*: The consumer has already previously processed the choice and just executes the results of this previous processing.

E. *Can't tell-not clear cut*: The consumer may be constructing a decision rule, using analytic implementation, or using preprocessed choice; but given the protocol data, it is not clear and really impossible to tell which type of processing is involved.

F. *Other*: None of the above cases seems descriptive of the episode.

the judges[5]), were used to judge the protocol episodes. Each judge received a total of 86 items, distributed so that each individual episode was categorized in total by seven judges. The judges received an instruction booklet describing the protocol data and defining the basic notions about types of processing to be used. The specific categories provided the judges are shown in Exhibit 1. This sheet was accompanied by lengthier descriptions roughly like those in the first section of this paper.

The judges were instructed to indicate for each episode the primary type of processing occurring in that episode. Also, if the judge felt there was more than one kind of processing being used, he could indicate a secondary processing type for that same episode. The distinction between the constructive consumer and constructive experimenter categories was made because some of the episodes seemed to involve a good deal of constructive processing that was not initiated by the consumer, but by leading questions from the experimenter gathering the protocols. The task took the judges an average of two hours.

Before examining the results of the study, a final comment about the episode categories is necessary. No specific rules for translating particular protocol episodes into categories were given, because making such rules involved premature narrowing of the definitions of the categories. Protocol data are simply verbal expressions which provide clues, often vague,

[5] This was considered acceptable because no specific hypotheses were being tested.

TABLE 1

PERCENTAGE DISTRIBUTION OF JUDGES' RESPONSES[a]

	Percent of responses		
Processing type	Primary process	Secondary process	Total
Constructive consumer	25.7	18.2	24.2
Constructive experimenter	8.6	32.2	13.3
Analytic implementation	28.6	32.2	29.3
Preprocessed choice	27.1	16.1	24.9
Can't tell	7.5	1.0	6.2
Other	2.5	.3	2.1

[a] There were 1,204 primary process and 298 secondary process responses.

to underlying processes. It was felt that to provide specific rules for relating such clues to presently ill-understood processing types was presumptuous, given current knowledge of the relation of protocol data to process and of these processing types. This decision is discussed more fully later.

Results

The total distribution of responses for all 14 judges is shown in Table 1. Indications of secondary processing types were used in roughly 25 percent of the episodes. Overall, analytic implementation, preprocessed choice, and constructive processing initiated by the consumer are the most common categories used by the judges. Secondary processing types are characterized more often as constructive activity in response to the experimenter, and less often as preprocessed choice.

Agreement Among the Judges. The criterion used for agreement among the judges for an episode was that at least five of the seven judges for that episode noted the *presence* of a particular process, either as primary or secondary. This was decided because the presence or absence of the process was the important factor, not whether a judge had labeled the process as primary or secondary. Using this criterion, Table 2 shows the number of episodes for which judges agreed, by processing type and by consumer. Using the stated criterion, 76 episodes, or 44.2 percent, were agreed upon by the judges.[6] This is a low proportion of agreements for a judging task. However, the protocol data proved quite difficult for the judges. Often an episode could be interpreted in several different ways, depending upon the meaning ascribed to a particular phrase or sentence. The decision, discussed previously, to not provide detailed judging rules also led to

[6] If only primary responses were used, 54 episodes were agreed upon. The relative proportions of the various processes were very similar to those reported in Table 2. There were 36 episodes where six or more judges agreed using both primary and secondary process responses (27 for primary process responses alone). In all cases these were significantly greater ($p < .001$) than the agreement expected under the appropriate random model.

TABLE 2

SUMMARY OF EPISODES WHERE JUDGES AGREED[a]

Processing type	Consumer C_1	Consumer C_4	Total[b]
Constructive consumer	8	8	16 (21.1)
Constructive experimenter	3	0	3 (3.9)
Analytic implementation	18	8	26 (34.2)
Preprocessed choice	11	19	30 (39.5)
Can't tell	0	1	1 (1.3)
Other	0	0	0 (.0)
Total	40[c]	36[c]	76[c]

[a] At least five of seven judges, both primary and secondary process responses included.

[b] Numbers in parentheses are percentages of the total.

[c] There was agreement on 40 of 102 episodes (39.2%) for C_1; 36 of 70 episodes (51.4%) for C_4; and 76 of 172 episodes (44.2%) in total.

differences in interpretation among the judges, as discussed shortly.[7]

To better evaluate the degree of agreement obtained, a random model was constructed in which seven judges responded randomly, with probabilities equal to the actual empirical frequencies given in Table 1 for the total number of responses and gave a secondary process response with probabilities equal to those used by the judges.[8] This random model was simulated for 10,000 trials, and the estimated probability of five or more judges agreeing was .123. The obtained proportion is significantly greater ($p < .001$). Thus the agreement, although low, is well beyond chance levels.[9] Finally, Exhibit 2 displays examples of episodes where agreement was reached for constructive, analytic implementation, and preprocessed choice, and Exhibit 3 shows examples of episodes where no agreement was reached.

Examination of the Judgment Data. The data in Table 2 indicate that roughly 25 percent of the consumer choice processing in those episodes where judges agreed was constructive in nature, with roughly 75 percent nonconstructive. If only constructive

[7] The low agreement levels could also be due to low reliability. Since the task was long, all of the judges were not asked to provide repeated judgments. However, one of the authors (JB) redid 17 episodes two weeks after the first judging. Of 28 responses, 22 matched those in the original judging if the primary and secondary process distinction is ignored. Of the 17 episodes, 10 were matched exactly, and 6 more erred only in one or the other of the primary or secondary processes or in one of those processes (these 6 episodes all had both primary and secondary process responses).

[8] Since fourteen judges were used, the judges were ranked by the number of secondary process responses used, and then paired (i.e., the judges ranked 1 and 2 were paired, and so on). The average frequency of a secondary process response for each pair was then used as the secondary process response probability for one judge in the random model.

[9] One might argue that using the actual frequencies for the various responses understates the agreement achieved, since use of one category more than another by judges shows some agreement. A random model with equal probabilities for all responses yielded a probability of five or more judges agreeing of .031.

EXHIBIT 2

EXAMPLES OF EPISODES WHERE JUDGES AGREED[a]

A. Constructive Episodes

Episode 9A

C Alright, maybe you can help me. Kathy wants to have soup when she comes home from school, but she doesn't want it to be a fattening one. What should I get her?
B Oh, I'll tell you. I don't know. Well, chicken broth I think is your least fattening. You could get her bouillon, that's only about six calories per cube.
C Well, yeah, but she is also a growing girl.
B I'll tell you, in this stuff, this Hunter's soup is out of this world and, also, what was the one that we tried that was a very light and, it had meat and all kinds of stuff in it. It was this, yeah, chicken, beef, and vegetable soup. And you just open the can. It's expensive.
C Well, this is, I don't care if I can get her to lose weight. I'll pay anything.
B Yeah, well that's pretty thin. It's a thin broth and it has meat, and chicken and vegetables in it. Try it and see.
C Yeah. I'll try that, and see if it makes any difference. (looks for beef bouillon) No, I didn't, because they didn't have any beef Whoosie-whatsises. Well, I guess I'll just try the one, and then ask her. You can tell them I'd like them to put back plain cranberry juice sometime.

Judges' responses[b]

	A	B	C	D	E	F
Primary	6	0	0	0	1	0
Secondary	0	0	0	0	0	0

Episode 47B

C Pears is what I'm after.
J Everybody got that Dole pineapple in its own juice, so we finally had to try some, and it's great.
C Isn't it? It's very good, I like that. . . . I'm after pineapple, but I like a larger can than that, because I don't think that will. . .
J Pears you mean?
C Pears, yes. You influenced me by the pineapple, see, but I'll, I'm really after pears. . . . This is the size I want. It's kind of six in one, half a dozen of the other. These look, some of them are bashed, I never get anything that has a bashed can. Well, this one is too. They're the same price, so I guess it doesn't matter. So I'll get the Richmond.
J What was running through your mind there, while you are sitting there debating?
C I was looking to see which of the cans, well, first I was looking for Bartlett pears, but they both said Bartlett, pears, so then I looked to see um, if one of them, if all of the cans were in good condition in one, and, I think I'll only get one of them, and if one of them, all of them were in good condition, then I'd get that one, over the ones that most of them were bashed in. The third thing I looked for was price, and they were the same price.
J What if the ones that had been some of them bashed in were lower in price? What would you have done then?
C I think it would depend on how many of them were bashed in. A lot of them are in this one. And only one of them over here, so I'd still probably get this one.

Judges' responses[b]

	A	B	C	D	E	F
Primary	5	1	1	0	0	0
Secondary	0	0	2	0	0	0

EXHIBIT 2 (Continued)

B. Analytic Implementation Episodes

Episode 14B

C The more weight you get, for the same number of pieces, in a chicken, usually, the more meat you get. . . . That's assuming that they're all the same size so that the bones are the same. . . . Well, I think they've bred them this way, sort of. It's a theory that I work under.
J If they're heavier it just means they're fatter and not bonier?
C No, well, they are bonier, but the relationship between the two. I, one hopes. After all, you've got to rely on something.

Judges' responses[b]

	A	B	C	D	E	F
Primary	1	0	5	0	1	0
Secondary	0	0	0	0	0	0

Episode 24B

C Next are paper towels, but I don't know what kind I'm getting. He must be just doing them. There's not a price on anything. I wonder what the price is on that? Oh here. 2 for 69, Finast, how much are these? (unmarked, asks clerk).
Clerk: 37, I think.
C They're 37? Wow. That's a big difference. Well, could be. Oh, that's for napkins, I see. (the 2 for 69) 37, and these are 37. What about the other ones? Are there any other ones? What about ⸳ Scott? Those are 45. I'll get these. By price. We use them up fast, so I might as well get the cheapest thing. Cause I'll be getting more.
J So that's the case of a product where the brand doesn't really matter at all to you?
C No. . . . Paper products don't matter to me.

Judges' responses[b]

	A	B	C	D	E	F
Primary	1	0	6	0	0	0
Secondary	1	0	0	0	0	0

EXHIBIT 2 (Continued)

C. Preprocessed Choice Episodes

Episode 13A

C Mazola. The reason I get that instead of Wesson Oil, as a matter of fact, I used to get Wesson Oil, was that B wanted to try Mazola one time. We had a choice between the two, at one time, and we compared everything on them, what was in them, one was corn oil, and the other being vegetable oil that they were both vegetable oils, and he wanted this kind, and we cooked almost everything, we practically used up the bottle but we tried it on everything that I make, and it came out much better for some reason, so I keep on doing whatever works best. My theory, whatever works.
J How did you decide that it came out better?
C I liked the taste better, and he did too. We both agreed on it. Then we would have had to, if we didn't agree, then we'd have to keep trying one then the other. They've got a new bottle, I think, it did not use to be red in here.

Judges' responses[b]

	A	B	C	D	E	F
Primary	1	0	2	4	0	0
Secondary	0	0	1	1	0	0

Episode 38A

C There's what he likes. Small pea beans, that looks like it. Yup, B&M, because that's the kind he likes, he doesn't like any other kind.

Judges' responses[b]

	A	B	C	D	E	F
Primary	0	0	0	7	0	0
Secondary	0	0	2	0	0	0

[a] In the protocols, C is the consumer, J the experimenter, and B another consumer.
[b] The codes are A = constructive consumer; B = constructive experimenter; C = analytic implementation; D = preprocessed choice, E = can't tell; and F = other.

consumer, analytic implementation, and preprocessed choice are considered, then the respective proportions are 22.2, 36.1, and 41.7 percent. Compared to Table 1, there are relatively fewer agreements on constructive processes, and relatively more on analytic implementation and preprocessed choice. This is to be expected, since these processing types are much easier to characterize than constructive processes. Finally, there was greater agreement on C_4's episodes. This is because C_1's episodes tended to be much more complex than C_4's, often with several decisions inextricably intermixed. C_1 also tended to not verbalize as much as C_4, thus yielding sparser protocol data.

Splitting the 172 episodes into ten basic types of product choices, shows that preprocessed choice is low for meat and produce, as might be expected, since consumers cannot really rely on brand name for most choices of this type. More analytic implementation responses (application of rules) seem to be found, particularly for produce. Preprocessed choice was high for beverages and dairy, where either strong taste preferences may exist or only a limited number of brands are available. Judges tended to agree more for beverage and produce decisions, and less for snacks, desserts, and baking supplies.

Discussion

As noted previously, there were two major purposes in carrying out the study: determining how effective the protocol methodology is for studying constructive processes, and gaining some initial empirical insights into the use of stored rule and constructive processes. Each of these purposes is now considered.

Implications for the Protocol Judging Methodology Used. It was argued that collection of protocols during the actual process of making choices was the best

EXAMPLES OF EPISODES WHERE JUDGES DID NOT AGREE[a]

Episode 3A

C This part I really can't do without a child to tell me, which cereal is in favor this week.
J It sort of changes from week to week?
C Yes, it does.

Judges' responses[b]

	A	B	C	D	E	F
Primary	1	0	2	1	2	1
Secondary	0	1	0	0	0	0

Episode 7A

C There happens to be only one kind of walnuts as far as I can see, but the recipe I'm using required California walnuts, and it says exactly what they want on the recipe. If there were another kind I'd probably still take these, because it's vacuum packed and sometimes you can get them in a kind of a sealed plastic container, but I think that they're a lot fresher if they're vacuum packed in a can, so i think I'd probably still get these.

Judges' responses[b]

	A	B	C	D	E	F
Primary	3	0	3	1	0	0
Secondary	0	0	1	0	0	0

Episode 19A

C And then I want, um, one stick of butter. So it'll be bound to, whichever kinds come in sticks first, and then Land O'Lake, if it comes in sticks, because I think I've gotten it before, and it's a name brand that I'm familiar with.

Judges' responses[b]

	A	B	C	D	E	F
Primary	2	0	4	1	0	0
Secondary	0	0	0	3	0	0

Episode 50B

C Oh, that's dreadful stuff. At least this you can take it out of the bag and the smell is gone after a while, so when you get to use it, it doesn't stick to you. . . . Alright, now what color am I buying? Aqua. Dear me.
J Why did you decide on the Zest?
C Well, I like the, my daughter is starting to have facial difficulties, and she feels that a deodorant soap or hexachlorophene or whatever it is, is good for her face.
J So that, that isn't entirely by price?
C No, so I got the cheapest deodorant soap. And this stuff i use for the downstairs bathroom, where they usually wash their hands.

Judges' responses[b]

	A	B	C	D	E	F
Primary	3	1	2	1	0	0
Secondary	0	0	1	1	0	0

[a] In the protocols, C is the consumer and J the experimenter.
[b] The codes are A = constructive consumer; B = constructive experimenter; C = analytic implementation; D = preprocessed choice; E = can't tell; and F = other.

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method for studying the use of stored rule and constructive processes. The results of the exploratory study suggest several severe biases and limitations in this methodology.

Several types of biases in the protocols themselves could lead to over representation of both constructive and analytic implementation episodes. First, the protocols were collected in the store, while the consumer was shopping. Since constructive processes will usually be carried out in the store, this will make the protocols appear more constructive than might be the case if the protocols were taken when the shopper's list was being prepared outside the store, for example. Use of the in-store shelf display for making comparisons will lead to more constructive activity, as the consumer is confronted with various types of information on the packages.

A second bias in the protocols occurs because the consumer is asked to give protocols for choices where in many cases a great deal of learning has already occurred. In typical applications of protocol analysis in psychology, the subject is given a task, e.g., proving logic theorems, with which he is not familiar. Then the subject is doing a good deal of thinking in performing the task and can verbalize some portion of this thinking. In the shopping task, however, the consumer may have bought the same brand many times, and may not really think much about this type of choice while it is being made. The request from the experimenter to keep talking may then lead to *retrospection* about why the particular brand was bought in the first place, although such reasoning is not relevant now. This retrospection can appear like construction or analytic implementation, when in reality the choice was preprocessed, with the retrospection an artifact due to the demands to keep talking.

Another major problem with the protocol judging method was the low degree of agreement on episodes obtained. An analysis of those episodes where agreement was not reached suggests that four interrelated reasons seem to account for most of the problems. First, the problem of retrospection led to confusion. If a consumer bought what she always bought, but then gave a rationale for why she had originally started buying that brand, some judges would judge the episodes as preprocessed, while others judged the the rationale itself, leading to constructive or analytic implementation responses. Episode 50B in Exhibit 3 shows this type of bias, where the consumer had always bought Zest, but gave her reasons in response to the experimenter.

Second, some episodes could be interpreted in several ways, with not enough detail in the protocol to allow an unambiguous interpretation. For example, in Episode 7A in Exhibit 3, the judge must decide whether the consumer had a rule in mind based on the recipe and applied that rule or whether she constructed that rationale in the store. Episode 19A poses the same kinds of problems. It can be interpreted as analytic implementation if the judge believes the consumer has

a preexisting rule "choose, among kinds which come in sticks, a brand I have bought before," as preprocessed if the judge believes she is reciting a rationale and is merely buying her normal brand, or as constructive if the judge feels the rule did not exist *a priori.*

A third problem, related to the first two, is that the judge has *only the context of a single episode*, since episodes were not grouped by consumer and were judged one at a time. This means that the judge does not know "typical" rules for a consumer. For example, the consumer may always choose large sizes, but if the judge does not know this, the appearance of a statement about large sizes in the protocol may be judged as constructive rather than perhaps analytic implementation. It is very difficult for the judge to ascertain whether a rule preexists the specific episode he is judging or whether the rule was created on the spot. This problem occurred in Episodes 7A and 19A, as noted.

Finally, there were problems with the definition of episodes. Some episodes, such as 3A in Exhibit 3, gave virtually no information to the judge. Others had several decisions intermingled, making it difficult for the judge to determine how to respond.

This discussion of biases and limitations of the methodology suggests that to study constructive processes an iterative approach is needed, and that the adequacy of the protocol methodology used in the present study should be examined in some detail to allow improvements in future methods. Several of the choices made in this study regarding the judging task can now be examined in light of this discussion. First, judges were not given detailed judging rules. The major limitation which could be remedied by more detailed rules was the problem of retrospection. Judges could have been instructed to ignore any rationale in judging episodes where the consumer was buying what she always bought. This is not as easy to implement as might be imagined, since in many cases it was not clear from the protocols that the consumer was buying her normal brand. It would not have been possible to deal with the problems of context or interpretation by more detailed judging rules without making unwarranted assumptions, such as "assume that rules mentioned in the protocol exist before the consumer made the choice" (needed to clarify such episodes as 7A or 19A).

A second choice made was to define episodes broadly. As noted, some episodes, like 3A, were not informative enough, whereas others were too complex, containing several choices. A rule that each episode should refer to only one choice would be useful, but it is hard to determine when an episode has enough information to judge.

Finally, episodes were intermixed, so that each consumer's episodes did not appear together. This procedure limits the amount of context information that can be obtained. Episodes could be grouped by consumer, with judges instructed to read through all episodes before judging any. However, this might add

its biases and would certainly make the judges' task even more burdensome.

Thus, one purpose of the exploratory study has been accomplished, in that much has been learned about the adequacy of the protocol judging methodology and how that methodology could be improved. First, consumers could be instructed at providing protocols, and told not to provide rationales where they were buying what they always bought. Second, judges could be told to ignore obvious retrospection. Third, multiple decision episodes could be eliminated, episodes could be grouped by consumer, and judges instructed to read each consumer's episodes before beginning judging. This would then necessitate reducing the number of episodes to be given to each judge.

Even with these changes, some ambiguity would remain. The shopping task, as noted, is characterized by a great deal of *prior* learning, which has not been observed. This makes interpretation of protocol data difficult and leads to potential problems of retrospection. In general, therefore, the protocol data, however detailed they may be, are still relatively ambiguous and in many cases uninformative as to the nature of internal processing.[10] Protocol data are perhaps the *most* detailed data collected by consumer researchers, so this poses the question of how one can study use of stored rule, constructive processing, or other similar complex information processing phenomena. Perhaps criteria can be devised which would allow other process methodologies to be useful;[11] but, as noted earlier, determining when a sequence of eye movements, say, represented a particular type of processing would be exceedingly difficult. The most promising approach seems to be to control experimentally the type of processing required, such as presenting choices for unfamiliar items to attempt to ensure constructive processing, and then trying to measure the nature of the resulting choice process, using process methods such as eye movements, protocols, and so on.

Some Initial Empirical Insights. The results of the exploratory study also have several interesting substantive implications. First, the specific results are congruent with the content of the decision nets for C_1 and C_4 as described in Bettman (1970). One of the major rules used by C_1 was to buy the cheapest, and C_4 used a rule of buying the same as the last time (Bettman 1971). These simple rules are found in the judges' responses: C_1 uses analytic implementation relatively more (calculation of price per unit, implementing her "buy the cheapest" rule) and C_4 is characterized more by preprocessed choice. The

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[10] As many researchers have noted and Haines (1974) has explicitly demonstrated, it is also very difficult to develop choice models from protocol data. Haines found that different modelers, given the same protocol data, developed quite different decision net depictions of the choice processes represented by the protocols.

[11] For example, see studies of the eye movements (Russo and Rosen 1975) or of information acquisition (Bettman and Jacoby 1975).

results do raise some questions about such past decision net research, however. As noted earlier, Nakanishi (1974) had questioned the depiction of decision nets as fixed programs invoked by the consumer for each choice as net research had treated these models.[12] The evidence for some degree of constructive processing found in the present study supports Nakanishi's contention. This then raises the issue of the meaning of past decision net models— are the nets depicted merely the results of particular construction processes, which may change from one choice occasion to the next; are they a kind of "average" depiction of these constructions; or are they some further alternative? This question cannot be answered given the present data, but this points out the need for research which can characterize constructive processes in terms of possible underlying regularities.

A second set of substantive implications concerns the specific proportions of each processing type found. If constructive, analytic implementation, and pre-processed choice are roughly related to Howard and Sheth's (1969) extensive problem solving, limited problem solving, and routinized response behavior, respectively, then this study represents the first empirical work on the extent of these stages. The surprising aspect of the percentages presented here, perhaps, is the relatively large number of constructive and analytic implementation episodes relative to pre-processed choice episodes. There is certainly evidence for a good deal of consumer learning of rules as units, but there is also much continuing information processing by the two consumers studied. As noted previously, the percentage of constructive and analytic implementation episodes may be biased upward. These figures are specific to the task and consumers used.

A final set of substantive implications relates to the notion of constructive processes as being synthesized during the process of choice rather than *a priori*. This view emphasizes the need for examining such factors as the form in which information is presented, the processability of such information, and other properties of the choice environment which might affect how information is acquired and integrated (Bettman 1975; Russo, Krieser, and Miyashita 1975). Also, this view points out the importance of influencing the consumer in the store, at the moment of decision, for decisions where there is little prior knowledge or experience; not necessarily relying on out-of-store information presentations or influence attempts. This is true both for the policy maker, who may wish to present information in the choice environment in addition to or in place of using media such as television advertising, and for the marketer.

Thus the present paper has introduced some new

concepts about how consumers carry out choices, has considered how one might study these concepts, and has reported an exploratory study designed to provide insights into both these concepts and the methodology proposed. The results suggest substantial changes in the kinds of methodologies required, and yield some interesting empirical findings. Further characterization of the ways in which consumers implement choices seems to be an intriguing area for future research, although studies of such details of consumer processing seem to be more difficult than might have been anticipated.

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[12] Thus Bettman (1970) applies the net in a fixed manner to data for each choice.

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