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EXPERIENCING INFORMATION PROCESSING STRATEGIES AS A TO DECISION MAKING

David R. Lambert, Case Western Reserve University

Nancy E. Uhring, The University of Akron

ABSTRACT

This paper presents an experiential exercise designed to permit students to explore their own decision-making styles within the context of the current stream of findings concerning information handling and simplification strategies for decision-making. In the exercise, students are required to choose between several different apartments, and in so doing, experience information overload and implementation of decision simplification procedures. Formal information processing strategies are experienced by the students, compared with their unassisted decision simplification method, and used as the basis of classroom discussion of the viability and ease of implementation of each of the various strategies. This discussion is expected to lead to students' discovery of multi-stage processing.

INTRODUCTION

A consistent body of findings from cognitive psychology, marketing, organizational behavior, and other disciplines suggests that the basic structure of the human mind is a serious impediment to "optimal" decision-making. A non-trivial decision confronting anyone, regardless of the decision context, is likely to involve a greater number of bits of information than can be realistically managed. For example, reviewing the numerous studies conducted to that time, Miller concluded that our abilities to process information (simultaneous cognitions") are limited to the range of five to nine. (1) This conclusion continues to receive support. Accordingly, when we are confronted with a decision task which exceeds our cognitive capabilities, we tend to simplify the task.

SIMPLIFICATION STRATEGIES

A number of potential decision simplification strategies have emerged from the empirical studies of complex decision-making (generally reported under the rubric "information processing"). While there is no single, universally acceptable taxonomy of such strategies which finds acceptance among all researchers in the field, several points of agreement emerge:

1. There are two basic classes of information processing strategies: compensatory and noncompensatory
2. Within the noncompensatory classification, there are three most commonly referenced methods: conjunctive, disjunctive, and lexicographic.

Some researchers break-down compensatory decision making into several styles,[2] or expand the noncompensatory styles to include other approaches. However, these further divisions appear to be variations on a theme, and are not immediately pertinent to the objectives of this experiential exercise.

Compensatory

Compensatory information processing is characterized by the decision-maker's willingness to trade-off one attribute of the decision objects for another. The mental process required for this style of information use in decision-making may be likened to the familiar linear regression model, in which different attributes receive different weights in the overall evaluation of an object and superior performance in one attribute may be freely substituted for inferior performance in another.

Conjunctive

Conjunctive processing, like disjunctive and lexicographic which follow, is non-compensatory. Unlike compensatory models which allow for tradeoffs between attributes, in noncompensatory models alternative comparisons are made on an attribute by attribute basis. In conjunctive processing, the decision-maker establishes minimum levels of performance on each attribute. To be acceptable an alternative course of action must exceed all of these minima. Thus, inadequate performance on any attribute cannot be offset by superior performance on any other attribute. Coombs refers to an illustration of the psychological construct underlying the conjunctive models (3]

in the case of an individual taking a history test written in French. He has to know enough French to be able to understand the questions but no matter how much more French he knows, it will not help answer the questions; and he has to know enough history to answer the question, but no matter how much history he knows, it will not compensate for not knowing enough French to understand the questions. (p.246)

The conjunctive model is noncompensatory in that failure of an alternative to meet the cutoff points established for one attribute cannot be compensated for by exceeding the minimum levels established for other attributes.

Disjunctive

Disjunctive processing is the logical inverse of conjunctive, in that alternatives are evaluated as a function of some maximum, rather than minimum level. In disjunctive processing, the decision-maker establishes maximum performance levels on each attribute, and a course of action which meets or exceeds any desired performance level is acceptable. The disjunctive model is noncompensatory in that there is no level of the other attributes that can compensate for failure to meet the maximum levels established for the specified attributes. The disjunctive model is sometimes referred to as a maximum evaluation function since the alternative is judged on the basis of its best attribute regardless of the other attributes of the alternative. Einhorn offers an illustration of the disjunctive heuristic [4]

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In selecting players for a football team, we might want someone who can kick run pass with a great deal of skill. Each person is selected on his best ability regardless of his other attributes.(p.223)

Lexicographic

In lexicographic processing, the decision-maker evaluates alternatives on an attribute-by-attribute basis. If there is an object or course of action which is clearly superior in terms of the attribute judged to be most important by the decision-maker, that alternative is chosen. If several are tied in terms of the most important attribute, the next most important attribute is evaluated, and so on, until the choice is made.

To illustrate lexicographic processing, consider the following example of consumer behavior. Perhaps a consumer requires a new car for basic transportation, and does not attach much importance to a car or its attributes. Such a consumer might view price as the attribute of paramount importance. Accordingly, that consumer would select the lowest price car available. If two or more cars have the same price (or nearly the same price), then these cars with the lowest price would be evaluated in terms of the next most importance attribute, for example, fuel consumption. Note that lexicographic is noncompensatory in that all the cars outside the lowest priced set are excluded from evaluation on fuel consumption, and for any other consideration.

Exercise

Givers that decision-makers find some simplification strategy essential when confronted with a complex decision task, our purpose in this paper is to illustrate an experiential approach to be used as a pedagogical vehicle to illustrate alternative strategies for utilizing information in the decision-making process. The purpose of the exercise is to provide students with a conceptual schema for choice within a variety of decision-making contexts.

LEARNING

1. To provide insight into the handling of information in decision-making in a business context and, more broadly, decision-making in general.
2. To provide a means for understanding the current cognitive psychology thrust in the business disciplines.
3. To provide the student with a better understanding of his/her own decision-making processes, and to provide a basis for their enhancement.

IMPLEMENTATION PROCEDURE

STEP 1. Devise a complex choice situation, defined by multi-attributes such that the decision maker (student) is in information overload. (Information overload is not an unusual situation facing business or personal decision-makers.) The example used by the authors is detailed in the

appendix.

STEP 2. The students make individual decisions without assistance in information processing.

STEP 3. Students record the Stages involved in their decision-making process.

STEP 4. The instructor describes alternative information processing strategies and explains the conceptual basis for the use of decision rules.

STEP 5. Students implement a set of written instructions provided for operationalizing each information processing style discussed in the lecture.

STEP 6. Instructor collects the completed formalized decision forms and administers the post- questionnaire (included in the appendix).

STEP 7. Debriefing and general discussion of information processing strategies.

CONCLUSIONS

In our personal as well as our work lives, we are all involved in decision tasks which require us to handle more information than we are really capable of managing. The better we understand the processes we naturally use, and those formal processes we might use, the more our decision-making is facilitated. Awareness of various information processing strategies offer great potential for generating higher quality decisions.

The experiential learning exercise described in this paper is designed to generate an awareness among students of (1) the concept of information overload and the simplification strategies necessary to deal with it; (2) the methods which they invoke to process information; and (3) phased models of information handling.

Phased models are multistage processing strategies, in which one simplification schema is used to screen alternatives, then another strategy is used with those alternatives which remain. For example, conjunctive processing may be used to narrow-down the choice set, for the use of compensatory processing on those which remain. In the apartment hunting example used in the exercise, students typically employ a phased approach, and will thereby "discover" them without their introduction by the instructor. This discovery then can become the basis for class discussion.

Class room testing with MBA students suggests that the exercise is a useful vehicle for the introduction of these issues. The exercise requires an hour or an hour and a half to complete. As is generally true of experiential learning exercises, this exercise successfully generates student involvement, and devices a more profound level of understanding than would be the likely result of the usual lecture approach. While the exercise has been used, to date, in marketing management courses, it is equally appropriate for use in consumer behavior, marketing research,

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organizational behavior, and business policy courses.

REFERENCES

- [1] Miller, George A., "The Magical Number Seven, Plus or Minus Two: Some Limits on our Capacity for Information Processing," Psychological Review, Vol 63, March 1956, pp. 81-97.
- [2] Wright, Peter L., "Consumer Choice Strategies: Simplifying Vs. Optimizing," Journal of Marketing Research, Vol 12, February, 1975, pp. 60-66.
- [3] Coombs, C. H., A Theory New York: John Wiley and Sons, Inc., 1964, p.264.
- [4] Einhorn, H. J., "The Use of Nonlinear, Noncompensatory Models in Decision-Making," Psychological Bulletin, Vol 73, p.223.

APPENDIX

INSTRUCTIONS ON THE USE OF SPECIFIC DECISION RULES

Formalized Decision

Compensatory Style of Information Processing.

STEP 1. Assign values to each attribute such that the values reflect your view of their importance in deciding upon an apartment, and so that the sum of the values is 100. Use column one of the Compensatory worksheet provided to record the importance values.

STEP 2. Refer to the rank order of each level attribute you completed prior to making your initial decision. Using column two of the Compensatory worksheet, record those level ranks on each attribute for each apartment choice.

STEP 3. For each of the ten apartments, calculate a total score by multiplying the values you developed in step 1 by the corresponding rank you determined in step 2, and sum across all attributes to find a total score for each apartment. Multiply column 1 (value) by column 2 (rank) to find the attribute total (column 3). Then sum all attribute totals to arrive at a grand total for each apartment.

STEP 4. The apartment with the highest total number of points is your choice.

Conjunctive/Disjunctive Style of Information Processing.

STEP 1. After reading the list of apartment attributes which follow, indicate in the space provided, the appropriate minimum or maximum level of the attribute you deem acceptable.

Number of Bedrooms	_____	
Monthly Rent	_____	(maximum)
Distance to work	_____	(maximum)
Easily Accessible Mass Transit	_____	

Pets Allowed _____

Children Allowed _____

Wood Burning Fireplace _____

Garage _____

STEP 2. Evaluate each apartment offering, such that any apartment which fails to meet any of the minimums or maximums you have established is unacceptable. If this initial procedure fails to result in a single choice for you, adjust your minimum and/or maximum levels and re-evaluate the apartments. Continue this process until a single choice results.

Lexicographic Style of Information Processing.

STEP 1. In the list of apartment attributes that follow, rank order them in terms of their importance to you, such that 1 indicates important and 8 signifies least important.

Number of Bedrooms _____

Monthly Rent _____

Distance to work _____

Easily Accessible Mass Transit _____

Pets Allowed _____

Children Allowed _____

wood Burning Fireplace _____

Garage _____

STEP 2. Evaluate each of the apartments in terms of the attribute ranked number 1 by you. Consider only this attribute for each apartment. If one of the apartments is superior on that one, most important attribute, it is your choice. If this initial process results in a tie between two or more apartments, evaluate the list of apartments on the second most important attribute. If this process yields a tie, evaluate all apartments on the third most important attribute, and so on, until one apartment is selected.

Decision Questionnaire

1. Did implementation of each of the decision rules (i.e. your unassisted, compensatory, conjunctive and lexicographic) result in the same apartment choice? How do you account for the similarity or differences in choice?

2. Which of the information processing strategies presented most closely approximates your unassisted decision process? Comment on each of the strategies, including the unassisted strategy you initially used.

3. Rank order all of the simplification strategies (including your unassisted strategy) with number 1 being the most sound technique and 5 indicating the

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least sound procedure.

Compensatory _____
 Conjunctive _____
 Disjunctive _____
 Lexicographic _____
 Unassisted (Yours) _____

INSTRUCTIONS

ASSUME YOU ARE IN THE MARKET FOR M APARTMENT. THE APARTMENT PROFILES PROVIDED REPRESENT A GROUPING THAT YOU HAVE SUMMARIZED FROM THE CLASSIFIED ADS.

REVIEW THE APARTMENT OFFERINGS AND CHOOSE ONE APARTMENT WHICH WOULD BE MOST LIKELY TO RENT BASED UPON THE AVAILABLE INFORMATION.

APARTMENT S

Monthly Rent?	\$550.00
Number of Bedrooms?	3
Distance to Work?	16 to 20 miles
Mass Transit Easily Accessible?	yes
Pets Allowed?	yes
Children allowed?	yes
Wood Burning Fireplace?	yes
Garage?	1 car

APARTMENT O

Monthly Rent?	\$175.00
Number of Bedrooms?	2
Distance to Work?	11 to 15 miles
Mass Transit Easily Accessible?	no
Pets Allowed?	no
Children allowed?	no
Wood Burning Fireplace?	no
Garage?	no

APARTMENT D

Monthly Rent?	\$175.00
Number of Bedrooms	Efficiency
Distance to Work?	5 to 10 miles
Mass Transit Easily Accessible?	no
Pets Allowed?	no
Children allowed	yes
Wood Burning Fireplace?	no
Garage?	2 car

APARTMENT N

Monthly Rent?	\$250.00
Number of Bedrooms?	2
Distance to Work?	16 to 20 miles
Mass Transit Easily Accessible?	no
Pets Allowed	yes
Children allowed?	no
Wood Burning Fireplace?	no
Garage?	No

APARTMENT E

Monthly Rent?	\$250.00
Number of Bedrooms?	1
Distance to Work?	less than 5 miles
Mass Transit Easily Accessible?	yes
Pets Allowed?	yes
Children allowed?	yes
wood Burning Fireplace?	no
Garage?	1 car

APARTMENT M

Monthly Rent?	\$350.00
Number of Bedrooms?	3
Distance to Work?	less than 5 miles
Mass Transit Easily Accessible?	accessible?no
Pets Allowed?	yes
Children allowed	yes
Wood Burning Fireplace?	no
Garage?	No

APARTMENT C

Monthly Rent?	\$350.00
Number of Bedrooms?	2
Distance to work?	less than 5 miles
Mass Transit Easily Accessible?	yes
Pets Allowed?	no
Children allowed?	yes
Wood Burning Fireplace?	yes
Garage?	1 car

APARTMENT A

Monthly Rent?	\$450.00
Number of Bedrooms?	3
Distance to Work?	5 to 10 miles
Mass Transit Easily Accessible?	yea
Pets Allowed?	yes
Children allowed	yes
wood Burning Fireplace?	no
Garage?	2 car

APARTMENT I

Monthly Rent?	\$450.00
Number of Bedrooms?	2
Distance to Work?	11 to 15 miles
Mass Transit Easily Accessible?	no
Pets Allowed?	no
Children allowed?	no
wood Burning Fireplace?	no
Garage?	2 car

APARTMENT K

Monthly Rent?	\$550.00
Number of Bedrooms?	3+
Distance to Work?	11 to 15 miles
Mass Transit Easily Accessible?	no
Pets Allowed?	yes
Children allowed?	no
Wood Burning Fireplace?	yes
Garage?	2 car

COMPENSATORY WORKSHEET

Multiply col.1 X col.2 = (col.3)						
Attribute	Importance Value	Apt D Rank (total)	Apt E Rank (total)	Apt C Rank (total)	Apt I Rank (total)	Apt S Rank (total)
RENT	—	()	()	()	()	()
#BR's	—	()	()	()	()	()
DIST TO WORK	—	()	()	()	()	()
MASS TRANSIT	—	()	()	()	()	()
PETS	—	()	()	()	()	()
CHILDREN	—	()	()	()	()	()
WBFP	—	()	()	()	()	()
GARAGE	—	()	()	()	()	()
£ /100 GRAND TOTALS =						

Attribute	Importance Value	Apt O Rank (total)	Apt N Rank (total)	Apt M Rank (total)	Apt A Rank (total)	Apt K Rank (total)
RENT	—	()	()	()	()	()
#BR's	—	()	()	()	()	()
DIST TO WORK	—	()	()	()	()	()
MASS TRANSIT	—	()	()	()	()	()
PETS	—	()	()	()	()	()
CHILDREN	—	()	()	()	()	()
WBFP	—	()	()	()	()	()
GARAGE	—	()	()	()	()	()
£ /100 GRAND TOTALS =						