Food Demand and Consumption Behavior
Selected Research Topics

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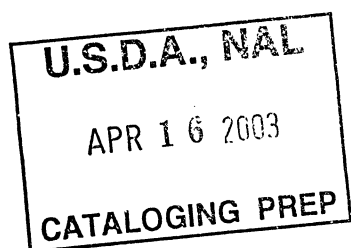
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NEEDED RESEARCH ON THE IMPACT OF
SOCIO-PSYCHOLOGICAL FACTORS ON FOOD DEMAND

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When I was approached about appearing on this program, the request was that I describe applications of contemporary socio-psychological concepts and methods to the analysis of food demand and consumption behavior. I asked to be excused, because I was not aware of any considerable systematic body of research that could fill the requirement. There are "bits and pieces" here and there dealing with aspects of demand for food. But, such "bits and pieces" make practically no contribution to the need for systematic and comprehensive analysis of socio-psychological factors in food demand. I was still invited to come, with the charge being that I discuss what I see as research that is needed in this area.

What I propose to do is to describe a comprehensive and systematic socio-psychological approach to demand that applies regardless of particular class of product. This description will include concepts and methods. There will be examples of pertinent research, some based upon food; others dealing with situations quite removed from food.

The comprehensive and systematic socio-psychological approach to demand contains five components:

1. The <u>structure</u> of the needs, expectations, and perceptions that operate among consumers with respect to a given class of products (e.g. food).

2. The <u>differentiation</u> system, within a given product-class, that consumers use in categorizing the individual components of the product-class.

3. For particular items within the product-class, the <u>preference patterns</u> that exist with respect to the structure of needs, expectations and perceptions that operate among consumers (1 above).

4. The system by which consumers are grouped in terms of similar psychological characteristics with respect to the product-class. The emphasis here is upon <u>psychological segments</u> rather than upon straight demographic groupings such as by income, education, etc.

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5. Given the psychological groupings, or segments, into which consumers are divided, the nature of the related strictly demographic characteristics.

Structure of Needs, Expectations and Perceptions

The question raised here is not particularly contemporary in socio-psychological research. It simply states that, given a rather large array of needs, expectations, and perceptions that exist with respect to some situation, there must be some structure around which people organize all of these possibilities. The seeming miscellany must be organized around some parsimonious set of particular concepts or dimensions. Factor analysis is a method for determining such socio-psychological structure within a given array.

Let me hasten to give an example in the area of food. Many years ago I conducted a research project for the American Dairy Association that had as one of its components the application of factor analysis to consumer perceptions and attitudes about milk. We started with 104 items that covered just about every possible idea that people might use in considering milk. Factor analysis revealed that the 104 items fell into a structure that contained the following six factors. Each factor represents an independent basic dimension that people utilize in assessing milk.

   I. Body-building growth ("Milk is needed for children," etc.)

  II. Vitality; strength ("Milk gives you pep and energy, etc.)

 III. Health threat ("Milk causes hear trouble," etc.)

(NOTE that whereas one would expect a health dimension to appear in the factor analysis of milk, three different health factors emerged, one with a negative connotation).

  IV. Personableness ("Milk give girls nice figures," etc.)

   V. Use factor ("Milk is more refreshing than coffee"; "Milk helps you go to sleep," etc.)

  VI. Age factor - ("The calcium in milk is good for children"; "Teenageers should drink one or more glasses of milk every day"; "Doctors think that adults should drink milk")

These factors represent the cognitive structure that consumers use as they range from highly positive to highly negative reactions to making use of milk.

It is my view that this type of search for the fundamental socio-psychological structure that operates within consumers needs to be determined for foods, as a class, in contrast to the above research

that was concerned with just one food product. My argument is that such factorial components represent the intrinsic basis of consumer demand - they represent what the consumer is really trying to buy (or want to avoid buying, as in the case of milk being perceived as a health threat).

One of my dream research projects would be to take an array of food products, representing each of several categories of foods, and using a common list of items dealing with attitudes and perceptions about foods, conduct a series of factor analyses. My hypothesis would be that there is some basic factorial set of dimensions that always occurs. This basic factorial set would be the "structure" for foods, as a class. In addition, there should be factorial components that would emerge only for particular food categories.

The above point was demonstrated in a large-scale research project conducted for a publisher of industrial magazines. Three quite different industrial groups were sampled and their respective needs and expectations in terms of information in industrial magazines were factor analyzed. Regardless of the heterogeneity of the industrial samples, there was a common body of factorial dimensions that crossed them. On the other hand, each sample had particular factorial components that were associated only with it.

Differentiation System Within Product-Class

I might have slipped something by you in the last part of the prior discussion. This was when I referred to my dream project and said I would start with an array of food products, representing each of several categories of foods. The issue, or problem, is what system of categorization of foods should be used in preparing the array? My first research having to do with consumers and food came during World War II in the old Bureau of Agricultural Economics (That certainly dates me!!!!!). In those days we used a system known as the "Basic Seven". Today, I believe, the system uses four food groupings. In either case, the categorization is based upon expert, nutritionist data. Do consumers group foods in the same way? Are these the groupings that consumers use in organizing foods into categories?

Recent developments in the field of multidimensional scaling permit us to investigate how people group or categorize items in their thinking. The particular application of concern to us here is known as "cognitive mapping". Because I am not aware of the use of this concept and procedure for foods as a general class, I will have to illustrate this by research in another area.

In the research project having to do with industrial publications, it was demonstrated that the target audiences have available to them a rather large variety of publications that deal with their job concerns.

One phase of the research was directed toward determining preference assessments of six of the most popular of the industrial publications going to a pargicular industry. Ordinarily, one might proceed by asking the sample to either rank order the six publications, in terms of preference in relation to "doing your job", or a rating scale procedure might be used. In any event, the results could take this form:

High
Preference

C

F

A   Magazines

B

E

D

Low
Preference
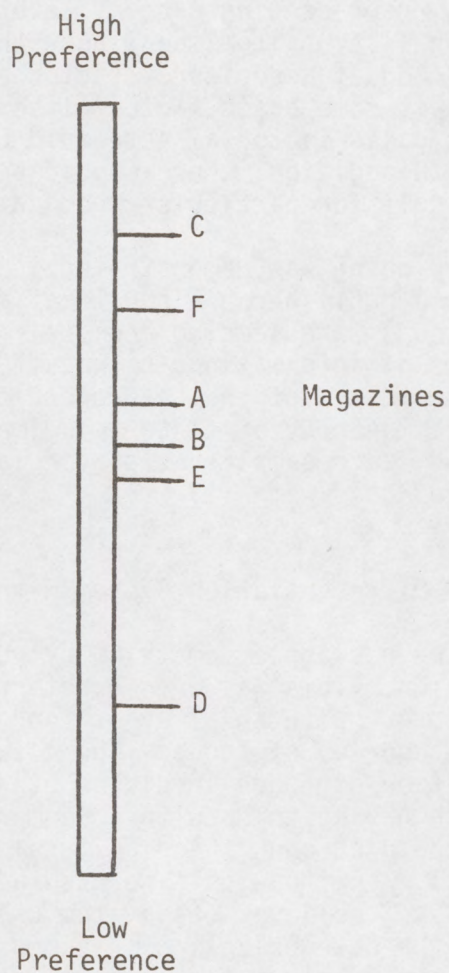
FIGURE 1. Unidimensional Preferences

This result, however, which seems to be quite straight forward, could be masking something that is very important, namely, that the audience does not really perceive these magazines as being competitive in unidimensional terms, as is implicit in the procedure and the results. There is the possibility that these six magazines represent different categories of some kind, and that the real competition is across categories and within categories. This is all in terms, please note, of how the audience perceives the situation.

In the present case, all possible fifteen (15) pairings of the six magazines were established. The sample judged each pair on the basis of a 7-point scale ranging from 1 - not at all alike to 7 - very much alike. The appropriate program for multidimensional scaling of such data produced the following cognitive map (the client magazine is C):

```
                              |
                              |
                      E       |
                              |
                              |
                              |
------------------------------+------------------------------
                              |
                              |     C    A
              B               |          F
                              |
                              |            D
                              |
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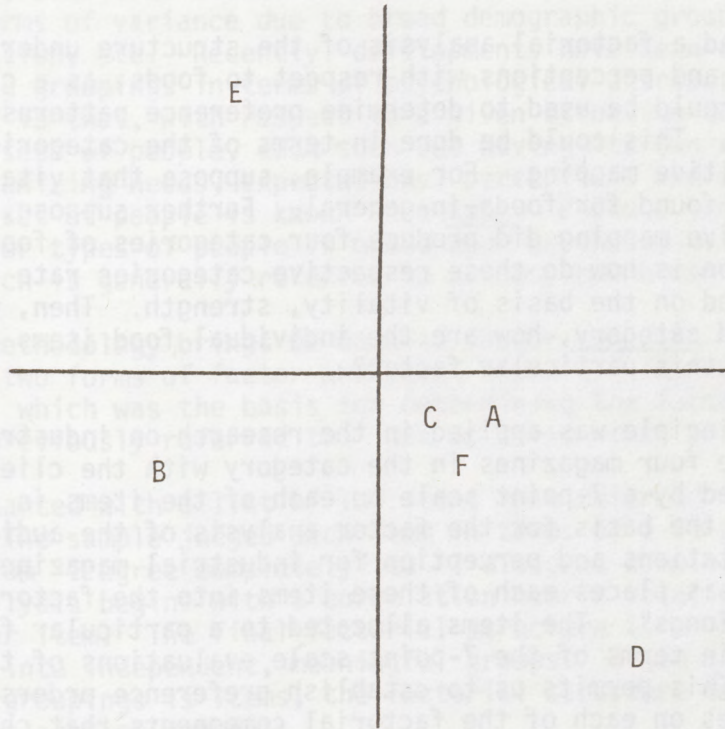
FIGURE 2. Cognitive Map: Similarity - Dissimilarity

This cognitive map demonstrates that the unidimensional approach to preference for the six magazines was wrong. The audience actually sees these six magazines falling into three categories. The client magazine actually competes with a sub-set of four, not the entire set of six. Magazines E and B, each, serve respective purposes that are quite different from those served by Magazines A, C, F and D. In this case, the latter four magazines are "tailored" to fit a particular industry; B is what is called a horizontal magazine - it covers sets of functions that cut across industries; E is a professional magazine that addresses itself to a particular field, such as chemical engineering. Also, A, C, and F are seen as being quite alike.

It would seem that any systematic effort to understand consumer demand for goods would have to take into consideration how people group or categorize the array of foods. It might well turn out that they do, in fact, think of foods in terms of the current four categories.

Wouldn't it be interesting if while nutritionists have developed a four-category system, people categorized on the basis of the "old time" seven-category system. In any event, a discrepancy between the consumer cognitive map and the "official" categorization would certainly point to our need for a consumer education program.

Preference Patterns

If we had a factorial analysis of the structure underlying needs, expectations and perceptions with respect to foods, as a class, this information could be used to determine preference patterns for individual foods. This could be done in terms of the categories developed through cognitive mapping. For example, suppose that vitality, strength was a factor found for foods-in-general. Further suppose, that, in fact, cognitive mapping did produce four categories of foods. The first question is how do these respective categories rate in terms of being assessed on the basis of vitality, strength. Then, within the highest rated category, how are the individual food items assessed on the basis of this particular factor?

This principle was applied in the research on industrial publications. The four magazines in the category with the client one, C, were evaluated by a 7-point scale on each of the items in the initial list used as the basis for the factor analysis of the audience's needs, expectations and perception for industrial magazines. The factor analysis places each of these items into the factorial structure where it "belongs". The items allocated to a particular factor are now studied in terms of the 7-point scale evaluations of the respective magazines. This permits us to establish preference orders for the four magazines on each of the factorial components that characterize industrial magazines as a class giving results such as:
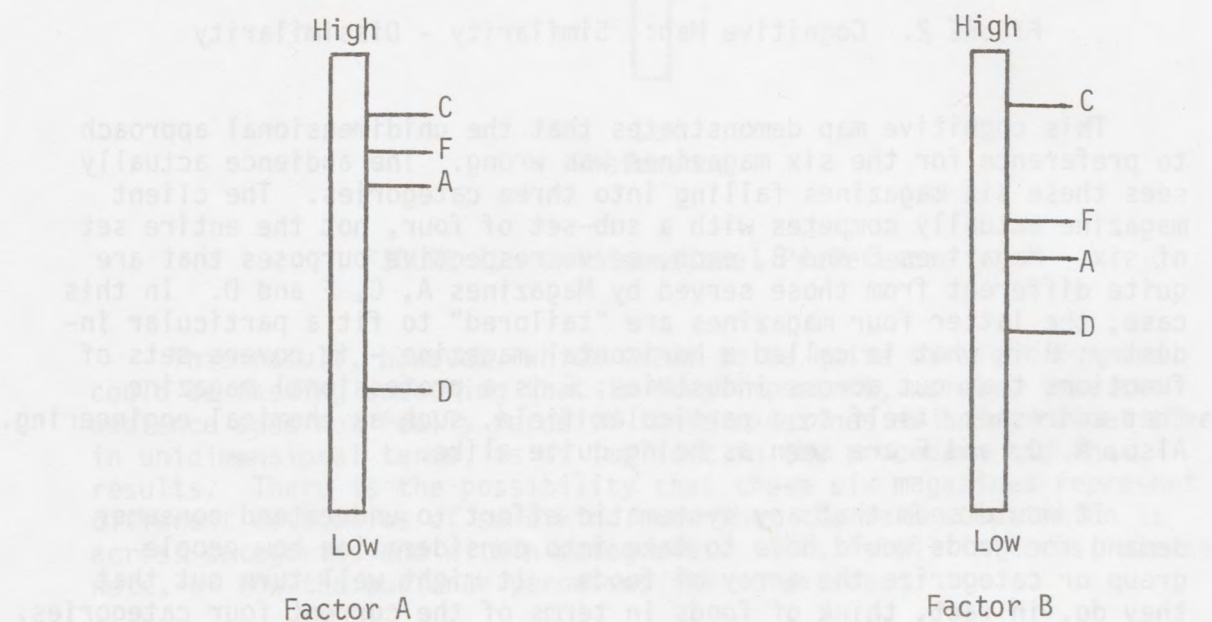

FIGURE 3. Factors A and B: Preferences

One must assume that information at levels such as these must be necessary to understanding consumer demand for food.

Psychological Segmentation

It has been traditional in social science research to investigate data in terms of variance due to broad demographic groupings - income, age, education, etc. Recently, developments have seen a shift to emphasizing groupings in terms of psychological attributes. What is being said is that, with respect to a given situation there can be different sets of people, each such set having its own characteristic way of organizing needs, expectations, perceptions and attitudes. Each such set of people is known as a _type_. Because the derivation of such sets or types of people is based upon psychological attributes, the approach is generally referred to as "psychological segmentation".

The methodology brings us back to factor analysis. Actually, there are two forms of factor analysis, R and Q. The most widely used form is R, which was the basis for determining the factorial structure of milk, previously referred to. Let us review that procedure.

We started with a list of 104 items that referred to some aspect of milk. The sample judged each item in terms of a 10-point scale ranging from "I agree completely" to "I disagree completely". R-factor analysis begins with a correlation matrix relating each item to every other item. The final factorial structure is an organization of the items into independent, meaningful groups. Since the basis of the factorial groupings is items, the factorial structure deals with independent sets of concepts.

Now, let us suppose that the above research was based upon a sample of 100 individuals. In Q-factor analysis, the initial correlation matrix relates each _individual_ to every other individual (R-factor analysis relates _items_). In this case the final factorial structure is an organization of the _individuals_ into independent, meaningful groups. Since the basis of this factorial grouping is _individuals_, the factorial structure deals with independent sets of _people_ (not concepts). What we have produced are sets (types or segments) of people who each have similar sets needs, expectations, perceptions, attitudes.

Here is an illustration. Several years ago I was involved in a research project designed to determine perceptions and attitudes of civilian young men toward military service. The sample scaled a rather long list of items that referred to nearly all aspects of military life. Q-factor analysis revealed that the young men fell into the following types or psychological segments:

I. Perceive the military as a place that "takes care of you" (food, shelter, clothing, medical care, etc.).

II. Perceive the military as a place to "escape to" (avoid unpleasant home conditions, can't find work, in legal trouble, etc.).

III. Perceive the military as a place for adventure (travel, do interesting things, meet interesting people, encounter challenges, etc.).

In addition to Q-factor analysis identifying psychological types or segments in the population of interest, the method also produces estimates of the distribution of the types in the population.

It seems that one must assume that people vary in how they approach food - that there are types, or psychological segments - each with its own unique set of needs, expectations, and perceptions about food. Each such type must, in turn, exert different demand patterns upon food. Again, I am not aware of any broad-based research on demand for food that includes this component.

Demographics As A Function Of Psychological Segmentation

Once the psychological types or segments have been identified, they can be inspected to determine their demographic characteristics. This is the reverse of the usual procedure - going from variance in demographic characteristics to variance in psychological attributes. The usual table is:

Attribute	Low income	Middle income	High income
A			
B			
C			

The new table would have this form:

	Type A	Type B	Type C
Income			
Low			
Middle			
High			

	Type A	Type B	Type C

Education

    Elementary

    High School

    College

    Post-college

Sex

    Male

    Female

Age

    etc.

The change is not just superficial. Now we are centering upon psychological types of people that have been demonstrated to exist and inquiring as to their differential demographic characteristics. The point is best made, perhaps, by returning to the military illustration. Imagine the problem faced by the military if it should develop that the type of young man most predisposed to consider entering a certain branch of the armed services has a pattern of attitudes and perceptions that that branch felt was least satisfactory and that the pattern existed in combination with the least desirable set of demographic characteristics.

With respect to demand for foods, the implication here is that psychological types of consumers will exert differential demands upon foods and that this picture will be further complicated by variance in demographic characteristics among the types. The two levels in combination represent a real socio-psychological problem for the analysis of consumer demand for food.

I have attempted to give an over-view of a comprehensive and systematic socio-psychological approach to demand for food. I have kept referring to this as being "comprehensive" and "systematic" because, first, the entire set of five components is required. Analysis just in terms of any one component is not sufficient. Secondly, the five components represent an integrative set of considerations the provide a fundamental ground-work for efforts to understand consumer demand for food.

Insofar as I am aware, no one is using this comprehensive and systematic approach - in a unitary, integrative fashion - as an effort to provide these aspects of the analysis of consumer demand for food.

Let me close on this note. I am just a lowly psychologist and I am flattered to have been invited to participate with lofty economists as they deliberate "The Economics of Household Consumption Behavior". I hate to end on this note - but - how on earth can these concepts and methods make a contribution to the analytical models of economists?

I don't have <u>that</u> problem - after all - I'm just a psychologist. I gladly leave that problem to you - the ECONOMISTS.