

## TEACHING CONSUMER ECONOMICS USING TASTE PANELS

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The teaching of economic theory has become a major topic in the economics literature. Siegfried and Fels point to the growing number of economists who consider their special interest to be economic education. More recently, educational economists have shown that the production function concept can be used in analyzing educational processes (Morgan and Vasche; Hanushek), and that the lecture is the most widely used method for communicating information (Chew-Wah et al., p. 3). Critics argue that the extensive use of lecture and other passive teaching techniques are subject to diminishing returns (White and White). Alternative teaching techniques can be introduced to offset diminishing returns to lectures and enhance the learning experience.

Several alternative teaching methods that permit active student participation are discussed in the literature (Kelly; French; Boehlje and Eidman; Nelson and Harris; and Mandercheid and Ferres). Siegfried and Fels (p. 940) discussed computer assisted games, programmed study, personalized systems of instruction, video instruction, and graduate student instructors. White and White describe some benefits to small group activities in agricultural policy courses, and Broder discussed the use of "hands-on" models for teaching economic theory to undergraduates.

This article describes how taste panels can be used as a supplementary technique for teaching consumer economics to undergraduates. More specifically, the objectives of this article are to (1) discuss problems associated with teaching consumer theory; (2) discuss those aspects of consumer economic theory that can be simulated with taste panels; and (3) describe the taste panel procedure and the results of its application in actual classroom settings. The focus of the taste panel is on learning and not on rigorous testing consumer preference theory.

### PROBLEM SETTING

The typical undergraduate curriculum for students in agricultural economics usually includes courses in economic principles and intermediate

microeconomic theory. The theoretical sections of these courses tend to be abstract and are not fully comprehended by many students. Instructors may encounter additional difficulties in teaching consumer economic theory because many agricultural economics undergraduate curriculum tend to be production oriented and devote less attention to consumer economics; and utility theory is limited to ordinal analysis and lacks the advantages of the more precise cardinal analysis of production economics. The problem setting is not one of teaching more courses in consumer economics, but one of teaching existing consumer economic theory more effectively.

A weak foundation in consumer economic theory tends to dampen the students' analytical skills in other areas, particularly in the area of market classification. Students are generally taught that taste and preferences are given, and that little attention is paid to the relationship between consumer theory and imperfect markets, the latter characterized by imperfect information, preference manipulation and interdependent utility functions (Quirk, p. 66; Schmid, p. 59).

### CONSUMER THEORY

In this section, the basic postulates of consumer behavior, more commonly known as modern utility theory, are presented, along with a discussion of imperfect markets and their effect on consumer behavior. The discussion serves as the foundation upon which the taste panel experiment was designed and conducted as a supplemental teaching technique.

Quirk (p. 59) suggests that consumer behavior rests on two fundamental postulates: (1) Consumers make choices from among alternatives in a manner consistent with their own evaluation of their self-interest; (2) Given adequate access to information, consumers are the best judge of their own self-interest. In pursuing their self-interest, consumers attempt to maximize utility, given their income and the bundles of goods and services available to them. This utility maximization behavior, as described in the context of in-

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difference curve analysis, is based on a set of utility axioms or assumptions that can be described as follows, where the symbol ( $\succeq$ ) refers to equal or greater preference, ( $>$ ) refers to greater preference and ( $\sim$ ) refers to equal or indifferent preference (Deaten and Muellbauer):

1. *Reflexivity* indicates that for any bundle of goods, A,  $A \succeq A$ , or that any bundle is as good as itself.
2. *Completeness* indicates that for any two bundles of goods A and B, either  $A \succeq B$  or  $B \succeq A$ . This suggests that consumers can choose between bundles, or that consumers have exact and full knowledge of all information relevant to their consumption decisions—knowledge of the goods and services available and of their technical capacity to satisfy wants—knowledge of market prices and money income (Ferguson and Gould, p. 14).
3. *Transitivity or consistency* indicates that for any set of choices, if  $A \succeq B$  and  $B \succeq C$ , then  $A \succeq C$ . This axiom insures that indifference curves do not intersect. As an extension of the completeness axiom, this axiom indicates that if  $A \succeq B \succeq C$ , then  $A \succeq B \succeq C$  in repeat rankings, or that preference orderings are distinct and not subject to guessing or random effects. Inconsistencies generally arise when hidden components of goods and services are not explicitly defined (Deaten and Muellbauer), or when consumer choices are exploratory in nature (Hirshleifer, p. 64).
4. *Continuity* indicates that consumer preferences can be represented by a continuous function.
5. *Nonsatiation* indicates that consumers (strictly) prefer more to less.
6. *Convexity* indicates that indifference curves are convex to the origin, or that bundles of goods are imperfect substitutes.

These axioms of utility analysis, along with an implicit assumption of perfectly competitive markets, are then used to derive optimal solutions to constrained utility maximization, to derive consumer demand, to discuss income and substitution effects, exchange and welfare, and so on. In short, the axioms of utility become the foundation of consumer economic theory.

With this analysis of individual consumer behavior, students are next shown how to derive market demand curves and later how to classify markets as being perfectly or imperfectly competitive. A weakness of many undergraduate texts is their failure to present a clear explanation that links market classification with the axioms of consumer behavior. For example, little attention is given to the proposition that the axiom of completeness may be violated in imperfectly competitive markets, or that advertising and

consumer ignorance threaten the validity of the transitivity-consistency assumption.

## THE EXPERIMENT

Taste panels were introduced into the classroom to supplement lectures on consumer behavior and to help students actively participate in laying the foundations of modern utility theory. By taking part in an actual taste panel, students are taught to acquire a better understanding of the strengths and limitations of consumer economics and to develop skills for evaluating the information provided by product advertisers.

Briefly, taste panels refer to the process in which random or select samples of consumers participate in blind taste tests—tests where the consumer does not have prior information on product brand, price, or ingredients. Taste panels are generally used scientifically by food scientists and marketing researchers for determining real or imagined differences in consumer products or consumer preferences.

Taste panels are also used in a nonscientific fashion by advertisers and, consequently, have become a part of our everyday lives. Television advertising has made it possible for sellers to tell us repeatedly that “Choosey mothers choose Jif,” or “The big Luzianne ice tea taste test is over,” or “Fifty-two percent of Budweiser drinkers choose Schlitz in a live taste test.” Advertisers have also used “expert” testimony (as in wine commercials) to show that their product tastes better than that of a competitor. Commercials constantly tell consumers which cola drinks taste better, or which brand of dog food “tastes more like real meat.” This evidence is usually presented by people or animals who have purportedly tried several different products and have come to prefer one product over the others. The taste panel experiment enabled the class to analyze critically the claims made by scrupulous and unscrupulous sellers.

The taste panel experiment is designed to simulate or illustrate the basic assumptions of consumer behavior, rather than to test systematically the validity of these assumptions. Clearly, not all assumptions and issues of modern utility can be readily simulated by taste panels. However, the following assumptions and issues of consumer economics can be addressed by the taste panel experiment:

1. To illustrate transitivity of preferences if brand A is preferred to brand B and brand B is preferred to brand C, is brand A preferred to brand C?
2. To illustrate consistency of preferences, are consumers consistent in their preference ranking in repeat taste panels?
3. To determine if product quality is associ-

ated with product price, can consumers detect price-quality differences, and do they actually prefer more to less?

4. To illustrate product differentiation and how advertising shapes preferences and impressions of product quality.
5. To illustrate that consumer utility has both physical and perceptual components, or that a particular good represents a bundle of goods with known and unknown components.

### Procedure

The taste panel experiment was conducted for three separate classes of a senior-level microeconomic theory course at the University of Georgia. Two variations of the taste panel were employed to test for preference consistency and preference transitivity. The classes were generally divided into two groups, with one group performing the transitivity experiment and the other group performing the consistency experiment. Participants were selected at random. Approximately one class session was devoted to the actual experiment and follow-up discussion. Food products for the taste panel were similar in taste, texture, and color, but differed in price and amount of advertising; to expedite the experiment, all foods were prepared and labeled before class.

To test for preference consistency, students were asked to give a single preference ranking for three closely related foods. Food samples were labeled brands, X, Y, and Z to disguise actual brands and to remove the effects of advertising and product price on consumer perceptions. After students had ranked the samples on the form (Figure 1), they were asked to identify (guess) the actual brands from a list provided by the instructor.

Some evidence of preference completeness can be obtained by repeating the test for preference consistency on the same samples with different labels (brands A, B, C). Students who change their preference rankings in repeat tests

**FIGURE 1.** Taste Panel Forms Used to Test for Consistency of Preferences

are thought to be guessing and may lack a distinct preference ordering. By removing any prior knowledge of product name or price, this test for consistency may also be used to illustrate the impact of advertising on consumer preferences, and whether consumers have a tendency to associate product price with product quality. Advertising campaigns that erroneously convince consumers that quality and price are synonymous may encourage violations of the nonsatiation assumption in cases where no real product differences exist. For example, the nonsatiation assumption would be violated when the consumer accepts a lower level of utility from a given budget by consuming a higher priced product, in place of a lower priced substitute that is capable of generating the same level of utility.

To test for transitivity of preferences, students were asked to rank products in pair-wise comparisons. More specifically, students were given three pairs of food samples and asked to rank their preference within each pair on the forms (Figure 2). In one experiment, Peter Pan, Skippy, and generic peanut butters were arranged in the following manner: pair one consisted of Skippy and generic (labeled brand A and B); pair two consisted of generic and Peter Pan (labeled brand N and P); and pair three consisted of Peter Pan and Skippy (labeled brand X and Y). This labeling procedure was used to disguise actual brands and to prevent second-guessing by student panelists.

### Results

The results of taste panels on four separate food groups in three separate classes are shown in Tables 1 and 2. Table 1 shows the results from preference consistency tests, including the num-

**FIGURE 2.** Taste Panel Forms Used to Test for Transitivity of Preferences

**TABLE 1. Taste Panel Results for Consistency of Preferences Among Agricultural Economics Seniors**

Item	Commodity Tested			
	Peanut Butter	Beer	Cola	Lemon-Lime Soda
Test Period	Spring 1981	Spring 1981	Fall 1981	Winter 1981
Number of Students	15	11	19	18
Numbers of students with				
consistent preferences:	9	0	7	5
inconsistent preferences:	6	11	12	13
Number of students who consistently identified				
one of three brands:	8	0	12	16
three of three brands:	4	0	5	4
Brand names (cents per ounce) <sup>a</sup>	Skippy (12.6) Peter Pan (12.6) Generic (9.9)	Michelob (4.9) Strohs (4.5) Generic (3.2)	Coke (2.3) Pepsi (2.3) Shasta (1.9)	Sprite (2.8) 7-UP (2.4) Shasta (2.2)
Group preferences (rank sums) <sup>b</sup>				
Student estimates:				
1st choice	Peter Pan (33)	Michelob (31)	Coke (57)	7-UP (50)
2nd choice	Skippy (56)	Strohs (33)	Pepsi (58)	Sprite (51)
3rd choice	Generic (73)	Generic (56)	Shasta (113)	Shasta (96)
Actual:				
1st choice	Peter Pan (44)	Strohs (38)	Coke (60)	Sprite (56)
2nd choice	Skippy (56)	Michelob (42)	Pepsi (68)	7-UP (57)
3rd choice	Generic (66)	Generic (58)	Shasta (100)	Shasta (92)

<sup>a</sup> retail price per ounce is shown in parentheses

<sup>b</sup> rank sums, shown in parentheses, were computed by summing individual student rankings for particular brands

**TABLE 2. Taste Panel Results for Transitivity of Preferences Among Agricultural Economics Seniors**

Item	Commodity Tested			
	Peanut Butter	Beer	Cola	Lemon-Lime Soda
Test period	Spring 1981	Spring 1981	Fall 1981	Winter 1981
Number of Students	15	10	19	17
Number of students preferences which were				
Transitive	10	9	17	13
Nontransitive:	5	1	2	4
Group preferences (rank sums) <sup>a</sup>				
1st choice	Skippy (20)	Generic (13)	Coke (22)	Sprite (18)
2nd choice	Peter Pan (20)	Strohs (17)	Pepsi (35)	7-UP (25)
3rd choice	Generic (20)	Michelob (24)	Shasta (45)	Shasta (35)

<sup>a</sup> actual rank sums for individuals with transitive preferences, shown in parentheses, were computed by summing individual student rankings for particular brands.

ber of panelists who were consistent in repeat samplings, the number of panelists who could identify products sampled, the per-unit cost of each product, and the group preference or the sum of individual preference rankings. Group preferences were computed by summing individual student rankings for particular brands. Group preference rankings given in Table 1 were based on student estimates of brands (what students imagined they were tasting) and actual brands used in the experiment.

Consistency test results indicate that only 9 of 15 students were consistent for peanut butter, 0 of 11 for beer, 7 of 19 for cola drinks, and 5 of 18 for lemon-lime sodas. Students scored poorly on brand identification, with less than one third of each group being able to correctly identify all brands tested. The highest priced product did not always receive the superior rating. Group preference differences between imagined and actual brands (Table 1) indicate that some students underestimated the quality of certain beers, peanut butters, and soft drinks. In some cases, lower priced products were actually preferred over higher priced substitutes, even though students imagined that the higher priced product should be superior. For example, students thought that the higher priced Michelob would taste better than the lower priced Strohs, while their actual preference was for Strohs. Apparently, Michelob's advertising had successfully convinced consumers of superiority, when actual group preference tests suggested otherwise. In the absence of hidden product components, such as the conspicuous consumption effects of drinking Michelob in a bar, the above cases are violations of the nonsatiation assumption.

Some elaboration on this apparent violation of the nonsatiation assumption is in order. Nonsatiation implies that consumers (strictly) prefer more utility to less utility, and that consumers will allocate their incomes to maximize their expected utilities. Yet in the above cases, students are deriving less utility from a given budget by consuming the less preferred, higher priced brand in place of an equal or larger quantity of the more preferred, lower priced brand. A particularly strong argument can be made for violations of the nonsatiation assumption for peanut butter, a product that is generally consumed in the home and is less subject to conspicuous consumption. Four of the 9 students with consistent preferences who thought they had ranked the higher priced Skippy over the lower priced generic, actually preferred generic over Skippy and could have increased their utility by changing to the lower priced generic.

The results of transitivity tests are shown in Table 2. These results indicate that 10 of 15 students were transitive in their preferences for peanut butter, 9 of 10 for beer, 17 of 19 for cola, and 13 of 17 for lemon-lime soda. Also shown in

Table 2 are group preferences that were computed by summing actual rankings for particular brands across students with transitive preferences. Equal rank sums for peanut butter (Table 2) indicate that students found little difference among peanut butter. This aggregate indifference for peanut butter was absent in tests for consistency in which Peter Pan was ranked first, Skippy second, and generic third. When group preferences were estimated for actual brands of beer, generic beer was ranked first, Strohs second, and Michelob third. These group preference rankings for beer in transitivity tests were in reverse order to those imagined by students in consistency tests. These apparent differences between group preference rankings obtained in consistency tests and those obtained in transitivity tests suggest that group preference rankings may vary with taste panel design.

## DISCUSSION

The results of the taste panel served as a basis for class discussion. Several major points of interest were related to consumer economics theory. Students were reminded of the basic assumptions of modern utility theory and were asked why the completeness, transitivity-consistency or nonsatiation assumptions had been violated by students in the experiment. As plausible explanations for discrepancies between taste panel results and consumer economic theory, students were asked to consider (1) whether consumers actually possess sufficient product information for making rational consumption decisions; (2) how product advertising, product differentiation, and other elements of imperfect competition influence consumer choice; (3) why a single good is said to consist of utility bundles with physical and perceptual components; (4) how interdependence among utility functions affects consumer preferences; and (5) whether the taste panel accounts for some of the hidden components of consumption.

Students were also reminded that the emphasis of the taste panel was on learning, rather than on rigorous testing of consumer preference theory, and were asked how a relaxation of basic assumptions would affect the analysis. They were informed that economic theories were only abstractions of reality, and that the validity of a theory need not rely solely on the realism of its assumptions, but more on its ability to predict general behavior.

A special discussion was devoted to the importance of reliable product information in consumer choice. The extensive use of advertising and its attempt to attach a unique image to a product was seen as a potential source of imperfect product information. Likewise, students were instructed to question the implications of using taste panels in advertising. Apparent contradictions in obtaining group preferences from

classroom taste panels made students skeptical about advertisers' claims that taste tests prove that their product is superior.

Student response to the taste panel was favorable. They were enthusiastic both in participation in the taste panel and in the discussion of its results. Following the procedure outlined in this article, the taste panel can be used with a variety of food items for supplementing conventional lectures on consumer economic theory. The ef-

fectiveness of taste panels on student learning was not fully explored in this article and remains a topic for further study. Such a study would require controlled applications of the taste panel technique by other instructors at other institutions. Results from informal reaction to the experiment and the subsequent discussions give a positive indication of the taste panel's potential as an effective supplemental technique for teaching consumer economics.

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