Consumer Food Attribute Perceptions
and Consumption Behavior

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This paper incorporates individual variations in perceived attributes of a food into the analysis of a cross-sectional demand with a large number of nonconsumers. The conceptual model recognizes that consumption is an individual choice decision and distinguishes between market participation and level of consumption. The results of an econometric analysis of oyster consumption in Southeastern U.S. indicate attribute perceptions of the food have significant effects on consumer choices.

Introduction

This paper examines two issues in research on consumer demand: the influences of product attributes and the presence of corner solutions. Generally speaking, there are two common ways that properties of a good such as quality can be incorporated in microeconomic demand analysis. One is the household production approach as developed by Lancaster (1966). In this approach, it is assumed that the household obtains utility from some underlying goods, i.e., properties or characteristics of the goods, that cannot be bought in the market but are instead produced in the household from inputs of market good and leisure time. It is also assumed that "the characteristics possessed by a good or a combination of goods are the same for all consumers and, given units of measurement, are in the same quantities" (Lancaster, 1966, p. 134). An alternative approach is to preserve goods as the objects of utility maximization but introducing characteristic parameters directly into the utility function (Houthakker, 1952-53; Theil, 1952-53). Specifically, market price of a good becomes a function of the measured or observed characteristics (e.g., quality) of a good. Consumers choose the characteristics explicitly and, by their choice of characteristics, they determine the price of the good. Therefore, it is evident that product characteristics are treated as objective and universal to all consumers.

There are reasons to believe that product attributes may not be considered homogenous by different individuals. Bayton (1963) pointed out the critical role that perceptions play in consumption. Individuals do not react directly to external stimuli but to their perceptions of the stimulus situations. A category of determinants that influence perceptions is the structural factors of a good, such as taste, color, size, and shape, that are based on the attributes of the good and the nature of the neurophysiological systems involved in transforming the attribute information about

the good into mental data. Another category of determinants is individual preferences and value judgments which are formed by subjective forces that are reflections of personal experiences, motivations, and so on. To the extent that individual neurophysiological systems and psychological backgrounds are not identical, perceptions become the intervening variable between stimuli and behavior and the sources of differences in observed individual behavior.

Evidence to support Bayton's proposition can be found in consumer behavior studies. Zeithaml (1988) observed from an extensive literature review that there is widespread acceptance that 1) objective quality which is measurable and verifiable and subjective quality, a highly relativistic phenomenon that varies between individuals, are different; 2) objective or market price may not be the price that consumers find meaningful and encodable in their minds. O'Shaughnessy (1987) and Assael (1987) suggest that consumer beliefs (perceptions) about anticipated effects of product attributes on satisfaction are one of the principal determinants of what is purchased. For products without significant differences that are not considered by the consumers as an important purchase, such as food, beliefs or perceptions about the product's characteristics may directly affect consumer purchases.

In recent years, a number of economic demand studies also introduced consumer perceptions and attitudes toward food products in empirical analyses. For instance, Capps et al. (1988) investigated the influences of consumers' attitudes toward price in grocery shopping and attitudes toward buying nonfat foods on the consumption of lean meat. The relationship between consumers' impressions of product characteristics and purchase decision for a beef product was studied in Menkhaus et al. (1988). Both found that subjective factors were relevant to food consumption behavior.

One phenomenon which often occurs in cross-sectional consumption studies is the existence of corner solutions or zero purchase. The likelihood for this occurrence is especially large in disaggregate or product-specific analysis. A case in point is the consumption of shellfish products. Earlier consumer survey found that 82.5 percent of U. S. households did not consume any shellfish at home (Cheng and Capps, 1988). Current literature suggests three main reasons for the corner solutions in cross-section data. First, the good was not desired and hence was not consumed. Second, impediments such as transaction and information cost prohibited purchases. Third, expenditures were misreported or the good was purchased infrequently. In the case of shellfish consumption, the first reason seems to be a primary cause of zero consumption. It is also known that consumers do not purchase shellfish products as often as other meats. Earlier qualitative studies of shellfish consumption indicate that there is a great deal of heterogeneity of consumer perceptions about the attributes of these products (Sanchez and

Konopa, 1974; National Fish and Seafood Promotional Council, 1988; Food Marketing Institute; Lin et al., 1989). Many non-users attributed their behavior to unfavorable taste, appearance, odor, or safety of such foods. Users frequently expressed positive beliefs of these properties. Therefore, consumption and nonconsumption of the foods seem to be related to individual perceptions of the foods' characteristics.

This paper explores an approach that incorporates individual variations in the perceived attributes of a food into the analysis of a cross-sectional demand with a large number of nonconsumers. The distinguishing feature of this approach is recognition that consumption is an individual choice decision and hence the explanation of individual behavior should be based on his/her views of the choice object. In addition to variables conventionally investigated in demand studies, subjective evaluations of the characteristics are included as explanatory variables. The second section introduces a conceptual framework that describes consumer behavior and distinguishes market participation from level of consumption. In the next section, an empirical demand model for a shellfish product, oysters, is developed. Previous findings of shellfish consumption, the data used, and statistical considerations are discussed. The last section reports the empirical results and contains some concluding remarks.

Behavioral Framework

Several assumptions about consumer behavior for an established food product[2] are used in the analysis. First, a consumer has imperfect knowledge of the product attributes, especially at each purchase occasion. Second, consumer choice of the established product (in contrast to new product) is mostly a habitual response behavior. Third, the product costs a small fraction of the total consumer budget. Most consumers are unlikely to become involved in an extensive information search and processing. Fourth, a consumer's purchase decision of such a product is partially related to the perceptions of product attributes (i.e., beliefs and awareness of the attributes) formed prior to purchase. Fifth, the food examined is weakly separable from all other goods in the individual's feasible consumption set.

Assume a well-defined sub-utility function for the food. The individual's consumption decision can be considered as a constrained optimization problem:

$$\text{Max}_{x} \quad U = U(x(K), Z) \quad (1)$$

$$\text{s.t.} \quad px = m$$
$$x \geq 0$$

where

U = Sub-utility for the food
x = the food examined
p = market prices of x
K = $(k_1, k_2, \ldots, k_j, \ldots, k_n)$, a vector of perceived attributes associated with the food

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[2]An established product is defined as an existing product in the marketplace of which many consumers are likely to have acquired some level of knowledge.

Z = a vector of individual demographic characteristics
m = expenditures on foods.

The relationship between the sub-utility and perceived attributes (K) is such that

$$\partial U / \partial k_j = (\partial U / \partial x)(\partial x / \partial k_j) > 0 \quad (2)$$

$$\text{for all } j\text{'s.}$$

Because nonsatiation axiom of preferences means $\partial U / \partial x > 0$, Equation (2) implies that

$$\partial x / \partial k_j > 0. \quad (3)$$

The optimal consumption of $x^*(K, m, p, Z)$ is then obtained by solving the constrained maximization problem (1) according to Kuhn-Tucker theorem.

The optimal consumption x^* can be put in the context of a behavioral model that is based on O'Shaughnessy's analysis of how individual motivations influence consumption. A consumer would not use a product if (s)he intrinsically dislikes it, or perceives it incompatible with her/his goals or needs or both. However, a consumer may not use the product even when (s)he is disposed toward considering a purchase. Unfavorable attribute perceptions or the constraint imposed by income or both can prevent the disposition from being realized and lead to no consumption.

Figure 1 depicts a behavioral framework where consumer motivations are integrated into the constrained utility maximization problem (Equation 1). Nonconsumption of a product is partly due to the product attribute perceptions held by the consumer. An individual may be observed not participating in a product market ($x^* = 0$) either because (s)he is not disposed to consider using the product ($q \leq q^*$, where q can be considered as
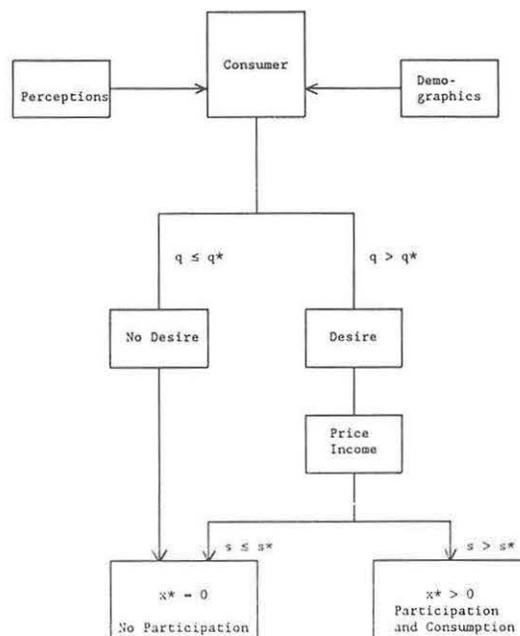
Figure 1
A Framework of Consumer Behavior

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an index that determines a person's potential to consume a product, q* a threshold of the potential) or due to factors that inhibit her/him from entering the market though (s)he is inclined to buy the good (i.e., q > q* but s ≤ s*, where s = an index that determines the realization of consumption potential, s* = threshold of the realization). For an individual who possesses strong enough disposition and is not inhibited by the factors mentioned above (q > q* and s > s*), the level of his/her actual use of the product is conditional on perceptual and economic factors.

If the price is held constant, then an individual's demand for the product can be written as

$$x^* = g(K, m, Z \mid p) \qquad (4)$$
$$\begin{aligned} &> 0 \quad \text{iff } q > q^* \text{ and } s > s^* \\ &= 0 \quad \text{if } q \le q^* \text{ or} \\ &\qquad \quad q > q^* \text{ but } s \le s^* \end{aligned}$$

where x* is the optimal demand and g is a demand function. It should be kept in mind that q, q*, s, and s* depend partly on attribute perceptions but are not observable. Nevertheless, the observed demand x* reflects the outcome of whether both of the thresholds (q* and s*) are successfully crossed.

Data, Statistical Considerations, and Empirical Model

A random digit telephone survey of adult population (18 years and older) in the Southeastern and Mid-Atlantic states[3] was the source of data for this study. The survey was conducted in January and between April and June of 1990. A total of 1094 completed interviews were obtained, with a response rate of 35 percent. Respondents were asked, among other things, their consumption of oysters during the preceding two months, beliefs about five attributes of oysters, and demographic backgrounds.[4] Average number of times that oysters were eaten in a month represents consumption. The percentage of observations corresponding to zero consumption is 75.43. The five attributes were measured on a one-to-seven rating scale using a semantic differential method. Other information was recorded in category or dichotomy.

The divergence of attribute perceptions among respondents can be clearly seen in Figure 2. Respondents showed no definite direction in their beliefs about the taste of oysters. However, there is a significant portion of respondents on both ends of the rating scale which indicates that many of them hold extreme beliefs about the taste (terrible or excellent). Their perceptions of other characteristics also vary across the sample, although the interquartile ranges of these attributes are smaller than that of taste.

To analyze statistically the determinants of consumption, participation (occurrence of consumption) and frequency (use of oysters) were treated as two decisions.

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[3]These states are Delaware, Maryland, Virginia, North and South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas.

[4]Distinctions in product form (raw, cooked, fresh, frozen, and so on) and where the consumption occurred (at-home or away-from-home) were not considered in the survey.

Median Rating and
Interquartile Range[*]
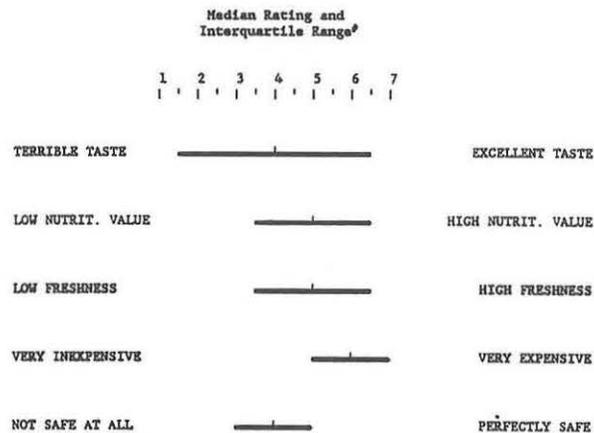
Note :

[*] - Respondents who did not answer the attribute rating question(s) were excluded from the computation of median ratings. These respondents either responded a "Don't know" or refused to rate the attribute(s).

Figure 2
Profile of Attribute Perceptions of Oysters

There is an event (purchase) which at each observation in the sample may or may not occur. If the event does occur, a discrete and positive random variable represents consumption frequency. Otherwise, this random variable has a value of zero. The two decisions are not necessarily determined by the same distribution or the same parameters. While acquisition occurs only when desired acquisition is, in some sense, positive, there may be factors that inhibit the realization of purchase desire. In such circumstances, failure for the observed consumption to take on positive values may arise either because the desired acquisition is not positive or because of factors that inhibit an individual from acting on the desire.

Given that the dependent variable, consumption frequency, is a count variable (0, 1, ...) and truncated at zero, and considering the underlying consumer behavior, a count hurdle model developed by Mullahy (1986) was selected for empirical analysis. In Mullahy's model, which is an analogy of Cragg's variant of the Tobit model, the relative probabilities of zero and non-zero realizations of the dependent variable are allowed to differ. A binomial probability model governs the binary outcome of whether the count variable has a zero or a positive realization. If the realization is positive, the conditional distribution of the positives is governed by a truncated-at-zero count data model.

In this study, the geometric distribution of frequency count was chosen as the data generating process. The geometric distribution of a count variable Y is represented by $G(Y = y) = \theta^y (1+\theta)^{-(y+1)}$, where θ is a population parameter, the observed Y is y $\in \Omega = \{0, 1, 2, ...\}$, $E(Y) = \theta$, and $\text{var}(Y) = \theta(1+\theta)$. To ensure θ is non-negative and to incorporate the vector of independent variables X, one can specify the relationship between θ and X as $E(\theta) = \exp(X'\beta)$, where β is a vector of unknown parameters. The model can then be estimated by maximizing the likelihood function

$$L = \prod_{i \in \Omega_0} \{1/[1+\exp(X_{1i}'\beta_1)]\} \qquad (5)$$

$$\cdot \prod_{i \in \Omega_+} \{\exp(X_{1i}'\beta_1)/[1+\exp(X_{1i}'\beta_1)]\}$$

$$\cdot \prod_{i \in \Omega_+} \{\exp[(y_i-1)X_{2i}'\beta_2]$$

$$/\{[1+\exp(X_{2i}'\beta_2)]\}^{y_i} \}$$

where $\Omega_0 = \{0\}$, $\Omega_+ = \{1, 2, \dots\}$, X_{1i} and X_{2i} are the vectors of independent variables that determine the probability of observing zero and positive counts, respectively; β_1 and β_2 are the associated parameters, respectively; and θ_1 and θ_2 are the population parameters, respectively.

Empirically, an individual's demand for oysters was modeled in two equations:

$$E(Y_m) = \exp(b_{m0} + b_{m1}TASTE + b_{m2}NUTR + \qquad (6)$$
$$b_{m3}FRESH + b_{m4}COST + b_{m5}SAFE +$$
$$b_{m6}EDUC + b_{m7}EXPOS + b_{m8}CHILD +$$
$$b_{m9}MALE + b_{m10}INLAND + b_{m11}INCOME +$$
$$b_{m12}AGE + b_{m13}WHITE + b_{m14}JEW +$$
$$b_{m15}SMSA)$$

where

m	= 1 for use/non-use, 2 for frequency of use
TASTE	= perception of taste (1 = terrible, 7 = excellent)
NUTR	= perception of nutritional value (1 = lowest, 7 = highest)
FRESH	= perception of freshness (1 = lowest, 7 = highest)
COST	= perception of cost (1 = very inexpensive, 7 = very expensive)
SAFE	= perception of safety (1 = not safe at all, 7 = perfectly safe)
EDUC	= education level (1 = grade school, 2 = some high school, 3 = high school graduate, 4 = some college, 5 = college graduate, 6 = post graduate)
EXPOS	= childhood exposure to oysters (1 = yes, 0 = no)
CHILD	= there are children under 12 living the household (1 = yes, 0 = no)
MALE	= (1 = yes, 0 = no)
INLAND	= residence is more than 100 miles from the nearest coast (1 = yes, 0 = no)
INCOME	= household income (1 = less than $20,000, 2 = $20,000 – $35,000, 3 = $35,000 – $50,000, 4 = more than $50,000)
AGE	= (1 = 18 - 34, 2 = 35 - 64, 3 = over 65)
WHITE	= (1 = white, 0 = nonwhite)
JEW	= (1 = Jew, 0 = non-Jew)
SMSA	= population size of the geographical area in which the respondent resided (1 = non-metropolitan, 2 = less than 100,000, 3 = 100,000 – 249,999, 4 = 250,000 – 499,999, 5 = 500,000 – 999,999, 6 = 1,000,000 – 2,499,999, 7 = more than 2,500,000)

The five product attributes were selected based on previous studies of seafood and shellfish consumption.[5] Taste has been mentioned in all qualitative studies of seafood consumption as the most important characteristic that influences seafood purchases (Lin et al., 1989; Better Homes and Garden in Otwell, 1988; Sanchez and Konopa, 1974). Better Homes and Garden found that nutritional value was one of three major factors that influenced seafood consumption. In Food Marketing Institute (no date) and Lin et al. (1989), it was also noted that consumers demanded assurances of freshness because seafood was perceived more perishable than other meat products. The perception of cost (COST) does not represent market price of oysters. Instead, it is the degree of costliness of the food in a consumer's mind. A consumer may not always know or remember the actual price and (s)he may incur nonmonetary costs (time, effort) to obtain or prepare the food or both. Therefore, subjective cost is more meaningful to a consumer and is likely the cost to which (s)he responds.

In Food Marketing Institute's (no date) focus group study, some individuals expressed fears and serious concerns about food-borne illness from fish and "this has a definite impact on consumer's fish consumption behavior" (p. 13). But, Lin et al. (1989) found that safety considerations did not appear to be a widespread inhibitor of oyster consumption, especially for users who had not gotten ill from or heard about safety problems with oysters. Hence, the heterogeneity of behavioral responses to perceived safety of oysters may be another reason for consumption variation.

Education, sex, age, and race were included to control for differences in demographics. Income, as a consumption constraint, is expected to influence positively both market participation and frequency of consumption. It has been suggested that consumers are less likely to purchase seafoods if they have not been exposed to these products when they were growing up (Food Marketing Institute; National Fish and Seafood Promotional Council, 1988). The presence of young children in the household was found to reduce at-home oyster consumption (Cheng and Capps, 1988). A consumer who lives in a coastal area may have more familiarity with and access to seafoods which in turn leads to more consumption. As orthodox Judaism prohibits eating shellfish because the food is not clean, individuals affiliated with Jewish religion may tend to avoid oysters. Finally, the population size of the area in which a consumer resides may determine the availability of the food. The larger the area is, the more likely oysters are marketed in local food outlets.

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[5]Most of the a priori expectations about how perceived attributes affect seafood consumption were based on focus group studies. By nature, these studies are not representative of any population. Therefore, inferences are not subject to statistical tests and should be taken as suggestive rather than conclusive or statistically significant. Furthermore, no information on the decomposition of consumption at product-specific level was available. Therefore, perception and demographic factors were assumed to have influence on both participation and level of consumption decisions.

Results and Concluding Remarks

Table 1 presents the descriptive statistics of the usable sample with 616 observations.[6] Maximum likelihood estimates of the model based on this sample are reported in Table 2. Estimated coefficients associated with the market participation decision are shown in column 1 and estimates for the frequency decision are in the second column. The asymptotic standard errors of the coefficients, adjusted for heteroscedasticity, are reported in parentheses.[7]

As far as market participation is concerned, coefficients for taste, freshness, and cost perceptions are statistically significant and have the expected sign. Nutritional value exhibits a negative and counter-intuitive influence on the participation decision. Safety perception does not appear to influence the decision to consume oysters. The higher education a respondent received, the more likely (s)he was an oyster consumer. The negative sign on the CHILD coefficient is consistent with prior understanding. None of the remaining coefficients is significant.

In terms of consumption frequency, all coefficients associated with attribute perceptions are significant and have the expected signs. Sex is the only significant demographic characteristic, with males eating oysters more often than females.

The major difference between this and previous food consumption studies is the recognition and incorporation of consumer subjective beliefs of food attributes in the analysis of observed behavior. Conventional studies, long-run studies in particular, usually attribute individual consumption variations to differences in individual income and demographic characteristics. By contrast, this research isolates behavior-influencing factors relevant to the consumer's own views of the food. Are these subjective variables of any analytical value in understanding consumption patterns? A likelihood ratio test between the hypothesized model (with perception variables) and a restricted model without the perception variables strongly suggests that they are.[8] Therefore, inclusion of product attribute perceptions did provide useful insights into individual economic behavior.

The practical contribution of the approach proposed here lies in the information it provides to help understand consumer food consumption behavior. The empirical findings suggest that market participation and frequency of use decisions may not be subject to the same influences. This distinction can be useful in cases where zero consumption is a systematic rather than random behavior. Moreover, the food industry can utilize the information to design more focused marketing strategies when one rather than both consumer

decisions is to be influenced. For instance, if frequency of eating oysters is chosen as the key target for increasing oyster consumption, then the factors that affect how often oysters are eaten would be more relevant than those influencing consumers' participation in this market.

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[6]A usable sample was defined as the sample without missing values in any observation for all of the dependent and independent variables.

[7]The standard errors were calculated using a procedure proposed by White (1982).

[8]Likelihood function value for each model is listed at the bottom of Table 2. The likelihood ratio is 118.17 and the table $\chi^2_{0.05}$ value for 10 degrees of freedom is 18.30.

Table 1
Characteristics of the Sample

Variable	No.	Median %
CONSUMPTION FREQUENCY		0
0 = Non-user	419	68.0
1 = Once or less	141	22.9
2 to 15 times a month	56	9.1
TASTE (perceived taste)		5
1 = Terrible	134	21.8
2	30	4.9
3	47	7.6
4	64	10.4
5	116	18.8
6	76	12.3
7 = Excellent	149	24.2
NUTR (perceived nutritional value)		5
1 = Lowest	44	7.1
2	50	8.1
3	79	12.8
4	102	16.6
5	167	27.1
6	84	13.6
7 = Highest	90	14.6
FRESH (perceived freshness)		5
1 = Lowest	32	5.2
2	27	4.4
3	52	8.4
4	99	16.1
5	137	22.2
6	100	16.2
7 = Highest	169	27.4
COST (perceived cost)		6
1 = Very inexpensive	6	1.0
2	5	0.9
3	18	2.9
4	49	8.0
5	136	22.1
6	151	24.5
7 = Very expensive	251	40.8
SAFETY (perceived safety)		4
1 = Not safe at all	49	7.8
2	54	8.8
3	112	18.2
4	140	22.7
5	129	20.9
6	73	11.9
7 = Perfectly safe	59	9.6
EXPOS (childhood exposure to oysters)		1
1 = Yes	450	73.0
0 = No	166	27.0
EDUC (education)		4
1 = Grade School	17	2.8
2 = Some High School	60	9.7
3 = High School Grad.	182	29.6
4 = Some College	165	26.8
5 = College Grad.	128	20.8
6 = Post-Graduate.	64	10.4
CHILD (presence of children		0
< 12 years old in household)		
1 = Yes	207	33.6
0 = No	409	66.4
MALE		0
1 = Male	256	41.6
0 = Female	360	58.4
INLAND (residence located more than		1
100 miles from coast)		
1 = Yes	390	63.3
0 = No	226	36.7

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INCOME(household income in the          3
    previous year)
1 = Less than $20,001              115   18.7
2 = $20,001 - $35,000              153   24.8
3 = $35,001 - $50,000              187   30.4
4 = More than $50,000              161   26.1

AGE                                      2
1 = 18 - 34 years                  237   38.5
2 = 35 - 64 years                  298   48.4
3 = over 65 years                   81   13.1

WHITE                                    1
1 = White                          495   80.4
0 = Non-White                      121   19.6

JEW                                      0
1 = Jewish                          10    1.6
0 = Other groups                   606   98.4

SMSA(population size of the area in      4
    which the respondent resided)#
1 = Non-Metro. area               182   29.6
2 = Less than 100,000               4    0.7
3 = 100,000 - 249,999              82   13.3
4 = 250,000 - 499,999              45    7.3
5 = 500,000 - 999,999             82    13.3
6 = 1 mil. - 2.5 mil.             87    14.1
7 = More than 2.5 mil.           134    21.8
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Table 2
Maximum Likelihood Estimates of the
Determinants of Consumption of Oysters

	Coefficient	
Variable	Participation	Frequency
Intercept	-2.98	-2.18
	(0.78)*	(1.17)
TASTE	0.39*	0.26*
	(0.05)	(0.12)
NUTR	-0.11	0.20*
	(0.07)	(0.11)
FRESH	0.11*	0.22*
	(0.06)	(0.12)
COST	-0.10**	-0.34*
	(0.08)	(0.11)
SAFE	0.06	0.16**
	(0.07)	(0.12)
EDUC	0.24‾	-0.07
	(0.09)	(0.14)
EXPOS	-0.02	0.19
	(0.23)	(0.33)
CHILD	-0.32**	0.33
	(0.22)	(0.32)‾
MALE	0.11	0.51**
	(0.20)	(0.31)
INLAND	-0.26**	0.30
	(0.20)	(0.32)
INCOME	0.10	-0.15
	(0.10)	(0.15)
AGE	-0.16	-0.28
	(0.16)	(0.25)
WHITE	0.23	-0.55
	(0.27)	(0.39)
JEW	-0.17	0.11
	(0.62)	(0.68)
SMSA	-0.04	0.04
	(0.04)	(0.07)

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N                               616
Log L                        -533.05
Log L (Slopes =0)            -620.01
McFadden's R²                   0.14b
Log L (Demographics only)    -593.21
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Note:
* - Numbers in parentheses are
heteroscadesticity-adjusted asymptotic
standard errors.
b - Computed as 1 - Log L/Log L(Slopes = 0).
* - The coefficient is significant at 0.05
level (one-tailed).
** - The coefficient is significant at 0.10
level (one-tailed).
‾ - The coefficient is significant at 0.05
level (two-tailed).

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Price Sensitivity and Food Consumption: Reactions to Use of Biotechnology and BST in Food Production

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This study addresses the relative importance of price as a food selection criterion as compared to other possible characteristics, the relationship of food selection criteria and food consumption patterns, and predictors of price sensitivity when biotechnology -- such as the use of BST -- is used in food production. Results indicate that taste and wholesomeness are more important than price in making food selection choices. Regression analysis reveals that those consumers who are concerned about BST are less likely to be price sensitive; those who, in general, rank price highly as an important selection criterion are more likely to be price sensitive; and males are more likely than females to be price sensitive for a biotech food product such as milk produced with BST.

With the movement of women into the labor force and the introduction of numerous technological innovations in the food industry, there has been considerable change in household food consumption patterns. It is relatively rare to find families who primarly grow, preserve, and prepare most foods from scratch these days, a common pattern several decades ago. The trend toward eating more meals outside the home has not abated, indicating continued change. In fact, it has been predicted that households in the future need not have a fully equipped kitchens (e.g. conventional ovens) as little food preparation will be done in the home.

Along with dramatic change in food consumption patterns, there has been shifting priorities in the criterion which consumers use to make food selection choices. Aggregate food demand studies have documented that price is increasingly less important in predicting market choices while tastes and preferences are increasingly more important (Raunikar & Huang 1987). This shift in selection criterion has undoubtedly been affected by the

increasing affluence level of our society, with continued rise in median family income in the 1970s and 1980s being maintained by the movement of women into the labor force -- a phenomenon which in itself is cause for change in selection criterion.

In recent years there has been another factor which may further affect household food consumption patterns and the criterion by which consumers make food selection choices: widespread public concern about food safety. While consumers are told that scientific standards indicate that the U.S. food supply is safer than ever (Toufexis 1989), there is widespread perceptions that there is a food safety problem (McKinney 1990, Mendenhall 1990, Smallwood 1989) and that our government regulatory agencies are not adequately assuring food safety (Lecos 1986, Kuehl & Simon 1973). Undoubtedly, the recent alar and poisoned Chilean grape scare has contributed to these consumer perceptions. Increasingly, consumers may feel that they must look out for themselves when it comes to food safety (Lecos 1986).

Biotechnological innovations, particularly the potential use of genetic engineering in producing food products with very different end-use characteristics, is another dimension of the current environment. While consumers have always viewed food production innovations with considerable skepticism (Warland & Hermann 1971; Slusher 1990), the current controversy over the use of bovine somatotropin (BST) in the dairy industry indicates that consumers are viewing this innovation with particular skepticism (Douthitt 1990, Slusher 1990, Washington Dairy Products Commission 1990).

Bovine somatotropin is a genetically-produced product that can boost a cow's milk production by 10 to 25 percent when injected into cows. It is a protein hormone which is also naturally occurring in cows. While the Federal Food and Drug Administration has not given approval for full commercial use of genetically-produced BST, they have asserted that milk produced with BST is safe for human consumption (Juskevich and Guyer, 1990) and have allowed experimental use. Although full FDA approval is expected in the near future,

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Consumers Union has asked for extensive additional research (Hansen, 1990). Jeremy Rifkin and his group, Foundation for Economic Trends, continue their campaign against approval. And, the chemical companies who developed the technology actively seek approval. Consumers are being given conflicting information, especially from opposing groups. As a result many consumers do have concerns about the safety of milk and dairy products produced with this new technology (McGuirk & Kaiser, 1991, Douthitt 1990, Slusher 1990, Washington Dairy Products Commission 1990).

This study addresses the degree to which contemporary consumers are price sensitive, especially with regard to foods which may be produced with new biotechnological innovations, such as BST. It is hypothesized that consumers with high concerns about a food production technology, such as BST, will be less price sensitive than those with less concern, regardless of socioeconomic factors. Consumers' food selection criterion and the relationship between such criterion and food consumption patterns will also be analyzed.

Study Methodology

Data Collection

A sampling frame of all listed telephone numbers for households in Missouri was used to randomly draw a sample of 1200. Each selected household was contacted by mail and the main grocery shopper was asked to complete and return a short mail questionnaire as well as participate at a later time in a thirty-minute telephone interview. Two hundred fourteen people returned the mail questionnaire. All of these households were contacted by telephone for the main interview. Additionally 242 households not returning the mail questionnaire were randomly selected and contacted by phone. Overall, 456 households were contacted for the main phone interview, with 81 noncontacts (e.g., disconnected phone, business numbers, etc.). Data were obtained for 219 households, representing 58 percent of the sample contacted by phone. Data were collected in March-May, 1990.

Sample Characteristics

Table 1 provides information on the characteristics of sample respondents and their households. Most respondents (70 percent) were female, an expected characteristic as the main grocery shopper was interviewed. Age ranged from 18 to 99 years, with a mean of 49.9 years. Respondents lived in diverse household types: 14 percent were in single person households, 35 percent were in two-person households, with the remaining being in larger households. Mean household size was 2.8.

Table 1
Characteristics of the Sample
(n=219)

	%	f
Gender of Respondent		
Male	26%	57
Female	70%	154
(Missing)	(4%)	(8)
Age of Respondent		
18-30 yrs.	9%	20
31-45 yrs.	30%	66
46-65 yrs.	38%	83
66 & over	17%	38
(Missing)	(6%)	(12)
Number of Household Members		
1	14%	30
2	35%	77
3	21%	46
4	14%	32
Over 4	13%	27
(Missing)	(3%)	(7)
Respondents Educational Level		
Grade School	10%	21
High School	30%	65
Vocational-Technical School	6%	14
Some College	29%	64
College Degree	15%	33
Advanced Degree	8%	18
(Missing)	(2%)	(4)
Whether Respondent Has Studied Food & Nutrition		
No	35%	77
Yes	63%	138
(Missing)	(2%)	(4)
Where Respondents Have Studied Food & Nutrition		
High School Home Economics	45%	99
College Course	12%	27
Extension Course	10%	21
4-H	10%	21
Where Respondent Spent Childhood		
Farm or Rural Area	38%	84
Small Town (<10,000)	22%	47
Small City (10,000 - 100,000)	14%	30
Large City (>100,000)	24%	53
(Missing)	(2%)	(5)
Current Residence		
Farm or Rural Area	21%	46
Small Town (<10,000)	21%	46
Small City (10,000-100,000)	22%	49
Large City (>100,000)	33%	72
(Missing)	(3%)	(6)
Household Income		
Below $10,000	6%	12
$10,000-20,000	17%	38
$20,000-30,000	25%	55
$30,000-40,000	20%	43
$40,000-50,000	12%	27
over $50,000	16%	35
(missing)	(4%)	(9)

All educational levels were represented. Nearly one-fourth of the sample had a college or graduate degree. Sixty-three percent had studied food and nutrition, most often in high school home economics classes.

While 38 percent of the respondents grew up in a rural area, only 21 percent currently reside in rural areas. Consistent with mobility trends over recent decades, more respondents currently reside in small or large cities.

All household income levels were represented, with 45 percent of the sample being in the $20,000 - $40,000 range. Six percent of the sample had income below $10,000 while 16 percent had income above $50,000.

Measures and Analytical Methods

Food Selection Criteria. Respondents ranked five food selection criteria in priority order of importance, with a 1 representing the most important criterion and a 5 representing the least important criterion. The food selection criteria were: price, taste, wholesomeness, convenience, and appearance. Descriptive statistics are used to analyze these rankings.

Selection Criteria and Food Consumption Patterns. Correlational analysis is used to assess the relationship between the rank ordering of food selection criteria and the degree to which respondents use five different patterns of meeting the household's food needs. Respondents provided the percentage of their household's food needs which are met through: 1) growing, preserving, and preparing own food, 2) purchasing basic food ingredients and preparing foods from scratch, 3) purchasing convenience or near-ready-to-serve food, 4) purchasing fully prepared foods and bringing home to eat, and 5) purchasing food and eating meals outside the home. This measure was correlated with the rank ordering of food selection criteria, after reversing the ranking scale so that high rankings reflect positive correlations with the percentage of food obtained through each pattern.

Price Sensitivity for Biotech-Produced Foods. Regression analysis was used to test the predictive ability of several variables in explaining the price sensitivity of respondents to biotech-produced foods. The dependent variable -- price sensitivity -- was an index derived from the following three questions: Would you purchase milk produced with a biotech process if it were cheaper? Would you pay more for food not produced with biotech? Would you purchase biotech food if it cost less, even if there may be risk? Cronbach's alpha coefficient for this three-item index is .60.

Independent variables were: rank order of price as a food selection criterion in general, importance of price as a food selection criterion for milk in particular, gender, educational level, income level, household size, age, and an index measuring the degree of concern respondents have about the use of BST in the production of milk. The BST Concern Index was derived from seven separate questions about whether respondents had any concern about using BST. The index has a Cronbach's alpha coefficient of .82.

FINDINGS AND DISCUSSION

Food Selection Criteria

As shown in Table 2, taste and wholesomeness have the lowest mean rankings of five food selection criteria indicating they are the most important food selection criteria; price is the third most important criteria; appearance and convenience are the least important criteria in the perceptions of these respondents. The modal ranking of wholesomeness and taste is #1 in importance; the modal ranking of price is #3 in importance; and the modal rankings of appearance and convenience is #5 in importance.

Table 2
Percentage Distribution and
Means of Respondents' Rankings
of Food Selection Criteria
(n=219)

| Rank* | ----- Food Selection Criteria ----- | | | | |
	Price	Taste	Wholesomeness	Convenience	Appearance
1st	18.0	33.6	39.2	3.2	7.8
2nd	25.8	30.4	24.9	11.5	6.9
3rd	33.2	23.0	17.1	14.7	12.0
4th	14.3	9.2	12.0	29.0	32.3
5th	8.8	3.7	6.9	41.5	41.0
$\bar{x}$	2.70	2.19	2.23	3.94	3.92

* 1 is most important while 5 is least important

However, there is considerable variability in the rankings of each criterion. For example, 18 percent of respondents rank price as most important while 9 percent rank it as least important. There appears to be diversity of opinion about what is important criteria in making food choices.

Selection Criteria and Food Consumption Patterns

Pearson correlations for the rank ordering (reversed scale) of the five food selection criteria and the extent to which respondents provided food needs in various ways are presented in Table 3. Correlations indicate a positive relationship between the rank ordering of price as a selection criteria and growing own foods, purchasing basic ingredients and preparing food from scratch while there is a significant negative relationship between the ranking of price and purchasing convenience foods as well as eating out. The higher respondents rank price, the more likely they are to grow their own food and to purchase and prepare foods from scratch. Those who do not rank price as an important criteria are more likely to purchase convenience foods and eat out. Given that growing and preserving ones own food and cooking from scratch are more economical methods of providing food, this makes sense.

There are significant correlations for the ranking of taste and purchasing basic ingredients and preparing foods from scratch, purchasing convenience foods, and eating out. Those who rank taste as important are less likely to purchase basic ingredients and prepare from scratch while they are more likely to purchase convenience foods and eat out.

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Table 3
Pearson Correlation Coefficients
(r) of Food Selection Criteria
and Food Consumption Patterns
(n=219)

| | Price | ---Food Selection Criteria--- | | | |
		Taste	Wholesomeness	Convenience	Appearance
Percent Grow/Preserve & Prepare from Scratch	.24***	-.04	.15*	-.18**	-.05
Percent Purchase Basic Ingredients & Prepare from Scratch	.15**	-.14*	.12*	-.35***	.16**
Percent Purchase Easy to Prepare Foods for Home Consumption	-.12*	.13*	-.17**	.32***	-.12*
Percent Purchase Already Prepared Food for Home Consumption	-.11	.01	-.22***	.39***	-.11*
Percent Eat Food Out	-.33***	.14*	-.02	.24***	-.06

$$* \quad p<.05$$
$$** \quad p<.01$$
$$*** \quad p<.001$$

Note -- Food Selection Scale was reversed so that #1 Rank = 5,
#2 Rank = 4, #3 Rank = 3, #4 Rank = 2, and #5 Rank = 1.

For wholesomeness, there is a significant correlation between rankings and the degree to which respondents grow and preserve their own food, purchase basic ingredients and prepare foods from scratch, use convenience foods, and purchase prepared foods to bring home to eat. The higher respondents rank wholesomeness, the more likely they are to grow and preserve their own food and purchase basic ingredients and prepare foods from scratch. The less likely they are to purchase convenience foods and to purchase prepared foods to bring home to eat.

The correlations for the ranking of convenience and food consumption patterns are what one would expect. The higher respondents rank convenience as a selection criteria, the less likely they are to grow and preserve their own food and to purchase basic ingredients and prepare foods from scratch; the more likely they are to purchase convenience foods, purchase prepared foods to bring home to eat, and to eat out.

For appearance, there is a significant correlation for purchasing basic ingredients and preparing food from scratch, purchasing convenience foods, and purchasing prepared foods to bring home to eat. The higher appearance is ranked the more likely respondents use basic ingredients to prepare foods from scratch, and the less likely they are to purchase convenience foods and bring home already prepared foods to eat.

These results indicate that consumers use growing, preserving, and preparing foods from purchased basic foods as ways of saving money and assuring wholesomeness of foods. They also indicate that buying near-ready to serve foods, bringing home prepared foods, and eating out are viewed as means of gaining convenience. Those who think that good taste is important are more likely to eat out while those who think tat appearance is important are more likely to prepare and/or eat in the home.

Price Sensitivity for Biotech-Produced Foods

Regression results are presented in Table 4. This model explains 31.7 percent of the variance in price sensitivity for biotech-produced foods. The significant predictor variables are the index measuring concerns about BST use, the overall ranking of price as an important food selection criterion, and gender.

Table 4
Results of Regression Analysis with
Price Sensitivity as Dependent Variable

Independent Variables	b	SE b	Beta
BST Concern Index	-.3503***	.0412	-.5415
Ranking of Price as General Food Selection Criteria	.2613*	.1296	.1356
Importance of Price in Milk Purchases	-.0418	.1058	-.0272
Gender (0=female,1=male)	.8645**	.3332	.1652
Educational Level	.0280	.0983	.0188
Income Level	-.1082	.1107	-.0714
Household Size	.0283	.1121	.0178
Age	-.0142	.0106	-.0956
Intercept	11.4664		
Adjusted R squared	.3170		
F Ratio	11.616***		

$$* \quad p<.05$$
$$** \quad p<.01$$
$$*** \quad p<.0001$$

The negative beta coefficient (-.54) for the BST concern index indicates that the higher the concern, the less likely that respondents respond to a low price as an inducement to purchase the product. Controlling for all other factors in the model, respondents who have concerns about BST are less price sensitive. This result was consistent with the hypothesis of a negative relationship as well as the hypothesis that this variable would be the most influential variable for explaining price sensitivity for biotech-produced foods. Those who rank price as an important food selection criterion are more likely to be price sensitive (Beta = .14). And, male respondents are more price sensitive than are females (Beta = .16).

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CONCLUSIONS

While price is an important food selection criteria, there are other factors which are more important for many consumers. Many consider taste and wholesomeness of foods to be more important than price when making food choices. Food provider's decision criteria are generally consistent with the way food is made available to family members. Those who consider price and wholesomeness important are more likely to grow, preserve, and prepare their food from scratch. Those who consider convenience and taste more important are more likely to purchase easy-to-prepare, already prepared foods, or eat out.

For the case of a food innovation when consumers typically have skepticism and concerns, the best predictors of price sensitivity is the degree of concern about the particular innovation in question, the relative importance of price as an important decision criteria, and gender. The higher the level of concern, the less price sensitive consumers are. They are less likely to purchase at any price. The more important price is as a selection criteria, the more price sensitive consumers are even for a product where there is some concern, regardless of income level. Finally, these findings indicate that male grocery shoppers are more likely to respond to lower prices for innovative products, even though there may be some concern about the product. Male food shoppers are greater risk takers.

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Couponing: Lessons For Consumers

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My assignment is to spell out lessons for two kinds of "consumers": (1) professional consumers of these research papers, and (2) consumer educators (broadly viewed) who are interested in what lessons these papers have for intelligent, non-professional consumers.

A Summary Of What We Know

In my view a careful reading of these papers should give the reader a comprehensive understanding of what we know of coupon use. In particular, the Warme-Maynes (1991) paper may be regarding as a "treasure hunt" whose prize is the enduring theory that best explains coupon use. In the judgment of Warme and Maynes, Role Theory offers the best single explanation of coupon use. In addition to this judgment Warme-Maynes offer a critical review of the literature. But theirs is not the only critical review. Consider the "literature review" section of the Avery-Bautista (1991) paper and you will encounter another, independent review with similar, but different emphases. Finally, in contrast to the Marketing literature reviewed by Warme-Maynes, Avery-Haynes (1991) and Avery-Bautista have undertaken strikingly original, but contrasting pieces of empirical research from the consumer viewpoint. Avery-Haynes have done an economic benefit-cost analysis of couponing while Avery-Bautista have analyzed the psychological payoffs.

Let me deal now with further lessons for consumer educators and their clients, intelligent consumers. First, let me note the substantial gross and net economic payoffs to coupon usage estimate by Avery-Haynes, amounting to 11 percent and 1.8 percent respectively of household income. Not bad!! But let me note that Avery-Haynes have ignored one enormous boon to couponers: "income" from couponing, the gross and net gains that Avery-Haynes have documented, are better than ordinary income. The reason: this kind of income is not taxed. Assuming a plausible marginal tax rate of 40 percent (28 percent Federal + 4 percent state income tax + 8 percent Social Security tax--up to

about $50,000), the true gross and net gains from couponing come to 18 percent and 3 percent respectively. Rather impressive!!! The kind of gain that, when explained to an appreciative mate, following Role Theory, should induce warm approbation.

Should coupon users seek to redeem coupons for all the brands and for all the products that one normally buys? Certainly not!! The selling policy of an insurance saleswoman belonging to the Million Dollar Round Table is instructive. The Round Table includes (agents who sell more then $1 million face value of life insurance per year). This particular member of the Round Table confined her sales efforts to prospects whom she thought to be "good for" policies with a face value of $200,000 or more. The lesson for couponers: establish a threshold value--say fifty cents--and trouble yourself only with coupons with redemption values greater than this. Of course, there are psychic payoffs from couponing in addition to the economic costs and benefits. Consideration of these should enable you to choose a threshold value appropriate to your circumstances.

To further discharge my responsibilities to consumer educators, let me point out that couponing is but one type of price discrimination from which consumers can benefits. Others include:

Genuine "Sales" of all types;
Bargaining
Off-Peak Discounts for Movies,
   "Early Bird" Meals, Off-Season
   Rents
Discounts to Members of Groups:
   Your Office Group, Eagles,
   Church/Synagogue Members,
   Boy/Girl Scouts, etc., etc.
Loyalty Clubs or Lists, e. g.,
   Frequent Flyer Coupons on
   Airlines, "Special" Sales to
   longtime customers
Upgrades, e.g., from an ordinary
   double hotel room to a suite,
   from Coach to First Class on
   Air Travel, etc.

Maynes 1990 offers a nontechnical review of Price Discrimination and a guide to consumers who wish to expand their income by taking advantage of price discrimination arrangements.

Lessons For Consumers Of Research

Be warned about the Warme-Maynes paper. This is a review-of-the-literature paper that is only as good as the care, the judgments, and the arguments of the authors. The paper presents no new empirical evidence. Unhappily, the only way for you to assure yourself of the correctness or uncorrectness of their conclusions is to redo the entire task yourself.

The Avery-Bautista paper presents another type of problem. It utilizes an indirect psychological measurement technique called projection. The respondent in their survey is asked to record his/her agreement or disagreements with such statements as:

"Coupon users are thrifty shoppers";

"Clipping coupons is fun."

It is assumed that a respondent answers such questions in terms of his/her own attitudes. But we do not know whether this in fact occurred. In trying to establish relationships between these psychic variables and coupon use, Avery-Bautista use widely accepted and sophisticated factor analysis techniques to analyze data obtained by projection techniques. Despite the sophistication and care invested in their analysis I am struck by the paucity of statistically significant relationships between the psychological variables and coupon use--about one statistically significant variable in each equation.

Could it be that direct questioning of coupon users and non-users might have elicited more illuminating insights and a greater number of statistically significant relationships? Suppose respondents were asked:

To what extent do coupon redemptions give you a feeling of "winning"? (Answer on a 0 to 10 scale.)

To what extent do you use coupons to try out new products at low cost? (0 to 10)

In my judgment it is worth a try.

Turning to Avery-Haynes, let me remind you that their study was confined to economic gains from couponing contrasting with the Avery-Bautista and Warme-Maynes who assert that psychological factors such as "winning" and obtaining satisfaction from the role of efficient purchasing are the dominant determinants of coupon use. Thus, Avery-Haynes, while fascinating, deals with only a portion of the "income" accruing from couponing.

Let me warn you that the Avery-Haynes study is based on a double survey: (1) a telephone survey of consumers, and (2) a mail-follow-up of a random subset of the telephone study. The paper tells us that survey #2--the mail survey achieved a 65 percent response rate, but nothing about the response rate achieved in the parent telephone study. Some may view a nonresponse rate of 35 percent as commendable. As an old survey researcher, I would assert that it is commendable only if the researchers provide us with convincing evidence that the nonrespondents are indeed "highly similar" to the respondents. If there is a substantial nonresponse bias, we may be misled, no matter how sophisticated or careful the analysis of the survey.

Finally, I urge Avery-Haynes to recognize that the economic gains from couponing that they have measured are indeed "untaxed income" and are therefore equivalent to a substantially larger amount of taxed income. (If the marginal tax rate is 40 percent, then each dollar of untaxed income is equivalent to $1.67 of taxed income.) A difference worth noting.

Summing up, these papers have instructed and stimulated us.

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Role Theory: A Psychographic Explanation for Coupon Redemption

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Previously published theories have isolated many of the costs faced by coupon redeemers, which often vary with the consumer's demographic characteristics. We attempt to integrate these findings into Role Theory, in which rational consumers consider both costs and benefits of couponing. By analyzing both economic and psychic factors in coupon redemption, which are suggested by psychographic variables, Role Theory attempts to predict couponing behavior even within a changing sociocultural context.

Introduction

Several theories have attempted to explain the somewhat surprising profile of the typical cents-off coupon redeemer: "a household with higher than average income, several family members, and a female head with higher than average education who does not work outside the home" (Levedahl 1988; Narasimhan 1984). This profile counters our intuitive prediction because high-income, highly educated consumers presumably have higher time costs (Levedahl 1988) as well as lower perceived marginal utilities for the money saved by using coupons, making coupon redemption less attractive (Levedahl 1988).

Numerous factors must be considered in interpreting coupon usage. Changing sociocultural variables influence which family members shop and the goals of these shoppers. Promotional tools as well as consumer products attract a target market; coupons enhance sales to consumers who have a specific role perception. That this role perception has led to higher coupon use among high income, highly educated, non-working wives and mothers results from the sociocultural environment rather than immutable characteristics of the shoppers who match this description.

Table 1 summarizes the consistent findings concerning consumers who use coupons. Coupon users are more likely to be female, to head large families, to be married with children, to have higher than average income levels, and

Table 1
Coupon Usage Segmentation

Characteristic	Coupon Users Likely to:	Non-Redeemers More Likely to:
(1) Household Size	large	live alone
(2) Sex	female	male
(3) Age	32-59	<32 or >72
(4) Marital Status	married	single
(5) Children	have kids	no kids
(6) Income	$20K to 50K	<20K or >50K
(7) Years Shopped	≥ 10 years	<10 years
(8) Shopping Frequency	<3 times/wk	≥ 3 times/wk
(9) Time Spent Shopping	≥ 1/2 hour	<1/2 hour
(10) Dollars Spent Shopping	≥ $20 per trip	<$20 per trip

Adapted from Meloy, 1988.

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to plan ahead for larger but less frequent shopping excursions.

The Case for Role Theory As the Dominant Explanation

Role Theory considers the coupon redeemer a rational economic person,

who compares the costs of coupon redemption with the benefits, where costs and benefits include both economic and psychic components. But the central idea of Role Theory is that psychic benefits occur when coupon redeemers perceive themselves or others perceive them to be successfully performing the behaviors associated with their role. Thus, Role Theory, in partial contrast to previous theories, discriminates among consumers on the basis of psychographic variables such as interests, values, and activities rather than demographic variables.

Our paper synthesizes and draws from several theories which have been developed to explain this surprising profile. We attempt to answer the critical question: What are the dominant, enduring theories and factors explaining coupon use? We believe that Role Theory provides the dominant explanation for coupon redemption behavior, as well as incorporating powerful aspects of previously suggested theories.

A Culling of the Literature

The "Efficiency Hypothesis"

One explanation for the high income, highly educated profile of the coupon redeemer is the "Efficiency Hypothesis." It asserts that consumers with more income and education "are better able to locate, sort, organize, and cash in coupons" (Levedahl 1988). Similar reasoning explains how this group tends to benefit from other forms of price discrimination as well.

However, as Antil argues (1985), more efficient search behavior cannot entirely explain higher rates of coupon redemption, since coupons have promotional value, and have been shown to increase sales more effectively than simple price reductions.

The Effect of Coupon Availability

Restricted availability of coupons has also been suggested as a reason for lower coupon use among less educated, lower income groups, who spend significantly less for reading material. Ninety percent of coupons are distributed in newspapers and magazines (D'Arcy, et. al. 1986), and direct mail distribution may be tailored to higher income groups.

However, consumers influenced by coupons in their purchase decisions listed product packages as one of their top two sources of coupons (Teel, Williams, Bearden 1980). Even when coupons are available, consumers still must take additional steps to redeem the coupons.

Income As a Determinant of Coupon Use

Narasimhan (1982) proposes that higher income households prefer higher-priced brands. Thus, on average, high income coupon users pay a higher pre-coupon price, using coupons as a means of purchasing these higher-priced brands cheaply. Yet consumers who redeem coupons use them over a wide range of product classes (Meloy 1988), suggesting that differences in demand elasticity result from differences in the opportunity costs of couponing rather than brand preferences.

Bawa and Shoemaker (1987b) argue that coupons help impulse purchasers by reducing the perceived risk of buying an unfamiliar brand since coupons are often distributed for new brands. While Bawa and Shoemaker don't correlate brand loyalty with income, Meloy observes that as income increases, brand loyalty decreases (1988). However, Meloy's observation may well depend on the working status of the female shoppers in her sample, since the higher income shopper she describes is more variety-seeking than the contrasting lower-income shopper, and since brand loyalty saves the step of price comparison and evaluation.

Blattberg, et. al. (1978) concluded that income is a confounding variable confusing the relationship between income and coupon redemption rates. They point out that household resources such as car and home ownership reduce the transactions costs of shopping and thus increase 'deal proneness.' Unfortunately, since household resources are positively correlated with household income, we cannot determine which variable is operative. Further, the employment status of the wives is also highly correlated with household income.

Two criticisms apply to all of these theories. First, these explanations focus mainly on the costs of couponing for high income families. Both costs and benefits should be considered. Second, all of these theories were developed within a relatively short time span, and they make implicit assumptions about the sociocultural context.

As a result, these theories fail to predict changes in coupon redemption rates across groups as the sociocultural context changes. As a larger percentage of women work outside the home, and as the number of single parent households increases, there has been a fragmentation of the grocery market. Those who shop for groceries are more often men, working females, or unmarried females.

Though these hypotheses focus on the costs of coupon redemption to the exclusion of benefits, they still contribute to the cost benefit evaluation inherent in Role Theory. At present, higher income, more highly educated consumers have more household resources, more available media sources, and may perceive less risk in buying a new brand. These are important considerations in Role Theory as well, though Role Theory considers them in a less socioculturally-bound manner than the other theories.

Role Theory

As mentioned earlier, Role Theory considers the coupon user a rational economic person, who compares the savings achieved by using coupons with the time cost of using coupons. The benefits of coupon redemption include not only dollars saved, but also the psychic benefits of being a "smart shopper" (Schindler 1986). Hernandez (1990), in an analysis of home production roles, found that consumers spend time on household production based on both intrinsic rewards, such as the financial benefits derived from the activity itself, and extrinsic rewards, such as the approval of a spouse. These extrinsic rewards can be compared to role fulfillment, or psychic benefits.

To the extent that its psychic benefits decrease, coupon use will also decrease, since the rational shopper then perceives benefit only in the financial reward. Thus, while the opportunity costs of couponing are likely to be higher for the well educated, higher income consumer, the psychological benefits may be high enough to compensate.

Shimp and Kavas (1984) suggest that the perceived benefits of coupon use, such as money saved or praise from a spouse, and the perceived costs of couponing, such as buying non-preferred brands or spending time clipping coupons, vary among consumers. Therefore, couponing behavior is highly subject to both personal attitudes and family dynamics.

As illustrated in Table 2, we know that even among the broad category of regular coupon redeemers, we can differentiate among consumers based on intensity of coupon use. Consistent with the predictions of role theory, this table shows that consumers who are light users are more likely to be single and career oriented. Not surprisingly, the characteristics of light users more closely parallel attributes of non-redeemers.

The psychic benefits of coupon redemption include self-satisfaction as well as the approval of others. The "Smart Shopper mechanism" is Schindler's (1986) label for the fact that coupons allow the consumer to feel good about paying a lower price for a product, thus motivating the consumer to purchase the product. A survey by Meloy (1988) indicates that a majority of shoppers feel that coupons allow them to purchase a more expensive brand of the product than they would otherwise have purchased.

If the net benefits of couponing are more favorable in the traditional family setting, then we can expect the role of the price-conscious shopper and couponing behavior to become less influential as the number of traditional families declines and as women join the labor force.

What is the evidence for Role Theory? If Role Theory is correct, then family members who achieve recognition through this role will use coupons across many products, often over extended periods of time. This is exactly what various studies have found. For example, Bawa and Shoemaker (1987) found that consumers are consistent in their coupon usage. When

Table 2
Of all Coupon Users, Differentiating Characteristics of Heavy vs. Light Coupon Users

Characteristic	Heavy User Likely to:	Light User More Likely to:
(1) Household Size	≥ 5 people	1 person
(2) Education	high school	college
(3) Age	≥ 45 years	less than 32
(4) Marital Status	married	single
(5) Female Work Status	family-oriented	career-oriented
(6) Number of Kids	≥ 1 children	none
(7) Income	10K to 40K	<10K or ≥ 40K

Adapted from Meloy, 1988.

redemption rates were evaluated during two separate year-long periods, 75% of consumers were either above average or below average in redemption rates during both periods.

The A.C. Nielsen 1985 survey of shoppers found that most of those using coupons reported redeeming between one and four coupons per week. According to a survey by Meloy (1988), over half of those who use coupons redeem some on every shopping trip. We also know that coupon users differ from non-redeemers in that they engage in other behaviors consistent with the price-conscious shopper role. For example, they tend to scan newspaper advertisements before shopping (Teel, Williams, Bearden 1980).

Teel, Williams and Bearden (1980) found that those influenced most by coupons differed psychographically from other groups. Those who regularly redeem coupons are more likely to purchase products on impulse, which is compatible with the notion that coupons decrease the perceived risk of trying unfamiliar brands. They used more coupons, redeemed coupons more frequently, perceived larger savings from redemption, and enjoyed both grocery shopping and collecting/ redeeming coupons more than others (Teel, Williams and Bearden 1980). All of these activities and attitudes are consistent with a commitment to homemaking and a perception of great rewards for performing the role of the smart shopper.

The Future for Coupons

The next question is how this psychographic profile of the coupon user can be used to predict future rates of coupon redemption across groups. According to Zeithaml's (1985) analysis of the grocery market, working women may consider price and coupon savings less important in grocery purchases than convenience and time savings. Hence, they are likely to achieve more satisfaction from their professional work role than from the traditional homemaker/purchasing agent roles. In contrast to those in the traditional home management role, these working women have earning power and other sources of satisfaction and accomplishment. Consistent with this, working wives are less likely to report checking prices or using coupons (Zeithaml 1985).

However, although the time and effort devoted to homemaking duties may differ between employed and unemployed women, differences in attitudes do not arise from employment status alone. Women cite different reasons for working, and some continue to hold traditional views of household duties. The fact that many women are working out of economic necessity rather than to fulfill career aspirations may explain the continued popularity of coupons.

Consistent with Role Theory, Zeithaml's survey (Table 3) shows that women who stay at home plan more and use more information such as nutrition labeling when shopping. They are more likely than working women to agree with such statements as "Shopping Is Fun" and "Shopping Is an Important Task." This table shows that working women who view their jobs as "careers" score considerably lower on these variables than those who work for other reasons.

Table 3
Effects of Women's Working Status on Shopping Behavior[a]

Variable	All Women	Stay at Home	Just a Job	Career
		Female Working Status		
	Mean Scores[b]			
Extent of planning	11.31	12.13	11.19	9.67
Extent of information usage	13.23	13.80	12.85	12.50
"Shopping is Fun"	2.04	2.91	1.68	1.04
"Shopping is an important task"	4.2	4.58	3.99	3.8

[a]Adapted from Zeithaml, 1985
[b]Numbers in the table represented the scoring of questions asked in the survey. A higher score denotes greater agreement with each aspect of shopping behavior. Scores on the first two shopping variables run from 3 to 15 while scores on the last two run from 1 to 5.

As the number of non-married shoppers increases, psychic benefits such as the approval of a spouse are likely to become less important. An increase in the number of male shoppers may decrease the rate of coupon redemption among high income, highly educated consumers. Coupons may not influence male shoppers as effectively as female shoppers, because "males do not view shopping, planning, and economizing the same way females view them," regardless of their demographic characteristics (Zeithaml 1985). It seems that coupon use is not as role fulfilling for men as for women.

Some Mitigating Factors

If the sociocultural shifts we noted represent a trend, why haven't we observed precipitous declines in coupon distribution and coupon use? Empirical evidence suggests that even though substantial demographic changes have already taken place, coupon use is still high (Reibstein and Traver 1982; Vilcassim and Wittink 1987).

There are several mitigating factors. One explanation is that both the supply and demand sides of the coupon market have changed. Since coupons themselves have changed, consumers are now faced with different choices. Face values of coupons have increased over time (Reibstein and Traver 1982), boosting incentives to use coupons. In addition, retailers more commonly offer double and triple coupon savings. The popularity of coupon redemption has also increased the number of stores offering and accepting coupons as a matter of practice. On the demand side, seeing other shoppers redeeming coupons may influence consumers to incorporate couponing into their own definition of the shopper's role, and make consumers feel guilty if they don't use coupons.

A second explanation is that despite changes in the factors influencing role perception, shoppers may be clinging to past perceptions and behavioral patterns. Shoppers base their couponing behavior on both current and past influences. For example, when a woman re-enters the labor force after a period of voluntary unemployment, she may go out of her way to maintain the same couponing behaviors. Zeithaml (1985) makes a related point when she argues that age influences the shopper's attitude toward shopping, indicating either that consumers develop habits, or that individuals are influenced differently by certain costs, such as the opportunity cost of time.

Researchers have presented conflicting reports concerning the effects of age on coupon redemption. Several researchers have found that age and the number of years the consumer has shopped are positively correlated with coupon redemption. This is also predicted by the Efficiency Hypothesis, since experience may lead to lower costs of coupon redemption. Our feeling is that the effects may be product specific, or overridden by the effects of other variables, such as the sociocultural context experienced during certain stages in one's life.

To make a valuable contribution, Role Theory must suggest future trends in couponing. Role theory suggests that coupon use is not inherently the domain of certain consumers, based on sex, income level or education, but is subject to change with sociocultural influences on buying behavior. As more women consider themselves a permanent part of the labor force, we will probably see fewer differences in couponing behaviors between high and low income groups, or between consumers with higher and lower levels of education.

Yet other theories and even current trends in the marketplace suggest that coupons are here to stay. As those who shop for groceries become a more heterogeneous group, role theory predicts a fragmentation of the target market for coupons. While coupons may remain an effective promotional tool for a smaller market, our prediction is that marketers who target consumers with coupons based on demographic characteristics alone will be less and less successful as these changes develop.

Some Avenues for Future Research include:

- Studying the different effects of manufacturers' versus retailers' coupons, given that their distributions may be differently motivated. For example, retail coupons may serve as loss leaders to attract customers to the store.
- Documenting the effects of double and triple coupons.
- Analyzing whether there will be further demographic fragmentation in the grocery market.

More current figures are also needed concerning the amount by which coupon redemption reduces the consumer's grocery bill. For consumers, coupon savings are even more valuable than regular income, since the

savings are not taxed. For example, for consumers at a 35% marginal tax rate, saving one dollar using coupons is equivalent to earning $1.54 of additional (taxable) income!! Yet consumers may not even be aware of this important difference! Here is a task for consumer educators.

Information on both gross payoffs, calculated before search costs are deducted, and net payoffs, which would vary with the shopper's role perceptions, would also be of interest to economists. These findings could be stratified by characteristics such as intensity of coupon use.

We call your attention to two consumer-oriented studies which had not yet been added to the predominantly marketing-oriented literature in the field at the time of our review. The Avery-Haynes study (1991) seeks to document both gross and net savings from couponing and the Avery-Bautista study (1991) seeks to measure psychological benefits from couponing.

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Price Discrimination in the Grocery Market? A Cost Benefit Analysis of Coupon Use

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Price reductions offered via coupons have been criticized on the grounds that they discriminate against certain groups of consumers and provide only illusionary savings. This study identifies possible discriminatory effects of coupons and describes the net savings/losses accruing to consumers from coupon use. Results indicate that most consumers realize real net savings from coupon use; and coupons don't appear to discriminate against consumers based on the "costs" of the couponing activity.

Coupon exchange is an aspect of market functioning that has experienced near phenomenal growth over the last few decades. Manufacturer and retailer sponsored coupons have been recognized as an effective marketing tool since their first introduction by C. W. Post in 1895. Since 1895 the number of coupons distributed by both manufacturers and retailers has grown rapidly from approximately 2.1 billion in 1970 to 221.7 billion issued in 1988. In 1970, 58 percent of households reported using coupons, and by 1980, 76 percent households were taking advantage of this type of promotional offer. The total number of redeemed coupons in 1988 was 7.05 billion, representing an estimated $2.93 billion of consumer savings (Antil 1985). In 1989, the latest year for which figures are available, manufacturers distributed an estimated 267.6 billion coupons (approximately 2,910 per household) with a total potential savings of nearly $132 billion per year (Wall Street Journal 1991).

Faced with the potential of such significant market savings, many consumer advisors and educators have recommended and endorsed the use of cents-off coupons as an economizing measure in weekly grocery shopping. Empirical evidence suggests that coupons appear to meet the market test of satisfaction and value in that they are used, and the continued growth in coupon distribution and redemption offers strong evidence of the high level of consumer interest in coupons (Bawa and Shoemaker 1987; Blattberg et al. 1978; Levedahl 1988; Neslin and Clarke 1987). However, since the early 1970's a group of consumer researchers and advocates have been debating the virtues of this form of promotion from the perspective of the individual consumer, and more broadly in terms of social welfare (Uhl 1982; Antil 1985; Peckham 1978; Cotton and Babb 1978; LaCroix 1983; Varian 1985). Price reductions offered via coupons have been criticized as discriminatory against low income consumers, minority consumers, and consumers with a high opportunity cost of time. They have been further criticized on the grounds that they increase prices, create demand surges and distort consumer decision making by providing only illusionary savings (Uhl 1982).

At the heart of this debate is the possible psychological impact that couponing may have on some consumers. Uhl (1982) holds that coupons contain a built in bias. Consumers have a clear financial incentive to use them, and in fact are penalized if they don't use them, but these incentives distort perceptions by creating the illusion that one is getting "something for nothing." The consumer may in fact be interpreting the coupon redemption value as compensation for their couponing activity. Uhl (1982) holds that for many consumers this may well be an accounting error and that the time and energy cost invested in the activity of couponing are an economic dead weight loss resulting in consumers donating their time and energy cost in service to the coupon sponsors. Other researchers are in agreement with this view. It has been suggested that the "thrill of dealing" (Antil 1985) or feelings of being a "good shopper" (Schindler 1984, 1988a, 1988b) that result from coupon redemption are, in fact, leading consumers to undertake economically irrational behavior.

There has been no empirical evidence to date to resolve this debate. Little is known regarding consumers' time and effort in coupon related activities nor the fruits of

this labor in terms of dollars saved. The work reported in this paper attempts to address this issue. The empirical analysis focuses on identifying the determinants of coupon use and describing the "real" savings accruing to consumers from coupon use. The hypothesis explored in this research is that price reductions offered via coupons discriminate against those consumers who face a high opportunity cost of their time and/or those who face severe time constraints in their purchase activities. In addition, an analysis is performed to identify groups of consumers who may be potential net "gainers" or "losers" from couponing in economic cost accounting terms.

The next section presents the conceptual framework, based on a model developed by Shimp and Kavas (1984) and a theory of information search developed by Stigler (1961). This conceptual framework forms the basis of the empirical analysis in this research.

Conceptual Model

The guiding premise in this research is that coupon use is rational, systematic, and thoughtful behavior. Households are assumed to make decisions in regard to the extent of coupon use in an attempt to maximize their utility, subject to constraints on their resources. Utility is obtained from market goods and services which are of two types, those purchased with coupons and those purchased without coupons. The price of goods purchased without coupons (X_i) is assumed to be P_i. The price of goods and services bought with coupons (X_i^*) is more complex. Coupons provide benefits in the form of dollar savings resulting from lower prices paid for products. However, there are certain costs associated with coupon use. These costs include both fixed costs (which do not vary with the number of coupons processed by the consumer) and variable costs (which vary directly with the number of coupons processed by the consumer).[1] Fixed costs include the money paid by the consumer for coupon sources, i.e., newspapers, magazines, etc., as well as the time and effort expended by the consumer in scanning newspapers and other coupon sources for desired coupons. Variable costs refer to cost incurred for "handling" coupons. These costs include time and effort spent clipping, sorting, filing, and redeeming the coupons in the store.

Consumers are assumed to be rational in their behavior in that they will use coupons if the marginal

benefit of redeeming the coupons (reduction in price) exceeds the marginal cost of handling and processing the coupons. Restating this notion, coupons will be used under the following conditions, if

$$\sum P_i + P_{pm} + [T_{pm} + \sum T_{hi} + \sum T_{si}] * W - \sum C_i < \sum P_i \quad (1)$$

or

$$(P_{pm} + [T_{pm} + \sum T_{hi} + \sum T_{si}] * W) < \sum C_i \quad (2)$$

where:

$\sum P_i$ = weekly grocery expenditure before coupon redemption

P_{pm} = money spent on the purchase of magazines and other print material

T_{pm} = time spent scanning print materials for coupons

$\sum T_{hi}$ = time spent in handling coupon i

$\sum T_{si}$ = time spent redeeming coupon in store

W = dollar value of grocery shopper's time

$\sum C_i$ = face value of redeemed coupon

Equation 1 states that it would be rational for the consumer to use coupons if the total benefit of couponing (real price reduction) is greater than the full cost of couponing.

Based on the rationale developed above, the consumer's decision to use coupons may be framed in terms of a time/money trade-off since the "costs" associated with coupon use are primarily time related. From equation 1 it would be predicted that consumers facing severe time constraints or consumers with a high money value of time would be less likely to use coupons. In the following section an empirical model is formulated to test these predictions.

Method

Data and Sample

Data for this analysis were obtained in Columbus, Ohio during 1990. The data were obtained as part of a larger study of grocery shopping behavior designed and funded by The Ohio State University (Department of Marketing) and collected by Spencer Research Associates of Columbus. The study consisted of a telephone interview and follow-up mail survey administered to a random sample (generated by random digit dialing) of households in the Columbus, Ohio metropolitan area. The telephone interview focussed on aspects of grocery shopping such as respondents'

store patronage, reasons for store patronage, weekly expenditure on groceries, time spent grocery shopping (including travelling time) and various buying strategies including price comparisons, purchasing on special, and coupon use. The mail survey contained a battery of attitude statements regarding the functioning of the grocery market, perceptions of the quality of service in this market, price dispersion in the market, and consumer attitudes toward coupon usage.

Telephone interviews and mail surveys were completed by the primary grocery shopper in the household. Six hundred telephone interviews were completed, and the response rate to the mail survey was 62 percent (N=373). An observation was used in the analysis if it had complete information from both the telephone interview and mail survey, resulting in a sample of 373 respondents. Missing data and other data related problems further reduced

the final sample size to 358 respondents.

Description of the Sample
Table 1 summarizes the descriptive statistics for those respondents who were light coupon users (clipped less than eleven coupons per week) and heavy coupon users (those that clipped eleven or more coupons per week). Primary grocery shoppers in the household were predominantly female (85 percent). Non-users of coupons were more likely to be male. The average age of respondents in the sample was 46.2 years. Mean age and educational level were not found to differ significantly by coupon use intensity. Coupon users differed from non-coupon users in that a significantly higher proportion of non-users were unmarried. Coupon users were more likely to have young children in the home and live in larger families. Average household size was 2.1 for non-users and 3.0 for heavy users of coupons. Heavy coupon users were more

Table 1
Characteristics of Coupon Users by Intensity[a]

Characteristic of Primary Grocery Shopper		Coupon Use Category			
		Total Sample N=358	Non-Users N=62	Light Users N=165	Heavy Users N=131
Age	Mean	46.2	45.0	48.8	43.6
	Std. dev.	17.2	20.6	17.6	14.5
Sex	Female	85	69	86	92
	Male	15	31	14	8
Marital Status					
	Married	61	37	58	76
	Not Married	39	63	43	24
Education					
	Less than HS	8	6	8	9
	Completed HS	29	24	29	31
	1-3 years college	29	29	27	30
	4 years college	21	18	24	20
	> 4 years college	13	23	12	10
Living with children 6 years or younger					
	None	81	92	84	73
	1 or more	19	8	16	27
Household Size					
	Mean	2.6	2.1	2.3	3.0
	Std. dev.	1.3	1.2	1.2	1.4
Employment Status					
	Working	70	68	68	73
	> 20 hours	66	60	66	69
	< 20 hours	4	8	2	4
	Not working	30	32	32	27
Annual gross household income					
	Mean (in $1,000)	41.5	35.1	40.3	46.1
	Std. dev.	27.8	24.8	29.1	27.0
Weekly grocery expenditure					
	Mean ($)	64.7	52.5	62.0	73.9
	Std. dev.	33.4	29.4	32.6	34.6
Time spent grocery shopping each week					
	Mean (in min.)	95.3	79.4	91.5	107.9
	Std. dev.	52.0	47.7	49.8	54.2

likely to be in the labor force and working full time. Mean yearly household income for the sample was $41,500. As a category, heavy coupon users were found to have a slightly higher mean yearly household income $46,100. On average, coupon users were found to spend more money on groceries per week ($73.90 for heavy users compared with $52.50 for non-users), and more time in the grocery store (107.9 minutes for heavy users compared with 79.4 minutes for non-users).

The next section defines and discusses the dependent and independent variables employed in the empirical model.

Empirical Measures

Coupon Use and Savings

In the telephone interview respondents were asked if they used coupons in their weekly grocery shopping. In addition, coupon users (defined as those who clip at least one coupon per week) were asked the estimated dollar amount saved each week with the use of these coupons and their estimated weekly grocery expenditure. A variable was created to indicate the net proportion (net of time and coupon source costs) of weekly household grocery expenditures saved by using coupons (CSAVE). This variables was calculated as follows:

$$\text{SAVE} = \sum C_i - [P_{pm} + (T_{pm} + \sum T_h + \sum T_s) * W] \quad (3)$$

$$\text{CSAVE} = \text{SAVE} / (\sum P_i + \sum C_i) \quad (4)$$

where:

SAVE = net dollar savings from coupon use

CSAVE = net proportion of household grocery expenditure saved by using coupons

Resource Constraints and Control Variables

Four variables were created to indicate the degree of time pressure experienced by the primary grocery shopper. The first of these variables (HHSIZE) indicates the number of individuals in the respondents household. Larger household sizes are assumed to be associated with larger food expenditures and greater time spent shopping. The second time variable is a dummy variable created to indicate the presence of children under six years of age (KIDL6) in respondent's home. The presence of pre-school children in the home is assumed to be associated with specific time pressures. Labor force participation of the primary grocery

shopper can severely constrain the time available for household production, including grocery shopping. Dummy variables were entered into the model to indicate labor force participation by the primary grocery shopper (EMPSTAT) and a variable indicating actual hours of labor market work per week (LFPHRS).

The argument was made previously that consumers with high money value of their time, i.e., high wage individuals, would be less likely to use coupons. The wage rate of the primary grocery shopper (LWRATE) was entered into the model in its natural logged form.[2]

The marketing literature reports several demographic characteristics which have been associated with coupon use. These factors include household income, availability of personal transportation, marital status, age and sex. A set of variables was created to control for these effects in the model. Note that the variable AGESQ is included in the model to capture the reported non-linearities between coupon use and age (Lee and Brown 1985). Based on findings from previous research which provides evidence of a non-linear relationship between coupon use and household income, household income was entered into the model in the natural logged form.[3] Descriptive statistics on all the variables used in this analysis are presented in Table 2.

Empirical Models and Estimation

The regression model attempts to explain variation in the net proportion of grocery expenditure saved by coupon use in terms of household time constraints and the money value of time of the primary grocery shopper, while controlling for the demographic characteristics of the coupon user. The model was estimated using the SAS Proc Reg linear models algorithm. Results of this analysis are reported in Table 3.

Based on results from the estimation of the model a simulated cost/benefit analysis was undertaken using two alternative specifications for the consumer's cost of time and selected characteristics for three groups of consumers to identify potential "net gainers" or "net losers" from coupon use. Results of this simulation are reported in Table 4. Results of this analysis are reported and discussed in the following section.

Results and Discussion

The estimation results for the regression model are summarized in

Table 2
Variable Description

Variable Name	Variable Description	Mean or Proportion of Sample
COUPON	Respondent is a coupon user	82.7%
SAVE	Net dollar saving from coupon use	$2.10
CSAVE	Net proportion of weekly grocery expenditure saved by using coupons	1.8%
HHSIZE	Number of household members	2.6
KIDL6	Children under six present in the home (yes)	19.0%
LFPHRS	Hours of market work (hours/week)	26.5 hrs
EMPSTAT	Primary grocery shopper is employed	70.2%
LWRATE	Market wage rate of shopper	$9.0
LHHY	Predicted annual family income	$41,500
CAR	Respondent owns a car	87.0%
MSTATUS	Primary grocery shopper married	61.0%
AGE	Age of primary grocery shopper	46.2 yrs
SEXF	Primary grocery shopper is female	85.0%

Table 3
Regression on Net Proportion of Weekly Grocery Expenditure Saved by Using Coupons, Using Minimum Wage Rate ($3.65) as the Estimate of the Cost of Consumer's Time in Couponing Activity

Variable Name	Parameter Estimate	Standard Errors
Intercept	0.0045	0.0446
HHSIZE	0.0065	0.0049
KIDL6	0.0292*	0.0153
LFPHRS	0.0014**	0.0006
EMPSTAT	−0.0571**	0.0252
LWRATE	0.0018	0.0061
LHHY	−0.0135*	0.0077
CAR	−0.0048	0.0159
MSTATUS	−0.0008	0.0129
AGE	0.0008*	0.0005
AGESQ	−0.0001**	0.0000
SEXF	0.0339**	0.0142

N = 358
$F_{(11,346)}$ = 3.784
R^2 / R^2 adj. = .1074/.0790

*Coefficient significant at the .10 level
**Coefficient significant at the .05 level or less

Table 4
Cost/Benefit Analysis

KEY

Costs and benefits		Consumer Group
1 = source costs	6 = percent saved	LW = Low Wage[a]
2 = time in couponing	7 = $ grocery	HW = High Wage
3 = cost of time	expenditure	LV = Low Income[b]
4 = total time cost	8 = $ saved	HY = High Income
5 = total cost	9 = net savings	

ANALYSIS USING MINIMUM WAGE RATE

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Single Respondents:									
LW, LY:	1.96	24.63	3.65	1.50	3.46	12.50%	38.35	4.79	1.34
LW, HY:	2.88	27.66	3.65	1.68	4.56	5.00%	64.55	3.23	-1.34
HW, LY:	2.01	29.56	3.65	1.80	3.81	13.30%	44.69	5.94	2.14
HW, HY:	2.51	37.79	3.65	2.30	4.81	14.50%	56.09	8.13	3.32
Married Respondents:									
LW, LY:	2.31	29.60	3.65	1.80	4.11	8.90%	62.23	5.54	1.43
LW, HY:	1.97	28.83	3.65	1.75	3.72	8.60%	80.11	6.89	3.17
HW, LY:	1.55	36.95	3.65	2.25	3.80	13.33%	72.43	9.65	5.86
HW, HY:	2.33	22.30	3.65	1.96	4.29	9.70%	82.71	8.02	3.73

Table 3. The results do not support the hypothesis of discrimination against consumers with high time pressures in the grocery market. In fact, employed individuals and individuals in households with higher than average household income were found to obtain significantly lower savings from coupon use. Those individuals working longer hours in the labor force and those with children under six in the home were found to accrue significantly higher proportion saved from the use of coupons.

A surprising result is that the individual's market wage rate was not a significant predictor of the net proportion saved from this activity. This result would suggest that an objective measure of the consumer's opportunity cost of time (i.e., market wage rate) is not the appropriate measure of time costs used by the consumer in his/her evaluation of time in search and purchase activities. Much of the literature on market search behavior suggests that consumers use an implicit value of their time in their purchase decisions, evaluating the marginal costs and benefits of each transaction. These results would appear to indicate that, in couponing, this value is not the individual's wage rate.

Having investigated the determinants of coupon savings, an interesting further analysis is to determine the dollar amounts involved in these evaluations. Table 4 reports the results of a cost benefit analysis performed to identify groups of consumers who are likely to be "net losers" or "net gainers" in couponing transactions. The minimum wage rate was used in these analyses to value the time of the primary shopper. Results indicate that, using the minimum wage rate to evaluate consumer's time in couponing activity, very few consumers are net losers in these transactions. Net savings ranged from $1.34 per week for low wage, low income single individuals to $5.86 for high wage married individuals in low income households. Despite the fact that minimum wage is a conservative estimate of the value of time in couponing, one particular group of consumers emerged as "net losers" in this analysis. Results indicate that unmarried primary grocery shoppers with a low individual wage rate living in high income households are likely to lose, on average, approximately $1.34 per week from couponing.

What is striking about this type of market activity is the complicated mechanism by which price reductions are offered via coupons compared with other price promotional efforts. Coupons are issued at some real cost to the manufacturer/retailer which is passed on to the consumer in the form of a higher price (albeit trivial according to Antil 1985). The consumer then expends some non-trivial amount of money, time and energy in redeeming coupons. While the active involvement of the consumer in this type of market transaction process does not appear to be viewed negatively by consumers, the

true benefits to this type of activity are complicated and difficult to estimate, and the potential exists that some consumers will be discriminated against via these type of transactions.

Results of this study are encouraging for consumers. Results indicate that, using a conservative estimate of cost of time in couponing activity, consumers do in fact realize real benefits from coupon use, but that these savings are relatively small. In addition, savings offered via coupons do not appear to discriminate against consumers based on the "costs" of their involvement in the activity. However, in evaluating the results of this study it should be noted that the estimates of coupon savings are highly dependent on the price of time chosen in such an evaluation. In addition, it should be noted that coupon savings are in some sense better than ordinary income to the consumer in that they represent "pre-tax" real income. This fact would further inflate the savings estimates presented in this research.

Endnotes

1. Shimp and Kavas (1984) also include "substitution" costs in their model. These costs refer to the reduction in utility resulting from the purchase of a less preferred brand in order to realize the benefits from a coupon. Substitution cost could not be assessed in this research and are assumed to be zero. The implications of this assumption are discussed in the final section of this paper.

2. Results were robust across both specifications.

3. An alternative specification was estimated using dollar household income. Results of the analysis were not sensitive to these alternative specifications.

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An Examination of the Psychological Aspects of Purchase Behavior: Motivations for Coupon Use

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This research examines the psychological rewards of couponing and examines the role that these rewards play in explaining the dollar savings accruing from coupon redemption. Data were collected in Columbus, Ohio in 1990. Results indicate that the benefits of coupon use are both economic and psychological in nature. Some consumers were found to be net losers in couponing. However, the monetary losses from couponing may be "compensated" by positive feelings about self and by perceptions that coupons increase general purchase ability.

Introduction

Over the past few decades, couponing has grown into a major promotional tool for manufacturers. It has also become an important purchase strategy for consumers, with 79% of U.S. households redeeming coupons (Nielsen 1985). Coupons owe their popularity among marketers to their recognized cost-effectiveness, flexibility as a promotional device, and consumers' acceptance and generally favorable response to them. Extensive research has been undertaken focusses on couponing from the marketer's perspective with the purpose of enhancing its promotional effectiveness. In comparison, very little research has focussed on consumer's perceptions of the costs and benefits attached to coupon use.

The purpose of this research was to examine: consumers' perceptions of their own coupon use behavior; and, how these perceptions affect their shopping behavior, specifically, their actual coupon use.

Facts About Coupons and Couponed Products

From the marketer's viewpoint, couponing is a way to generate sales by providing consumers with the incentive to continue purchasing a product or to encourage trial of a new product. The number of coupons redeemed by consumers relative to the number issued is low (3.2% in 1988) although the incidence if coupon usage among consumers is high, with 4 out of 10 consumers using coupons every time they shop (Food Marketing Institute Survey 1988). The majority of coupons issued in the market are for mass-distributed packaged consumer goods, and the most popular distribution mechanism for these coupons is free-standing inserts in newspapers, although instant in/on-pack coupons have the highest redemption rates (Bowman 1980). Coupon face values have continued to increase in real dollar terms over the past decade (Nielsen 1985). Most of the top 20 couponed items have long purchase cycles (e.g., coffee, analgesics, bar soap, sanitary products, hosiery, air freshener, and bleach).

The Shopping Behavior of Coupon Users

Research has indicated that, compared with non-users, coupon users: shop more frequently at the grocery store; spend more money and time in the store on each shopping trip; are less brand loyal and more variety seeking in their shopping behavior; and, engage in more pre-store search activity (Meloy 1988; Ward and Davis 1978). Meloy (1988) found that the two most important factors consumers considered in deciding to use coupons were: past experience with the product; and, coupon face value. In addition, she found that the ease of coupon clipping was of little importance in the decision to use coupons. The majority of respondents in her study perceived that the use of coupons substantially reduced their grocery expenditure. In addition, coupons were not found to result in the purchase of products which were not needed or wanted.

Results of studies by Schindler (1989) and Shimp and Kavas (1984) lend support to the hypothesis that couponing activity provides more than just monetary benefits to consumers. They found that the benefits to couponing were both utilitarian and ego-expressive in nature. Utilitarian benefits included: the need to shop

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economically in response to inflation; to obtain information about products; and, to obtain higher quality products at a reduced price (substitution benefits). Ego-expressive benefits included: feelings of being a "smart shopper"; approval and support from family members which relates to support and encouragement for the efficient shopper role; and, feelings of winning, beating the system, or being in control of the price paid for a product in the market.

Objectives of the Study

The focus of this research was to investigate the role that these ego-expressive factors play in actual market behavior. Specifically, the question addressed was whether the ego-expressive factors (perceptions of the activity being fun and enjoyable, involvement with the role of grocery shopper, perceptions of being an expert in shopping) could explain why some consumers are net losers from coupon use.

Method

The Data

The data for this research were taken from a study of grocery shopping behavior conducted in Franklin County, Ohio by Spencer Research Associates for The Ohio State University. The study consisted of a telephone survey and a follow-up mail survey. Respondents were the primary grocery shopper for the household unit. The sample of telephone interviews was generated via random digit dialing. Of the 600 telephone respondents, 27 refused to participate in the mail survey.

Empirical Measures

Net monetary gain from coupon use. The net monetary gain from coupon usage (NMG) was obtained by evaluating the monetary benefits and monetary costs of couponing as follows:

$$NMG_i = B_i - C_i \qquad (1)$$

where:

NMG_i = net monetary gain from coupon usage of ith respondent

B_i = monetary benefits (average weekly dollar savings from use of coupons by the ith respondent)

C_i = monetary costs (average weekly direct and indirect costs incurred by the ith respondent in the redemption of coupons)

In the telephone survey, coupon users (defined as those who clip at least one coupon a week) were asked to estimate the dollar amount saved each week from couponing. The average reported weekly coupon savings was $7.80 and ranged from an average of $5.40 for light coupon users (those who clip 10 or less coupons a week) to $10.40 for heavy coupon users (those who clip more than 10 coupons a week).

There are both direct (dollar outlay) and indirect monetary costs (opportunity cost of time) involved in the use of coupons. In the telephone interview, respondents were asked the weekly amount they spent on coupon sources such as newspapers and magazines. About 18% of coupon users reported not incurring any of these direct costs. Indirect costs include the opportunity cost of time spent clipping coupons and the additional time spent in the supermarket resulting from coupon redemption. The average time spent in coupon clipping was 21 minutes per week. About 40% reported that the use of coupons resulted in additional time spent in the grocery store. Mean additional time spent in the grocery store was 20 minutes per week. The total cost of coupon use for each respondent was calculated as follows:

$$C_i = d_i + (s_i + a_i) * w_i \qquad (2)$$

where:

C_i = total dollar cost of coupon use of ith respondent per week

d_i = total weekly dollar expenditure on the purchase of coupon sources by the ith respondent

s_i = number of minutes per week spent clipping coupons by the ith respondent

a_i = additional number of minutes per week spent in grocery shopping by ith respondent as a result of coupon use

w_i = value of time of the ith respondent in couponing activity

Predicted reservation wage (Zick and Bryant 1983) was used to value respondent's time in couponing activities.

Non-monetary Benefits

The non-monetary benefits derived from coupon use may be summarized in three categories: (a) self-image benefits; (b) fun and enjoyment; and, (c) perceived rational benefits. In the mail survey, respondents were asked

to rate a set of attitude statements which were designed to capture the hypothesized non-monetary benefits of coupon use using a 5-point Likert scale ("strongly agree" to "strongly disagree"). To identify a parsimonious set of latent variables from the set of measured variables representing the ego-expressive motivations for coupon use, a factor analysis procedure was employed (Rummel 1970). Principal factor analysis was used to extract the initial factors. To enhance interpretability of the initial matrix of factor loadings, varimax rotation was employed. Using the greater-than-one eigenvalue criterion, 5 factors were retained for further analysis. These factors were interpreted as follows. Factor 1 was labelled the "self-image benefits" (IMAGE). Items loading on this factor related to the self-perceptions of being a smart, conscientious, price-conscious shoppers, having initiative, and being thrifty and budget-conscious. Factor 2 was interpreted as measuring the "fun" aspect of coupon use (FUN). Loading highest on this factor were statements which indicated that shopping with coupons, coupon clipping and swapping are fun. Factor 3 was interpreted as measuring the belief that coupon activity is "rewarding and worthwhile" (REWARD). Variables loading highest on this factor included those indicating that coupon use was "worth the time and effort", "savings are worth the effort", "creates good feelings of saving" and "reduces the grocery bill a lot." Factor 4 indicated that part of the benefits of coupon use is in the creation of a "purchase script" (SCRIPT). The highest loadings on this factor were on statements such as "coupons help shoppers choose what brand/product they will buy", "coupons reduce shopper loyalty to a single brand" and "coupons do not encourage the purchase of items not needed." Factor 5 identified the "purchase benefit effect" of coupons (PURCHBEN) Perceptions of "being able to upgrade purchases", "reduce the risk of trial of new brands", and "obtaining informational value from coupons" had the highest loadings on this factor.

Marketplace Expertise and Involvement

Four additional factors were extracted from a set of attitude statement measuring the individual's "maven" characteristics (i.e., activities of aiding and assisting other consumers in their purchase activities), grocery shopping involvement, and consumer's perceptions of their own knowledgeability of grocery stores. Factor 6 was interpreted as measuring "market maven characteristics" (MAVEN). This factor

describes coupon users' propensity to share information about the market such as prices, quality, new products, and best buys. Factor 7 was interpreted as "knowledge of quality service" (QUALITY). Loading highest on this factor were items regarding the consumer's perceived knowledge of the "best bakery", "best meat department", "best deli" and sources of "high quality products." Factor 8 was interpreted as measuring "general knowledge of grocery stores" (PRICE). It appeared to indicate awareness of the different grocery stores in the area and prices/specials offered in these stores. Factor 9 was interpreted as measuring "grocery shopping involvement" (INVOLVE). The variables which had the highest loadings on this factor were statements that indicated strong interest and involvement in grocery shopping.

Using the loadings on the set of identified factors representing the non-monetary benefits of coupon use, factor scores were computed and used as explanatory variables in the estimation of the empirical model.

Demographic Control Variables

Demographic variables were included in the model to control for factors which may be related to the net monetary gain from coupon use. These variables included: respondent's age, entered in its natural log form (LAGE); sex (FEMALE); a set of dummy variables for educational level of the respondent (LESSHS= less than high school education; SOMECOLL= some college education; COLLEGE= college education); household size (HHSIZE); and, log of household income (LPHINC). In addition, because the analysis was performed on only those respondents who reported using coupons, a procedure was used to correct for possible sample selection bias (Maddala 1983). The inverse Mills ratio (MILLS), which was generated using the SAS PROC MPROBIT algorithm, served this purpose and was included in the empirical model as a regressor.

Model Estimation

The final sample on which the model was estimated consisted of 277 coupon users. Ordinary least squares (OLS) regression was used in the estimation of the following model:

$$NMG = W\alpha + X\beta + Z\tau + M\Gamma + e \qquad (3)$$

where:

W = vector of factor scores relating to the ego-expressive benefits of coupon usage

X = vector of factor scores
relating to marketplace
expertise and involvement
Z = vector of demographic
control variables
M = inverse Mills ratio
e = error term

In addition, the model was
estimated separately for net "losers"
and net "gainers" from coupon use.

Description of the Sample
The role of primary grocery
shopper was widely held by women in the
sample (85% of respondents were
female). The majority of respondents
were married, had at least one year of
college education and were engaged in
market work at the time of the survey.

Only one-fourth of the respondents had
young children living at home. The
average weekly grocery expenditure was
$64.50. Grocery shopping time averaged
97 minutes per week. 83% of respondents
reported clipping at least one coupon
per week. Nonusers of coupons tended to
be male and live in smaller households.
There were significantly more single
person households among nonusers.
Nonusers were also less likely to have
young children living with them. Owing
to the fact that they have smaller
households, grocery expenditures and
the amount of time spent in grocery
shopping was lower for nonusers than
for coupon users. Employment status
and household income were not found to
be associated with coupon use (Table
1).

Table 1
Sample Descriptives By Coupon Usage

Sample Characteristic	TOTAL (N=373)	USERS (N=308)	NONUSER (N=65)
	Mean (Standard deviation) or Proportion		
Age in years	46.7 (17.4)	47.1 (16.8)	45.2 (20.3)
Sex female	85	88	69
Married	60	65	38
Education at least one year of college	63	61	68
Household size	2.5 (1.3)	2.6 (1.3)	2.2 (1.2)
Living with children 10 years or younger None	75	72	89
Employment status Working	69	69	65
Annual gross income in thousand $	38.2 (23.4)	39.5 (23.4)	32.4 (22.4)
Weekly grocery expenditure	$64.5 (33.3)	$67.0 (33.5)	$52.1 (29.4)
Time spent grocery shopping min/week	97.0 (57.8)	101.1 (59.2)	78.5 (46.7)

Results

Estimation results are presented
in Table 2. The full model was
significant and the adjusted R^2
indicates that the predictor variables

account for 17% of the variation in net
monetary gain from coupon use. The
coefficient on the variable FUN was
significant and negative, indicating
that perceptions of fun and enjoyment
from coupon use are associated with net

losses rather than net savings. A possible reason for this finding is that people who perceive couponing as "fun" are more likely to invest a substantial amount of time in coupon clipping and redemption. They may perceive the time in coupon activity as "free" but when objectively evaluated the investment is likely to be associated with lower net monetary gains or even net monetary losses. The coefficient on the variable IMAGE was positive and significant, suggesting that positive psychic rewards from the use of coupons is associated with net savings rather than net losses. Feelings of being "a smart shopper" may result from actual efficiency in the couponing activity.

In addition, results indicate that household size is positively associated with net monetary gains. The positive relationship may be explained by the fact that a greater volume of food is purchased by larger households, and/or that there is a greater need to economize in large households.

The significant coefficient on the Mills ratio indicates that sample selection bias exists, i.e., that coupon users are fundamentally different from the population of non-coupon users with respect to the independent variables.

Table 2 reports the results of separate regression analyses for gainers and losers. Both models have highly significant F-statistics. The coefficient on the measure of purchase benefits was significant and positive for gainers. A possible explanation for this finding is that since gainers are more intense coupon users, they redeem coupons not only for their regular brands but for a wider range of products as well.

It is interesting to note that the coefficient on the measure of self-image benefits in the analysis on net losers was significant at the .1 level. A positive self-concept (i.e., being smart, conscientious and thrifty) was found to be associated with smaller net monetary losses for "net losers." In addition, for both gainers and losers, the coefficient on the measure of enjoyment was significant and negative. These results provide evidence of the psychological benefits that coupon users derive from couponing resulting

Table 2
Regression Results

Variable	Full Model (N=277)	Net Gainers (N=182)	Net Losers (N=92)
INTERCEPT	-12.15	-2.28	9.79
IMAGE	1.02*	0.25	2.17*
FUN	-2.59***	-1.15**	-2.16*
REWARD	0.82	0.82	-1.80
SCRIPT	0.39	-0.63	1.11
PURCHBEN	0.70	1.55***	0.42
MAVEN	-1.08	0.15	-3.14***
QUALITY	0.17	-0.39	0.31
PRICE	-.02	-1.29**	1.12
INVOLVE	0.48	0.04	-0.17
AGE	2.06	-0.54	-0.66
HHSIZE	2.36***	0.97***	1.22
LPHINC	-1.81	1.00	-4.61
LESSHS	1.03	4.72***	-6.54
SOMECOLL	-0.23	-0.11	-1.08
COLLEGE	-0.47	0.25	-1.52
FEMALE	2.70	1.62	1.55
MILLS	14.75**	4.46	6.56
F	4.40***	3.69***	2.31***
R^2	.22	0.28	0.34
adjR^2	.17	0.20	0.19

*significant at .10 level
**significant at .05 level
***significant at .01 level

in "irrational" behavior when coupon benefits are evaluated in monetary terms.

Among the marketplace expertise factors, general knowledge of grocery stores (PRICE) was significant and negative for net gainers. Among losers, the market maven factor was significant and negative. These results are contrary to the expected positive relationship between marketplace expertise and net savings. It is possible that consumers who are knowledgeable about the market also have a high opportunity cost of time. This fact would result in a low net monetary gain from coupon use.

Discussion

Whether coupon users benefit from couponing as a purchase strategy will depend on the specific "costs" involved in this activity. When the full monetary costs of coupon use (i.e., including the cost of time in couponing activity) are considered, this study found that some coupon users are net losers (in an economic sense) from the use of coupons. However, results indicate that these losses may be compensated by the positive feelings couponing creates in the mind of the consumer. It is likely that some coupon users (i.e., net monetary losers) do not put a high money value on their time spent scanning, clipping, organizing and retrieving coupons, in which case couponing activity would produce pure "non-taxed" savings to the individual.

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