

# THE DETERMINANTS OF TIME ALLOCATED TO SHOPPING BY HOMEMAKERS AND SPOUSES\*

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## Abstract

The study examined the ability of four sets of factors to explain homemakers' and spouses' shopping time. Data interviews and time records of 210 Wisconsin families were used. Tobit analysis revealed that homemakers' shopping time varied by time use and situational factors; spouses' shopping time varied by affluence, time use, situational, and demographic factors.

Shopping is one of the major activities of households, and, according to Vanek, it has become more time consuming than it once was (6). Walker and Woods found that two-thirds of all families shopped on the days data were collected and that shopping made up as large a proportion of household work time as did regular house care. Shopping took 12-14 percent of the time devoted to household work (7).

While shopping does take time, two family resources, time and money, are involved in shopping. Over the years, many families have increased their total money resources. Families cannot, however, increase their total time resources.

From these two resources, money and time, two alternate and somewhat conflicting predictions have been proposed regarding the effect of increasing affluence on the amount of time families spend in shopping. One prediction is that, as income increases, more items and more kinds of items will be purchased; thus, the total amount of time spent in shopping will increase. The other prediction is based on the concepts of time scarcity and the shadow price of time. Becker stated that as income rises, one's time has a higher shadow-price, that price being the person's wage rate (1). This higher shadow price increases the cost of nonwork activities, including shopping. Linder suggested that with higher time costs one would reduce the time spent in shopping. He concluded by suggesting that there was a "rationale for growing irrationality" in consumer purchase behavior (3, p. 60).

The purpose of this study was to identify predictors of shopping time. Four sets of variables were analyzed in relation to the shopping time of homemakers and spouses. The first set was affluence variables, which included measures of income and of assets. The second set was time variables, which included the weekly hours of paid work of the homemaker and spouse, and their household work, leisure, and other time

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allocations. These two sets of variables tested money resources and time resources as predictors of shopping time. A third set of variables involved situational factors such as day of the week, month of the year, weather conditions, shopping for large ticket items, and the amount of purchased services. The fourth set of variables involved demographic characteristics of the individuals. From these four sets a final equation was developed, using variables previously found significant, to provide an overall prediction of the shopping time of the homemaker and the spouse.

The importance of the study was identified in the effectiveness of the purchasing decisions made by shoppers. If the shadow price of time and, thereby, its scarcity, reduced shopping time and resulted in less rational purchase decisions, there would be individual household level and market level effects. The household, with less time and less information on which to base informed choices, would increase the risk of making poor choices and of being less satisfied with individual purchases. At the market level, those less satisfactory purchases would be economic votes for less satisfactory products and firms. Thus, the economic discipline which the dollar votes of consumers would provide in the market would break down; less satisfactory products and firms would remain in the market, and more satisfactory products and firms would not be appropriately rewarded. In sum, there would be a deterioration in the efficiency of the market and an increase in consumer dissatisfaction.

Two assumptions were made for this study. First, it was assumed that the number and variety of purchase decisions increased as income increased. Second, it was assumed that time spent in the search for information had a cost and that shoppers would weigh that cost in relation to the expected benefits of search as they allocated time to shopping.

## Data and Sample

The data for this analysis were from the Wisconsin portion of NE-113, "An Interstate Urban/Rural Comparison of Families Time Use." The data were collected throughout 1978 in Madison, Wisconsin, and rural Dane County. The households studied were two-parent, two-child families where the children ranged from birth through the age of 17. The sample of 210 families was randomly drawn and was stratified by the age of the youngest child and by urban or rural residence. Equal numbers of families from each strata were included in the sample. Therefore, some strata are over sampled, relative to their proportion of the population. The completion rate was 62.69 percent.

The interview instruments included a time record and a questionnaire. An interviewer visited the home on two occasions. The time data analyzed here is from a record the homemaker filled out the day before the interviewer's second visit.

#### Methods

The study utilized Tobit analysis. This analysis has been described by its originator, James Tobin, as "a hybrid of probit analysis and multiple regression" (5). Tobit analysis was designed for those instances when the dependent variable was continuous over some range and was truncated at either the upper or lower end or both. Shopping time was this type of dependent variable; a number of cases were clustered at the zero level because, while shopping was a frequent activity, it was not a daily activity.

Tobit analysis was used to test the predictability of shopping time based on 1) affluence variables, 2) time variables, 3) situational variables, 4) demographic variables, and 5) a final equation of those variables found significant in the previous four sets of variables. Data were analyzed for the dependent variables of the shopping time of the homemaker and the spouse. Analyses were done using the Limited Dependent Variable Regression Program (2).

#### Empirical Results

The affluence equation included income and asset variables. In addition to the total yearly income of the family, objective and subjective measures of income adequacy were used. The asset variables included home ownership, number of rooms in the home, and vehicle and equipment ownership.

The estimate of the shopping time of the homemaker as predicted by affluence variables is found in the first two columns of Table 1. The non-normalized coefficients in Tobit analysis correspond to the usual regression coefficients and should be of approximately the same scale as the coefficients from ordinary least squares. The t-statistic is a measure of the significance for each independent variable. None of the affluence variables tested here was a significant predictor of the homemaker's shopping time.

The estimate of the shopping time of the spouse as predicted by affluence variables is found in the last two columns of Table 1. Two asset variables are significant predictors of the spouse's shopping time. The number of rooms in the home is positively related to shopping time, while the amount of equipment owned was negatively related to shopping time. The spouse's affluence equation was significant at the .005 level when the chi-square test was applied to the log of the likelihood ratio multiplied by  $-2(\text{Log } \lambda)$ .

The next set of equations predicted the shopping time of the homemaker and the spouse from time variables (Table 2). Both equations were found to be significant at the .001 level. All of the daily time variables of the homemaker--food related work, home maintenance, child care, unpaid work, paid work, and social and recreational time--were significant at the .01 level and were negatively related to shopping time. Two other variables, the shopping time of the partner (spouse) and of the children, were significant and were positively related to the homemaker's shopping time. Thus, the shopping time of other family members did not serve as a substitute for shopping by the homemaker. To the contrary, shopping time by other family members increased the shopping time of the homemaker.

The spouse's shopping time was also significantly related to his/her time in other activities on that day. The spouse's time in food related work--food preparation and clean-up--was positively related to shopping time. The spouse's time in other activities that same day was negatively related, and time in paid and unpaid work and social and recreational time were significant at the .01 level. The spouse's shopping time was significantly and positively related to the homemaker's shopping time, indicating that, perhaps, they shopped together. The spouse's shopping time was negatively related to the presence of a youngest child in the family who was between the ages of 2 and 5 years old.

In comparing the predictions of homemaker's shopping time from sets of affluence and of time variables, time variables were the better predictors. The homemaker's equation was significant for time variables, but not for affluence variables. Income and asset variables were not significantly related to time spent in shopping, and the log likelihood ratio was only 4.59. In contrast, all daily time variables of the homemaker were significant and were negatively related to shopping time, and time spent shopping by other family members was positively related to the homemaker's shopping time. The log likelihood ratio was 53.27 and was significant at the .001 level.

Both affluence variables and time variables predicted the spouse's shopping time at a significant level. However, affluence variables were significant at the .005 level and the log of likelihood ratio was 15.46, while, with time variables, the level of significance was better, .001, and the log of the likelihood ratio was larger, 38.49. Most daily time variables of the spouse were negatively related to the spouse's shopping time. It was concluded that time variables were better predictors of shopping time than were the affluence variables tested in this study.

As a follow-up, two additional sets of variables--situational variables and demographic variables--were tested for their ability to predict the shopping times of homemakers and spouses. The

TABLE 1. Affluence Variables as Predictors of Shopping Time

Independent Variables	HOMEMAKER		SPOUSE	
	Non-Norm. Coef.	t-Stat.	Non-Norm. Coef.	t-Stat.
<b>INCOME VARIABLES</b>				
Family Income	-7.64	-.72	-10.11	-.92
Obj. Adequacy	-2.48	-.36	-5.34	-.76
Subj. Inc.: Adequate	-1.13	-.05	-19.64	-.91
Subj. Inc.: Very Adequate	-8.25	-.26	-53.61	-1.35
<b>ASSET VARIABLES</b>				
Home Ownership	17.74	1.50	.00	.81
No. Rooms in Home	6.06	.62	20.58	2.01**
No. Vehicles Owned	15.57	.48	41.19	1.22
Equipment Owned	-7.94	-1.12	-12.43	-1.65*
<b>SAMPLING VARIABLES</b>				
Yngst. Child: baby	-38.67	-1.38	2.43	.09
Yngst. Child: 1 yr.	-39.52	-1.45	-39.41	-1.44
Yngst. Child: 2-5 yrs.	-17.67	-.65	-115.31	-.35
Yngst. Child: 12-17 yrs.	-8.15	-.30	-35.69	-1.29
Rural/Urban	-28.53	-1.62	-11.31	-.63
CONSTANT	117.32	1.52	21.67	.28
Standard Error of the Equation	112.61		97.56	
Log (constrained)	-796.18		-433.10	
Log (unconstrained)	-791.59		-417.64	
Log of Likelihood Ratio	4.59		15.46	
	-2 (Log λ) = -9.18		-2 (Log λ) = -30.92	
	n.s. d.f. = 13		p = .005 d.f. = 13	

TABLE 2. Time Variables as Predictors of Shopping Time

Independent Variables	HOMEMAKER		SPOUSE	
	Non-Norm. Coef.	t-Stat.	Non-Norm. Coef.	t-Stat.
<b>DAY'S TIME VARIABLES</b>				
Minutes of:				
Food Related Work	-.38	-3.39***	.65	2.27***
Household Maintenance	-.34	-4.54***	-.16	-1.64
Child Care	-.29	-3.15***	-.24	-1.65*
Unpaid Work	-.36	-5.00***	-.36	-3.75***
Paid Work	-.33	-5.44***	-.21	-4.45***
Social and Rec. Time	-.32	-5.02***	-.15	-2.61***
Shopping Time, Partner <sup>1</sup>	.64	4.31***	.48	4.42***
Shopping Time, Children	.29	3.68***	-.04	-.39
<b>WEEKLY TIME VARIABLES</b>				
Paid Work of Homemaker	-.30	-.76	.16	.38
Paid Work of Spouse	-.09	-.24	-.39	-.66
<b>SAMPLING VARIABLES</b>				
Yngst. Child: baby	-460.73	-.21	31.66	1.43
Yngst. Child: 1 yr.	-50.87	-.24	-8.22	-.36
Yngst. Child: 2-5 yrs.	24.34	1.24	-97.62	-3.39***
Yngst. Child: 12-17 yrs.	8.24	.42	-28.65	-1.27
Urban/Rural	-4.13	-.33	-2.43	-.16
CONSTANT	269.40	5.03***	103.70	1.84*
Standard Error of the Equation	78.13		77.52	
Log (constrained)	-796.18		-433.10	
Log (unconstrained)	-742.91		-394.61	
Log of Likelihood Ratio	53.27		38.49	
	-2 (Log λ) = -106.54		-2 (Log λ) = -76.98	
	p = .001 d.f. = 15		p = .001 d.f. = 15	

<sup>1</sup> Partner, in the homemaker's equation, is the spouse's time. And, in the spouse's equation, partner is the homemaker.

\*p. < .10  
\*\*p. < .05  
\*\*\*p. < .01

TABLE 3. Situational Variables as Predictors of Shopping Time

Independent Variables	HOMEMAKER		SPOUSE	
	Non-Norm. Coef.	t-Stat.	Non-Norm. Coef.	t-Stat.
<b>DAY VARIABLES</b>				
Sunday			56.28	1.78*
Monday	-4.09	-.14	15.82	.47
Wednesday	-24.64	-.82	-20.90	-.56
Thursday	-11.11	-.37	44.57	1.36
Friday	13.21	.44	94.53	2.99**
Saturday	56.53	1.90*	69.36	2.17**
18.01	.60			
<b>MONTH VARIABLES</b>				
January	57.14	1.33*	-39.32	-.93
February	-43.52	-1.14	-40.64	-1.14
March	-37.60	-.92	-30.15	-.81
April	19.73	.51	-2.35	-.07
May	12.50	.33	-42.61	-1.14
June	26.88	.72	-72.07	-1.86*
August	17.89	.45	-120.32	-2.42**
September	8.60	-.23	-29.94	-.84
October	-73.41	-1.78*	-74.60	-1.88*
Nov./Dec.	23.98	.69	-59.66	-1.83*
<b>OTHER VARIABLES</b>				
Weather Conditions	55.54	2.37**	-6.33	.27
Days Shop Lrg. Purchase	5.03	.78	5.03	.87
\$ of Purchased Services	-.11	-.81	.20	2.19
<b>SAMPLING VARIABLES</b>				
Yngst. Child: baby	-25.65	-1.04	19.71	.87
Yngst. Child: 1 yr.	-29.60	-1.20	-21.36	-.88
Yngst. Child: 2-5 yrs.	-7.97	.33	-99.39	-3.24
Yngst. Child: 12-17 yrs.	-11.52	-.46	-36.14	-1.42
Urban/Rural	-21.40	-1.32	-17.01	-1.00
CONSTANT	-46.75	-.72	-17.01	-.26
Standard Error of the Equation	102.47		86.33	
Log (constrained)	-796.18		-433.10	
Log (unconstrained)	-776.74		-404.21	
Log of Likelihood Ratio	19.44		28.89	
	-2 (Log λ) = -38.88		-2 (Log λ) = -57.78	
	p = .05 d.f. = 24		p = .001 d.f. = 24	

TABLE 4. Demographic Variables as Predictors of Shopping Time

Independent Variables	HOMEMAKER		SPOUSE	
	Non-Norm. Coef.	t-Stat.	Non-Norm. Coef.	t-Stat.
<b>DEMOGRAPHIC VARIABLES</b>				
Education	1.93	.43	1.18	.37
Age 2: 30-34 yrs.	-23.72	-.95	45.93	1.84*
Age 3: 35-39 yrs.	-97.81	-2.59***	-11.83	-.35
Age 4: 40-63 yrs.	-44.49	-1.08	-.06	-.00
<b>SAMPLING VARIABLES</b>				
Age, Yngst. Child: baby	-74.14	-2.12**	13.09	.43
Age, Yngst. Child: 1 yr.	-75.09	-3.38***	-31.24	-1.03
Age, Yngst. Child: 2-5 yrs.	-43.85	-1.46	-113.45	-3.28***
Age, Yngst. Child: 12-17 yrs.	-11.97	-.41	-33.85	-1.11
Urban/Rural	-18.29	-1.02	-10.32	-.54
CONSTANT	85.65	1.87*	-43.28	-.88
Standard Error of the Equation	112.36		100.20	
Log (constrained)	-796.18		-433.10	
Log (unconstrained)	-789.69		-419.39	
Log of Likelihood Ratio	6.49		13.71	
	-2 (Log λ) = -12.98		-2 (Log λ) = -27.42	
	p = n.s. d.f. = 9		p = .005 d.f. = 9	

\*p. < .10  
\*\*p. < .05  
\*\*\*p. < .01

situational variables tested were the day of the week, month of the year, weather conditions, and two shopping related variables, the dollar amount of purchased services and the number of days in the past week that someone in the family shopped for large ticket items.

The equation predicting the homemaker's shopping time from situational factors was significant at the .05 level of probability (Table 3). One day of the week, Friday, was significant, and positively related to the homemakers shopping time, when compared with the omitted day of the week, Tuesday. January was significant and positively related to shopping time, while October was negatively related to shopping time when those months were compared to the omitted month of July. Weather conditions were significant and positively related to the homemaker's shopping time. Thus, homemakers shopped more when there were no unusual weather conditions.

The equation predicting the spouse's shopping time from situational variables was significant at the .01 level of probability. Days of the week which were significantly and positively related to the spouse's shopping time were Friday and Saturday. The one month which was significant and negatively related to the spouse's shopping time was August, as compared with the omitted category of July. The dollar amount of purchased services was significant and positively related to the spouse's shopping time.

Equations were also used to predict the shopping time of homemakers and spouses from demographic variables (Table 4). The variables included years of education and age. The list of demographic variables was limited because of problems of high intercorrelations; age of shopper was coded as a binary variable for the same reason. The equation predicting homemaker's shopping time was not significant although one age of homemaker category--age 35 to 39--was, and two of the age of youngest child categories--babies and one-year-old children--were significant. Each of these age categories was negatively related to the homemaker's shopping time.

The equation predicting shopping time of the spouse from demographic variables was significant at the .005 level of probability. Two age variables in the equation were significant. The age of younger spouses, ages 30 to 34, was significant, when compared with the omitted category of youngest spouses. The second variable that was significant was the age of youngest child category, children two through five years old, when compared with the omitted category of youngest children ages 6 through 11 years old.

Two final equations were developed to predict the shopping time of homemakers and spouses (Table 5). Variables in the homemakers summary equation were those found significant in each of that individual's four previous equations. Both equations were significant at the .001 level of probability and each had the largest log of

likelihood ratio of the equations for that person--those ratios were 71.56 for the homemaker's equation and 56.00 for the spouse's equation. Comparing the summary equations with previous equations, some differences occurred. Affluence variables in the spouses equation were no longer significant. All time variables in the homemakers equation continued to be significant, although the size of the coefficients changed somewhat. Five of the six time variables in the spouses equation continued to be significant. For the spouse, Friday remained significantly related to shopping time, while Saturday and Sunday were no longer. Sunday became significant for the homemaker and Friday lost significance. Similarly puzzling shifts occurred in the months of the year which were significant in the homemakers and spouses equations. For the spouse, August was one month which had been significant in the situational variable equation continued to be significant in the final summary equation. No month remained a significant predictor of the homemaker's shopping time. The only other variable found significant in either equation was a spouse's age variable. A positive relationship was found between spouse's shopping time and spouses aged 30 to 34, when compared with the youngest spouses.

#### Summary and Discussion

The findings of the study are summarized below.

First, time variables were better predictors of shopping time than were affluence variables, both for homemakers and spouses. In the final summary equations, there were no affluence variables for homemakers and no significant affluence variables for spouses. Daily time use variables of the shopper were negatively related to shopping time, with the exception of the spouse's time in food related work, which was positively related to the spouse's shopping time. Time spent in shopping by the partner was not a substitute for the shopping time of either the homemaker or the spouse. It did, in fact, increase their shopping time.

Second, situational variables were the second best set of predictors among the first four equations tested for the homemaker and for the spouse. One day of the week, Friday, was significantly and positively related to the shopping time of the spouse in both the situational variable and final summary variable equations. One month of the year, August, was significantly and negatively related to the homemaker's shopping time in both the situational variable and final summary equations. Homemakers shopped more when there were no unusual weather conditions. Spouses shopped more when the family spent more dollars on purchased services.

Third, the final summary equations, which included variables found significant in the four previous equations, were the best predictors of the shopping time of homemakers and spouses. The largest number of significant variables in

TABLE 5. Summary Model of Variables Predicting Shopping Time

Independent Variables	HOMEMAKER		SPOUSE	
	Non-Norm. Coef.	t-Stat.	Non-Norm. Coef.	t-Stat.
<b>AFFLUENCE VARIABLES</b>				
No. of Rooms	----	----	-3.62	-.65
Equipment Ownership	----	----	1.52	.30
<b>TIME VARIABLES</b>				
Food Related Work	-.32	-3.09***	.50	1.77*
Household Maintenance	-.38	-5.33***	----	----
Child Care	-.37	-3.91***	-.19	-1.36
Unpaid Work	-.34	-4.87***	-.33	-3.77***
Paid Work	-.41	-6.50***	-.16	-3.68***
Social & Recreational Time	-.30	-4.97***	-.11	-2.20**
Shopping Time of Partner <sup>2</sup>	.57	3.49***	.43	4.58***
Shopping Time of Children	.23	2.91***	----	----
<b>SITUATIONAL VARIABLES</b>				
Sunday	-40.76	-1.81*	25.27	.80
Monday	3.03	.14	21.09	.78
Wednesday	3.35	.16	-16.16	-.52
Thursday	-5.68	-.26	20.18	.75
Friday	34.86	1.63	55.07	2.26**
Saturday	-33.99	-1.48	12.04	.41
January	50.23	1.58	-41.30	-1.16
February	-9.12	-.33	-1.77	.06
March	-18.64	-.63	2.49	.08
April	26.49	.94	27.51	.93
May	30.47	1.07	-17.81	-.58
June	24.50	.89	-45.53	-1.36
August	13.96	.47	-121.31	-2.92***
September	19.83	.72	-28.39	.07
October	-14.73	-.49	-17.02	-.53
Nov./Dec.	38.24	1.45	-20.04	-.72
Weather Conditions	56.83	3.29***	----	----
\$ of Purchased Services	----	----	.15	2.06**
<b>DEMOGRAPHIC VARIABLES</b>				
Age: 30-34 yrs.	-12.61	-.76	35.73	1.87*
Age: 35-39 yrs.	-35.35	-1.43	-13.91	-.53
Age: 40-63 yrs.	-40.04	-1.41	2.65	.09
<b>SAMPLING VARIABLES</b>				
Age, Yngst. Child: baby	-22.76	-.89	25.75	1.15
Age, Yngst. Child: 1 yr.	-25.81	-1.08	-11.04	-.50
Age, Yngst. Child: 2-5 yrs.	11.16	-.05	-93.42	.34
Age, Yngst. Child: 12-17 yrs.	13.19	.64	-15.19	-.67
Urban/Rural	3.80	.32	-3.81	-.28
CONSTANT	178.04	2.77***	63.46	1.01
Standard Error of the Equation		70.37		68.49
Log (constrained)		-796.18		-433.10
Log (unconstrained)		<u>-724.62</u>		<u>-377.10</u>
Log of Likelihood Ratio		71.56		56.00
		-2 (Log λ) = -143.12		-2 (Log λ) = -112.00
		p. = .001 d.f. = 33		p. = .001 d.f. = 27

<sup>1</sup>Partner, in the homemaker's shopping time equation, is the spouse's time. In the spouse's shopping time equation, partner is the homemaker.

\*p. < .10  
 \*\*p. < .05  
 \*\*\*p. < .01

both the homemakers' and the spouses' final summary equations were time variables.

### Conclusions

For the population studied here, time spent in most other activities was an important and a negative predictor of the shopping time of homemakers and spouses. The level of affluence, as measured in this study, was a weak, and frequently not significant, predictor of shopping time. Situational variables are useful in predicting shopping time. The day of week and month of year variables provided somewhat inconsistent results when they were included in two equations.

### Implications

The results of the study have implications for the development and delivery of consumer information. The allocation of time to other activities, as predicted by Linder, reduces shopping time. Thus the productivity of consumer information might be increased to increase the benefit or, as Maynes would say, pay-off, to time spent in shopping (4). Product testing magazines, which the consumer could subscribe to, are one way to reduce information search costs. Since time scarcity is a major consideration in the development and delivery of consumer information for purchase decisions, emphasis will need to be placed on concise, easy to understand and readily applicable information made available through time efficient delivery systems.

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# CONSUMER POLICY CRITERIA: A STARTING POINT FOR EVALUATION<sup>1</sup>

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## Abstract

Political changes can alter the policies, rules, and regulatory actions that affect consumers. Individuals in the consumer movement need to objectively analyze current and proposed policies to arrive at defensible positions in the consumer interest. The authors suggest ten criteria for such policy evaluations.

Political change is a fact of American life. From political changes flow changes in economic conditions and other circumstances surrounding consumer policy making. Changes in the American scene beginning in 1981 have had and continue to have a profound impact on policies, rule-making procedures, regulatory effectiveness and the representation of consumer interests in the public arena.

Such changes necessitate appraisals of current and proposed consumer policies. These appraisals and possible calls for action are best when based on objective analyses rather than pre-disposition and emotion. Consumers and the consumer movement in a collective sense need to be able to appraise policies and judge the relative merits of alternatives.

Criteria, drawn from a number of perspectives including welfare economics, that could be used to begin policy evaluation include:

### 1. What are the benefits? What are the costs?

A partial analysis of benefits and costs simply requires that benefits exceed costs. A larger, more comprehensive view requires an examination of the relative benefit:cost ratios of various policies and programs so that scarce resources are allocated to those areas which have the promise of greatest return (i.e. the greatest benefit:cost ratios).

Not only are we concerned about benefit:cost comparisons, and particularly about the relative ratios, but it must be kept in mind that not all benefits and costs lend themselves to monetary measurement. Thus, benefit:cost analyses are

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only a partial basis for decision-making; judgments that include non-measurable elements are involved, too, at the policy level. Therefore, broad concerns of equity and distribution of benefits also merit attention.

### 2. Who receives the benefits? Who bears the costs?

Essentially, these questions focus attention on equity between the proportion of costs which an individual consumer bears and the amount of benefit that a consumer experiences. Further, they suggest the possibility -- possibly the desirability -- of some consumers bearing more than a proportionate share of the costs while others receive benefits greater than their contribution to the costs of the program. In such instances, it is important to identify the groups of individuals bearing costs and accruing benefits.

### 3. What is the distributional impact of the policy?

A particular policy may have differential impacts on various groups of consumers. When this happens, consideration must be given to which groups are affected. The rich? The poor? Business? Older adults? etc. How are various groups affected?

### 4. What is the welfare effect?

In the unusual event that a particular policy makes some people better off while not making others worse off, no welfare question is posed. However, in the larger sphere of consumer policy it is much more likely that some people or groups will have their condition enhanced while other consumers or groups of consumers may have their situation diminished. Or, in the broader impacts, business may perceive their lot is adversely affected as a result of the implementation of a certain policy while consumers as a group may see theirs as improved. Therefore, questions arise about whether these changes in welfare are equitable. Can they be defended in terms of being desirable on the ground that total welfare is enhanced? Or, to apply the hard-nosed welfare economics concept, might it be possible (not that it be required, but simply possible) for the gainers to pay the losers and for the gainers to still feel better off than they were before the policy was initiated?

### 5. What are the efficiency effects?

From an economic viewpoint, the results of a given policy are positive if it encourages more output from a given input of resources, or, al-

ternatively stated, if it results in the same output being sustained with a lesser input of resources. Clearly, if this situation exists the policy is a success (assuming resources are not used to produce inferior goods/services).

Beyond economic efficiency, however, are concerns about social efficiency. For example, does a policy lead to greater physical health of the population? If so, society gains in general. Or, does a particular policy lead to lessened feelings of antagonism between groups in society? If so, the increased social cohesion may enhance social efficiency.

#### 6. What are the effects on incentives?

A policy that heightens people's incentives to achieve is a potential contribution to the total good. Increased incentive is likely to lead to greater effort which results in more production. Contrariwise, a policy that diminishes incentives subtracts from productivity, making fewer goods and services available to satisfy consumer demands. In the consumer market, the availability of unit price information may provide incentive to comparison shop.

#### 7. What effects will the policy have on variety in life experiences?

Policies that have the effect of making life more monolithic obviously seem questionable in a pluralistic society. The quality of life experienced is often thought to be affected not only by the quantity of goods and services available but also by the variety of life itself. Policies which permit -- even encourage -- variety in choice of life experiences would tend to pass muster in policy evaluation.

#### 8. Would the policy be easy to administer?

The ease with which a policy can be administered affects the costs of implementing that policy. A policy that might be highly desirable on other counts might be suspect if the costs of administering it are too high. Policy analysts who agree with withholding taxes on interest income may still object to implementing such a policy because of the resources required to administer it. This criterion becomes important when considering alternative policies which may be proposed to address essentially the same problem. Alternative policy proposals need to be examined for their ease and relative costs of administration.

#### 9. What are the effects on privacy?

In a society which prides itself on individual freedom and its corollary, privacy, any policy which makes heavy inroads on individual privacy is suspect. However, this, like many other things, becomes a relative matter and our evaluation is likely to come down to a consideration

of which policy offers the least invasion of individual privacy.

#### 10. Long-run versus short-run effects.

Some policies may address short-run concerns primarily while others offer solutions to long-run problems. In fact, most policies have both short- and long-run effects. However, in ex ante evaluation of policy proposals, it is appropriate to estimate as best we can the short-run gains in light of long-run effects. Some of these may not be positive. In other words, our lens need to focus on both aspects and, hopefully, not be myopic. On the other hand, policies with long run advantages may impose such high tariffs in the short-run that they are unpalatable.

This list of criteria might be expanded or refined with insights from others. Objective evaluation of consumer policies clearly needs our attention. It is important to apply appropriate criteria in the evaluation of current and proposed policies affecting the consumer interest. Through careful application of well-defined criteria in the evaluation of alternative policies, the consumer movement can more adequately defend appropriate existing policies and advance policy proposals that serve both the public and consumer interest.

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Evaluating Energy Conservation Strategies  
for Public Housing Residents

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"Mary, like most women her age, lives on a fixed income. The spiraling costs of energy, food, clothing and medical services have forced the magnitude of her decisions to the point of being critical. She may be forced to move because her utility bills cost so much. Like other older adults, Mary cannot bargain for salary increases (she has what economists call 'a constrained decision matrix')."

This paper presents the results of a project which examined the success of no- and low-cost energy conservation measures for low-income women 62 years of age or over residing in a public housing development. The research tested the efficacy of a purposefully created conservation program by comparisons between treatment versus control group changes in knowledge and attitudes towards utility conservation as well as KWhr usage (adjusted for degree days). The 17-point educational program was based upon 33 utility company and government pamphlets and handouts as well as a pre-assessment of respondent appliance possession and usage, lifestyle characteristics, and key energy behaviors. Data indicate that, although positive changes in energy attitudes and energy conservation knowledge were recorded for the women receiving the educational presentation, decrease in adjusted KWhr usage (and therefore monetary savings) were frustrated by two factors: 1) Elderly low-income women were already using small amounts of energy, thereby making further reductions more difficult; more importantly, however, 2) The women were "structure locked". Although the minimum HUD building standards were followed, as determined by extensive energy audits of the apartments, these standards were not stringent enough regarding insulation R-Values and passive solar heating and cooling usage. The women in this research were helpless to reduce their energy costs significantly.

#### INTRODUCTION

Inflation has created a multiplicity of problems for all Americans. The spiraling costs of energy, food clothing and medical services have put a considerable strain on the typical family budget. Older adults cannot bargain for salary increases as an employed person might do and, in fact, older adults face a gradual decline in their real incomes as long as they live (Business Week, 1978).

Although the elderly population consumes less energy than any other age group, a greater proportion of their income is spent on energy (Aging, 1977i). Moreover, the present inverted

utility rate structure (as opposed to, say, a life-line rate structure) places an additional burden on the elderly, since small users pay higher rates than do families who consume larger amounts of energy (Aging, 1977ii). As a result of the dramatic increases in the cost of fuels, the ability of fixed income assistance--has been greatly affected. Thus, the elderly are more likely to be disadvantaged and more likely to be forced to decide between heating (and in certain climates, cooling) and food, medical or quality of life concerns (Castro and Day, 1977).

Many older persons have been forced to limit or eliminate their use of home heating or cooling, which has resulted in exposure to extreme temperatures. An examination of health problems among the elderly discloses that, for several reasons, they often have a physical need for more heat than do younger persons. Persons suffering from arthritis may need higher degrees of home heating to help reduce stiffening of joints. Some medications, such as "blood thinners," which are commonly prescribed to older persons, can cause a person to feel cooler, thus increasing his/her need for heating. In addition, as the body ages, it becomes less efficient at temperature regulation; therefore, the elderly require higher temperatures. Since elderly persons may not be aware of excessive cold and their bodies do not automatically adjust to the temperature changes, these people are more likely to die from exposure to cold. Hyperpyrexia, a condition in which a person is unable to withstand unduly high temperatures, has also led to death in some elderly persons (Castro and Day, 1977).

According to a report by the Community Services Administration in 1980, poor and elderly are most likely to suffer from the energy crisis and at the same time are least able to afford measures which could lower their consumption of fossil fuels (Smith, 1976).

The same report stated that fewer than forty-three percent of low-income households have home insulation and nearly sixty percent have no storm windows, yet they use less energy than the average American household. The most readily available data show that the average low-income households in 1975 used 55.4 percent less electricity and 24.1 percent less natural gas than the average middle-income United States households (Smith, 1976). What can be observed is a group of persons who are using smaller amounts of energy while paying a higher proportion of their income for it. These persons are capable of embracing conservation and the need to adjust lifestyles, but are in a position where addi-

tional conservation is very difficult if not impossible.

Testimony before the United States Commission on Aging revealed that low-income elderly are paying an increasing percentage of their incomes for home energy. In 1976, 16 to 17 percent of the low-income elderly's budget went toward energy; in 1978, it rose to 30 percent; and in the winter of 1979-80, it was estimated to take 50 percent (Castro and Day, 1977). In a report prepared for the United States Department of Energy by the School of Engineering and Applied Science at George Washington University in Washington, D.C., researchers concluded that this combination of conditions " . . . results in clear discrimination, unintentional as it may be, against the aged in terms of energy usage" (Castro and Day, 1977). Figures cited by several sources tend to back up the previous statement. For example, the poorest one-tenth of the population spends an estimated thirty-four percent of its before-tax income on energy, while the higher one-tenth spends only five percent (Alabama Power Company, 1980). This comes in the face of current political solutions which advocate conservation through free market price increases (price induced conservation).

The energy education materials developed for this research utilized a personalized approach making use of low-cost and no-cost measures. The majority of current energy educational material for consumers is presented through the mass media--television, newspapers and radio. However, an in-depth study of mass media campaigns for conserving energy (5, 27) found that these educational attempts "have been only slightly successful and should be re-examined in terms of both content and mode of distribution. "Other research found that although educational campaigns from the media might affect consumers' attitudes and opinions regarding energy conservation, "they have had little effect on consumption behavior."

There are two main reasons for the failure of mass media campaigns to have a significant effect on consumer's energy conservation behaviors. The first is that these types of presentations don't motivate the recipients to act in an energy-conserving manner. One explanation for this is that, by substituting vicarious experience for genuine participation, . . . the mass media encourage passivity and uninvolvedness at the same time that they are informing their audience" (Field, 1973).

In other words, the campaigns encourage an attitude of "that is what should be done," rather than "that is what I should do." Therefore, although recipients of the educational material recognize the value of the suggested activities, in many cases, they aren't motivated to follow through with them. Therefore, mass media doesn't seem to be the most effective way to encourage energy conservation behavior. Instead, personalized, more individualized programs are cited as the best means of presentation. A study of

the effectiveness of mass media campaigns concerning energy conservation (Field, 1973) stated that it is "likely that the same information will be differently received if it is presented personally to the individual rather than through mass media."

#### THE RESEARCH RESPONDENTS AND RESIDENTIAL UNITS

The research reported here examined the energy use patterns of 26 single, non-disabled, white women aged 62 years or older residing in a fifty-unit apartment complex (Hillcrest Apartments) in Tallahassee, Alabama. The complex was constructed with HUD 221 D-4 monies. A concomitant Section 8 rental subsidy program is also offered in which residents pay no more than 25 percent of their adjusted gross incomes for housing. Occupancy is restricted to elderly or handicapped persons whose incomes fall below 80 percent of the median in the area. The units in the complex are identical in design, layout, and size; varying only in solar orientation. Each unit is fully electric and submetered. The research respondents paid their own utility bills in total.

Respondents in the study were volunteers living in Hillcrest Apartments and were placed in either a control group or an experimental group on the basis of two factors: 1) the number of correct answers on a 13-item energy quiz and 2) the number of kilowatt hours of electricity used by each respondent during the December 1980 billing period. These two measures determined the matching of the control and experimental groups on the basis of current energy conservation knowledge and past energy usage. Table I presents these data for each of the 26 respondents and the two matched groups. In addition to the quiz responses, other data were collected prior to the placement of respondents. These included attitudes toward energy conservation, home energy use practices, currently practiced energy conservation measures, and demographic data including respondent's age, prior housing type, and reasons for moving to Hillcrest Apartments. Table II highlights several of the characteristics of the respondents.

#### DEVELOPMENT OF THE ENERGY EDUCATION PROGRAM

After pairing the women into equally balanced control and treatment groups the designated treatment group received an energy education program. The education program was based upon four factors. First, responses in the initial questionnaire concerning current energy practices were examined. For example only five of the 26 respondents ever ironed clothing. Similarly, half of the women took tub baths (quick showers save energy) while the other half took showers. Of the "tub bath takers" most reported that physical conditions prevented them from taking showers while the "shower takers" most reported a similar bias (for physical reasons) against tubs. None of the respondents

indicated a willingness to change their method of bathing.

The second factor considered in making up the educational program was the physical characteristics of the apartments. Water heaters, for example, were less than two years old and were constructed with adequate interior insulation.

A third factor involved the income characteristics of the women in the study and a desire to make the educational program sensitive to the situations of the low-income rental housing residents. The program stressed low-cost and no-cost measures of energy conservation. Therefore recommendations regarding attic insulation, storm windows and the like were omitted. The low-cost and no-cost measures were employed in this study even though expensive energy-saving suggestions (such as the addition of storm windows and extra attic insulation) have been getting most of the attention. The approach in this research was to stress the measures that offer the greatest return for the least effort and expense. The soon-to-be-defunct U.S. Department of Energy estimates these low-cost/ no-cost measures can save up to 25 percent on one's gas and electricity bills.

The fourth and final factor considered in developing the energy education program involved the practices of the management of Hillcrest Apartments. The management had already lowered water heater thermostats in the apartments and stressed defrosting the freezers every seven to ten days.

The energy education program was developed with these four factors in mind. The final 17 low- and no-cost conservation techniques reflected appliance possession and usage, lifestyle characteristics, key energy and income behaviors, management policy, and physical attributes of the apartments. Materials were adapted from various sources including Alabama Cooperative Extension Service, Alabama Power Company, Alabama Gas Company, The Tennessee Valley Authority, The Governor's Science Advisory Committee (Maryland), General Electric Corporation, Gulf Oil Cooperation, the U.S. Department of Commerce, National Bureau of Standards and the U.S. Department of Energy.

In total, seventeen energy conservation techniques were chosen for inclusion in the educational message. Of these measures, three dealt with hot water usage; one with thermostat regulation; five with preventing drafts and using window treatments in an energy conserving manner; one with dressing warmly and seven with cooking methods. The educational demonstration consisted of explaining each of the measures in detail. This was done on a one-to-one basis in each respondent's apartment. Posters showing the "wrong" and "right" way of utilizing a measure were used to strengthen the interest and impact of the independence.

Each conservation method was explained by referring to the script and showing the corresponding poster. Where practical, the research demonstrated the measure to the respondent by actually showing her how to utilize the measure in her apartment. For example, the two energy conservation measures which dealt with using the dishwasher were explained by going into the kitchen and showing the respondent how to set the temperature of the drying cycle and how to cut off the machine after the last rinse cycle, open the machine, and let the dishes air dry. At the end of the demonstration, the respondent was given a handout with written and visual reminders of the measures. Easy-to-read, large print and easy-to-understand diagrams similar to those on the posters were used.

### Results

The efficacy of the conservation strategy was determined in two ways. First, within the treatment group, the change rates in attitudes, knowledge and energy usage (comparisons of KWHrs used pre-, during-, and post-treatment periods) were examined. One would expect improvements if the treatment had some positive effect. Secondly, these changes in attitudes, knowledge and adjusted energy usage were compared to equivalent data for the paired control group.

The women's attitudes toward energy conservation were measured in two ways: 1) How important the women thought saving energy was to them (seven point Likert Scale ranging from very important to not important) and 2) How well the women thought they saved energy (seven point Likert scale ranging from thought they did the best possible to didn't think they saved energy at all). These two attitudinal measures showed moderate (non-significant) positive changes in the treatment group's pre- and post-educational program responses while the control group's responses showed no or only slight increase (TABLE III).

The women's scores in the pre- and post-treatment 13-item energy quiz followed a similar pattern to the attitudinal data above. Those women who received the educational program demonstrated a moderate (non-significant), positive increase in number of correct changes when compared to the women not receiving the energy conservation program (TABLE III).

As encouraging as the positive increases in attitudes and knowledge were for the women receiving the educational knowledge program, the most important variable (in the economic sense) of KWHr usage showed little improvement for women in the treatment group. Figure I displays the monthly KWHr usage for women in the treatment and control groups for the three months prior to and following the educational program's administration. One can observe that the difference between the two groups remains constant as the heating system peaks on the January bill and declines with the onset of Spring. If the edu-

cational program had been as effective on behavior as it was on attitudes and knowledge, the difference between the treatment and control groups would have grown after January 14 rather than remaining the same.

#### SUMMARY AND CONCLUSIONS

An energy conservation educational program was effective in improving attitudes toward energy conservation and increasing knowledge about ways to conserve energy. However, the behavioral aspect of the research, the reduction of KWhr consumption, was not achieved. The reduction in energy usage (and money spent for energy), was frustrated by two primary factors. First, elderly low-income women were already using small amounts of energy, thereby making further reductions more difficult. More importantly, however, the women were "structure locked" and were helpless to reduce their energy costs significantly. Although the minimum HUD building specifications were followed, these standards were not stringent enough regarding insulation R-Values and passive solar heating and cooling usage. As a matter of fact, several of the women in the research were contemplating moving out of the housing development due to high energy bills. Four women recorded bills of over \$90 for one month!

Expecting all households to equally adopt conservation measures based upon existing programs has been proven impractical and ineffective. This research recommends revised building standards, a critical review of current utility rate structures, and a reassessment of energy conservation strategies currently employed by most utility companies.

First, solar energy proponents (including progressive utility companies) have demonstrated the benefits of judicious site planning for passive solar interior space apartments on the site so as to maximize southern exposure while limiting the use of glazing on on-southern walls has been demonstrated to save 30-50 percent of a home's heating and cooling costs. In conjunction with overhangs and higher insulation values (Hillcrest Residents received the HUD minimum specification of only R-19 Ceilings and moderate increases in building costs if done at the time of construction. However, once these decisions (insulation levels, overhangs, site orientation, etc.) have been made it becomes very difficult and expensive (or impossible) to remediate. It should be noted from Figure I that the heating degree days (a measure of how cold the temperatures are over a period of time) take the exact same shape as the curves for KWhr usage for the control and treatment groups. This reflects the fact that space heating accounts for the largest portion of winter energy use (60 percent or more for average household). Also, the similarity of the curves demonstrates the degree to which the women in the study have already adopted a low energy use profile for those applications over which they have control.

Secondly, typical energy conservation programs employed by most utility companies greatly favor: 1) homeowners, 2) households with large discretionary incomes, and 3) household with higher educational levels. Other studies (Heffran, 1981) also recommend that since "the current conservation campaigns seem biased toward homeowners and neglect the needs or concerns of renters," that "it is imperative to focus specific campaigns on renters, showing how they are affected by the energy situation and what they can do to reduce their energy costs." An examination of typical utility education programs includes T.V. and radio media sorts which have been demonstrated to be of limited value in promoting energy conservation (Morrison and Gladhart, 1976; U.S. Department of Agriculture, 1976).

Another reason for the failure of these media campaigns may be that the consumers put little faith in energy information generated by the government and major energy companies, the primary sources of these types of educational messages (Field, 1973). This is probably because the American consumer is prone to blame those entities for the energy crisis. In fact, the results of questionnaires given to 782 urban Texas residents found that oil, gas and electric companies and the Federal Government were ranked lowest as accurate and honest information sources regarding energy conservation and are typically biased toward owner-occupied single-family residences. These biases are typified by an Alabama Power's (Southern Utilities Cooperative member) home energy audit simulation which favors recommendations such as storm windows and doors, attic insulation, conversion to a heat pump, etc. which are very costly versus low- and no-cost energy conservation measures. Up to 50 percent of the heat (or cooling) loss in homes can be accounted for by air infiltration. The various low-cost measures which would remedy this situation (plugging pipe and wiring inlets, sealing and weatherstripping baseboards, windows, doors and holes around exhaust fans, etc.) can be accomplished in most homes for under \$50 and can save between 15-25 percent of one's utility bills in both heating and air conditioning seasons.

Finally, one must re-examine current utility rate structures which are "declining block" in nature. This means that the more energy a household uses the cheaper per unit the energy becomes. This obviously encourages large consumption of energy. A more progressive approach would be life-line or so-called conservation rates, which charge a lower rate for the first increment of energy used (say 500 or 750 KWhr per month) and then gradually raises the rates for large domestic uses. This rewards users who consume small amounts of energy and justly charges large users larger amounts for their use above the life-line level. Remember that low-income households typically use much less energy than high-income households.

The research demonstrates the difficulties low-income elderly women residing in a public housing development are having with their energy costs

and the inability of an educational program to help in their energy crisis (Field, 1973). Although positive changes were demonstrated in resident attitudes and knowledge the critical need to reduce KWhr consumption was frustrated. The reduction in utility bills for these women was frustrated due to being structure locked with the inability to afford the modifications necessary to reduce their energy dependence.

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TABLE I

Selection of Control and Experiment Groups,  
Hillcrest Apartments, Tallahassee, Alabama

Apartment #	Experimental Group		Control Group	
	Kilowatt Hours Used* 12/80	Correct Quiz Responses**	Apartment #	Kilowatt Hours Used* 12/80
103A	396	8	104B	1067
103B	1210	7	104C	1074
103C	684	11	106B	1161
103D	1266	12	106C	398
104A	968	8	107A	1413
104D	518	7	107C	911
105C	1029	9	108A	1024
106A	1167	11	109B	1515
106D	1158	7	109D	1532
107B	1575	9	110B	499
108C	1478	7	110C	741
109C***	1112	8	110D	1649
111B	1094	6	112B	1171
MEAN	1050	8.46		1089
S.D.	367.44	1.98		386.38
				Correct Quiz Responses**
				8.77
				1.80

\*Number of kilowatt hours used between Nov. 10, 1980 and Dec. 12, 1980.

\*\*Test scores are number correct out of a possible thirteen.

\*\*\*Test group member 109C was substituted for test member 112C, who moved from Hillcrest Apartments in March, 1981, before the study was completed. Member 109C received all educational materials that others in the "test" group received.

TABLE II  
Characteristics of the Respondents

<u>Age of Respondents (years)</u>	<u>Control Group</u>	<u>Treatment</u>
62-65	2	3
66-70	5	3
71-75	2	3
76-80	2	3
over 80	2	1
<u>Prior Type of Housing</u>		
Single Family-Owner Occupied	8	3
Single Family-Rental	3	5
Apartment-Pental	1	4
Mobile Home-Rental	1	1
<u>Prior Space Heating System</u>		
Space Heater-Gas	8	7
Floor Furnace-Gas	1	3
Wall Heater-Gas	1	1
Central-Gas	1	0
Floor Furnace & Space Heater(s)	1	2
Central-Electric	1	0
<u>Reasons for Moving to Hillcrest Apartments</u>		
Cheaper	2	2
Easier to Maintain	4	1
Racial Reasons	1	1
Safer	0	1
Closer to Family	3	3
Greater Independence	0	2
Other	3	3

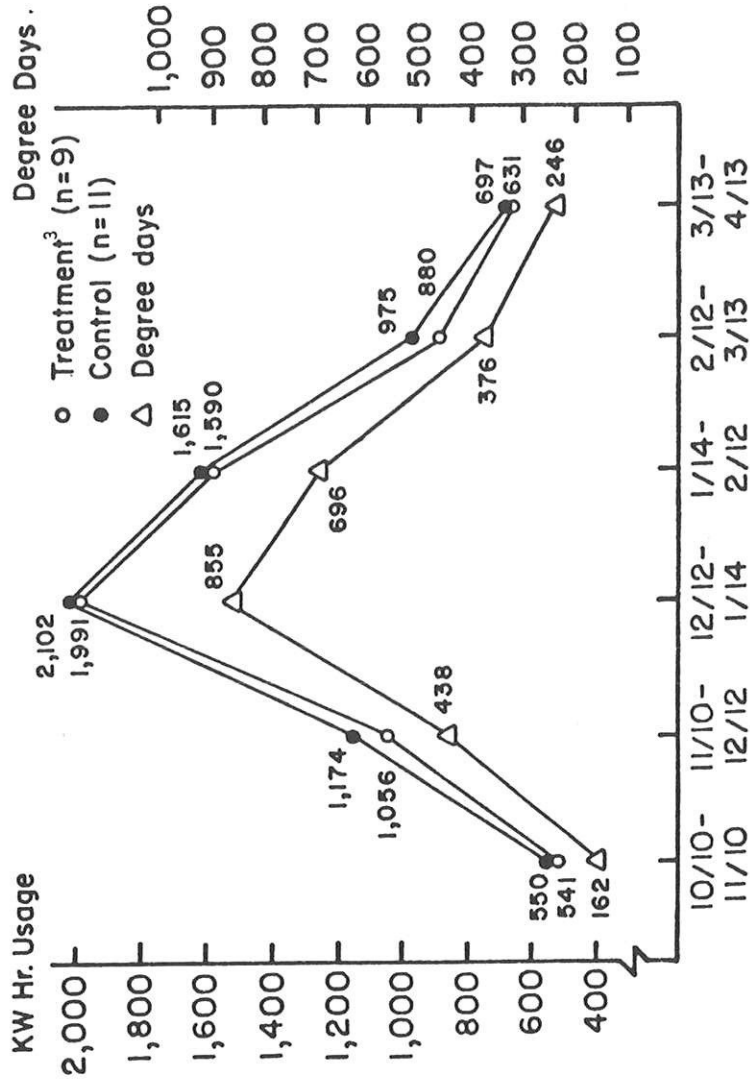
TABLE III  
 Pre- and Post-Treatment Attitudes Towards and  
 Knowledge of Energy Conservation for Treatment and Control Groups

<u>Attitudes</u>	<u>Treatment Group</u>		<u>Control Group</u>	
	<u>Pre-Treatment</u>	<u>Post-Treatment</u>	<u>Pre-Treatment</u>	<u>Post-Treatment</u>
Importance of Saving Energy (seven point Likert Scale 1 = not at all important; 7 = very important)	4.31	5.00	4.54	4.54
How Well They Felt They Saved Energy (seven point Likert Scale 1 = thought they did the best possible, 7 = didn't think they saved energy at all)	4.00	4.85	4.46	4.69
<u>Energy Quiz (13-items)</u>				
Average number of questions answered correctly	5.69	7.46	5.85	6.62



Figure I

Average Monthly KwHr Usage for Three Months Prior To and Following the Treatment Group Demonstration<sup>1</sup> Including Heating Degree-Days<sup>2</sup>



Date of Billing Period

<sup>1</sup>The educational Demonstration was administered 01/14/81

<sup>2</sup>Heating Degree Days are defined to be the daily mean temperature (°F) subtracted from 65°F and summed for the period

<sup>3</sup>Residents leaving their apartment for more than two days and/or nights during a billing period were omitted from the analysis

CONSUMER PRICE INFORMATION PROGRAMS:  
NEED, FEASIBILITY, AND DESIRABILITY

Robert D. Boynton and Warren Preston<sup>1</sup>

Abstract

Consumer price information programs have the potential to lower the cost of individual search and reduce price dispersion in local markets. Several such programs have been tried and many more contemplated and recommended. Our recent experience with one such program convinced us of the importance of evaluating the desirability of such programs in specific product markets. In this paper we develop a framework for the a priori evaluation of the need for and the feasibility of price information programs. These two criteria are then used to jointly determine the desirability of the program. The framework is applied to six product markets. Based on our results, which incorporate considerable judgement on our part, price information systems in some product markets are not desirable despite strong need. The procedure we outline requires refinement, additional application, and research into the relative importance of certain key factors.

Having just completed a frustrating, hectic, and sometimes less than satisfying (but professionally invigorating) experiment with buyer information enhancement in food markets, the temptation is strong to try to identify product markets where such an exercise might be easier and more productive [2]. We incurred the wrath of grocers, suffered the loss of support of the medium disseminating the information, and were largely unappreciated by consumers. Were it not for the support and encouragement of our professional and government colleagues and the observation that sellers' pricing behavior was modified in a competitive direction by the information program, we might have become noticeably despondent. It occurred to us that the need for such an information program and its feasibility should be thoroughly examined before again committing scarce resources and sensitive people to such an endeavor.

It is toward the development of a framework for the a priori evaluation of the desirability of a price information program that this paper is devoted. We will argue that the desirability of supplemental buyer information is related both to the need for such information in the relevant market and the feasibility of its efficient and accurate provision. Each of these contributors is, of course, itself a function of numerous factors. We will explore each in turn and apply our framework, albeit crude, to the appointed task in six product markets: food and sundries, auto parts, optical services and products, insurance, credit, and home appliances.

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The Role of Consumer Information Programs

Much theoretical attention has been devoted to the existence and consequences of information imbalances between buyers and sellers [6,8,9,10,11]. In general, seller market power is believed associated with information asymmetry and confusing, if not also spurious, differentiation. Unwarranted price dispersion among competing sellers is the ultimate result. While other alternatives are entertained, improved buyer information is often suggested as the most direct and practical solution to this competitive imperfection. Stigler [13] lucidly argued that rational buyers would equate the costs and returns to information search at the margin, thereby establishing the equilibrium level of search. Stigler's search rule of course, does not preclude price dispersions which are justified by valid quality and service differences among sellers. In addition, however, his rule allows the continuance of large, unjustified dispersions when search costs are correspondingly high. This latter condition implies that if search costs for the individual buyer could be reduced, search activity would increase and price dispersion drop. The prevalence of high search costs is plausible due to the technical complexity of some products, the large number of sellers over which to search, high consumer opportunity costs, and frequent price changes, to name only a few factors. A plausible prescription in such cases would be the centralized collection, processing, and dissemination of information for use by a large group of buyers.

Maynes, et al. [5] have laid out plans for local consumer information systems to serve just this search cost-reducing function. Boynton, et al. [2], Devine [3], and Devine and Marion [4] have tested specific types of food price information systems in U.S. and Canadian cities. Everyone involved in such activities seems to agree that payoffs to widespread information provision are high but all have failed, as best we can tell, to explicitly address the question of where -- which product markets -- the largest payoffs are likely to occur. In this era of reduced expectations and commensurate resource reductions, allocating our dollars, expertise, and energy to achieve the largest return is of vital importance. In this paper we develop a framework for making such evaluations. Perhaps because we are economists our focus is on the evaluation of price information systems. In such systems one endeavors to either hold quantity and service constant across firms/products or let buyers make those price-quality tradeoffs armed with improved price information. In Shephard's consumer research taxonomy, our information system evaluation framework includes all three market components -- consumers, producers, and the product [12]. Our scheme has important implications for consumer educators, researchers, and policy-

makers.

#### The Need for Consumer Price Information

Eight (8) factors are hypothesized to impact the consumers' need for comparative price information across firms. These are

1. dispersion of prices
2. the number of sellers
3. search time required
4. share of annual budget allocated to product
5. price saliency
6. prior information available
7. frequency of price changes
8. knowledge required for effective search.

Dispersion of prices. This is probably the single most important factor affecting the need for buyer price information. It is at the same time a symptom of the consumer's information problem and a measure of the potential return to additional search.

Number of sellers. This factor plays a dual role and although it is hypothesized to have a negative correlation with need, perhaps its net impact on information need is ambiguous. As the number of sellers increases, ceteris paribus, the more effective should competition be in the market and the smaller the need for consumer information. At the same time, however, the more alternative outlets the buyer faces, the greater is the search job. This effect of the number of sellers is taken up under the next factor - search time required. It should also be recognized that a large number of sellers could be associated with a small set of dominant firms with major market shares. This suggests that the largest firm's market share and the four and eight firm concentration ratios should also be examined in an effort to assess the extent of competition in the market under study.

Search time required. The amount of time required to acquire price information is positively related to the number of sellers, the complexity of product attributes, the number of products typically purchased per shopping trip (e.g. contrast this for groceries and home appliances), and the necessity of on-premise search.

Share of annual budget. Ceteris paribus, the more importance the product assumes in the typical consumer's household budget, the greater the

need for price information. The Bureau of Labor Statistics can readily provide such information for a restricted number of consumer types/localities.

Price saliency. As price takes on more importance in consumers' store and/or product choice criteria set, the more crucial is timely, accurate, and comprehensive price information. One could argue that as price saliency increases, so will consumers' perceived search returns. This might moderate the need for additional price information. It is also possible that additional price information may increase price saliency among consumers.

Prior information available. Consumers acquire price and product information from a variety of sources, including advertising, information publications (e.g. "Consumer Reports"), other consumers, and experience. While advertising can be very helpful to consumers, it is typically not designed to facilitate store price comparisons, at least not in food markets (see for example [1]). Experience is positively related to frequency of purchase. All these factors too are related to the search/knowledge sophistication of the consumer.

Frequency of price changes. The more frequently sellers change prices, the greater are the search costs. That is, having invested in search, a consumer finds the information obsolete as rapidly as sellers adjust prices. This problem was recognized by Maynes, et al. [5, p. 26]. It suggests the need for centralized search and widespread information dissemination.

Knowledge required for effective search. Some products are technically complex, requiring considerable knowledge for truly effective search (e.g. stereo components). That is, if accurate and useful price comparisons are to be made, product characteristics must be evaluated either to make reliable price-quality tradeoffs or in order to assemble a group of relatively homogeneous alternative products/firms from which to choose the least expensive. This knowledge factor along with search time and cost defines the extent of buyer validation of existing price dispersion in the market.

#### The Feasibility of Public Provision of Price Information

Feasibility encompasses the notion of cost of an information program but is not limited to cost considerations alone. Nine (9) factors are expected to affect the feasibility of the widespread dissemination of comparative price information in a market. These are

1. product homogeneity
2. sellers' margin shifting potential
3. number of sellers

4. frequency of provision necessary
5. feasibility of use of public media
6. potential price collection error
7. importance of services to buyer
8. sellers' ability to impose other rationing methods
9. ease of representing the firm/store price structure via a compact message unit.

Product homogeneity. The more homogeneous the product is across sellers, the more easily can price serve as a proxy for value. This is crucial to the feasibility of price reporting. When products are not homogeneous, it becomes important to feasibility whether these non-price qualities can be assessed prior to or only after purchase (see for example [7]). If purchase frequency is low and the latter condition prevails, the feasibility of price information falls.

Margin shifting potential. When sellers can respond to a price report by lowering prices on surveyed items while raising prices of non-surveyed ones, the benefits of reporting may be dissipated. This problem is related to the number of items carried, the frequency of price changes, the number of items purchased per visit, and sellers' knowledge of the identity of items included in a composite price measurement (if one is reported). The latter factor is also affected by the ability of the surveyor to collect needed price data without detection over the long run.

Number of sellers. As the number of sellers in a market area rises, the feasibility of a comprehensive price report declines. One remedial measure in the case of a large number of sellers, is to randomly rotate those surveyed each reporting period.

Frequency of provision necessary. A price report is less practical (or at least much more costly) as the frequency of its publication increases. As the frequency of purchase and the frequency of price changes increase, so does the need for more frequent reporting.

Feasibility of use of public media. Public media (such as newspapers, radio, and television) offer a relatively low cost -- in some cases even free -- means to disseminate price information to a large proportion of the potential buyers. Both the cost and the breadth of information dissemination affect price reporting's feasibility, at least in the long run. The willingness (ability?) of these media to sell or donate space for an on-going price information program may be impaired by economic pressures brought by advertisers. If the product(s) included in the report are sold by major newspaper advertisers, the only viable, permanent dissemination medium may be direct mail -- a costlier alternative with a longer lag.

Potential price collection error. As specifications for the surveyed product proliferate (e.g. size, slight formulation variations, grades), the skill of the surveyor becomes more important to the successful execution of a price reporting system. Such proliferation increases the potential for error, even among trained surveyors. This problem is closely related to the number of items carried by the surveyed outlets. Importance of service. If service after the sale or services associated with the purchase of the product (e.g. store convenience, salesperson attributes) are important components of the purchase decision, then price reporting may not be an accurate barometer of value. This factor of course, is a variation on product heterogeneity previously discussed.

Ability to impose other rationing methods. Faced with an on-going price reporting system, sellers may be able to reduce price on the included item(s) but restrict its sale by other means. These might include stocking only a limited supply, quantity purchase limitations, or special buyer qualification requirements (e.g. loan qualification terms or insurance rate qualification requirements). Of course, to the extent buyers discipline sellers who engage in these restrictive practices, their continuance and severity will be greatly reduced.

Ease of representing store price structure with a compact price message. Any price report is likely to convey a price impression among buyers which extends beyond the specific items mentioned in the report or included in the survey. If a single item or small group of items can be surveyed and reported which i) tend not to create a major price impression beyond their own boundaries or (ii) accurately create such a broadened impression, then the feasibility of price reporting is greatly enhanced. The ability to successfully cope with this impression-creating problem is negatively related to the number of items carried by the store/firm and the number of items purchased from a store/firm per visit, and positively related to the homogeneity of the product line carried.

#### Need and Feasibility

It is expected that some product markets will exhibit substantial need for additional price information but its provision may be quite impractical. This would suggest careful consideration be given before undertaking a price information program. Similarly, with high feasibility but low need, the wisdom of embarking on an information system should be questioned. It would seem appropriate to follow a framework such as this both to evaluate the desirability of an individual information project and to choose among alternative product market information projects.