Scaled from 1 to 5: 1 = lowest perception money cost
5 = highest perception money cost

actions would be monetarily, emotionally, and temporally expensive. Perceived chances of winning and is probably also important. While the differences between the two groups was significant on this variable, the individuals who didn't go to court perceived a high probability of success, which might indicate that this factor plays a reduced role in preventing consumers from going to court. Finally, access to court did not seem to be a major inhibiting factor, as those individuals who took legal action saw more access problems than did the other consumers.

Motivating Factors

There are factors that might motivate a consumer to take legal action. Such motivating factors can be classified in monetary and emotional incentives. Perceived monetary incentives are presented in Table 6. People who went to court perceived more money benefits to action than did those individuals who didn't take legal action. However, neither mean value was above 3, so this might indicate that monetary incentives, while important, are not crucial to a consumer decision to take legal action.

The value of the claim, and the value placed on extra money are also presented in Table 6. Individuals who went to court had a mean claim of $531, compared to $423 for the other consumers. While this difference is not significant, because these are large variances in claim values, it is still very substantial. The amount of money at stake, then, may influence perception of money costs. There appear to be no significant differences in the value placed on extra money between the two group. So this variable probably doesn't influence perception of money costs.

TABLE 6

Motivating Factors: Monetary Incentive
(mean values and significance levels)

Construct	Took legal action	Didn't take legal action	p value
Perceived money benefits to action	2.89	2.21	.01
Value Claim*	$531	$423	.45
Value placed on extra money	3.23	3.36	.41

*Simple monetary value of claim

Others scaled from 1 to 5: 1 = lowest perceived money benefits and value placed on money
5 = highest perceived money benefits and value placed on money

Table 7 presents emotional incentives to taking legal action. There is a significant difference between the consumers who took and didn't take legal in action perception of emotional benefits. In addition, the consumers who took action had a high mean value on the emotional benefits question, which may indicate that this is an especially strong reason for taking legal action.

Anger at the seller and a belief that one was intentionally mistreated, might be factors which influence perceived emotional benefits. However, while both groups of consumers had very high mean values on these variables, the difference between the groups is not significant. This might indicate that anger and perception of mistreatment might play a limited role in motivating a consumer to take legal action.

TABLE 7

Motivating Factors: Emotional Incentives
(mean values and significance levels)

Construct	Took legal action	Didn't take legal action	p value
Perceived emotional benefits	3.70	3.06	.03
Anger at seller	4.33	4.49	.41
Belief seller intentionally acted wrongfully	3.86	3.33	.24

Scaled from 1 to 5: 1 = lowest perceived emotional benefits, anger at seller, and belief of intentional mistreatment
5 = highest perceived emotional benefits, anger at seller, and belief of intentional mistreatment

IMPLICATIONS

In addition to contributing to academic knowledge, these results suggest several ways that small claims court might be restructured to facilitate use by consumers. First, the modest nature of the filing and serving costs in small claims court might be more fully publicized.

Currently, a very important reason why people don't pursue their claims in court is the perceived monetary costs, such as filing and serving expenses. Yet these expenses are relatively minor and are recoverable if the plaintiff prevails. More effort might be made by Consumer Services Division and similar agencies in other states, to make people aware of the limited costs of filing a case in small claims court.

Since perceived time costs is a reason why people don't take legal action, states might take steps to make using small claims court less time consuming. One step might be to reduce the lead time between filing and the hearing, by holding more small claims sessions. Such sessions might be held every day or every other day. Many courts in Oregon hold small claims sessions just once a week, which means that plaintiffs who are scheduled to appear may wait much of the morning before their case is heard. By holding just several cases a day the courts may better be able to schedule small claims cases, and reduce litigant waiting time.

Since perceived emotional costs are also important, Consumer Services or similar agencies in other states, might establish a program to counsel consumers about possible legal action. This might not only alleviate the anxieties of those consumers who have decided to take action, but it might also encourage other consumers with valid claims to take action who might otherwise be afraid of the court.

There has also been discussion of raising the monetary limits of small claims court to facilitate their use by consumers. Table 8 shows the distribution of the monetary values of the claims. As can be seen over three fourths of the claims are under $500. Thus it seems that most of the state jurisdictional limits of small claims courts, as reported by Friedman, are set at level that would allow the great preponderance of consumers to pursue their claim in this form. [7]

TABLE 8

Distribution of Value of Claims

Value of Claim ($)	Frequency	Cumulative Percent
0 - 249	122	61%
250 - 499	31	76%
500 - 749	21	88%
750 - 1000	7	91%
over 1000	19	100%

LIMITATIONS

There are several limitations to the research. It may be possible that the characteristics of those who responded may be different than those who didn't respond, thus introducing some bias into the results. Several tests were made to estimate non-response bias. First, from the limited amount of information about the non-respondents that was available from the files of Consumer Services, it was found by use of a chi-square and difference t tests that the respondents and non-respondents did not differ significantly at the .05 level in the size or nature of the claim.

Also, wave analysis was performed in that the responses of the individuals who answered in the first wave were compared with the responses of those that answered in the second wave. The following variables were found to be significantly different at the .10 level: difficulty in taking time off work, education, nature prior court experiences, perceived monetary benefits, and value placed one extra money. Presumably, the respondents would be different from non-respondents on these variables. While wave analysis indicated there may be some non-response error it should be noted that the response rate in this research was fifty one percent which was higher than in the other published studies on consumer of the court. [3, 14].

This research, as well as much work that is done in social psychology, in subject to measurement error because the research relies on self-report. Thus, respondents may have answered in a socially acceptable manner or selected answers consistent with their actions. For instance, a likert scale such as "The thought of going to court made me nervous" may have led people to disagree with that statement since they may have perceived "being nervous" as having negative social connotations.

Also the nature of the sample might lead to error. In generalizing the results, one should note that Oregon courts are different from other states' courts. For example, Oregon does not allow lawyers in small claims courts. However this error would be difficult to avoid as access to a sample similar to the one used in this research from both other state mediation services and the Better Business Bureau is generally prohibited to protected the confidentiality of the consumer. Further, the sample of the other published studies on consumer use of the courts were from Syracuse and Philadelphia. So the sample used in this research is relatively broad by comparison.

REFERENCES

1. Best A. and A. Andreasen, (1977), "Consumer Response to Unsatisfactory Purchases, A Survey of Perceiving Defects, Voicing Complaints and Obtaining Redress," Law and Society Review, 11: 701-735.

2. Bosching, M. (1976), "Manufacturer's Responses to Consumer Complaints on Guaranteed Products, Journal of Consumer Affairs 6: 86-90.

3. Bradley, J., D. Sherman, and W.K. Bryant, (1982), "Winning in Small Claims Court: An Empirical Analysis," Journal of Consumer Affairs, 16: 112-138.

4. Diener, B. (1975), "Information and Redress: Consumer Needs and Company Responses-- The Case of the Personal Care Industry," working paper No. 75-113, Marketing Science Institute.

5. Diener, B. and S. Greyser, (1976), "Consumer Views of Redress Needs," Journal of Marketing, 2: 21-28.

6. Eovaldi T. and P. Meyers, (1978), "The Pro Se Small Claims Court in Chicago and Justice for the Little Guy," Northwestern Law Review, 72: 947-964.

7. Joseph, J. and B. Friedman (1977), "Consumer Redress Through the Small Claims Court: A Proposed Model Consumer Justice Act." Boston College Industrial and Commercial Law Review, 18:839-891.

8. Kruger, W. (1975), "The Small Claims Court in Washington," Gonzaga Law Review, 10: 683-696.

9. Liefield, J.P., F.H.C. Edgecombe, and L. White, (1975), "Demographic Characteristics of Canadian Consumer Complainers," Journal of Consumer Affairs, 9: 73-81.

10. Nielsen, A.C. (1975), "Caveat Venditor," The Nielsen Researcher, 6: 2-3.

11. Oregon Consumer News, (1980), "Consumer Attitude Survey Completed," April-May-June, 5.

12. Ross, H.L. and N. Littlefield, (1978), "Complaint as a Problem-Solving Mechanism," Law and Society Review, 12: 199-217.

13. Sarat, A. (1976), "Alternatives in Dispute Processing Litigation in a Small Claims Court," Law and Society Review, 10: 339-366.

14. Steadman J. and R. Rosenstein, (1973), "Small Claims Consumer Plaintiffs in Philadelphia Municipal Courts: An Empirical Study," University of Pennsylvania Law Review, 121: 1309-1361.

15. Steele, E. (1974-1975), "Fraud, Dispute, and the Consumer: Responding to Consumer Complaints," University of Pennsylvania Law Review, 123: 1107-1186.

16. Swan J. and J. Longman, (1973), "Consumer Satisfaction with Automobile Repair Performance: Attitudes Toward the Industry and Government Control," Proceedings of the American Marketing Association, 241-248.

17. Wall, M. (1974), "Consumer Satisfaction with Clothing Wear and Care Performance and Consumer Communication of Clothing Performance Complaints," Ph.D. Dissertation, Ohio State University.

18. Warland, H., and Willits, "Dissatisfied Consumers: Who Gets Upset and Takes Action," (1973) Journal of Consumer Affairs, 9: 148-164.

19. Westbrook, R., R. Newman, and R. Taylor, (1978), "Satisfaction/Dissatisfaction in the Purchase Decision Process," Journal of Marketing, 2: 54-61.

20. Wolin, D. (1978), "How to Defeat the Jurisdiction (and Purpose) of Small Claims Courts for Only Fifteen Dollars," Brooklyn Law Review, 44: 431-516.

21. Yngvesson B. and P. Hennessey, (1975) "Small Claims, Complex Disputes: A Review of Small Claims Literature," Law and Society Review, 10: 219-250.

THE IMPACT OF THE ECONOMIC ENVIRONMENT AND SOCIO-ECONOMIC VARIABLES ON THE PURCHASE OF SMALL CARS[1]

Rachel Dardis, Diane Hrozencik[2]

ABSTRACT

The purpose of this paper was to investigate the demand for small cars by different types of households using data from the 1972-73 Consumer Expenditure Survey. These two years were characterized by different economic/energy conditions so that the analysis also provided information concerning the impact of changing economic conditions on the demand for small cars. The results indicated that the socioeconomic characteristics of households had a significant effect on the demand for small cars in 1972 and 1973. The impact of these characteristics was similar in both years. Second, there was a considerable increase in the demand for small cars from 1972 to 1973 reflecting household response to changing economic conditions and the emerging energy problem. Both findings indicate that while households differed with respect to purchase patterns they made similar responses to changing economic/energy conditions.

INTRODUCTION

In the past decade sales of small cars have taken an increasing share of total car sales. This reflects consumer response to changing economic conditions and the need for energy conservation. Information is limited, however, concerning the response of different households to these changes. Only two studies have used disaggregate household data to analyze purchases of small cars in recent years [6, 11]. The purpose of this paper was to investigate the demand for small cars by different types of households using data from the 1972-73 Consumer Expenditure Survey. These two years were characterized by different economic conditions so that the analysis should also provide information concerning the impact of changing economic conditions on the demand for small cars. It was assumed that the characteristics of households purchasing new cars would not vary greatly between the two time periods. Thus, changes in purchase patterns would reflect changes in overall economic conditions.

Background

The economy in 1972 was characterized by strong employment and large income increases [15]. Consumers were optimistic and spending for goods and services increased by 6 percent in real terms. Expenditures on durable goods, including automobiles, increased. Consumers were unaware of the impending energy crisis. An article in the April 1972 Oil and Gas Journal stated that "the major energy problem in the U.S. is the fact that the public is not yet aware that there is a problem" [18].

While 1973 started strongly it was subject to shortages and heavy inflationary pressures during the year [16]. The increase in real GNP was well below the rate obtained in 1972. Consumer confidence waned and the savings rate rose relative to 1972. By the end of 1973 most consumers had become aware of the energy problem and sales of small cars increased. In 1974 the U.S. economy experienced the most severe inflation since the period immediately following World War II while rising unemployment and a severe decline in real disposable income heralded the onset of a major recession [17].

SAMPLES AND VARIABLES SELECTED

The data were taken from the 1972-73 Bureau of Labor Statistics (BLS) Consumer Expenditure Survey (Detailed Public Use Tape No. 2 and Durable Expenditures Tape). The survey data included household purchases and ownership of automobiles as well as household income and other socio-economic characteristics. The analysis was confined to purchasers of new cars in 1972 and 1973 and excluded households that purchased more than one new car in either survey year. Multiple purchase households were excluded since more than one size class might be involved. They accounted for approximately 5 percent of all purchasing households in either year.

Two size classes of automobiles were investigated - small and large. Small cars were compacts and subcompacts while large cars were intermediate, medium, standard and luxury [19, 20]. The dependent variable was the probability of purchasing a small automobile in a given year. Selection of the independent variables was based on research reported in the literature concerning new car purchases [1, 5, 6, 7, 8, 10, 22] and choice of size class [2, 3, 6, 11, 21]. Researchers cited income; family life cycle; race, sex, education, and occupation of household head; location; and stock of automobiles as major factors influencing the demand for new automobiles. Gasoline prices were also used in analyzing purchases of small or large cars [2, 3, 6, 21]. Housing tenure was added in this study as an additional explanatory variable. It was believed that housing tenure would affect other investment decisions e.g. purchases of durable goods by the household. Each of the major independent variables is discussed below.

[1]University of Maryland Agriculture Experiment Station, Article No. A-3799. Computer time was supported through the facilities of the Computer Science Center of the University of Maryland.

[2]Professor and graduate assistant, Department of Textiles and Consumer Economics

Income

Two income measures were considered in this study. The first measure was disposable personal income, i.e. personal income of all persons in the household less federal, state and local income taxes, property taxes and other personal taxes. The second measure was total household expenditures. The use of total expenditures has been defended on the basis of the permanent income hypothesis and the fact that it is a better measure of the household's permanent income than disposable income which may fluctuate over short periods of time [14]. While most of the demand studies cited have used disposable income it was acknowledged that some type of permanent income might provide a better measure of the perceived purchasing power of the household [3, 5]. Total household expenditures were used in this study since it was believed that this income measure would avoid problems associated with fluctuations in disposable income, in particular since economic conditions differed in 1972 and 1973. It was hypothesized that total household expenditures would be negatively related to the probability of purchasing a small car.

Family Life Cycle

Family life cycle variables included age of household head, marital status, family size and number of adults in household. It was hypothesized that the probability of purchasing a small car would decline as the age of the household head increased. This would reflect past purchase patterns and the reluctance of individuals to switch from large size cars, to which they had become accustomed, to small cars. Six categories, ranging from less than 25 years to more than 65 years were used. Dummy variables were assigned to each category with the exception of the 35-45 age category in order to avoid producing linear dependence in the data matrix [9, 13]. Thus the results of the other five dummy variables categories are relative to this category. An increase in family size was also hypothesized to reduce the probability of purchasing a small car. In contrast an increase in the number of adults was hypothesized to increase the purchase probability since a small car would be more appropriate for use by individual members of the household. This type of household was more likely to purchase a second "small" car. The remaining life cycle variable was marital status. No hypothesis was made concerning the effect of this variable on the purchase probability.

Other Household Characteristics

These included race and sex of household head, employment status of spouse, and housing tenure. Based on work by Greenlees [6] it was hypothesized that households headed by blacks would be less likely to purchase a small car than households headed by nonblacks. Male headed households were also considered less likely to purchase small cars than female headed households. No hypothesis was made concerning the effect of a working spouse on the purchase probability. The final variable, housing tenure, was not investigated in previous studies on automobile demand. Its inclusion in this study was based on the hypothesis that home owners in the early 1970's were in a stronger asset position than renters and thus more likely to purchase a larger car. In addition, renters who wished to become homeowners in the future, might wish to economize by purchasing a small car.

Social Class

Education and occupation of household head were used to represent the social class of the household. These variables were included based on the hypothesis that households with higher educational and occupational levels were more likely to be aware of the need for energy conservation and the desirability of purchasing small cars. Three categories ranging from not a high school graduate to education beyond high school were used for education. Dummy variables were assigned to the lower and upper categories so that the results for these categories were relative to the omitted category - high school graduate. Five categories were used for occupation with dummy variables assigned to each category except for the blue collar category which was omitted.

Location

Four regions were reported in the survey - Western, North Eastern, North Central and Southern, necessitating the use of three dummy variables. The Southern region was the omitted region. The second location variable was the degree of urbanization i.e. whether the household lived in an urban or rural area. Location was hypothesized to have an effect on the probability of purchasing a small car due to differences in driving conditions, the availability of public transportation, gasoline prices and life styles in different parts of the country.

Unfortunately it was not possible to estimate the separate impact of gasoline prices in this study since location and gas price data pertained to the same region. The use of a gasoline price index to reflect prices in different regions would thus have led to perfect multicollinearity since all households in the same region had the same gasoline price index.

Net Stock

This variable represented the stock of automobiles owned by the household excluding the new purchase. It was hypothesized that net stock would be positively related to the probability of purchasing a small automobile since the larger the number of automobiles owned by the household the more likely that the next purchase would be a small car which could be used by individual members of the household.

SAMPLE SIZE

More than one thousand households purchased new vehicles in each year. However, data by size class were only available for 846 and 867 households in 1972 and 1973 respectively. Lack of complete socio-economic information for some of

these households led to a further reduction in sample size. As a result the sample size was 720 households in 1972 and 756 households in 1973.

LOGIT ANALYSIS

Logit analysis was used to investigate the relationship between automobile size class and socio-economic characteristics of households. This analysis is appropriate when the dependent variable is dichotomous since the predicted probabilities of purchasing a small car are bounded between 0 and 1 [9, 13]. The logit probability function is given by

$$P_i = F(A + BX_i) = \frac{1}{1 + e^{-(A + BX_i)}}$$

where P_i = probability of purchasing a small car and the X_i represent the various independent variables. The individual P_i are not observed (the household purchases or does not purchase a small car) so that it is necessary to convert the equation to an estimating form as follows.

$$\begin{aligned} \text{Let } Z_i &= A + BX_i. \\ \text{Then } P_i &= 1/(1+e^{-Z_i}) \\ 1/P_i &= 1+e^{-Z_i} \\ P_i/(1-P_i) &= e^{-Z_i} \\ \text{and } \log(P_i/(1-P_i)) &= Z_i \\ &= A + BX_i. \end{aligned}$$

The dependent variable in this regression equation is the logarithm of the odds that a particular choice (purchase of a small car) will be made. The purchase of a small car by a household is coded as 1 while the purchase of a large car is coded as 0. The method of maximum likelihood is then used to obtain estimates of A and B based on the purchase patterns of households and their socio-economic characteristics [9, 13].

The significance of all coefficients or a subset of coefficients in the model was tested using the following test statistic:

-2 (log likelihood of the reduced model - log likelihood of the full model).

This statistic has a Chi-Square distribution with k degrees of freedom where k equals the number of variables in the full model minus the number of variables in the reduced model. Thus, in the case of a test of the significance of the full model k is equal to the number of parameters in the equation other than the constant. In the case of a test of significance of social class, k is equal to six where six is the number of education/occupation variables removed in the reduced model. Asymptotic t-tests were used to determine the significance of individual coefficients.

The results for the two years were also compared using the following test statistic: 2 (log likelihood 1972 + log likelihood 1973 - log likelihood of pooled sample). This statistic has a Chi-Square distribution with k degrees of freedom where k equals the number of parameters in the equation other than the constant. If the resulting test statistic is significant this means that there is a significant difference between the two years with respect to the model parameters.

The results of the logit analysis were used to estimate purchase probabilities for different socio-economic households using the equation

$$P_i = \frac{1}{1 + e^{-(A + BX_i)}}.$$

The estimated values for A and B were combined with data for various types of households to estimate the probability of purchasing a small car by household type. A representative household was first defined and the various X_i values which characterized this household were used to determine its purchase probability. The household characteristics were then varied to determine the impact of different socio-economic characteristics on the purchase probabilities. Changes in purchase probabilities from 1972 to 1973 were examined.

RESULTS

Forty-six percent of households purchased small cars in 1972 compared to 54 percent in 1973. The mean values and distribution of the independent variables used in the analysis are given in Table 1. Total household expenditures are in current dollars each year and are similar when adjusted for inflation (household expenditures in 1973 are equal to $12,005.43 in constant 1972 dollars). A Chi-Square analysis of differences between the 1972 and 1973 samples indicated no significant differences at the 5% level for most of the independent variables. The exceptions were marital status and sex of the household head, housing tenure and region. However, there was no significant difference at the 1% level in the case of tenure and region.

The results of the logit analysis for 1972 are given in Table 2. In the case of categorical variables the omitted category is enclosed in parenthesis. As noted earlier the values for the remaining categories are then relative to the omitted category. A positive coefficient indicates that households in this category have a greater probability of purchasing small cars than households in the omitted category. The reverse occurs in the case of a negative coefficient. Thus, in the case of region households in the Northeast and West have a greater probability of purchasing a small car than households in the South (omitted category). In contrast households in the north central region have a smaller probability of purchasing.

The likelihood ratio statistic which is given at the bottom of the table was significant at the 5% level. This means that the entire model was significant in explaining the probability of purchasing a small car. The likelihood ratio index

was .103. This index is similar in concept to the R^2 values obtained in ordinary least squares regression analysis. However, it will generally be lower than R^2 values [9, 13].

TABLE 1. Mean Values and Distribution of Variables Used in Logit Analysis

Independent Variable	1972 (N = 720)	1973 (N = 756)
Total Household Expenditures	$11,921.62	$12,771.73
Life Cycle		
Age of the Household Head		
Less than 25 years	8.1	7.3
25 - 35 years	20.0	21.4
35 - 45 years	19.4	20.2
45 - 55 years	25.7	27.0
55 - 65 years	17.1	15.6
Greater than 65 years	9.7	8.5
Marital Status		
Married	87.8	83.2
Not Married	12.2	16.8
Household Size (persons)	3.3	3.3
Number of Adults		
Household members age 18 or older	2.4	2.3
Other Household Characteristics		
Race of Household Head		
Non-Black	94.7	94.3
Black	5.3	5.7
Sex of Household Head		
Male	91.2	88.0
Female	8.8	12.0
Employment Status of Spouse		
No spouse, spouse not working	51.1	50.4
Spouse works full or part time	48.9	49.6
Housing Tenure		
Homeowner	70.6	72.4
Renter	22.4	23.3
Renter and owner in survey year	7.1	4.2
Social Class		
Education of Household Head		
Not a high school graduate	30.0	28.2
High school graduate	34.0	34.9
Education beyond high school	36.0	36.9
Occupation of Household Head		
Professional, managerial	32.9	34.3
Sales and clerical	12.1	12.3
Blue collar	41.7	41.9
Not working, self employed	5.7	4.5
Retired	7.6	7.0
Location		
Region		
Northeast	22.2	25.4
North Central	32.5	30.6
South	29.6	25.8
West	15.7	18.3
Urbanization		
Urban	82.2	84.8
Rural	17.8	15.2
Stock Characteristics		
Number of net stock vehicles in household	.5	.6

Table 2. Estimated Coefficients: 1972

Independent Variable	Coefficient	A.S.E.[a]
Total Household Expenditures	$-.562 \times 10^{-6}$*	$.202 \times 10^{-6}$
Life Cycle		
Age (35 - 45 years)		
Less than 25 years	.617	.382
25 - 35 years	.366	.272
45 - 55 years	-.108	.255
55 - 65 years	-.452	.307
Greater than 65 years	-.819**	.435
Marital Status (married)	-.044	.439
Household Size	-.005	.007
Number of Adults	.381*	.131
Other Household Characteristics		
Race (non-black)	-.473	.381
Sex (male)	.869**	.479
Employment Status of Spouse (non-working spouse)	-.205	.180
Housing Tenure (homeowner)		
Renter	.395**	.240
Renter and owner in survey year	.502	.334
Social Class		
Education (high school graduate)		
Not a high school graduate	.265	.216
Education beyond high school	.614*	.212
Occupation (blue collar worker)		
Professional, managerial	.287	.219
Clerical and sales	.124	.274
Not working or self-employed	-.109	.380
Retired	.133	.422
Location		
Region (south)		
Northeast	.407**	.227
North Central	-.534*	.212
West	.472**	.256
Urban (rural)	.041	.224
Net Stock	.321*	.136
Likelihood Ratio Statistic	101.97*	
Likelihood Ratio Index	.103	

[a] Asymptotic Standard Error
* Statistically significant at the 5% level
** Statistically significant at the 10% level

The asymptotic standard error is given in the third column of Table 2. The coefficient divided

by its asymptotic standard error yields a t- statistic which may be used to test for the significance of the individual variables. Coefficients, which were significant at the 5 percent and 10 percent level, are indicated in the table.

Total household expenditures were negatively related to the probability of purchasing a small car as hypothesized. Age was significant in only one instance but it is worth noting the decline in purchase probability with age. While family size is insignificant the number of adults was positively related to the probability of purchasing a small car. Households headed by a black or a male were also less likely to purchase a small car than other households though the result was not significant in the case of race.

Only one of the social class variables was significant. In contrast region, housing tenure, and net stock emerged as major explanatory variables with the two latter variables having a positive impact as hypothesized. The higher purchase probabilities for households living in the Northeast and West compared to households living in the South is interesting and may reflect a variety of factors including differences in driving conditions, gasoline prices, public transportation and life styles. Differences in gasoline prices in the four regions are given below.

TABLE 3. Gas Price Indexes in 1972 and 1973

Region	1972	1973
West	86.6	98.5
Northeast	92.5	99.1
South	85.7	91.4
North Central	88.1	98.1

The higher prices for the Northeast and West relative to the South are in keeping with the positive coefficients shown in Table 2.

The results for 1973 are given in Table 4. The likelihood ratio statistic was again significant at the 5 percent level while there was an increase in the likelihood ratio index. The results for the individual variables are similar in many respects to those obtained for 1972 with respect to total household expenditures, number of adults, age of household head, region, housing tenure and net stock.

TABLE 4. Estimated Coefficients: 1973

Independent Variable	Coefficient	A.S.E.[a]
Total Household Expenditures	$-.476 \times 10^{-6}$*	$.205 \times 10^{-6}$
Life Cycle		
Age (35 - 45 years)		
Less than 25 years	.324	.423
25 - 35 years	-.022	.261
45 - 55 years	-.721*	.264
55 - 65 years	-.934*	.314
Greater than 65 years	-1.442*	.464
Marital Status (married)	.780**	.433
Household Size	.001	.007
Number of Adults	.257**	.142
Other Household Characteristics		
Race (non-black)	-.963*	.376
Sex (male)	-.255	.445
Employment Status of Spouse (non-working spouse)	.075	.182
Housing Tenure (homeowner)		
Renter	.536*	.232
Renter and owner in survey year	.487	.426
Social Class		
Education (high school graduate)		
Not a high school graduate	-.128	.218
Education beyond high school	.122	.210
Occupation (blue collar worker)		
Professional, managerial	.273	.218
Clerical and sales	.338	.281
Not working or self-employed	.410	.415
Retired	.896*	.450
Location		
Region (south)		
Northeast	.428**	.227
North Central	-.102*	.216
West	1.515*	.274
Urban (rural)	-.272	.231
Net Stock	.615*	.140
Likelihood Ratio Statistic	128.28*	
Likelihood Ratio Index	.123	

[a] Asymptotic Standard Error
* Statistically significant at the 5% level
** Statistically significant at the 10% level

It is possible that the results reported for the individual variables may reflect multicollinearity with respect to family life cycle, social class or location since the variables within these groups are inter-related. Accordingly the significance of subsets of variables was tested using the procedure mentioned earlier. The results are given in Table 5 for 1972 and 1973. All three sets of variables were significant at the 5 percent level in 1972 while family life cycle variables and location variables were significant in 1973 at the 5 percent level.

TABLE 5. Contribution of Sets of Variables: Chi-Square Statistic

Year	Variables Removed: Family Life Cycle	Social Class	Location
1972	20.07*	15.90*	24.34*
1973	28.54*	8.43	48.02*

*Statistically significant at the 5% level

A comparison of the results for the two years using data for the individual years and both years combined resulted in a Chi-Square value equal to 36.64 which was less than the value required at the 5 percent level of significance.

The Chi-Square value was, however, significant at the 10 percent level.

The results of the analyses were also used to estimate the purchase probabilities for different types of households and the data are given in Table 6. The representative household was a household headed by a non-black married male aged 35-45 with a high school education and employed in a blue collar job. The head was a homeowner, and lived in a rural area in the South. Total household expenditures, household size, number of adults in the household and net stock were the mean values given in Table 1. The purchase probability for this representative household was .503 and .804 in 1972 and 1973 respectively compared to mean probabilities for the entire sample of .610 and .815.

TABLE 6. Sample Probability Calculations

Household Type	1972	1973
Full Sample	.610	.815
Representative Household	.503	.804
Changes to Representative Household		
Number of Adults Increased by One	.597	.841
Age Less than 25 Years	.652	.850
Age 25 - 35 Years	.593	.800
Age 55 - 65 Years	.392	.617
Age Greater than 65 Years	.308	.492
Professional, Managerial Occupation	.574	.843
Clerical, Sales Occupation	.534	.852
Renter	.600	.875
Northeast Region	.603	.863
North Central Region	.372	.787
Western Region	.618	.949
Urban Location	.513	.758
Net Stock Increased by One	.582	.884

The results when changes in household characteristics are made are in agreement with the signs of the coefficients given in Tables 2 and 3. Age and occupation of household head, region, housing tenure and net stock have a major impact on purchase probabilities in both years. Probabilities range from .308 to .652 in 1972 compared to values of .492 and .949 in 1973.

As the data indicate there was a considerable increase in purchase probabilities for all household types from 1972 and 1973. While the impact of changes in household characteristics on the purchase probabilities are similar in both years purchase probabilities were far higher for each household type in 1973 than for 1972. This suggests that changes in economic conditions in 1973 affected the demand for small cars by all types of households. The failure of the Chi-Square test to reject the hypothesis of no difference between the two years may thus reflect the fact that the variances in both years were too great to establish significance at the 5% percent level.

The success of the logit model in predicting purchases may also be estimated by comparing actual and predicted probabilities. There were a total of 720 new car purchasers in 1972 of whom 334 purchased small cars and 386 purchased large cars. According to the model 201 of the small car purchasers were predicted to purchase small cars while 282 of the large car purchasers were predicted to purchase large cars. The proportion predicted correctly was 67 percent-(201 + 282) /720. This proportion was then compared to the proportion predicted by chance. Based on the actual distrubution of car purchasers (46 percent small, 54 percent large) the proportion predicted by chance was $.46^2 + .54^2$ or 50 percent [12]. The difference between the two proportions is significant at the 5 percent level.

Similar results were obtained for 1973 with the model predicting 68 percent correctly compared to a chance prediction of 50 percent.

DISCUSSION

The major findings of the study are given below.

1. Total household expenditures were significantly and negatively related to the probability of purchasing a small car in both years. This result is in agreement with the results reported by Carlson [3] and Greenlees [6].

2. Tests for sets of variables indicate that family life cycle, and location were significant in both years. Social class was only significant in 1972.

3. Age of household head was negatively related to the probability of purchasing a small car in 1973. This may reflect past experience with large cars by older consumers and their reluctance to switch to smaller cars.

4. Other significant variables were the number of adults, housing tenure and region. The number of adults was positively related to the probability of purchasing a small car in both years. Renters were also more likely to purchase small cars than homeowners. This may reflect differences in asset positions and the need to save by renters if they are to own homes in the future. Households located in the Northeast and West were also more likely to purchase small cars than households located in the South. Differences in gas prices, particularly in 1973 may explain this result.

5. Net stock of automobiles was a significant explanatory variable in both years. An increase in the net stock increased the probability of purchasing a small car. This probably reflects the fact that the purchase of a second car by the household is likely to be a small car for use by individual members of the family.

6. The coefficients for education and occupation were insignificant in both years with

two exceptions. The remaining variables were also insignificant with the exception of sex (significant in 1972) and race (significant in 1973). Households headed by males or households headed by blacks were less likely to purchase a small car than other households.

7. There was a considerable difference in purchase probabilities in 1972 and 1973. Purchase probabilities increased from 1972 to 1973 for the entire sample as well as for different types of households.

The above findings may be summarized as follows. First the socio-economic characteristics of households had a significant effect on the demand for small cars in 1972 and 1973. The impact of these characteristics was similar in both years. Second, there was a considerable increase in the demand for small cars from 1972 to 1973 reflecting household response to changing economic conditions and the emerging energy problem. Both findings indicate that while households differed with respect to purchase patterns they made similar responses to changing economic/energy conditions.

The results of this study should be of interest to energy policymakers and the domestic automobile industry. Households headed by younger, lower-income, individuals who rented their homes and lived in the Northeast or West were more likely to purchase small, fuel-efficient cars in 1972 and 1973. The results of similar analysis using data for the 1980's could also be compared to the results of this study to determine household response under different economic conditions and the increased availability of small domestic automobiles.

REFERENCES

1. Armstrong, A. G. and Odling-Smee, J. C. (1978). "The Demand for New Cars." Oxford Bulletin of Economics and Statistics, 40 (November), 281-301.

2. Blomquist, A. G. and Haessel, W. W. (1978). "Small Cars, Large Cars and the Price of Gasoline." Canadian Journal of Economics, 11 (August), 470-489.

3. Carlson, Rodney L. (1976). "Seemingly Unrelated Regression and the Demand for Automobiles of Different Sizes, 1965-75: A Disaggregate Approach." Journal of Business, 51 (April), 243-62.

4. Cragg, John G., and Uhler, Russel S. (1970). "The Demand for Automobiles." Canadian Journal of Economics, 3 (August), 386-406.

5. DeJanosi, Peter E. (1959). "Factors Influencing the Demand for New Automobiles." Journal of Marketing, 23 (April), 412-418.

6. Greenlees, J. S. (1980). "Gasoline Prices and Purchases of New Automobiles." Southern Economic Journal, 47 (January), 167-178.

7. Huang, David S. (1964). "Discrete Stock Adjustment: The Case of Demand for Automobiles." International Economic Review, 5 (January), 46-64.

8. Johnson, Terry R. (1978). "A Cross-Section Analysis of the Demand for New and Used Automobiles in the United States." Economic Inquiry, 16, (October), 531-48.

9. Judge, G. G., R. C. Hill, W. E. Griffiths, H. Lutkenpohl, and T. Lee (1982). Introduction to the Theory and Practice of Econometrics. New York: Wiley, pp. 515-547.

10. Kreinin, Mordechai E., and Lininger, Charles A. (1963). "Ownership and Purchase of New Cars in the United States." International Economic Review, 4 (September), 310-324.

11. Lave, C. A. and Train, K. (1979). "A Disaggregate Model of Auto Type Choice." Transportation Research, 7 (June), 1-9.

12. Morrison, Donald G. (1969). On the Interpretation of Discriminant Analysis, Journal of Marketing Research, 6 (May), 156-163.

13. Pindyck, R. S. and D. L. Rubinfeld (1981). Econometric Models and Economic Forecasts, 2nd edition. New York: McGraw-Hill Book Company, pp. 273-315.

14. Prais, S. J. and Houthakker, H. S. (1971). The Analysis of Family Budgets, (2nd ed.). Cambridge: University of Cambridge.

15. U.S. Board of Govenors of the Federal Reserve System (1973). "1972: A Year of Accelerating Recovery." Federal Reserve Bulletin, 59 (January), 1-11.

16. U.S. Board of Govenors of the Federal Reserve System (1974). "The Economy in 1973." Federal Reserve Bulletin, 60 (January), 1-14.

17. U.S. Board of Govenors of the Federal Reserve System, (1975). "The Economy in 1974." Federal Reserve Bulletin, 61 (January) 1-10.

18. "U.S. Unaware of Budding Energy Crisis," (1972). The Oil and Gas Journal, 70, 52-53.

19. Ward's 1972 Automotive Yearbook (1972). 34th edition. Detroit, Michigan: Ward's Communications, Inc., p. 24.

20. Ward's 1974 Automotive Yearbook (1974). 36th edition. Detroit, Michigan: Ward's Communications, Inc., pp. 148-151.

21. Wetzel, J. and Hoffer, G. (1982). "Consumer Demand for Automobiles: A Disaggregated Market Approach." Journal of Consumer Research, 9 (September), 159-199.

22. Wykoff, F. C. (1973). "A User Cost Approach to New Automobile Expenditures." Review of Economics and Statistics, 40, 377-490.

FACTORS AFFECTING CONSUMER ACCEPTANCE AND USE OF CHILD RESTRAINT DEVICES

Jo Lynn Cunningham[1], Wilma Jozwiak[2], and John Philpot[3], The University of Tennessee, Knoxville

ABSTRACT

Nonuse and misuse of child restraint devices (CRDs) are responsible for many deaths and serious injuries. The present study was designed to focus on two factors with potential relevance to this problem: CRD design and directions for use. Observations, interviews, and questionnaires were used to collect information about CRD beliefs and behavior from both experienced and inexperienced CRD users. Panels of engineers and educators reviewed results and made suggestions for improving CRD design and for improving instructions and consumer information.

Over 46,000 deaths and 1,800,000 injuries per year result from automobile accidents in this country. It has been estimated that the United States spends $38 billion to provide medical care for the injured [1]. Of children under 5 years old, 1,000 die and 60,000 are injured each year in automobile accidents. The head and face are involved in approximately 60% of the accidents, and brain damage occurs in 10% of the accidents of children under 5 years of age [1].

Siegel, Nahum, and Appleby studied various types of child restraint devices (CRDs) and provided convincing evidence for the effectiveness of CRDs in reducing severity of injuries sustained by children in automobile accidents [7]. The most comprehensive studies of the effectiveness of use of CRDs have been done by Scherz in the state of Washington. He concluded that 91% of fatalities and 67% of disabling injuries from automobile accidents might be avoided if children were restrained properly in CRDs [6].

---

[1]Professor of Child and Family Studies

[2]Research Assistant at Transporation Center at time of study; currently with Knox County (TN) Schools

[3]Professor of Statistics

This paper is based on a project funded by the National Traffic Safety Administration, U.S. Department of Transportation, to the Transportation Center at The University of Tennessee. Appreciation is expressed to Pat Capps, Carol Culler, Catherine Marshall, Kevon Miller, Dianne Sontag, and Stephan Wilson for assistance with data collection; to Betty Heathington for assistance with readability and information analysis; to Ken Heathington for assistance with engineering design analysis and highway safety education/evaluation; and to Mike Bronzini for administrative support. Appreciation also is expressed to the parents and children who participated in this study.

Despite overwhelming evidence of the benefits of using CRDs, usage rates have been very low. Increased public attention to the importance of CRD use has been associated with definite increases in CRD ownership and moderate increases in CRD use, but a serious problem still exists with respect to appropriateness of use. For example, Williams found that 15% of CRDs observed were not used, and of those in use, 73% were not used correctly [8]. Likewise, Hall and Council found that of the 26% of the children they observed riding in CRDs in North Carolina, only 5.9% were riding in properly secured CRDs [4]. Thus, effectiveness of protection to children in CRDs is hampered significantly.

Many factors related to nonuse of CRDs appear to be related to those of misuse. Parents with higher educational levels are more likely than other parents to use CRDs, and parents who own but do not use CRDs regularly have reported that perceived lack of comfort and convenience and difficulty in following manufacturers' directions contribute to nonuse [2]. Thus, even though a potential solution to the ravages on the nation's highways is available, means of facilitating consumer use must be identified before the problem is alleviated.

The present study was designed to focus on two factors with potential relevance to the CRD usage problem: CRD design and directions for use. Primary objectives were to determine the effect of CRD design on initial consumer acceptance and use, to determine the effect of readability of CRD instructions on initial consumer acceptance and use, and to determine the effect of CRD design on consumer acceptance and use over time. Secondary objectives were to determine the impact on consumer acceptance and use of various CRD design features, to determine the relationship between consumer acceptance and use of various CRD design features and sociodemographic characteristics, and to determine the relationship between consumer acceptance and use of various CRD design features and vehicle characteristics. Ultimate objectives were to develop recommendations for consumer education designed to improve proper CRD use, for improving manufacturers' instructions for CRD use, and for improving CRD design.

METHODS

The study included three components designed to answer questions about CRD use relative to parents' attitudes toward CRDs at several points in their CRD use experience. The initial use component of the study was focused on the inital parental contact with the CRD, including

first-time CRD installation and child placement. The repeated use--longitudinal sample component of the study began with the initial parental contact with the CRD and continued through the first 2 months of use of a loaned CRD. The repeated use--cross-sectional sample component of the study was focused on parents identified as consistent CRD users.

Materials

CRDs included in the initial use and repeated use--longitudinal sample components were selected based on relevant design features. Six models were selected: Bobbie-Mac Champion, Century Safe-T-Rider, Cosco-Peterson Safe-T-Shield, Ford Tot-Guard, Kantwet-Questor One-Step, and Takata Guardian (a Japanese seat not available in the U.S. and used only in the initial use component of the project).

Instructions for CRD use were designed to vary in readability. Three sets of instructions were developed for each CRD in the initial use component: instructions written at the normative reading level (10th grade) plus pictures, instructions written at a reduced reading level (3rd grade) plus pictures, and pictures only (with labels). Manufacturers' instructions were used for the repeated use--longitudinal sample component.

Design and Sample

A separate design was used for each project component. However, these designs were coordinated so some comparison across components was possible.

Names of potential subjects for all project components were obtained from day care centers, schools, churches, welfare and WIC (Women, Infants, and Children) offices, physicians, and personal contacts. For the longitudinal sample component, potential subjects also were solicited through radio, television, and newspaper articles and advertisements. Family's socioeconomic status (SES) was determined by occupation on the basis of the Duncan Socioeconomic Index [3]. In two-parent households, family's SES determination was made on the basis of the parent with the occupation of the highest rank.

Initial use component. The design for the initial use project component contained three controlled sources of variation: CRD type (6 levels), type of instructions (3 levels), and regional site/observer (4 levels--Iowa, New York, Tennessee, and Utah). Three components were held constant: parent's gender (mothers only), CRD experience (none), and vehicle type (mid-size four-door sedan). There were three counterbalanced sources of variation: family's SES (low, middle, and high), child's age (1-, 2-, and 3-year olds), and child's gender (females and males). Dependent variables were overall success in CRD installation, correctness of safety belt installation, correctness of tether installation (where applicable), correctness of internal harness installation (where applicable), perceived ease of installing CRD, perceived ease of placing child in CRD, acceptance of CRD, perceived cost to children, perceived cost to parents, and satisfaction with CRD. At each of the four sites, there were 54 subjects, for a total of 216 subjects (3 observations/cell).

Repeated use--longitudinal sample component. The design for the repeated use--longitudinal sample component contained two controlled sources of variation: CRD type (5) and time periods (repeated measures across time, with 4 levels for some variables and 2 levels for others). Four components were held constant: parent's gender (mothers only), CRD experience (none), site (Tennessee only), and type of instructions (manufacturer's). There were three counterbalanced sources of variation: family's SES (low/lower-middle and upper-middle/high), child's age (1-, 2-, and 3-year olds), and child's gender (females and males). Dependent variables were overall success in CRD installation, correctness of safety belt installation, correctness of tether installation, correctness of internal harness installation, correctness of shield installation, perceived ease of installing CRD, perceived ease of placing child in CRD, acceptance of CRD, perceived cost to children, perceived cost to parents, and satisfaction with CRD. A total of 30 subjects were included in this sample component.

Repeated use--cross-sectional sample component. The design for the repeated use--cross-sectional sample component contained four sources of variation: site/observer (Iowa and Tennessee), child's age (1-, 2-, and 3-year olds), child's gender (females and males), and parent's gender (fathers and mothers). The variable of CRD experience was held constant; all subjects were experienced users. Variables included beliefs/behavior relevant to CRD use (overall success in CRD installation, ease of installing CRD, ease of placing child in CRD, acceptance of CRD, perceived cost to children, perceived cost to parents, satisfaction with CRD, and extent of CRD use) and descriptive characteristics (parental sociodemographic characteristics, CRD features, and vehicle features). There were 40 subjects at each site, for a total of 80 participants.

Instruments

Several instruments were developed or adapted for this study. The Observation of CRD Installation included quantitative data--child's gender and age; parent's gender, SES, and occupation; CRD type; make and model of vehicle; initial and final choice of seat (front or back) and seating position (left, center, or right) for CRD installation; parental approach to the installation problem; time required for installation--and qualitative data (parental verbal and nonverbal behavior during

installation). The CRD Beliefs Questionnaire, a self-administered form, included scales for ease of installing CRD, ease of placing child in CRD, the number of CRD uses on the last five long car trips and the last five short car trips. The Sociodemographic Information Questionnaire, a self-administered form, included scales for number of children; both parents' occupations; respondent parent's level of education, marital status, age, and ethnic group; family's income; and parent's experience in using a CRD. The CRD Installation Interview included questions about the CRD presented to the parent for the inital use and repeated use--longitudinal sample components; additional questions added for the repeated use--cross-sectional sample component were used to solicit parents' opinions about CRDs they had used previously. The CRD Use Interview was used in the repeated use--longitudinal sample component of the study to solicit information about numbers of times parents used and failed to use the CRD, numbers of times other persons used and failed to use the CRD, situations that made the parent feel more positive or less positive toward CRD use, and things the parent liked or disliked about the CRD. Adequate content validity and interobserver or internal consistency reliability were established for all instruments except the ease of installation and ease of child placement scales of the Car Seat Beliefs Questionnaire.

Procedures

Different individuals were used to collect data at each site. All were white and in the 25- to 35-year age range; all but one (the one responsible for data collection from the repeated use--longitudinal sample) were female. All had both undergraduate and graduate work in child development and/or education, and all had previous experience as interviewers.

Procedures manuals were developed to train the data collectors. This information was supplemented by extensive telephone or personal follow-up training designed to check understanding of procedures.

Initial use component. Data collection was conducted at a location convenient for the parent (e.g., day care center, home). In each site, a mid-size four-door American-made sedan with a tether bolt installed in the rear panel was used for CRD installation. Before data collection began, each mother was given a brief project description, informed of her right to refuse to participate or withdraw from participation, and asked to sign a consent form.

Each mother was presented with one CRD and one set of instructions (determined in advance by the factorial design) and asked to attempt to install that CRD and place the toddler in it. Although the data collector did not answer questions during installation, mothers were encouraged to "think out loud" as they worked. Mothers were assured that questions would be answered at the end of the contact. If successful installation and child placement had not occurred after 20 minutes, the installation was stopped.

The Observation of CRD Installation was completed by the data collector during the installation period. After this procedure, the mother was asked to complete the CRD Beliefs Questionnaire and the Sociodemographic Information Questionnaire. Finally, the CRD Installation Interview was conducted.

Repeated use--longitudinal sample component. The initial contact in this project component was identical to that in the initial use component except that (a) manufacturers' instructions were used in all cases; (b) the mother was "debriefed" at the end of the first installation session to ensure that she could install the seat properly; (c) installation was in the parent's vehicle; and (d) with tethered seats, the parent was given the name and address of a local agency that had agreed to install the tether bolt free of charge. The mother then began a "loaner" period using the CRD she had attempted to install.

In addition to the initial contact, three more in-person data collection occasions (at the end of the 2nd, 5th, and 8th weeks) were used. On each of these occasions, the mother was asked to install the borrowed CRD in her own vehicle. The data collector completed the Observation of CRD Installation and the CRD Use Interview each time.

On the weeks not planned for in-person contacts, the mothers were contacted by telephone and administered the CRD Use Interview. After each contact, mothers were encouraged to clear up any questions they had about correct CRD use.

Repeated use--cross-sectional sample component. Data collection was conducted at a location convenient for the parent (e.g., day care center, home). Each parent first was given a brief description of the project, informed of his/her right to refuse to participate in the study or to withdraw at any time, and asked to sign a consent form.

The parent then was asked to install the CRD normally used with the child in the family's own vehicle and to place the child in the CRD. S/he was allowed to consult the instructions provided with the CRD if desired. The parent was allowed 20 minutes for installation; if installation was not completed by that time, the observation was terminated.

The Observation of CRD Installation was completed by the data collector during the observation period. Then the parent was asked to complete the CRD Beliefs Questionnaire and the Sociodemographic Information Questionnaire. Finally, the CRD Installation Interview (including four questions not used in the initial use component) was administered.

Analysis

Both quantitative and qualitative analyses of data were conducted. To answer questions about success in installation of CRDs relative to type of CRD, form of instructions, site, parent's gender, and/or experience, cross tabulations/chi-square analyses were conducted. To determine differences in beliefs relative to these same independent variables, analyses of variance were conducted. To determine whether the belief/behavior variables could be used to form systematic clusters of individuals (i.e., groups of individuals with common beliefs and behavior), cluster analysis was used. Qualitative analyses included categorization and summary of verbal responses. In all cases, the individual was the unit of analysis, and the criterion for significance was an alpha level of .05 for quantitative analyses.

RESULTS

Separate quantitative and qualitative analyses were conducted for each project component. Panels of professionals also were used to make recommendations related to project objectives.

Initial Use Component

Quantitative analyses were used to determine whether there were differences in installation success and beliefs in relation to type of CRD, form of instructions, and/or site. Qualitative analyses were focused on mothers' perceptions of CRD characteristics.

Quantitative analyses. Relationships between accuracy of installation and the six types of CRDs (each having at least two CRD components identified as typical of toddler CRDs) were examined. A chi-square analysis performed on these data was not significant. However, there was a wide range of success rates for CRD installation. For example, the complex Kantwet-Questor One-Step was installed correctly by only 17% of these first-time users, as compared with 53% for the Ford Tot-Guard and 58% for the Century Safe-T-Rider, the two least complex CRDs tested.

The relationship of accuracy of installation to CRD type also was examined by combining the correct usage of CRD components across all CRDs that included these components. Again, none of the differences were significant, but there was a wide range of success rates for the various components. The tether was used incorrectly most often (53% of the time). The automobile safety belt, the one component common to all CRDs available in the U.S., was installed correctly almost two-thirds of the time (62%). Apparently, the components in combination make the CRD more difficult to use than its parts; overall, the CRDs were installed completely correctly only 41% of the time.

Analysis of the scores on the CRD Beliefs Questionnaire resulted in several differences. Mothers in New York who tested the Century Safe-T-Rider had more positive satisfaction scores than did New York mothers who tested the Kantwet-Questor One-Step. Mothers (across sites) who installed the Takata Guardian had more positive scores on acceptance of and satisfaction with CRDs than did mothers who installed the Ford Tot-Guard. Mothers in Tennessee and New York, both of which had child restraint laws, scored more positively on acceptance of CRDs than did mothers in Iowa, which did not have child restraint legislation. Mothers in Tennessee also had more positive satisfaction with CRDs than did mothers in Iowa. However, no differences were found on car seat beliefs by form of instructions. Scores on cost to parents and cost to children did not differ by CRD type or site.

Qualitative analyses. Initial users made few comments during installation. Those comments that were made usually fell into one of four categories: (a) mother's self-perception of mechanical prowess; (b) physical characteristics of the CRD; (c) ease/difficulty of installation; and (d) likelihood of the toddler's agreeing to ride in the CRD.

The most common comment overall involved mothers' disparaging their own mechanical skills amd/or comments about how helpless they felt when faced with such a task. Mothers' nonverbal behavior also suggested much frustration with the installation task. Based on verbal and nonverbal behavior during installation, correctly placing the tether strap on the Kantwet-Questor One-Step appeared to be the most troublesome task, but some mothers even tried to place the shield of the Ford Tot-Guard upside down and/or backwards.

Although there was a slight tendency for lower SES mothers to complain about the instructions, the mother's approach to the problem seemed to be more important than her reading ability. The most common complaint about the illustrations was that they were too small. Lack of organization and realism were mentioned by a few mothers. Finally, the instructions consisting only of labeled pictures were criticized by some mothers who thought that pictures alone were not sufficient.

Repeated Use--Longitudinal Sample Component

Quantitative analyses were conducted to determine whether there were differences in installation success relative to type of CRD and/or time/experience, as well as whether there were differences in beliefs relative to CRD type. Qualitative analyses were focused on mothers' perceptions of CRD characteristics.

Quantitative analyses. Mothers in this project component improved over the four time periods in

both overall accuracy and also accuracy of installation relative to specific CRD components. Correct use was better for Periods 2-4 than for Period 1 for the automobile safety belt, tether, internal harness, and shield. There were some mistakes with use of the safety belt, tether, and/or internal harness for all time periods; some parents failed to install the tether bolt for several weeks (or at all), despite the offer of free installation at a local agency. By the fourth time period, 100% success was achieved with all seats for the shield component. CRD position and booster seat use had 100% accuracy rates for all periods.

Qualitative analyses. Mothers who participated in the longitudinal component of the study had relatively few specific comments (positive or negative) recorded about the CRDs during the CRD Installation Interview. They tended to make more general comments and to be more positive toward the seat in this initial contact than in later contacts. Although some of these differences may be because of differences in the way the observer recorded comments, it also may be partly because they were being loaned the CRDs and may not have wanted to make many negative comments about CRDs they were going to be using (at no cost).

During subsequent contacts, mothers made few comments about problems encountered in using the CRDs; most of the comments they made were given during the first three follow-up contacts, suggesting that some problems may have abated with experience in use. The mothers had several comments about incidents that had made them more positive toward CRDs; the most common was that the mother had to stop quickly, slam on her brakes, or swerve abruptly and the CRD protected the child. Mothers made very few comments about things that made them feel less positive toward CRDs.

Repeated Use--Cross-Sectional Sample Component

Quantitative analyses were used to determine whether the belief/behavior variables could be used to form systematic clusters of individuals. Qualitative analyses were focused on perceptions of CRD characteristics.

CRD ownership. Parents (both mothers and fathers) in the repeated use--cross-sectional sample component of the study were observed installing the toddler CRD currently used. No differences in parents' behavior or responses were noted between the Tennessee and Iowa sites, allowing data from the two sites to be combined in reporting results.

A definite pattern emerged in the type of CRD used by parents in this component. The Strollee Wee-Care, a tethered seat, was used by 34 parents. Bobby-Mac seats with shields requiring the automobile safety belt to be clipped in place over the shield (Bobby-Mac Champion, Deluxe, or 3-N-1) were used by 13 parents. Another 11 parents installed the tethered GM Toddler Love Seat. The Century Travel-Guard was installed by 6 parents. There were 9 other CRDs used by 3 or fewer parents each.

Almost three-quarters of the parents in the sample had owned another type of CRD prior to the one used in the study. Of this group, 33 parents had owned one seat previously, 15 had owned two seats previously, and 6 had owned three seats previously.

Quantitative analyses. There were no differences in installation success associated with type of CRD. However, parent's gender was significant. Mothers were successful in correctly installing all components of their CRDs only 21% of the time, in comparison with the fathers' 38% rate of completely correct installation; 62% of all completely correct installations were accomplished by fathers. Child's gender also was significant; the parents of female children accomplished 67% of the completely correct installations. A final significant factor in determining completely correct installation was the vehicle style in which the CRD was installed. Parents who installed their CRDs in four-door sedans were completely correct in installation only 13% of the time, whereas parents who used two-door sedans achieved 37% success, and parents who used four-door station wagons achieved 39% success.

Results of the cluster analysis revealed that, on the basis of the belief and behavior variables, there were three relatively distinct groups of parents. These were mothers who were relatively positive and successful in CRD use, mothers who were relatively positive but unsuccessful in CRD use, and fathers (who tended to be more successful but less positive in their approach to CRD use).

Differences in acceptance of CRD were noted only in relation to family's SES. High-SES parents responded more positively than midddle-SES parents.

Differences in perceived cost to children were noted in relation to parent's gender and CRD type. Fathers and parents using the GM Toddler Love Seat perceived a greater cost to children than did either mothers or parents using the Strollee Wee-Care.

Perceived cost to parents differed in relation to number of children under 4 years of age, parent's education, family's income, site, and parent's gender. Differences related to parent's education, however, may be an artifact of confounding this variable with the parent's gender. Parents who had graduate degrees perceived a greater cost to parents than those who had some college or other college degrees; however, 70% of parents holding graduate degrees were males, and 62.5% of parents holding other college degrees were females. As in previous studies, males perceived a greater cost to

parents than did females. Only 18 Tennessee parents had some college or higher levels of education, but all 40 Iowa parents had some college; 32 Iowa parents but only 5 Tennessee parents had college or graduate degrees. Iowa parents perceived a greater cost to parents than did Tennessee parents, but the effects of site and education cannot be separated. Cost to parent scores also varied with family's income; parents in the $30,000 to $34,999 bracket perceived the least cost to parents, in contrast to parents in all other income brackets.

Differences in satisfaction with CRD were noted in relation to parent's education and parent's gender. As with the cost to parents, it is likely that the impact of parent's education on satisfaction is an artifact of parent's gender. Parents with graduate degrees (70% of whom were male) had less CRD satisfaction than parents with other college degrees (62.5% of whom were female) and those with some college.

Differences in extent of CRD use were noted in relation to family's income, site, child's age, and family's SES. Greater use was reported by parents with higher family income, parents in Tennessee, parents with younger children (1- and 2-year-olds), and higher SES parents.

Qualitative analyses. Various comments were made about CRD size, installation ease, cleanability, durability, appearance, comfort, convenience, safety, vehicle compatibility, use of specific CRD components, and instructions. Both positive and negative comments were made about all types.

Parents' Recommendations to Manufacturers

Parents in all study components were asked to make suggestions to CRD manufacturers. The most commonly occurring comment (52 parents) was that CRDs should be made high enough to allow the child to see out of the automobile. Cloth covers for the vinyl seat pads provided with CRD purchase were requested by 22 parents. A reclining feature or an easier-to-use reclining feature was requested by 21 parents, the same number that wanted a soft seat cushion. There were 16 parents who wanted an easy-to-install CRD, whereas 15 wanted a CRD to convert from infant to toddler positions. "One-step" child placement was requested by 14 parents. There were 13 parent requests for clearer instructions, less expensive CRDs, and quick and easy child placement.

Review Panel Recommendations

Two panels of professionals were organized to review study results and to make recommendations. One panel, composed of engineers, identified some 15 recommendations forfor improving CRD design to facilitate consumer acceptance and use. The other panel, composed of educators, identified some 20 recommendations for improving instructions and other means of providing usage information to consumers.

CONCLUSIONS

In general, the state of the art in the child restraint field is much better than was the case even in the relatively recent past. However, a number of problems remain. Some of these problems appear to be related to CRD design, some to lack of consumer information (or to misinformation), and some to social context.

Based on the results of this study, several general recommendations can be made. These include the following:

1. Tethered seats should be discontinued--or at least be allowed only if they pass the safety standard test procedures without use of the tether.

2. Information about the importance of CRD use--and correct use in particular--should be directed to wholesale and retail sales personnel. If possible, there should be incentives for providing good consumer information.

3. Information to promote restraint use needs to include emphasis on correct CRD use; public information and education programs (e.g., public service announcements) need to be developed with more attention to this dimenion. Sources of information for consumers (e.g., a consumer hot line) also need to be made available through public and/or private means, and instructions for contacting such sources should be affixed to each CRD.

4. Manufacturers should organize instructions to facilitate transmission of essential information. This might at the very least include provision of an advance organizer (probably including an illustration of the overall CRD design), a checklist for ascertaining that correct installation has been made, and adequate illustrations or other graphics showing a detailed sequence of steps for installation.

5. The problem of vehicle compatibility should be addressed through cooperation of CRD manufacturers, automobile manufacturers, and regulatory agencies. Improvement of CRD usability may involve standardization and/or modification of vehicle features or components (e.g., safety belts).

6. Alternatives for simplifying use of automobile safety belts need to be developed. Although progress has been made with alleviation of problems with retractors, additional attention needs to be given to design of safety belts that enhance CRD usability and perhaps even facilitate development of new CRD designs. In addition, CRD designers need to be aware of the need for ameliorating misuse of the vehicle safety belt.

7. Provision of information to consumers to assist in a purchase decision that will be satisfactory in the long term should be given priority. Although there are various sets of guidelines available that provide useful information for potential consumers, several points need to be stressed. The "problem of the match" (i.e., vehicle characteristics, family usage patterns, child build and temperament) should be emphasized. Also, consumers need to be permitted and encouraged to try a CRD with the child and vehicle with which it will be used before making a purchase decision.

8. The assistance of public agencies and private service organizations should be enlisted in providing information about CRDs for potential consumers. In particular, there should be programs with examples of the various CRDs on the market where a potential consumer could compare the features of each and perhaps even have information about the advantages and disadvantages of each.

9. Manufacturers might be encouraged to consider information on consumer satisfaction with design and anthropometric considerations as part of the data required for CRD approval. Sensitivity to the growth variations in individual children also is important. For example, although a seat may be labeled as appropriate for a child of given weight, it might depend on the build of the child as to whether the CRD actually would be appropriate.

10. Simplified design should be encouraged. The steps for installation of the CRD in the vehicle and the child in the CRD should be as few and as simple as possible. Placement of installation guides directly on the CRD should be included.

REFERENCES

1. "Child Automobile Safety," Health and Values: Achieving High Level Wellness, Vol. 3, No. 1, 1979, pp. 5-6.

2. Cunningham, J. L., Hughes, E. C., Philpot, J. W., and Pentz, C. A., Parents' Knowledge, Attitudes and Behavior About Child Passenger Safety, Knoxville: The University of Tennessee, Transportation Center, 1981.

3. Duncan, O. D., "Socioeconomic Index for All Occupations," in A. J. Reiss (ed.), Occupations and Social Status, Glencoe, IL: Free Press, 1961.

4. Hall, R. W., and Council, F. M., Project Progress Report: Increasing Child Restraint Usage Through Physicians and Public Education, Chapel Hill: University of North Carolina, Highway Safety Research Center, 1978.

5. Philpot, J., Heathington, K. W., Perry, R. L., and Hughes, E. C., "The Use of Child Passenger Safety Devices in Tennessee," Transportation Research Record, Vol. 739, 1979, pp. 8-14.

6. Scherz, R. G., "Washington State Seat Belt Study 1970-1977," A paper presented at the Child Passenger Safety Conference, Nashville, May 1978.

7. Siegel, A. W., Nahum, A. M., and Appleby, M. R.. "Injuries to Children in Automobile Collisions," Proceedings of the Twelfth Stapp Car Crash Conference, New York: Society of Automotive Engineers, 1978.

8. Williams, A. F., "Observed Child Restraint Use in Automobiles," American Journal of Diseases of Children, Vol. 130, 1976, pp. 1311-1317.

THE IMPACT OF SOCIAL SECURITY INFORMATION UPON PLANNING FOR RETIREMENT INCOME

Flora Williams and Laury Adams[1]

ABSTRACT

Results of the study indicate that women's knowledge of Social Security policies and benefits and how this knowledge affects them was limited. This lack may have influenced decisions about employment and family finances for the future. About one-fourth of the respondents did not anticipate any retirement income. Knowledge of Social Security was not associated with supplementing public saving with private saving, when other variables were held constant but it did increase the explanation of variance. Age was more important in predicting anticipated sources of income than was marital status, employment status, education, and family income. Increased awareness of the effects of the system was related to an increase in the importance that women placed on having Social Security information. Results imply the need for more effective information delivery to aid consumers in financial planning for retirement.

KNOWLEDGE OF SOCIAL SECURITY AND EFFECT UPON ANTICIPATED SOURCES OF RETIREMENT INCOME

With proposed changes in Social Security, it is critically important to understand the program and how it impacts upon decisions about employment and saving. In order to realistically plan for economic security, it is essential to have an understanding of the Social Security program during early adulthood when decisions about employment and family financial arrangements are being made. Also, we need to understand the system in order to influence changes in the program to correct the perceived inequities.

The Social Security system affects almost every American either as a contributor or as a beneficiary. It is a program that requires contributions during the working life of an individual. One-half of American workers are paying more in Social Security levies than they are in federal income taxes (6). In 1977, 93 percent of Americans of retirement age were eligible to draw benefits (1). For the majority of people, these benefits are the most important factor in determining their level of living in later years (2). However, little is known about their knowledge level of Social Security policies and benefits and how the amount of knowledge affects anticipated sources of income.

Due to the differing employment patterns and the earning differentials of men and women which have existed in the past, the system impacts differently upon the sexes. In years past, 86 percent of males age 57-64 years of age had fully insured status compared to 65 percent of females in that age group (4). Another difference can be seen in the benefits paid to male and female beneficiaries. In 1978, the average monthly benefit paid to a retired male worker was $320 compared to $265 paid to a retired female worker (8, p. 338), based on differing life expectancies.

The interrupted employment patterns and various marital situations of women affect the Social Security benefits they will receive. For example, a woman who has decided to make a domestic contribution to the family and remain unemployed receives zero years credit on her Social Security record, and there are presently no provisions for a husband and wife to share credits. Although the unemployed dependent spouse is entitled to a retirement benefit equal to one-half that of the employed spouse, actual receipt of that benefit is dependent upon the employed spouse retiring. A woman who is divorced later in life with no job skills loses her access to her former spouse's benefits. Under the present system, it is possible that at retirement age a woman who has contributed to Social Security through her lifetime employment could receive a smaller monthly benefit than would a dependent spouse who had never contributed yet would be entitled to higher benefits because she was married to a high income male wage earner. These are but a few examples of the ways in which women are affected.

The purposes of this study were to measure the extent of women's knowledge about the policies and benefits of Social Security; to identify their sources of this knowledge; to determine how this knowledge was related to age, family income, marital status, educational level, and employment; and to analyze the relationship of this knowledge to anticipated sources of retirement income when these socioeconomic variables were held constant.

The question "if women know about Social Security will they have different saving patterns than if they are unknowledgeable" inspired this study. Another related question is "Are women who do know about Social Security substituting personal saving for forced saving while they stay home with a family?"

A review discussing issues in retirement policies pointed out a possible role of knowledge of Social Security and suggested hypotheses for this study (3). "Recent evidence suggests that the Social Security system may substantially reduce savings... Recent increases in Social Security taxes and

[1]Flora Williams is associate professor in the Department of Consumer Sciences and Retailing, Purdue University, West Lafayette, IN 47907. Laury Adams is an instructor in the Department of Consumer Sciences, University of Houston.

promised future benefit levels have likely exacerbated this effect... Since eligibility for OASI benefits depends upon long term contribution promised higher future benefit levels may stimulate longer tenure in the work force on the part of younger workers. However, this entitlement effect is likely to be greatest for low-wage workers as the benefit-earnings ratio declines as earnings rise. Moreover, since married females have the option of receiving either their own benefits or 50 percent of their husband's benefits (100 percent after he dies) their lifetime work effort entitles them to only small net additional OASI benefits and the entitlement effect is likely to be unimportant for them." (3, p. 132).

METHODOLOGY

A self-administered questionnaire developed from materials distributed by the Social Security Administration was distributed to 250 women at meetings of various organizations and community centers. The completion rate was 60 percent. Prior to collecting the data, ten women evaluated the questions for clarity and revisions were made.

The right answers were verified by employees of the Social Security Administration who were presumed to be knowledgeable about the system. The seventeen knowledge questions dealt with features of the system that could affect women and some general knowledge questions. Respondents were discouraged from guessing and encouraged to use the "do not know" option if they were uncertain of the correct answer. Respondents provided demographic characteristics, answered the 17 knowledge questions, and identified the sources of their information about the Social Security system from a checklist. They listed anticipated retirement income and their current income.

A survey question was included in this study to determine how important women felt that having information on Social Security was to their financial planning. It was typed on a separate sheet of paper and stapled to the front of the answer sheet so that the respondents would answer it before answering the test questions. The same question was again asked of subjects after they had completed the questionnaire to see if increased awareness of how they might be affected by the system would change their view of the importance of having information.

Items pertaining to women's knowledge of Social Security were analyzed by examining the results of a reliability test. The alpha coefficient of reliability was .87 which suggests that the items would represent multiple measurements essentially using the same scale at least 87 percent of the time. Positive correlations among the items indicated that the items were measuring a concept of Social Security knowledge and justified keeping all original items in the scale.

Demographic Description of the Sample

The sample consisted of women between the ages of 19 and 65 years who were not receiving Social Security benefits. The median age of the group was 36.5 years. Sixty-two percent of the women were married and 37 percent were single, divorced, or widowed. The median education level of the respondents was 13 years of school. Sixty-nine percent of the women were employed at the time of testing. This employment status was determined by their response to the simple question of either being employed or not being employed. The total family gross income ranged from $1,600 to $90,000 with a median of $15,422 which roughly equivalent to the median income for the North Central United States of $15,411 at that time.

RESULTS

The Extent of Women's Knowledge

The knowledge scores indicated that most women were not knowledgeable about the Social Security system. Individual total scores ranged from zero to 14 correctly answered of a possible 17, with a mean of 6.21 and standard deviation of 3.64. Respondents used the "do not know" foil on 1,266 (49%) of the total 2,584 responses. As a group, respondents responded correctly on 37 percent of all items and incorrectly on 14 percent (Table 1).

The 37 percent correct responses indicated the extent of women's knowledge. Only three facts about Social Security were known by over half the subjects. Women were knowledgeable about general concepts such as the fact that reduced benefits may be taken at the age of 62, that an employer makes a contribution equal to that of an employee, and that there is no guaranteed return on money paid into the system. Specific areas of knowledge and percentage of correct responses are shown in Table 1.

The 14 percent of the questions that were answered incorrectly represent the extent to which the respondents may be misinformed about Social Security. The greatest amount of misinformation centered on widow benefits and coverage under the system. The greatest number of incorrect answers were for the item requiring respondents to know that a woman who is collecting widow's benefits may now continue to receive the full amount in the event that she remarries. Only eight percent knew this to be a fact. Since this was one of the changes implemented by the 1977 Social Security Amendments (effective December 1978), it was concluded that these women were not well-informed about recent reforms in the laws.

Twenty-nine percent of the women thought incorrectly that a widow under the age of 60 could collect benefits even though she no longer had dependent children under 18 in her care. Another 41 percent did not know about a widow's rights in this situation. Twenty-eight percent of the women erroneously thought they were entitled to draw benefits on their own record regardless of how little they worked under the system; and an additional 26 percent were not aware of a work time requirement.

Only 24 percent of the women indicated or correctly guessed that receiving a dependent spouse's benefit at 65 depends on the husband's retirement. Twenty-four percent knew that size of annuity was

related to income of payee. As few as nine percent knew how to earn quarters of coverage and only ten percent realized that the lump sum benefit is payable only at the death of the retired worker but not at the death of a dependent spouse.

Factors Associated with Women's Knowledge

It was hypothesized that women's level of knowledge of Social Security would be a function of women's age, number of years of education, employment status, and amount of family income. Regression analysis was performed to evaluate the extent to which the hypothesized variables were associated with variations in the knowledge score (Table 2). Each of the variables was included as a continuous variable except for employment status and marital status which were entered as a dummy variable set. No intercorrelation coefficient (Pearson product-moment) was over 0.40. Therefore, multicollinearity was not considered a problem. Fifteen percent of the variation in knowledge was explained when the four factors were included in the model. The F value for age, education, income and employment status was 4.35, significant at the .001 level.

Age of respondent strongly predicted knowledge of Social Security ($p<.001$), holding the other variables constant. This may be a result of increased experiences and increased exposure to various sources of information. It might be expected that the closer one gets to the age when Social Security will affect one's economic well-being during retirement, the greater the need to learn about the system. The F values obtained for single factors indicated that educational level, employment status, and amount of family income were not significantly related to women's knowledge about Social Security.

Sources of Information About Social Security.

The educational material prepared by Social Security is only one of the sources of this information. The distribution of sources of information was "word of mouth" or experiences of friends and relatives, for 68 percent of the respondents, the media for 45 percent, materials prepared by Social Security for 19 percent and vocational training classes for eight percent.

Although the number of sources of information does not necessarily predict knowledge, a relationship between the two was found. The hypothesis that sources of information would be related to knowledge of Social Security was tested by chi square analysis. Twenty-seven women with the high knowledge scores of 11, 12, 13, or 14 were compared with 26 women in the lowest scoring group with scores of 0, 1, or 2 (Table 3). Of women who had several sources of information, 100 percent were most knowledgeable compared to none for those who had no source of information and 40 percent for those who had one source of information.

Most knowledgeable women differed from least knowledgeable women in their information source (Table 3). A higher percentage those who relied on "word of mouth" were least knowledgeable (59%) than most knowledgeable (41%). A higher percentage of those who received information for the media (newspaper, magazines and TV) (89%), from the Social Security Administration and other U.S. government agencies (82%), or from vocational education classes (67%) were most knowledgeable than were least knowledgeable (11%, 18%, and 33% respectively).

Seventy-four percent of the entire sample anticipated having income to supplement their public benefits during retirement. Three percent planned on Social Security only, 12 percent planned on private sources of retirement income only and 59 percent planned on a combination of public and private sources of retirement income. Other women did not identify a source of retirement income. Several respondents mentioned a doubt that Social Security would be able to pay benefits by the time they reached retirement.

Number of anticipated sources of retirement income reported by respondents is of interest to professionals concerned with economic well-being of the aged. Of the total group, the number of anticipated sources of income were reported by the following percentages: one source was anticipated by six percent of the entire sample; two sources by 18 percent; three sources by 36 percent; four sources by 11 percent; and five sources by three percent.

As would be expected those least knowledgeable about Social Security were least knowledgeable about any future income. Of the 26 percent of the entire sample who anticipated no sources of income, 93 percent were in the least knowledgeable group of women (Table 3). Of those who anticipated a combination of private and public retirement income, 72 percent were in the most knowledgeable group compared to 28 percent in the least knowledgeable group.

At first glance it appeared that women with the lowest income and who were the least knowledgeable and educated, but probably most dependent upon Social Security, anticipated the fewest sources of retirement income. According to zero-order correlation analysis, number of sources of retirement income was related to Social Security knowledge, ($r=17$, $p<.05$), women's age ($r=.25$, $p<.01$), family income ($r=.19$, $p<.05$), and educational level ($r=.25$, $p<.01$). However, when other variables were held constant in stepwise regression, Social Security knowledge, family income, and employment status were not significantly associated with number of sources (Table 4). For this regression analysis, several variables were entered as dummy sets into the regression equation because of results of tests of linearity. Stepwise regression was used to determine the contribution of Social Security knowledge after other variables were entered into the equation.

Results of the regression analysis indicate that women under 35 or 35-44 were less likely to anticipate numerous sources of retirement income than women age 55 and older. Women with a B.S. degree were more likely to anticipate numerous sources

than those with less than a high school degree. Based on the standardized regression coefficients, betas, age was relatively more important in predicting number of sources of retirement income than were the other socio-demographic variables surveyed.

It is possible that those with the most knowledge of the system realized that Social Security is meant to provide only a "floor of protection" and those with the least knowledge may have thought Social Security was enough. The least knowledgeable women may have made a rational choice to substitute public for private saving or there was no choice involved as in the case of low income. This latter reason could be examined in regression analysis holding income constant.

The results from regression analysis for type of retirement income were similar to the regression for number of retirement income sources. When other variables were held constant, women under 35 or 35-44 years of age were less likely than older women to plan on supplementing Social Security with private saving while women having a B.S. degree were more likely to supplement Social Security than were those with less than a high school degree (Table 4). Age and educational levels explained 19 percent of the variation in the dependent variable (coded 0, 1). According to standardized regression coefficients, betas, Social Security knowledge was relatively more important than employment status, marital status, and family income as a predictor of planning to supplement Social Security with private saving but less important than significant variables.

Social Security knowledge was significantly associated with type of retirement income according to zero-order correlation analysis ($r=.22$, $p<.05$) in addition to age while family income, employment status, and marital status were not. Social Security knowledge was significant in multiple regression analyses when other variables were held constant but the addition of the Social Security variable significantly increased R^2 obtained in the regression results (Table 4). Therefore, Social Security knowledge contributed to the explanation of variance in planning to supplement Social Security with private savings. A series of interaction terms were entered into other regressions to determine combined effect of Social Security knowledge and other variables. Results of these further analyses revealed that knowledge of the Social Security system interacting with homemaker status was a significant variable. Status as a homemaker, as may be revealed, was not associated with type of anticipated retirement income by itself.

Discriminant analysis was used in an attempt to further confirm any differentiation of those planning to supplement it via saving it on several factors. With this statistical method the effect of a collection of interval-level independent variables on a nominal dependent variable are calculated (5, p. 9). This technique "forms one or more linear combination of the discriminating variables", and "identifies the variables which contribute most to differentiation along the respective dimension (function)". The weighting coefficients may be interpreted similarly as regression coefficients. The original set of cases were classified to see how many were correctly classified by the variables being used as a check of the adequacy of the discriminate functions (5, p. 9).

Knowledge of Social Security and age distinguished those planning on Social Security only from those planning to supplement Social Security when in linear combination with other variables, although income did not. According to standardized canonical discriminant function coefficients, the variable "age" contributed the most to differentiation along the discriminant function and Social Security knowledge the least. The discriminant function using all the variables correctly classified 68.4 percent of the respondents according to whether or not they planned to supplement Social Security. The chi square test of correctly classifying those planning on Social Security only from those planning to supplement it was significant ($X^2 = 19$, 1 df, $p<.01$).

It was hypothesized that women would increase the importance they placed on having information on the system after they had been exposed to the questions concerning Social Security, for this would increase their awareness of how they could be affected by the system. The change in score values of the importance of having information was examined by omitting 46 percent of the respondents who initially gave it the highest rating of five since they could not have increased the original rating. Of the 82 respondents who had originally ranked it lower than five, 33 persons (40% of that group) increased the importance of their second rating. Seven respondents decreased the rating.

Results of the t-test analysis indicated a significant increase ($p=.001$) in the importance rating from the initial rating to the second rating as hypothesized. The mean initially was 3.00 on a scale of one to five, and 3.60 afterwards.

CONCLUSIONS AND IMPLICATIONS

This survey of women's knowledge of Social Security benefits and policies revealed that they were knowledgeable on about a third of the selected items representing knowledge and misinformed or unknowledgeable on the other items. The most common source of knowledge was "word of mouth" or experiences of friends and relatives. The level of correct knowledge was greater among those who obtained it through formal educational media rather than the informal "word of mouth" or experiences of others. About one-fifth of the respondents had obtained knowledge through materials prepared by Social Security. The level of knowledge of Social Security was related to age of respondent but not to family income, marital status, educational level, and employment. Anticipated retirement income and, indirectly, inferred saving pattern was related to level of Social Security knowledge in univariate analyses but not in multivariate analysis when other variables were held constant. Age of respondent was the most important predictor of

anticipated retirement income via saving when other variables such as current income and employment were held constant. However, the addition of Social Security knowledge as an explanatory variable did increase the explanation of variance in planning to supplement Social Security with personal saving.

The women in this study had limited knowledge about Social Security. They did not understand the method of taxation, the manner of accruing credits, or the benefit structure. Therefore, it is likely that they did not understand how they inevitably will be affected by the system. It is probably difficult for consumers to believe that a paternalistic program might require one to do something (planning) to take advantage of it.

The woman who was knowledgeable about Social Security could not be identified by her educational level, income level, or employment status. However, a likely profile would be that of an older woman who had relied on the media and/or Social Security materials for her information and who anticipated supplementing Social Security benefits with private sources of retirement income. Older women would have had more years of exposure to information, increased experiences and might feel an increased need to learn about the system that will furnish the major part of their retirement income.

An important implication of the age relationship with dependent variables in this study is that it indicates that women do not have information that is vital to the decision-making process early in adult life when they are making choices about employment and family financial arrangements. This does not suggest that all women who are knowledgeable about Social Security would choose to be employed instead of taking zero credits for years as a homemaker. However, a couple with a non-employed wife might elect to make investments or provide other types of future income to compensate the woman if such a decision results in potential financial loss. Families could plan more realistically and responsibly for the economic well-being of both partners if consumer educational programs and materials were directed toward young people informing them of the strengths and limitations of Social Security. Otherwise young people regardless of low-income or high income levels would consider retirement too remote to make decisions based on Social Security knowledge. At this time, the uncertainty of the future of the Social Security System may cause people to make decisions based on insecurity as to the anticipated benefits of it.

Results of the study imply that women most knowledgeable about Social Security had different anticipations about source of retirement income than less knowledgeable women. A combination of public and private saving was the anticipated source of retirement by a higher percentage of the most knowledge than of the least knowledgeable women. Social Security knowledge was significantly associated with anticipated use of private saving in addition to public (Social Security) in simple correlation analysis but was not when holding constant variables of woman's age, educational level, marital status, and family income. Age was relatively more important than knowledge; and age was a significant predictor of behavior when other variables were held constant. Social Security knowledge in linear combination with age distinguished those women anticipating Social Security only as the retirement source from those supplementing it with private saving. Saving behavior based on age and Social Security knowledge could be predicted for two thirds of the sample.

Women in this sample who were knowledgeable about Social Security may have to some extent substituted personal saving for Social Security as anticipated retirement income while they stayed home with a family. Status as a homemaker was not associated with anticipated use of personal saving but Social Security knowledge interacting with homemaker status did increase the predictability of using personal saving as anticipated retirement income.

Results are of interest to professionals and policy makers concerned about the economic well-being of people throughout the stages of life. Over one-fourth of the women did not anticipate any retirement income other than Social Security or public assistance. With increased longevity and a shift in population to a greater portion of elderly, consumers' life span financial planning must be encouraged if that segment of society is not to become a burden on younger generations. An understanding of Social Security is essential to such planning.

The unique nature of Social Security makes the government a producer of a service for public consumers. In this era, emphasis has been placed on facilitating informed decision-making on the part of the consumer. This process requires the producer to provide relevant information and the consumer to accept the responsibility of utilizing that information. It is possible that the mandatory nature of this system interferes with the information process. The government is not required to implement the most effective information delivery system and the consumer may not feel the need for information if he/she does not understand the effects of the system or the need for benefits seems remote. Perhaps the nonvoluntary nature of participating in the system encourages lack of interest in acquiring knowledge about it. This study showed through pretest and posttest results that increased awareness of the effects of the system likewise increased the importance women placed on having Social Security information.

The media and government prepared materials could be effective means of properly informing the public about Social Security. These sources of information could be particularly useful in publicizing recent changes in the Social Security laws which was the area of the women's most incorrect information in this study. Since such a small number of women indicated they had gained information from the media and government documents, it suggests that these sources need to be more fully publicized or other media including formal education classes and financial planning seminars be utilized for this information.

REFERENCES

1. Ball, Robert M., Social Security Today and Tomorrow, New York: Columbia University Press 1978.

2. Coates, Robert, Investment Strategies, New York: McGraw Hill Book Company, 1978.

3. Ehrenberg, Ronald G., "Retirement Policies, Employment, and Unemployment The American Economic Review", May 1979, pp. 131-147.

4. Mall, Lucy, "Women's Work Lives and Future Social Security Benefits," Social Security Bulletin, April 1976, pp. 3-13.

5. Nie, Norman H.; Hull, C. Hadlai; Jenkins, Jean G.; Steinbrenner, Karen; and Bent, Dale H. Statistical Package for the Social Sciences, 2nd Ed. McGraw-Hill Book Company. 1975, p. 436.

6. Simon, William E., A Time for Truth, New York: Readers Digest Press, McGraw Hill Book Company 1978.

7. U.S. Bureau of the Census, Statistical Abstract of the United States: 1979, (100th edition) Washington, D.C., 1979, p. 338.

8. U.S. Department of Labor Statistics, Earnings and Employment, Vol. 26, No. 3, Washington, D.C.: U.S. Government Printing Office, March 1979, p. 29.

TABLE 2

Regression of Knowledge of the Social Security System

	Knowledge of Social Security System (mean=6.21) (range=0-14) (Std. Dev.=3.65)		
Independent variables	r	betas	F ratio
Age	.38***	.38***	14.97***
Marital status[1]	.00	-.11	1.25
Family income	.13	.12	1.61
Employment status[2]	-.04	.03	.13
Years employed	.17	.00	.19
Years of education	-.09	-.05	.30
(constant)			
Regression F value	4.35		
R	.39		
R^2	.15		

[1]Coded as dummy variable with married women as the omitted group.
[2]Coded as dummy variable with employed women as the omitted group.
***Significant at the .001 level.

TABLE 1

Responses on Knowledge of Social Security Item for 152 Women.

Item	Correct Responses	Incorrect Responses	Did Not Know Responses
1. Required work time for drawing benefits	46%	28%	26%
2. Homemaker's zero earnings	43	14	43
3. Taxes for couples	44	15	41
4. Homemaker's benefits tied to husbands earnings	45	10	45
5. Age requirements for benefits	75	3	22
6. Amount of homemaker's benefits on retired husband's record	38	1	61
7. Homemakers benefits on husband's retirement	24	10	66
8. Divorcee's benefits	34	8	58
9. Widow's benefits tied to husband's earnings	40	16	44
10. Widow's benefits depending on dependents	30	29	41
11. Widow's remarriage and benefits	8	36	56
12. Employed, compared to non-employed benefits in relation to earnings	24	5	71
13. Calculation of quarters of coverage	9	21	70
14. Request of earnings statement	30	17	53
15. Lump sum benefit	10	18	72
16. Employer contribution	70	6	24
17. Guaranteed return on payments	61	5	34
Over-all total	37	14	49

TABLE 3

Distribution of Most Knowledgeable and Least Knowledgeable Women by Sources of Information about Social Security, by Number of Sources of Information, and by Type of Anticipated Retirement Income

Group	Women			
	Total Number	Most Knowledgeable N=27	Least Knowledgeable N=26	Chi Square
		percentage		
Sources of Information				
"Word of mouth" and experience of friends and/or relatives	104[1]	41	59	2.04[2]
Media information such as newspapers, magazines, TV, etc.	69	89	11	12.88***
Materials prepared by the Social Security Administration or other U.S. government agency	29	82	18	3.59
Information presented in classes during education or vocational training	10	67	33	.004
Other	12	100	0	3.21
Number of Sources of Information				
0	6	0	100	
1	85	40	61	
2	51	92	8	
3-5	11	100	0	16.766***
Types of Anticipated Retirement Income				
None	38	7	93	
Public only	5	100	0	
Private only	19	57	43	
Combination	90	72	28	18.19***

[1]Total for various sources of information does not equal 100 percent because more than one source could be checked.

[2]Chi square analysis was applied to yes/no response for each source.

***Significant at the .001 level.

TABLE 4

Regressions of Number of Retirement Income Sources and Type of Retirement Income Source (Planning on Social Security Only or Supplementing It Via Saving)

	Number of retirement income sources[6]					Planning on Social Security or Supplementing It				
Step profile variable	r	beta	t	Multiple R^2 when this variable is added	Regression F ratio	r	beta	t	Multiple R^2 when this variable is added[5]	Regression F value
<35 years of age[1]	-.36***	-.36***	-2.74	.13	17.1***	-.35***	-.35***	-3.12	.12	16.4***
B.S. degree level[2]	.25**	.24***	2.32	.19	13.1***	.22*	.21**	2.19	.17	11.5***
35-44 years of age[1]	.05	-.18*	-1.52	.19	10.2***	.05	-.17**	-1.95	.19	8.9***
Non-employed[3]	.11	.09	1.36	.22	7.9***	.12	.09	1.57	.21	6.0***
Marital status[4]	-.04	.11	- .20	.23	6.6***	-.03	.11	1.14	.22	5.2***
Family income	.19*	.13	- .14	.24	5.8***	.15	.05	.48	.23	4.0***
High School[2] education level	-.16	-.07	- .92	.24	5.0***	-.13	-.08	- .54	.22	4.5***
45-54 years of age[1]	.25**	-.03	-1.03	.24	4.4***	.20*	-.18	-1.13	.20	7.2***
Social Security knowledge score	.17*	.05	- .58	.24	3.9***	.22*	.12	1.22	.24	4.0***

[1]coded as dummy variable with age 55 and older as the omitted group

[2]coded as dummy variable with less than high school degree as the omitted group

[3]coded as dummy variable with employed women as the omitted group

[4]coded as dummy variable with married as the omitted group

[5]stepwise regression forcing Social Security knowledge in last

[6]mean number of retirement sources was 2.12.

* p<0.05

** p<0.01

***p<0.001

DESIGNING EFFECTIVE CONSUMER PROGRAMS FOR THE ELDERLY: THE NEIGHBORHOOD RESEARCH APPROACH

Karen F. Stein, University of Delaware[1]

ABSTRACT

This research examines whether consumer services and programs for the elderly could be more effective if social area contexts (neighborhoods) were consciously used as the targeting mechanisms for their design and delivery in place of, or along with, traditional personal attributes.

Data analysis indicates that attitudes about three consumer service programs, personal efficacy, and three sources of consumer policy vary by neighborhood more often than by age. Neighborhoods are an important variable in determining whether or not services designed to increase the elderly's quality of life are likely to be accepted and positively valued by the clients.

INTRODUCTION

One group that has received much attention in the consumer services delivery area has been the elderly. The main emphasis of this attention revolves around the issue of program and policy delivery. Of paramount concern is: 1) How likely is it that programs and policies (usually designed to increase the elderly's quality of life through income and/or in-kind supports) will be accepted by those they are designed to help; 2) what kind of delivery vehicle is most likely to be successful; and 3) who should be locally responsible for the program/policy delivery [2,4,7]?

Consumer research which addresses these questions, generally tend to treat all people with a particular demographic characteristic alike. That is, all people who are over a certain age, for example, are referred to as "the elderly," and all "elderly" are then assumed to behave in a certain manner. Of course, sometimes further delineations are made, but these again are very broad, i.e. the "urban elderly consumer". Based upon these large categories, needs are assessed, program recommendations are made, and supports may be delivered for the group as a whole [3,8].

The principle theme of this paper is that there is no single set of policy or program strategies which would be successful in enhancing the consumer welfare of all people belonging to a particular demographic group, in this case, the elderly. Rather, the effectiveness of particular strategies and programs may vary from place to place, even within a rather small geographic area. It is proposed that it is these "place" differences which determine, to a significant degree, whether or not a particular program designed to increase the clientele's quality of life will be successful. The remainder of this paper shall: 1) Empirically test the hypothesis that, at least in urban areas, the different social area contexts (i.e. neighborhoods) of the elderly, as much as or more than their age group indicate their preferences, abilities to cope, and attitudes toward social "helping" programs; and 2) discuss the implications of the empirical results for program and service delivery.

AN EMPIRICAL TEST OF SOCIAL CONTEXT TARGETING

This research seeks to examine whether services and programs for the elderly could be more effective if social area contexts (neighborhoods) were consciously used as the targeting mechanisms for their design and delivery. To this end, 511 residents in six neighborhoods in Wilmington, Delaware were surveyed to determine their attitudes towards social welfare programs, their feelings of efficacy, and their attitudes towards certain institutions. Of these residents, 194 were age 60 or older and of these neighborhoods, three were heavily populated by persons age sixty and over.

It might be generally expected that younger and older persons would have widely varying opinions which could affect program acceptance and service delivery methods. One of these opinions might have to do with how favorably social support programs are viewed. Randomly selected residents were asked by a professional interviewer whether they thought certain programs strengthened or weakened families (see Table 1).

With the exception of subsidized housing, people who are under 60 and those who are over have significantly different attitudes towards certain social programs. Despite the fact that the programs are designed to help people, a statistically significant and greater number of the elderly believe they actually weaken families. It is not the intention of this paper to explain the possible reasons for this particular response. Suffice it to say that different age groups have different views about social policies aimed at supporting families.

Of more interest is the lower half of Table 1 which represents the views of only those who are at least sixty years old and who live in the three neighborhoods with a substantial elderly population. Does recognizing social area contexts give any additional insight into these program views? We find, in fact, that the attitudes the elderly have about certain "helping programs" vary greatly by social area contexts. In fact, the elderly tend to differ among

[1] Assistant Professor of Consumer Economics