Variables Related to Consumer Practices:
The Initial and Longer Term Experience of Southeast Asian Refugees

This paper describes the use of consumer practices by Southeast Asian refugees and assesses variables related to refugees' use of consumer practices after 2, 4, and 10 years in Canada. All of the consumer practices were used more frequently over time. Having employment, fluency in English and prior experience with the practices were key variables accounting for use of the consumer practices.

Phyllis J. Johnson, University of British Columbia[1]

The consumer practices assessed in this study were major ones that were new to the refugees or were practiced quite differently in Canada. The practices were: having a checking account, saving money, purchasing property and life insurance, borrowing money, and having a credit card. The refugees would be expected to have increased their participation in these practices over time. Reasons for increased participation include: they have become more familiar with options available for consumers in the Canadian setting, they may have a need for purchasing or using the item, and they may have become qualified to receive the item (e.g., life insurance as an employee benefit). Variables associated with adaptation (age, some fluency in English, education, sponsorship status, employment, ethnicity), with access to some of the practices such as borrowing money (gender, employment), and with a need for the practice (age, marital status, and gender) would be expected to affect the use of consumer practices.

Method

The subjects are a one in three probability sample of adult refugees who settled in an urban center, and a total sample of those who settled in a rural community in British Columbia between 1979 and 1981. Three interviews have been conducted: Time 1, within 18 months of their arrival (1981); Time 2: a follow-up interview 2 years later (1983), and Time 3: a follow-up interview after 10 to 12 years in Canada (1991-93). Data analysis is based on the 649 respondents interviewed three times (48% of the original sample).

The respondents who were re-interviewed do not differ from those who dropped out on gender, age, and educational level. They do differ on marital status, with singles more likely to have attrited than marrieds. Those who were not available for work and who had no English ability at Time 1 were more likely to have attrited by Time 3.

At Time 3, respondents were married (80%), employed (77%), had some fluency in English (60%) or spoke English well (32%), had a high school education (55%), and were a mean age of 41 years.

Refugee consultants assisted in developing culturally appropriate instruments and ensured appropriate translation of the questionnaires. The personal interviews were usually conducted in the respondent's native language.

The independent variables include marital status (married or other), ethnicity (Non-Chinese vs. Chinese-Vietnamese), age, sex, sponsorship (private or government), education (elementary school, high school, university), employment (yes, no), time in Canada, and score on use of consumer practices. The dependent variable, a composite measure of consumer practices, was created by counting if the respondents had participated in a practice, dividing that number by 6 (the total number possible), and multiplying by 100.

A regression analysis of the selected variables on this composite measure of consumer practices was done for each of the three interviews with a respondent.

Results

All of the consumer practices were used by more of the respondents over time. Having insurance (life or property) was the least used, although almost half of the respondents had life insurance and 65% property insurance by the time of the third interview. An interesting pattern emerged for the remaining practices -- by the third interview they were used by 71-86% of the respondents. This is in sharp contrast to use of these practices at the second interview: insurance, credit cards, and loans were much lower in use, with 15-37% of the respondents having them. In 1981, 18% used none of the 6 practices compared to 4% in 1992-93. In 1981, 2% used 5 or 6 practices compared to 55% in 1992-93.

From the regression analysis, the selected variables accounted for a significant proportion of the variance in use of consumer practices at Time 1, $F(9, 610) = 31.76$, $R^2 = .31$, $p < .001$. From the Beta values, significant variables associated with use of consumer practices were: being employed (.29), ability to speak some English (.21), longer time in Canada (.19), and being male (.12).

At Time 2, the selected variables accounted for a significant proportion of the variance in use of consumer practices, $F(10, 568) = 40.19$, $R^2 = .40$, $p < .001$. Based on the Beta values, the significant variables associated with use of consumer practices were: being employed (.34), participating in the consumer practices at Time 1 (.28), ability to speak some English (.16), and being married (.11).

At Time 3, the set of variables accounted for a significant proportion of the variance in use of consumer practices, $F(10, 565) = 52.63$, $R^2 = .47$, $p < .001$. Based on the Beta values, being employed (.27), having the ability to speak some English (.23), having previous experience with the consumer practices at Time 2 (.22), being younger (.14), and married (.13) were significantly associated with use of the consumer practices.

Neither sponsorship status nor ethnicity were significant in any of the analyses. The amount of variance accounted for was high, between 31 and 47%, with the pattern being that the set of variables accounted for more of the variance with each successive interview.

Discussion

Being employed, having some fluency in English, and having prior experience with the practices seem to be the key variables accounting for the use of these consumer practices at each point in time. By the second interview, time in Canada was no longer a variable accounting for use of consumer practices, although it had been important at the time of the first interview. Apparently, after 4 years in Canada, the refugees had had opportunity to learn about the consumer practices and their potential usefulness. By Time 2, being married and by Time 3, also being younger related to use of these practices. Some of the practices, such as life insurance, are not essential unless there are dependents. Also, borrowing money and having property insurance may be important for young married families who are accumulating possessions and a home.

These data provide some insight into variables affecting participation in the consumer setting by a recent immigrant group. Variables related to adaptation in general are important correlates of refugees' participation in the consumer setting. Also, the variables related to use of consumer practices are similar to those influencing use of these practices by adults in North America.

Acknowledgements

Endnotes
1. Associate Professor, School of Family and Nutritional Sciences.

The Effects of Divorce Awards on Financial Well-Being

This study investigated the effects of divorce awards on the financial well-being of individuals and families. Results revealed that of the six categories of awards available for choice by the respondents, the likelihood of an award varied by category.

Virginia Solis Zuiker, The Ohio State University[1]
Sharon B. Seiling, The Ohio State University[2]

Introduction and Literature Review

Research indicates that households who have experienced divorce often report severe economic problems that may stem from division of property and money, and moving into new residences (Day & Bahr, 1986; Espenshade, 1979). Upon divorce women with children may have to move into the labor force and/or increase the amount of hours worked in order to provide for the family. Therefore, divorce has a profound effect on the financial well-being of individuals and families.

Methodology

The respondents for this study consisted of women who filed for divorce during 1985 in three rural and one urban Ohio county and whose divorces were final as of 1986. A total of 1066 cases was randomly drawn from the four counties. Questionnaires were sent to 509 women for whom complete addresses could be found. Despite two follow-up attempts only 148 questionnaires were usable. The completed questionnaires were matched with their court record data.

Survey respondents differed from non-respondents in the following ways: they had been married longer, were more likely to choose dissolution, were more likely to be awarded alimony, were more likely to own a home, were less likely to have minor children, and had higher awards of child support.

At the time the survey data were collected, one-fourth of the respondents had remarried; just over half were ending their first marriage; almost 90 percent were working full-time, up from 66 percent at the time of divorce; almost 40 percent had had more education since their divorce.

Respondents were asked what part of their settlement had been the most financially helpful part for them. The responses were grouped into six categories: cash, home, other assets, spousal support (alimony), child support, and repayment of debts. Importance of award varied by length of marriage, type of marital termination, amount of post-divorce income, age, and increase in education after divorce.

Results

The home was chosen most often by those who had married longest; whereas, child support was rated higher by those who married a shorter period of time. Respondents who used the divorce procedure rated the home higher than did those who chose dissolution. The reverse was true for child support, with more of those who used dissolution rating child support the most important. As the amount of post-divorce income rose, both the home and child support were chosen most often among the respondents and non-respondents.

Respondents varied by age as to what facet of the settlement was the most helpful. Women between the ages of 35 and 49 rated the home as highest, while women between 20 and 29 responded that both child support and payment of debts were most helpful. Women over the age of fifty responded that spousal support was most beneficial to their financial well-being.

Financial benefit of divorce awards was similar for those who completed more schooling after divorce and those who did not. Women

who had more education listed the home as the most important, followed closely by child support (31 and 28 percent, respectively). Those who did not get additional training after divorce also chose the home and child support as the most beneficial; however, the disparity between them was greater (46 and 19 percent, respectively).

Implications

Of the six categories of awards available for choice by the respondents, the likelihood of an award varied by category. The proportion of respondents awarded child support was the highest at 56 percent, and the lowest proportion was cash settlement at 10 percent. The importance of the awards to the financial well-being of the women in the sample varied by their mix of awards, length of marriage, type of marital termination, amount of post-divorce income, age, and whether they obtained additional schooling. Award of the home was viewed by many as the most financially beneficial aspect of their divorce settlement. This may be true for a number of reasons. The home may be seen as a more "permanent" award, because child support typically ends when the children reach age eighteen, and the trend in alimony is to set a short-term or temporary award. Award of the home has costs associated with it in terms of mortgage repayment, taxes, and maintenance. It is not clear whether these factors have been taken into account fully by the respondents.

References

Day, R.D., & Bahr, S.J. (1986). Income changes following divorce and remarriage. Journal of Divorce, 9(3), 75-88.

Espenshade, T.J. (1979). The economic consequences of divorce. Journal of Marriage and the Family, 41, 615-625.

Endnotes
1. Ph.D Student, Family Resource Management.
2. Associate Professor, Family Resource Management.

The Relationship Between Canadians' Nutrition Attitudes and Purchasing Trends with Respect to Fat-Containing Foods

Food expenditure data were used to estimate the amounts of fat-containing foods purchased by Canadians in various socio-demographic groups. These trends were then examined in relation to recent nutrition attitude studies. Lower-income Canadians purchased more whole milk, eggs, fats and oils than average, perhaps partly because of a poorer understanding and awareness of nutrition. Nutrition education programs should be developed for low-income groups. There were also some significant trends in relation to household type.

Lynn Stewart and Linda Robbins, Agriculture and Agri-Food Canada[1]

Examining food consumption patterns in relation to socio-demographic characteristics can be useful to health professionals and the food industry. Canada has no system for determining the amount of foods eaten by individuals. But, data from the 1992 Family Food Expenditure Survey in Canada (Statistics Canada, 1994) were used here to estimate amounts of fat-containing foods consumed, according to household income and type (Table 1).

Noteworthy is the tendency for lower-income Canadians to purchase more whole milk, eggs and vegetable oil than the national average, and for higher income consumers to do the opposite. There were also consumption trends related to household type.

Reasons for variations in consumption of fat-containing foods among socio-demographic groups are not clear. However, previous research (Horton and Campbell, 1992) has shown, that income is a strong factor in the determination of dietary healthfulness. This may be related to food costs. However, a link can also be made between nutrition knowledge and attitudes, and food purchase behavior. For example, a survey showed that there tend to be more low income individuals in the "nutrition indifferent" population segment (Reid and Hendricks, 1993). The group these researchers called "moderate" tended to have a larger proportion of higher income Canadians, to whom nutrition and the use of labels as a source of nutrition information were somewhat more important in food selection.

Surveys also show that younger, single people are the least interested in nutrition, while younger couples are more interested (Grocery Product Manufacturers of Canada, 1993), especially if they have children (Beggs, Hendricks, Schwartz and Biro, 1993; Reid and Hendricks, 1993). However, studies have also shown (Beggs, Hendricks, Schwartz and Biro, 1993) that consumers in general have difficulty identifying many foods that are high sources of fat. More research is needed to clarify the relationship between nutrition attitudes and knowledge, and purchase behavior.

References

Beggs, L., Hendricks, S., Schwartz, N., & Biro, K. (1993). Tracking nutrition trends: Canadians' attitudes, knowledge and behaviors regarding fat, fibre and cholesterol. Journal of the Canadian Dietetic Association, 54, 21-25.

Grocery Products Manufacturers of Canada. (1993). Grocery attitudes of canadians.

Horton, S., & Campbell, C. (1992). Regional variations in apparent nutrient intake in urban Canada. Journal of the Canadian Dietetic Association, 53, 19-23.

Reid, D.J., Hendricks, S. (1993). Consumer awareness of nutrition information on food package labels. Journal of the Canadian Dietetic Association, 54, 127-131.

Statistics Canada (1994). Family food expenditure in Canada. Cat. No. 62-554 (in press).

Endnotes
1. Marketing Officers, Market & Industry Services Branch

Table 1
Annual per-capita quantities of fat-containing foods purchased by Canadians according to income quintile and household type, reported in kilograms and as a percentage of the national average[1]

Food category	National average	1st & 2nd quintiles $9,732[2] 1.9[3] 1.127[4]	3rd quintile $15,589[2] 2.5[3] 1.142[4]	4th quintile $19,191[2] 3.0[3] 1.145[4]	5th quintile $30,562[2] 3.2[3] 1.194[4]	Single person $25,944[2] 1.0[3] 1.347[4]	Married couples, no kids at home $25,085[2] 2.0[3] 1.172[4]	Married couples, kids at home $15,900[2] 3.9[3] 1.118[4]	Single parent families, all types $11,364[2] 2.6[3] 1.122[4]
Meat Products:	85.6 kg	96 %	103 %	95 %	107 %	123 %	113 %	95 %	89 %
Poultry	22.4	102	97	89	112	119	108	97	87
Fresh beef	24.3	94	113	95	101	125	111	94	95
Processed meat	19.6	92	103	103	103	126	118	96	91
Fish/marine products	8.5	104	94	84	113	150	125	83	81
Fresh pork	8.6	88	104	100	110	100	106	97	78
Dairy products:	146.1	101	98	98	111	124	103	97	105
Low-fat milk (2%)	69.3	101	95	93	105	115	95	101	110
Fluid whole milk	20.6	135	105	103	52	116	64	103	116
Cheese	10.1	92	94	104	110	136	125	91	
Ice cream	5.9	88	104	102	111	107	102	104	110
Yogurt	4.1	97	108	101	176	118	87	116	
Cream (excluding sour)	2.0	83	95	97	123	132	173	76	64
Eggs	9.3	114	95	93	94	137	119	88	92
Bakery products:	12.5	96	102	96	106	142	125	90	94
Doughnuts, pies, cakes, pastries, etc.	5.8	97	103	93	106	152	133	85	87
Cookies & sweet biscuits	4.5	100	104	95	102	136	118	92	112
Crackers & crisp breads	2.2	87	96	106	112	129	120	99	75
Fats and oils products:	14.0	108	104	101	88	139	122	90	97
Margarine	4.9	116	115	97	72	149	124	86	115
Butter	2.9	89	100	101	115	132	134	91	76
Salad/Cooking oil	3.6	114	101	101	83	117	120	93	72
Peanut butter	1.8	111	88	105	89	172	93	92	131
Shortening	0.3	93	126	106	103	106	150	102	145
Lard	0.2	83	85	143	116	125	182	98	107
Mayonnaise/salad dressings	0.3	88	84	107	117	133	128	92	78
Snack foods	4.2	86	96	106	114	137	120	94	91

[1] The national average is considered to be 100%
[2] Average per-capita income before tax
[3] Family size
[4] Data in each category were multiplied by a dining out factor = 21 meals a week divided by (21 minus meals away from home + meals served to guests)

Women's Reservation Wage Rates for Home-Based and Office-Based Work

The choice of home- versus office-based work was modelled as two sequential decisions and estimated on a sample of 2,959 married, adult women drawn from wave 19 of the Panel Study of Income Dynamics. The reservation wage for home-based work was $5.11; for office-based work, it was $4.99. Any flexibility or lower costs of entry associated with home-based work do not translate into a lower reservation wage.

Karen A. Duncan, University of Manitoba[1]
Kathryn Stafford, The Ohio State University[2]

Purpose

Two of the most important advantages attributed to home-based work are (1) the flexibility it can provide women in meeting the demands of work and family and (2) lower costs for home-based as opposed to office-based work.

The purpose of this research was to compare the reservation wage for home-based with that of office-based work to see if women perceive lower costs to home-based work as is suggested in the literature.

Model

The reservation wage is the wage at which a nonemployed person is indifferent between employment and remaining unemployed. One can think of nonemployed women as having two reservation wage rates: one for home-based and one for office-based work. A wage in excess of the home-based reservation wage rate would need to be offered to a nonemployed woman to induce her to enter home-based work while a wage in excess of the office-based reservation wage rate would need to be offered to induce her to enter office-based work. If lower costs are associated with home-based work, then the reservation wage for home-based work should be lower than that for office-based work.

The choice of home versus office employment was modelled as a sequential decision. The first decision was whether or not to enter the labour market; the second, whether or not to engage in home-based work, given that one is in the labour market. Following Fische, Trost, and Lurie (1981), it was assumed that the two decisions were not correlated, enabling the use of Heckman's (1976) correction for self-selection bias (Maddala, 1983). To generate the correction factor (LAMBDA), inverse mills ratios were calculated for each decision equation, multiplied together, and then entered as an independent variable in the market wage and hours of market work equations.

Method

Data

A sample of 2,959 adult, married women was drawn from the 1986 interviewing year of The Panel Study of Income Dynamics. Home-based workers were defined as those individuals who were employed but did not report travelling any distance to work. The sample was comprised of 1,037 nonlabour force participants and 1,922 labour force participants, of which 80 were home-based and 1,842 were office-based workers.

Empirical Specification

The market wage (1) and reservation wage (2) equations were specified as:

$$LNWRATE = a_0 + a_1 EXPER + a_2 EXPER2 + a_3 HIGHSCH + a_4 COLLEGE + a_5 HEALTHLT + a_6 SEO + a_7 UNEMP + a_8 LAMBDA \quad (1)$$

$$LNWSTAR = b_0 + b_1 EXPER + b_2 EXPER2 + b_3 HIGHSCH + b_4 COLLEGE + b_5 HEALTHLT + b_6 SEO + b_7 HUSBWY + b_8 TRANSFY + b_9 NUMKIDS + b_{10} HRSMKTWK \quad (2)$$

Equations (1) and (2) were equated and solved for hours of market work:

$$HRSMKTWK = c_1EXPER + c_2EXPER2 + c_3HIGHSCH + c_4COLLEGE + c_5HEALTHLT + c_6SEO + c_7UNEMP + c_8HUSBWY + c_9TRANSFY + c_{10}NUMKIDS + c_{11}LAMBDA. \qquad (3)$$

Both the labour force participation decision equation and the equation for participation in home-based work contained all variablies which appeared in either equation (1) or (3). Definitions of variables are presented in Table 1.

Results and Conclusions

The estimated reservation wage for home-based work was \$5.11; for office-based work, \$4.99.

The literature suggests women attach lower costs to home-based than to office-based work and perceive home-based work as an easier route by which to enter the labour force. This research does not provide evidence to support that argument.

References

Heckman, J. J. (1976). The common structure of statistical models of truncation, sample selection and limited dependent variables and a simple estimator for such models. Annals of Economics and Social Measurement, 5, 475-492.

Maddala, G. S. (1983). Limited-dependent and qualitative variables in econometrics. New York: Cambridge University Press.

Fische, R. P. H., Trost, R. P., & Lurie, P. H. (1981). Labor force earnings and college choice of young women. Economics of Education Review, 1, 169-191.

Endnotes
1. Assistant Professor, Department of Family Studies.
2. Associate Professor, Department of Family Resource Management.
3. Results of the estimation of the model are available from the authors on request.

Table 1
Definitions of Variables.

Variable	Definition
Dependent variables	
LNWRATE	Natural log of wage rate
LNWSTAR	Natural log of reservation wage
HRSMKTWK	Weekly hours worked in market by wife during survey week
Independent variables	
EXPER	Wife's years of labour force experience
EXPER2	Wife's years of labour force experience squared
LESSHSCH	Less than Grade 12 education (omitted category)
HIGHSCH	Grade 12 or more (non-academic training or some college)
COLLEGE	College degree or more
HEALTHLT	Wife has a condition that limits amount or type of work (0 = No; 1 = Yes)
NUMKIDS	Number of children under 18 present in household
HUSBWY	Income of husband from wages and salary
TRANSFY	Income of household from other sources
SEO	Household is part of the low income subsample (0 = No; 1 = Yes)
UNEMP	Unemployment rate for the county of residence (x.x%)
LAMBDA	Sample selection correction factor

Decision-Making Strategies: Should They Vary Across Consumers?

The need to recognize different preference structures when studying consumer choice and when providing consumers purchasing advice is noted. The effect of framing on consumer choice is discussed. The paper concludes by stressing the importance of using models and frameworks reflecting "true" consumer choice.

Loren V. Geistfeld, The Ohio State University[1]

In consumer economics we frequently "explain away" unexpected statistical results. Typical explanations include: poor data, misspecified equations, inappropriate statistical technique, etc. We frequently fail to question the underlying conceptual model. Rather, we tend to blame the data or the data analysis.

Consider the following example. An analysis of choices made by fully informed consumers is undertaken which is based on a model assuming consumers trade one product characteristic for another. Suppose that the "true" model of consumer choice is such that consumers select a model based on a single product characteristic. It is likely that the data will not fit the model resulting in the conclusion that consumers make poor choices. However, if we had utilized the "true" model, the data may have fit the model resulting in the opposite conclusion--consumers make good choices.

In some situations it may be appropriate to choose a specific model of consumer choice based on a belief system or set of values. This suggests there is an ideal or ultimate consumer choice model against which actual choice should be compared. In this instance poorly fitting data reflect inappropriate choices. However, it is important to recognize that the selection of a "normative ideal" is based on epistemological reasoning, not statistical fit. In addition, establishing a "normative ideal" may be inconsistent with the traditional rationality assumption which "is so general that it is not possible for a consumer's observed choices to be inconsistent with it" (Green,

1976:25) and implies "that consumers will, completely and consistently, do whatever they wish to do." (Asch, 1988:36) What consumers wish to do may not be consistent with a "normative ideal."

It is beyond the scope of this paper to argue the appropriateness or inappropriateness of particular consumer choice models. The underlying purpose of this paper is to increase sensitivity to alternative consumer choice models. The issue is not the correctness of a model, but the need to be aware of alternative models.

The remainder of this paper is divided into three sections. The first section focuses on consumer choice in a world of certainty. The second section considers consumer choice in an environment characterized by uncertainty. In the final section the discussion is drawn together in the form of several concluding statements.

Consumer Choice Under Certainty

Three models of consumer choice are noted for illustrative purposes: linear compensatory, conjunctive, and lexicographic. The discussion of the models is intentionally brief. For a more detailed discussion and related references, see Engel, Blackwell and Miniard (1990), and Lee (1993).

The choice model with the greatest intuitive appeal is the linear compensatory (or weighted additive) model. The operational premise of this model is that consumers trade one product characteristic for another. This model of choice is often used to describe consumer assessment of product quality.

Maynes (1976:56) defines quality

as "the extent to which the specimen provides the service characteristics that the individual consumer desires." The following mathematical expression illustrates this definition:

$$Q = W_1 C_1 + W_2 C_2 + \ldots + W_n C_n \quad (1)$$

where:
Q = quality level of a specimen.

W_i = importance weight for characteristic i.

C_i = amount of characteristic i embodied in specimen.

Equation (1) illustrates that consumers give up one characteristic for more of another with importance having a mediating effect. While it is easy to understand the attractiveness of the linear compensatory model, what if it does not describe "true" consumer choice?

Maynes (1976:59) suggests that departures from the additivity approach should be examined including "safety and other thresholds." The following paragraphs focus on consumer choice models that are not linear additive. These models may not be as intuitively appealing since they, in some way, preclude trade-offs. Two noncompensatory models are described: conjunctive and lexicographic.

Conjunctive models of consumer choice reflect, for example, the physical dimensions of products. When purchasing an item of clothing, the choice is made from garments that are the right size. Consumers do not trade color for size. Under a conjunctive model of consumer choice, a minimum threshold (or cutoff) level is established for a characteristic. If a specimen does not meet the threshold for each attribute for which a cutoff has been defined, the specimen is rejected. In essence there is (are) a characteristic(s) so important that unless a specimen possesses it (them) at some minimal level(s), the specimen is rejected. Consumers Union uses this approach when classifying items as unacceptable due to safety concerns.

Lexicographic models suggest consumers make choices by ordering characteristics by degree of importance. Consumers first compare specimens with respect to the most important characteristic. All specimens deemed inferior to the specimen(s) ranking best with respect to the most desirable characteristic are rejected. Specimens surviving this "first cut" are then considered using the second most important characteristic. Consumers continue this process until one specimen remains.

Are these noncompensatory models unreasonable? Could they could reasonably depict consumer choice? The answers to these questions is a resounding YES! This, I believe, suggests the need to seriously consider more than linear additive models of consumer choice.

Before leaving the discussion of consumer choice in a certain environment, the concept of framing needs to be introduced. Tversky and Kahneman (1981:453) define a frame as "the decision-maker's conception of the acts, outcomes, and contingencies associated with a particular choice." They note that a particular decision can be framed in more than one way. Framing has important implications when studying consumer choice regardless of the model used. Kahneman and Tversky (1984:347) provide the following "cost framing" example:

> Situation 1. Imagine that you are about to purchase a jacket for $125 and a calculator for $15. The calculator salesman informs you that the calculator you wish to buy is on sale for $10 at the other branch of the store, located 20 minutes drive away.

> Situation 2. Imagine that you are about to purchase a jacket for $15 and a calculator for $125. The calculator salesman informs you that the calculator you wish to buy is on sale for $120 at the other branch of the store, located 20 minutes drive away.

These authors report that the majority of subjects indicate a willingness to drive to the branch in

Situation 1 but not in Situation 2. In both instances one "earns" $5 for 20 minutes of time and if consumers make choices "at the margin" one would expect the same outcome to obtain. However, consumers appear to compare the amount of the savings to the size of the purchase. In other words saving $5 on a $15 purchase is worth the effort while saving $5 on a $125 purchase is not worth the effort. This suggests consumers do not make choices at the margin but that choices are relative to the original price of the item being purchased. Research findings such as this suggest a need to carefully examine the assumptions on which our consumer choice models are based.

Consumer Choice Under Uncertainty

Consumer choice under uncertainty centers on expected utility theory. Asch (1988:38) notes that under this model "consumers confronting uncertain choices will act to maximize expected utility." In other words, if facing a set of uncertain choices, consumers will select the choice having the greatest expected utility. More formally, the traditional expected utility model can be expressed as:

$$\text{Select MAX } [EU(X), EU(Y)] \quad (2)$$

where
$EU(X) = [P_x(x); 1-P_x(x')]$

$EU(Y) = [P_y(y); 1-P_y(y')]$

X, Y = prospects

x, x', y, y' = objects

$p_i, (1-p_i)$ = probability of objects i and i'

Rather than discussing alternative choice models in an uncertain environment, the issue addressed here is whether or not consumers can generate meaningful probability estimates. A cogent argument in this respect is the framing issue raised by Tversky and Kahneman (1981:453). They illustrate the importance of framing with the following:

> Situation. Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as specified below.

Frame 1
Program A. 200 people will be saved.

Program B. 1/3 probability that 600 people will be saved, and 2/3 probability that no people will be saved.

Frame 2
Program C. 400 people will die.

Program D. 1/3 probability that nobody will die, and 2/3 probability that 600 people will die.

Examination of the two frames reveals that Programs A and C are the same and Programs B and D are the same. However, when subjects were asked to identify the preferred program for each frame, the vast majority preferred Program A and Program D. Tversky and Kahneman (1981:453) noted that "choices involving gains are often risk averse and choices involving losses are often risk taking." A conclusion inconsistent with expected utility theory.

Lest one conclude that the hypothetical nature of the Tversky and Kahneman experiment precipitated the results, Roszkowski and Snelbecker (1990) applied the framing concept to financial planning using financial planners as subjects. The situation they presented was:

> Situation. Imagine that your client has $6000 invested in the stock market. A downturn in the economy is occurring. You have two investment strategies that you can recommend under the existing circumstances to

preserve your client's capital.

Frame 1
Strategy A. $2000 of your client's investment will be saved.

Strategy B. 1/3 probability that the entire $6000 will be saved, and a 2/3 probability that none of the principal will be saved.

Frame 2
Strategy C. $4000 of your client's money will be lost.

Strategy D. 1/3 probability that nothing will be lost, and a 2/3 probability that $6000 will be lost.

Again, examination of each frame reveals they are exactly the same in terms of the outcome. The difference between the frames is that one is framed as a gain and the other as a loss. Roszkowski and Snelbecker found the planners preferred Strategy A and Strategy D, i.e. they were risk avoiders with respect to gains and risk seekers with respect to losses. A finding consistent with that of Tversky and Kahneman.

The key concept emerging from these framing studies is that consumers appear not to be uniformly risk averse across choices. When facing the opportunity for gain, there is a tendency to "lock it in" and when facing the opportunity of a loss, there is a tendency to try to avoid it. What does this suggest about the tendency to assume consumers are uniformly risk averse?

Conclusion

Based on the preceding discussion, the following types of problems could be encountered if one is not sensitive to the underlying model used to study consumer choices.

What happens when consumers are provided decision-making advice or recommendations

inconsistent with "true" choices? If consumer choices are always perceived as being reflected by a linear compensatory model, what would be the effect on a consumer with a conjunctive choice model? Is it not likely this consumer would be given a recommendation not based on her/his threshold rules?

What about the "cost framing" issue? Are consumers inherently wrong because they respond to relative price reductions rather than absolute price reductions? If yes, we have a consumer education problem. If no, we need to develop better ways to evaluate consumer choice.

What about assuming uniform risk aversion when developing financial decision-making aids for consumers? This type of decision-making aid would provide "wrong" advice for the risk seeking consumer. Tools such as the Survey of Financial Risk Tolerance (Roszkowski, 1992) could provide the basis for developing decision-making aids that are more reflective of "true" risk tolerance.

We must not become slaves to convention or simplification. Rather, it is time for us to move forward making sure models and frameworks reflecting "true" consumer choice are used.

The following papers by Li and Gerner, and by Lee illustrate the importance of differences between consuming units. Li and Gerner find limited support for the assertion that household characteristics affect the attractiveness of grocery shopping strategies. Lee suggests a method of identifying consumer preference structures and notes an application of this method revealing that preference structures differ across consumers.

Acknowledgements

References

Asch, P. (1988). Consumer safety regulation. New York: Oxford University Press.

Engel, J. F., Blackwell, R. D. & Miniard, P. W. (1990). Consumer behavior, sixth edition. Chicago: The Dryden Press.

Green, H. A. J. (1976). Consumer theory, revised edition. New York: Academic Press.

Kahneman, D., & Tversky, A. (1984). Choices, values, and frames. American Psychologist, 39(4), 341-350.

Lee, J. K. (1993). Utility functions and decision rules: Implications for consumer decision making. Unpublished doctoral dissertation, The Ohio State University.

Maynes, E. S. (1976). Decision-making for consumers. New York: Macmillan Publishing Co.

Roszkowski, M. J. (1992). Personal financial risk tolerance. Bryn Mawr, PA: The American College.

Roszkowski, M. J., & Snelbecker, G. E. (1990). Effects of "framing" on measures of risk tolerance: Financial planners are not immune. The Journal of Behavioral Economics, 19(3), 237-46.

Tversky, A., & Kahneman, D. (1981). The framing of decision and the psychology of choice. Science, 211(30 January), 453-58.

Endnotes
1.   Professor, Department of Family Resource Management

Grocery Shopping Strategies: Evaluation and Implications

Household characteristics through budget shares and probability of purchase are introduced in the evaluation of four grocery shopping strategies so that monetary savings pertinent to a specific product and to a specific household type can be identified. Based on the results, recommendation on what shopping rules can be used to save money are made to different household types.

Jieyu P. Li, The Ohio State University[1]
Jennifer Gerner, Cornell University[2]

Grocery shopping is a major household activity that involves money and time (Ackerman; 1989). In recent years, consumers have seen increasing demands for their time and effort in grocery shopping along with the increased number of promotional schemes by retailers and manufacturers, complexity of stores (Hamel, 1989) and, especially, the increased amount of product choices and services available to consumers. This has also made consumer collection of shopping information more difficult (Thorelli and Thorelli, 1974).

To cope with this complex supermarket shopping environment and the demands on their time and effort, consumers may adopt certain "rules of thumb" or simplified heuristic rules in grocery shopping to minimize shopping costs. In fact, researchers from the field of consumer economics have offered shopping rules such as "buy the lowest unit price", "buy the sales items" (Walker and Cude, 1983), "buy in quantity when price is right" (Biesdorf et.al, 1989) or "buy the low priced products" (Tellis, 1987), to help consumers be more efficient shoppers. In this study, selected grocery shopping strategies will be evaluated and recommended to consumers who are from different household types.

The Literature

The most commonly practiced shopping rules from the literature are: buy the lowest unit price, buy the coupon items, buy the sale item, buy the largest size, and buy private brands. Studies that apply these shopping strategies will be reviewed.

Buy the Lowest Unit Price

Buying the lowest unit price, by definition, is the least expensive way to shop in terms of money savings. Walker and Cude (1983) found that buying the lowest unit price was the strategy that resulted in the largest monetary savings. They also found this strategy required many price comparisons among brands and may be inefficient for those who value their time more.

Buy the Largest Size Products

Buying the largest-sized product is often offered to consumers as a convenient shopping rule and as a "better buy" strategy. And Indeed, in studies by Granger and Billson (1972) and Nason and Bitta(1983), approximately 80 percent of consumers believed that larger sizes were less expensive per unit than smaller sizes. However, researchers have also found frequent quantity surcharges. They ranged from 18 percent (Widrick, 1979b), 25 percent (Nason and Bitter, 1983) to more than 30 percent (Widrick, 1979a; Nason and Bitter, 1983).

In comparison with other shopping strategies, buying the larger size rule was found to be more expensive than buying the lowest unit price (Walker and Cude, 1983) although the mean surcharges for each product category were quite small (Cude and Walker, 1984). However, using this rule, the number of price comparisons was reduced substantially.

Buy the Coupon Items

Couponing has become an increasingly important promotional tool for manufacturers and

supermarkets. Consumers are exposed to thousands of coupons annually, being offered the potential for monetary savings (Nelson, 1972). There are two arguments concerning the use of coupons as a shopping rule.

One argument is held by Uhl (1982) who argues that coupons act as an income-transfer device among shoppers which causes higher food prices for all. Some consumers can possibly save money at the expense of higher food prices for other consumers through the use of coupons. It is very unlikely that coupons provide any net savings to consumers as a class. Therefore, he points out that consumers and consumer advisers should take a much less favorable view of coupons.

On the other hand, Antil (1985) reviewed literature about couponing, and analyzed the coupon use from the perspectives of retailers, manufacturers, consumer sovereignty, and the psychological effects of using coupons. He suggests that buying the coupon items is a good strategy. Consumers can save substantial amount of money on regular basis. Since coupons are welcomed by both consumers and manufacturers, coupons are acting in the best interests of both parties. Therefore, Antil encourages more use of coupons especially for those households with limited budget.

Empirical studies have been focused on coupon redeemers (Levedahl, 1988; A.C. Nielson, 1972) and how consumers are influenced by coupons to try new products (Teel, Williams and Bearden 1980). The studies report that coupon redeemers have both greater income and more education than non-redeemers. However, no studies have compared coupon use with other shopping rules although coupons can save money for households who use them (Antil, 1985).

Buy the Sale Items

Buying the sale items is another strategy that is often offered to shoppers. Empirical research has indicated that food advertisements in newspapers have important influences on both purchase and patronage patterns of consumers (Van De Mark, 1962; Wilkinson and Mason, 1974). On the other hand, studies also have found that sale items may have higher prices than regular priced items (Walker and Cude, 1983). It may be deceptive to consumers who mistake the sale price as reduced prices (Wilkinson and Mason, 1974). Studies have found that consumers are unable to detect the sale items from the regular items (Dickson and Sawyer, 1990; Thayer, 1990; Liefeld and Heslop, 1985). Walker and Cude (1983) found that buying the sale items increased expenditures by $3-$4 compared to buying the lowest unit price but it decreased the number of price comparisons substantially.

Buy the Private Brand

Store brands have become popular again in supermarkets with the improved and more stable quality (Progressive Grocer, February, 1990). Walker and Cude (1983) found the expenditures for the buy-generic strategy were about $1 higher than buying the lowest unit price and the number of price comparisons decreased more than for other strategies.

Concluding Remark

Research has shown that different shopping strategies pose different advantages and disadvantages for a consumer. The most complete study of evaluating consumer shopping rules is by Walker and Cude (1983). They evaluated a set of seven strategies which could be used to reduce the time and monetary expenditures in supermarket shopping. The study found substantial differences both time and money wise for the seven strategies. In their study, it was assumed that the savings from using a particular shopping rule is the same for all households. The authors failed to see that savings from using a particular strategy by two household types may very well be different due to their different household characteristics, resulting in the differences in the odds they purchase the product and the budget share they allocate to the specific product.

In this study, a new research method will be developed in household evaluation of the efficiency of shopping strategies so that savings pertinent to a specific product can

be identified. Specifically, this study will recognize the fact that efficiency of shopping strategies will depend on the odds that the household purchase the product and the proportion of their food budget in purchasing that product.

Research Design

In this study, money saving from using a shopping strategy are assumed to depend on three factors. First it depends on what strategies households adopt for their shopping. Applications of different shopping strategies will result in different amounts of money needed to purchase that market basket. Second, it depends on the probability that the households purchase the food. If more households make such a purchase, the shopping strategy that can help save the most money for that food will be more beneficial to those households. Third, it also depends on the budget share of household food expenditures spent on the specific food. The last two factors, the odds of purchase and how much to allocate to the food, are influenced and determined by the household demographic and their socio-economic characteristics.

Choice of Shopping Strategies

The strategies chosen for this study should be commonly practiced by consumers and supported by literature. While the marketing literature focuses mainly on understanding pure consumer shopping behavior with the goal of maximizing profits (Tellis, 1987; Liefeld and Heslop, 1985; Tobolski, 1988; Urbany and Dickson, 1987; Teel et al., 1980), consumer economists offer heuristic money and time saving shopping rules for consumers (Biesdorf et al., 1986; Walker and Cude, 1983; Cude and Walker, 1985; Hawkins and McCain, 1979) with the goal of informing and educating consumers.

With the focus on evaluating the efficiency of shopping rules for consumers, shopping rules chosen for this study are adopted mainly from consumer literature. They are:
S1. Buy the lowest unit price;
S2. Buy the largest size among all possible brands;

S3. Buy the coupon item; if there is no coupon item, buy the sales item; if both are not available, buy the lowest unit price.
S4. Buy the store brands.

Choice of Household Types

The household types chosen for this study were selected so that they have sufficiently different characteristics to have different budget shares and probability of purchase. It is proposed that households in the same category would have the same budget shares and probability of purchase. Based on the above criteria, the household types used in this study are:
A. married couple with no children;
B. married couple with children;
C. single female with children; and
D. single person households.

The list of household types does not exhaust all the possible household types in the United States. For example, single males with children are excluded. Yet each type in the list is a significant subset of all the households in the United States and they represent unique purchasing patterns.

Choice of Product Bundle

For the particular research question in this study, a specific market basket, which comprises a subset of products selected from a full set of food products purchased by the households, is needed for the application of shopping strategies, for the prices resulting from applying these strategies and for generating budget share information. Several consideration have been put into the selection of the product bundle.

First, the product categories should be sufficiently large to allow the application of the strategies. Store brand or coupon items are not often available for many products. The broad choices of products can allow more frequent use of coupon or sales items. For example, corn flakes as a product category is too narrowly defined since it is difficult to have coupon or sale items for corn flakes. Cereal on the other hand, often has a sale item or coupon. Thus it is a more appropriate product category for all strategies to be applied.

Second, product categories should also be small enough so that choices within a product category can be considered to be close substitutes by consumers. For example, there are three kinds of canned tuna fish available: tuna in water, in oil, and diet tuna. It is not unreasonable to assume that the above three tuna fish can be considered as close substitutes.

Third, within each product category, each product has to be represented by multiple package sizes since buying the largest size cannot be applied otherwise. This criterion automatically eliminates all the products whose weights are decided at the point of purchase. Examples of these products are fresh meat, seafood and fresh produce.

Taken together these three criteria, the following 10 product categories are selected for this study: White bread; Canned kidney beans; Canned kernel corn; Canned tuna fish, all kinds; Bleached, enriched, all purpose flour; Cooking oil except oil shortening; Cereal; Frozen vegetables; Frozen orange juice; and Other frozen juice.

Evaluation of Shopping Strategies

As suggested in the last section, strategies can be analyzed on two dimensions. First, the actual cost of the product bundle can be determined. Second, the effect of that household characteristics have on food expenditures can be examined. Other researchers have examined the actual cost of the product bundle. To account for the effect of household characteristics, we can use empirically derived budget shares for particular food groups, along with the probability of purchasing particular food items. The budget share computed for those households who purchase the item measures how important the product is in a specific household type's food budget given that the household purchases the item. The probability of purchasing the item measures how likely it is that households of that type purchase the product at all.

Thus we offer two alternatives for assessing expenditures on the market basket. One, average weighted expenditures for the ith strategy, is expenditures for each of the ten items using the ith strategy, weighted by the budget share that this item represents among household who consume the item, summed over the ten items. The budget share used is specific to the household type under consideration. To assess how well the ith strategy performs for this household type, the average weighted expenditures for the ith strategy is subtracted from the average weighted expenditures using the lowest cost among all the strategies.

The second alternative we consider takes the probability of purchasing a particular item, as well as the budget share for that item. This alternative, the expected expenditure, is the expenditures for each of the ten items using the ith strategy, weighted by the expected budget share for this item for households of the type under consideration, summed over the ten items. The expected budget share is the budget share for those who consume multiplied by the proportion of households of the type under consideration who consume the item. As with the average weighted expenditures alternative, the ith strategy is evaluated by subtracting the expected expenditures for the ith strategy from the lowest cost strategy.

Data and Result

Budget Share and Probability to Purchase

Ten food-at-home products out of 95 products from the 1985-86 Diary of Consumer Expenditure Survey (CES) are used to construct budget shares and the probability of purchase. Expenditures files that provide detailed expenditure data on food and family files which provide family information are used. Out of 6896 households in the data set, 45 households did not buy any food at home or away from home during the two-week period when the data was collected. They are excluded from the sample.

Budget share, which is used as the weight to calculate the average weighted expenditure of the product bundle, is measured by the ratio of a particular household type's expenditure on the individual product over the total expenditure of food at

296

home, given that household purchased that product. If the budget share is large, it means that the household spends more money on this food item in proportion to their expenditure on food-at-home. The products with high budget shares will be weighted more heavily in the average weighted expenditure calculations.

The probability is the actual number of households who made the purchase over the total number of households in the specific household type. It is used together with budget shares to calculate the expected average expenditure. The probability is an indicator of the importance of the product for the specific household type. For high probability, it means that more households in that household type purchase the product and hence the strategy is more important for that household type.

Primary Data Collection
The product price and size data are collected from the local supermarket, Wegmen in the city of Ithaca during the week of November 12, 1990 -- November 18, 1990. In terms of store space and the varieties of products offered, it is the largest store in the city. It also has store brands with different sizes and offers more coupons to consumers than other stores in the local area.

The store lists the unit price, total price, size, and savings from using coupons, or sales on the shelf. Unit price of the product, total price, size of the product, information on whether the product was on sale, and how much the savings from buying the sale, special, or a coupon item, were all collected. These data were used to determine the expenditure on the individual product and the market basket. The instruction for applying the shopping strategies are presented as follows:

Buying the lowest unit price. In utilizing this strategy, the data collector was instructed to compare all the unit prices, including those with sale items and coupon items. If there are two products that have the same lowest unit price, pick the one with the lowest total price.

Buying the largest size. If the same largest size has more than one brand, pick the one with the lowest unit price.

Buying the items with coupon. If there was no coupon, the sale item was bought; if both were not available, the product with the lowest unit price was picked.

Buying the store brand. If the store brand was offered in different sizes, the one with the lowest unit price was picked.

Discussion and Implication

As previously discussed, two measures are used to determine how household characteristics affect the evaluation of supermarket shopping strategies. The first measure uses budget shares, resulting in weighted average expenditure. The second measure uses both the budget shares and probability of purchase, resulting in expected weighted expenditure. The expenditure is then subtracted from the least cost strategy using the lowest possible price generated across the four household types for the ten products. The smaller the difference, the more efficient the evaluated strategy is.

Result 1: Evaluating Shopping Strategy by Average Weighted Expenditures
The average weighted expenditure uses budget shares as the weights to capture the effect of household characteristics on food expenditure. The households with similar characteristics are assumed to have the same budget shares.

The overall differences between the evaluated strategy and the least cost strategy are very small since the weight of budget share is small. Overall, buying the lowest unit price and buying the store brand offer the most money savings for all household types. However, we also find the differences in average weighted expenditures across household types. As a result, single female with children should follow strategy 1, which are buying the lowest unit price. Married couples without children should follow strategy 2 and 3, which are buying the largest size and buying coupon items. There is no single best strategy for married couple with children. The results are inconclusive for single person

households.   Therefore,   no
recommendation is given to those
household types.

Result 2 : Evaluating Shopping Strategies By Expected Weighted Expenditure

The overall differences in
expenditure between the evaluated
strategy and the least cost strategy
are   very   small   since   both   the
probability of purchase and the
budget shares are very small numbers.
Again buying the lowest unit price
and the store brand are the most
money saving strategies.   However,
the   differences   across   household
types are large. Using such method,
single person households can benefit
the most from buying the lowest unit
price.   Couples without children
should   follow   the   strategies   of
buying   the   largest   sized   product,
and/or buying the coupon and sale
items.   Female   headed   households
should follow the strategy of buying
the store brand.   There is no best
strategy for married couple with
children.

Summary of Results

In this study, the use of
budget shares and the probability to
purchase was the first attempt to
introduce the effect of household
characteristics into the evaluation
of consumer shopping strategies.
Both measures used in this study
yield similar results.   The results
show   that   the   differences   in
expenditures between the evaluated
strategy and the least cost strategy
are not the same across household
types. This supports the hypothesis
of the study in that household
characteristics do affect the rules
the household should follow.

Although the results of this
study are very close to the results
by Cude and Walker (1983), the
results have stronger implications
than those by Cude and Walker. With
the   introduction   of   household
characteristics in the analysis, the
results   can   be   applied   to   all
households in the population.   No
matter what the characteristics of
the household, buying the lowest unit
price is always the most money saving
strategy and store brand is the
second most money saving strategy.
Cude and Walker's analysis does not

examine the effect of household types
in their evaluation of shopping
rules.

The   study   offer   some
implications for consumer educators.
The   results   show   that   the
expenditures from using a specific
strategy are different for different
household types.   It is important
that consumer educators realize the
role of household characteristics
when they make recommendations to
consumers about their food shopping
strategies.   Households   with
different characteristics may spend
different proportions of their food
budget on a specific food.

The results of the study,
however, have to be interpreted with
caution.   The   criteria   used   in
evaluation   of   the   strategies   is
monetary costs only. Other important
criteria in choosing a shopping
strategy like product quality and
time cost of utilizing a specific
strategy   are   not   considered.
Moreover the results are surely
dependent on the particular bundle of
goods chosen.

Reference

A.   C.   Nielson   Co.   (1972).   What
consumers think of coupons. The
Nielsen Researcher, 30(6), 3-
10.

Ackerman,   N.   M.   (1989).Money
resources, time demands, and
situational   factors   as
predictors of shopping time.
Journal of Consumer Studies and
Home Economics, 13, 1-19.

Antil, J. H. (1985). Couponing as a
promotional tool: Consumers do
benefit. Journal of Consumer
Affairs, 19(2), 316-327.

Biesdorf,   H.   B.,   Stimac,   L.   D.,
& Swanson, J. A. (1989). Be A
Better   Shopper.   Cornell
Cooperative Extension, Cornell
University, Ithaca, New York.

Cude,   B.,   &   Walker,   R.   (1984).
Quantity surcharges: Are they
important   in   choosing   a
shopping strategy? Journal of
Consumer Affairs, 18(2), 287-
295.

Cude, B., & Walker, R. (1985). Unit
pricing   and   alternatives:
Developing and individualized
shopping strategy. Journal of
Business Education, 60(4), 168-

172.

Cude, B. J. (1987). Estimating the returns to informed decision-making. Journal of Consumer Affairs, 21(1), 86-95.

Cude, B. J. (1988). Comparison shopping: Estimating the returns. Journal of Education for Business, 63(8), 369-371.

Cude, B. (1989). An overview of selected consumer decision rules. In M. Carsky(Ed.), The Proceedings of American Council on Consumer Interests (pp. 244-248). Columbia, MO: ACCI.

Donegan, P. (1989). Private label is alive and well. Progressive Grocer, February, 61-67.

Granger, C. W. J., & Billson, A. (1972). Consumers' Attitudes towards Package Size and Price. Journal of Marketing Research, 9(3), 239-248.

Hawkins, D..I., & McCain, G.(1979). An investigation of returns to different shopping strategies. Journal of Consumer Affairs, 13(1), 65-74.

Li, J. P. (1991). Evaluation of grocery shopping strategies. Unpublished master's thesis, Cornell University.

Liefeld, J., & Heslop, L. (1985). Reference prices and deception in newspaper advertising. Journal of Consumer Research, 11(4), 868-876.

Levedahl, W. J. (1988). Coupon redeemers: Are they better shoppers. Journal of Consumer Affairs, 22(2), 264-283.

Nason, R. W., & Della Bitta, A. J. (1983). The incidence and consumer perceptions of quantity surcharges. Journal of Retailing, 59(2), 40-53.

Teel, J., Williams, R., & Bearden, W.(1980). Correlates of consumer susceptibility to coupons in new grocery product introductions. Journal of Advertising, 9(3), 31-35.

Tellis, G. J. (1987). Consumer purchasing strategies and the information in retail prices. Journal of retailing, 63(3), 279-297.

Thayer, W. (1990). So your customers know what's on special? Do they care? Progressive Grocer, (The complete study is in July issue of Journal of Marketing), 79-82.

Thorelli, H. B., & Thorelli, S. V. (1974). Consumer information systems and consumer policy. Cambridge, MA: Ballinger.

Tolbolski, F. (1988, Sept. 26). Research a potent factor in reaching the 'macro market'. Marketing News, 22(20), 12-13.

Uhl, J. R. (1982). Cents-off coupons: Boon or boondoggle for consumers. Journal of Consumer Affairs, 16(1), 161-165.

Urbany, J. E., & Dickson P. R. (1987). Information search in the retail grocery market. Working Papers 87-39. College of Business, The Ohio State University.

Walker, R., & Cude, B (1983). In-store shopping strategies: Time and money costs in the supermarket. Journal of Consumer Affairs, 17(2), 357-369.

Widrick, S. M. (1979a). Quantity surcharge: A pricing practice among grocery store items -- Validation and extension. Journal of Retailing, 55(2), 47-58.

Widrick, S. M. (1979b). Measurement of incident of quantity surcharge among selected grocery products. Journal of Consumer Affairs, 13(1), 99-107.

Wilkinson J. B., & Mason, J. B. (1974). The grocery shopper and food specials: A case of subjective deception. Journal of Consumer Affairs, 8, 30-36.

Endnotes
1. Ph.D candidate, Department of Family Resource Management.
2. Professor, Department of Consumer Economics and Housing.

Utility Functions:
Do They Suggest Different Decision-Making Rules?

A model of consumer's buying decision is developed based on a synthesis which in one hand, integrate the choice models of Lancaster's characteristic theory and random utility theory, and on the other hand, incorporate the wealth of research in brand preference behavior addressing empirical issues. From an empirical study which utilizing this model it was found that individual consumers have different forms of utility functions which have implications for actual consumer decision-making rules.

Jinkook Lee, University of Tennessee[1]

Kyrk (1929) viewed expenditure as a three-fold process: choice-making or standard setting, income-apportionment or budgeting, and buying or market selection. The first step, choice-making, deals with the problems of deciding what we want. This step is important to human welfare since the choices an individual or a family makes determine the amount of food, clothing, housing, recreation, and the like which is ultimately used. However, since most individuals or families do not have sufficient money income to cover all their wants, planning ahead and apportioning available money, or budgeting, is necessary to insure the satisfaction of the most essential wants (Coles, 1938).

Market selection, or buying, is necessary to complete the expenditure process. Even though choices have been made and income has been apportioned, money has not been exchanged for the goods desired. It is in the marketplace that consumers exchange money for particular goods. Buying does not address what is wanted, the choices to be made between different kinds of goods, or the problems of budgeting; rather it deals with the process of selecting from goods of similar character from all of those appearing in the market (Coles, 1932).

Buying, therefore, does not involve choices between refrigerators and automobiles. These decisions belong to the process of choice-making. Neither does buying include the decisions as to how much to pay for the articles in question. These

are problems of income apportionment or budgeting. However, when consumers choose to purchase a refrigerator, they are concerned with the question of how to select wisely, how to determine the characteristics of different brands of refrigerator, and how to evaluate these characteristics.

Neoclassical economic theory provides a framework to analyze consumer choice under budget constraint and the consequent prediction of the change in a consumer's chosen collection of goods when prices change. Once a consumer's preferences among various goods collections are identified, the characteristics of goods have already been weighed and taken into account by the individual, and his preference map on collections of goods represents an inextricable combination of what he is personally seeking in the various goods and the objective properties possessed by those goods (Eastwood, 1985). Thus, the questions of how to select, how to determine and evaluate the characteristics of different brands cannot be answered under this traditional framework.

Lancaster (1971) proposed an economic model for the analysis of the buying decision which is based on the premise that goods are valued for the characteristics which they possess, and that differentiated goods are essentially different combinations of characteristics. This view of goods is the same as employed in applications of multidimensional scaling (Green & Wind, 1975) and multi-attribute

attitude models (Wilkie & Pessimier, 1973) in explaining brand preference in consumer behavior (Ratchford, 1979).

While choosing, budgeting and using commodities are important, they are not the focus of this study. Rather, this study focuses on problems related to selecting brands in the market. Consumer's buying decisions have been studied extensively, but independently, by psychology, marketing, and economics. That is, the efforts to integrate the research findings among the disciplines has been limited. The purpose of this paper is to propose a model of consumer buying decision based on the research traditions of these various research streams.

Ratchford (1979) proposed a modified Lancaster model which is reconciled with psychometric models of brand choice. It is enlightening since Ratchford's model provides an economic interpretation for psychometric methods of estimating brand preferences at the individual level. However, one criticism of Ratchford's model is the use of empirically unverified models to approximate consumer's choice behavior (Ladd & Zober, 1979). Therefore, a model of consumer's buying decision, in this study, will be conceptually based upon Lancaster's theory reconciled with empirically verified findings on individual consumer's brand preference behavior.

As a way to extend the deterministic model of modified Lancaster's characteristic model to a stochastic model, random utility theory can be applied. Random utility theory departs from the observation that even identical choice situations consumers do not always make the same choices. Under random utility theory an individual consumer is assumed to have unknown "true" utility that consists of a deterministic component which can be inferred from a series of observations of choice and random error. The modified Lancaster's model is, then, a deterministic component of the utility function in this study.[2]

The remainder of this paper starts with the description of the basic Lancaster characteristic model.

The empirical findings on brand preference behavior is then incorporated into Lancaster's model. Random utility theory will be then presented as an umbrella framework to include the modified Lancaster's model as the deterministic component. Finally, an empirical research which investigates individual consumers' utility functions will be presented with the implications.

Lancaster's Model

Under Lancaster's model, utility is derived from the characteristics which goods possess rather than goods themselves. A consumer maximizes utility with respect to characteristics. Lancaster's model may be defined more precisely as follows: A consumer maximizes an ordinal preference function for characteristics, $U(X)$, where X is a vector of characteristics, $1,...,n$, subject to the usual budget constraint $PG \leq I$, where P is a vector of prices for each of these goods and I is income. Goods, G, are transformed into characteristics, X, through the

relation $X=BG$, where B is an $n \times r$

matrix which transforms the r goods into n characteristics. The model may therefore be written as:

Maximize $U(X)$
Subject to $PG \leq I$, with $X=BG$

Lancaster (1971) analyzed brands as the goods which yield the similar combinations of characteristics in an industry. Thus, Lancaster's model postulates that brand preference in a buying decision is a function of the attributes or characteristics possessed by the brand. This model is similar to the multidimensional scaling and multi-attribute attitude models developed in psychology and marketing (Ratchford, 1979).

Lancaster's theory of consumer behavior has been formulated in terms of consumer preferences. That is, the consumer preferences are the fundamental element underlying choice, and utility is a way to describe preferences. A utility function, then, is a way to assign a level of satisfaction to every

possible characteristic combination.

Nearly any kind of "reasonable" preferences (ruling out intransitive preferences) can be represented by a utility function (Varian, 1987). While utility functions are not necessarily the same for all individuals, common functional form is often assumed with individual variations being characterized by coefficient or parameter variations (Lancaster, 1971; Einhorn, 1970; Ratchford, 1979). The reason for assuming a common functional form is to keep analyses more manageable.

However, if the same functional form is assumed for all consumers, individual differences in functional forms of utility are ignored. This results in a utility function which does not always give an optimal choice for individual consumers. Furthermore, although the resulting choice may be estimated depending on the statistical predictability of the functional model, the utility function does not make any implications for individual consumer's actual decision-making rules which consumer may use.

What is proposed in this paper is to eliminate the assumption of a single utility function for all consumers. Instead, various functional models of utility functions which represent known decision-making processes as well as resulting choice preferences are proposed to be employed. Various models of utility functions have been developed based upon empirical support provided by previous research findings on consumer decision-making. In the following section several examples of utility functions which represent actual consumer's choice preferences and decision-making processes will be introduced.

Brand Preference Behavior

Various models of brand preference behavior have been developed to describe consumers' decision-making rules. These models include linear compensatory, simple additive, conjunctive, disjunctive, lexicographic, lexicographic semiorder, elimination by aspects, and phased rules.

The most prevalent model in describing brand preference behavior

is the linear compensatory decision rule. Under a linear compensatory model, the decision maker considers all attributes of a given alternative in a way that a desirable attribute may offset, or compensate for an undesirable attribute. This is done for each alternative. The alternative with the greatest overall score is then chosen. The use of linear compensatory model is often limited to situations with few alternatives (Payne, 1976; Johnson & Meyer, 1984; Johnson, Meyer & Ghose, 1989).

Information processing theory partly explains the departure from the linear compensatory model in complex decision-making situations. Consumers switch from the linear compensatory model to less complex decision-making rules to reduce the information processing effort. However, there is evidence that consumers often do not employ the linear compensatory model even in non-complex decision-making situations (Alba & Marmorstein, 1987; Payne, 1976; Olshavsky, 1979; Reiley & Holman, 1977; Tversky, 1972).

The simple additive rule is a simple rule is a simple rule which has been found to be used by consumers (Alba & Marmorstein, 1987). A consumer using the simple additive rule counts the number of favorable attributes an alternative possesses. The alternative having the largest number of desirable attributes is chosen.

When using the conjunctive decision rule, a consumer establishes minimum cutoffs for each attribute. If an alternative does not exceed all the cutoffs for all attributes, it is rejected. Several researchers have identified use of the conjunctive rule (Payne, 1976; Lussier & Olshavsky, 1979).

Under the disjunctive rule, the consumer develops acceptable standards for each attribute which may be higher than the minimum cutoff levels for the conjunctive heuristic. If an alternative meets the standard for any attribute, it is accepted. However, empirical research examining usage of the disjunctive model is rare, and use of a disjunctive model has not been empirically supported.

A lexicographic rule implies consumers order attributes in terms

of importance. Alternatives are compared with respect to the most important attribute. If two or more alternatives are tied on the first attribute, the second most important attribute is considered, and so on. Reily and Holman (1977), Park (1978a), Olshavsky (1979), Bettman and Park (1980), and Klein (1983) found support for consumer's use of a lexicographic rule.

Lexicographic semiorder works like the lexicographic rule with the additional assumption that for the most important attribute there is a minimum difference between alternatives. That is, if the difference between two alternatives on an attribute is greater than the minimum difference, the alternative with the more attractive attribute value is chosen. However, if the difference between the attractiveness values on the most important attribute is less than or equal to the minimum difference, then a consumer considers the attribute that is next in importance. Consumer use of a lexicographic semiorder model has been supported by Park (1978b).

A consumer basing choice on the elimination by aspect rule selects the most important attribute and eliminates all attributes not exceeding the cutoff with regard to this attribute. An attribute second in importance is then selected and the elimination process continues until only one alternative remains. Tversky (1972), Payne (1976) and Klein (1983) presented empirical evidence supporting consumer use of elimination by aspects.

A phased model uses more than one of the rules mentioned above. A consumer eliminates some alternatives from consideration using a less complex rule. The ultimate choice from the reduced decision set is selected using a more complex rule. Several studies have reported use of the phased model (Slovic, Fishhoff & Lichtenstein, 1977; Payne, 1976; Lussier & Olshavsky, 1979; Olshavsky, 1979; Bettman & Park, 1980; Klein, 1983; Park, 1978ab). Since the consumer who uses the phased model does not try to maximize utility but simplifies the buying decision to reduce the burden of processing information, the phased model cannot be represented by a utility function.

Research suggests that consumer use six of the eight decision rules noted above. Several of these decision rules can be represented by a mathematical model of a utility function.

(1) Simple additive compensatory model (Alba & Marmorstein, 1987):

$$U = \sum_{j=1}^{n} X_j \qquad (1)$$

(2) Linear compensatory model (Fishbein, 1961; Geistfeld, 1974; Wilkie & Pessimier, 1973):

$$U = \sum_{j=1}^{n} W_j X_j \qquad (2)$$

(3) Conjunctive model (Einhorn, 1970):

$$U = \sum_{j=1}^{n} W_j \log X_j \qquad (3)$$

where U = utility score of an alternative,
X_j = attribute possession score of the jth attribute of an alternative,
W_j = subjective importance of the jth attributes, and
a_j = represents some value above the asymptotic level, that is a_j > X max.

Random Utility Theory

Random utility theory is concerned with choices among two or more alternatives. Based on the observation that even in identical choice situations decision makers do not always make the same choices, Thurstone (1927) postulated a random scale function at the individual level. The distinguishing feature of this theory is that a potential stochastic nature is attributed to individual utility level (Corstjens & Gautschi, 1983). Therefore, random utility theory assumed that an individual has an unknown "true" utility that consists of a deterministic component that can be inferred from a series of observations of choice and random error.

The source of the deterministic component is consistent with rational

choice theories in economics and psychology (Manski, 1973; Gensh & Recker, 1979). In this study, the deterministic component is represented by Lancaster's characteristic model reconciled with the findings in brand preference behavior literature.

The source of the random component, however, is different from the "repeated measurements" source of error in psychological studies (Bock & Jones, 1968). In addition to this type of source of error, the "repeated measurement," Manski (1975) listed "omitted structure," "measurement error," and "cross-sectional preference variation" as logical bases for the random error. These assumptions underlying the error term reflect the complexity and richness of the utility function by recognizing that a model of the utility function is not fully specified in terms of all the attributes that influence the utility function (Gensch & Recker, 1979).

Utility is thus written

$$U_i = V_i + \epsilon_i \qquad (4)$$

where: U_i = the utility of alternative i,
V_i = the deterministic component of choice alternative i, and
ϵ_i = the random component associated with choice alternative i which is assumed to be independently and identically distributed across all individuals.

While random utility theory identifies the general characteristics of the utility function, discrete choice models translate this preference structure into a model of choice. Under the discrete choice models it is postulated that an individual will choose the alternative perceived to have the greatest utility. The probability that an individual consumer will choose alternative i from a set of available alternatives A, denoted by P(i/A), can be written in utility terms as

$$P(i/A) = Prob(U_i > U_1 \text{ for all } 1 \in A, i \neq 1) \qquad (5)$$

In light of the division of utility in equation (4) into random and deterministic components, the preference probability can be rewritten

$$P(i/A) = [Prob(V_i + \epsilon_i) > (V_1 + \epsilon_1) \\ \text{for all } i \in A, i \neq 1] \qquad (6)$$

or

$$P(i/A) = Prob[(V_i - V_1) > (\epsilon_1 - \epsilon_i) \\ \text{for all } i \in A, i \neq 1] \qquad (7)$$

Since equation (7) is in the form of a probability statement, it lends itself to maximum likelihood estimation once the deterministic components, V_i, are specifically modeled and the joint distribution for the random terms, ϵ_i, is determined. The simple additive compensatory model, the linear compensatory model, and the conjunctive model can be used as the candidate forms for the deterministic component. Also, other utility functions which represent other decision-making rules such as the lexicographic, the lexicographic semi-order, and the elimination by aspect models can be identified and used as the candidate forms.

The joint distribution for the random terms, ϵ_i, is specified as follows. φ denotes the cumulative joint density function associated with the vector of random terms, ϵ_i (Punj & Staelin, 1978). Once this density is specified, it is conceptually possible to derive an expression for P as follows.

$$P(i/A) = \int_{t=-\infty}^{t=\infty} \varphi_i dt \qquad (8)$$

where φ_i is the derivative of φ with respect to i. In principle any joint distribution on the ϵs could be chosen. Unfortunately, most standard distributional assumptions require complex numerical integration to obtain P(i/A) from Equation (8). However, the double exponential distribution leads to a computationally feasible solution of Equation (8) (Punj & Staelin, 1978). If the elements of the random error terms are assumed to be independently and identically distributed across individuals and alternatives

304

according to the double exponential distribution,

$$P(i/A) = \exp(V_i) / \sum_{\substack{l \in A \\ i \neq l}} \exp(V_l) \quad (9)$$

or

$$P(i/A) = 1 / (1 + \sum_{\substack{l \in A \\ i \neq l}} \exp(V_i - V_l)) \quad (10)$$

(McFadden, 1974). This suggests the probability of an individual consumer choosing alternative i is equal to a ratio where the numerator is a function of the deterministic portion of an individual consumer's utility for alternative i and the denominator is a function of the deterministic portions of the same individual's utilities for all of the alternatives in his/her choice set.

A Model of Consumer Buying Decision: An Empirical Study

An empirical study is conducted utilizing the model of consumer buying decision to investigate whether consumers have different utility functions (Lee, 1993). One hundred subjects were asked to make choices among three hypothetical washing machine models. From the manifested choices of individual consumers each individual consumers' utility functions were estimated, and based on goodness-of-fit criteria the best fitting model of utility function was selected for individual consumers.

The research results indicated that individual consumers have different utility functions. It was found that some consumers' preferences were better represented by the linear compensatory utility function, while other consumers' preferences were better fitted by the conjunctive utility function. These findings contradict the conventional assumption of a uniform utility function across consumers. Furthermore, these different models of utility functions have implications for consumers' actual decision-making process. That is, the consumers who have linear compensatory utility functions may use the linear compensatory decision rules, while the consumers whose utility functions are conjunctive are more likely to use conjunctive decision rules.

This finding evokes a serious concern regarding the traditional approach toward a normative choice for consumers. If a uniform utility function is assumed, it is valid to propose a normative choice for all consumers. However, as found in the empirical research, individual consumers have different utility functions so that a normative choice drawn from a uniform utility function can not be guaranteed to give maximizing utilities for all individual consumers. In other words, recommending the best choice for individual consumers needs a care. What is best for one individual consumer may not be the best for others. There may be some situations where recommending the best choice for all consumers is inevitable. However, a normative choice drawn form an average consumer's or expert(s) preferences does not always maximize individual consumers' utilities.

Reference

Alba, J. W., & Marmorstein, H. (1987). The effects of frequency knowledge on consumer decision making. Journal of Consumer Research, 14, 14-25.

Bettman, J. R., & Park, C. W. (1980). Effects of prior knowledge and experience and phase of the choice process on consumer decision processes: A protocol analysis. Journal of Consumer Research, 7, 234-248.

Bock, R., & Jones, L. (1968). Measurement and prediction of judgment and choice, San Francisco: Holden Day.

Coles, J. V. (1938). The consumer-buyer and the market, New York: John Wiley.

Coles, J. V. (1932). Standardization of consumers' goods: An aid to consumer buying. New York: The Ronald Press Company.

Corstjens, M. S., & Gautschi, D. A. (1983). Formal choice models in marketing. Marketing Science, 2, 19-56.

Eastwood, D. (1985). The economics of consumer behavior. Boston: Allyn and Bacon, Inc.

Einhorn, H. J. (1970). The use of nonlinear, noncompensatory models in decision making. Psychological Bulletin, 73, 220-229.

Fishbein, M. (1961). An investigation of the relationships between beliefs about an object and the attitude toward that object, University of California, Los Angeles, Tech. Rep. No. 6, Contract Nonr-233 (54).

Geistfeld, L. V. (1974). A technical efficiency approach to consumer decision making. Unpublished doctoral dissertation, University of Minnesota.

Gensh, D. H., & Recker, W. W. (1979). The multinomial, multiattribute logit choice model. Journal of Marketing Research, 16, 124-132.

Green, P. E., & Wind, Y. (1975). Multivariate decisions in marketing: A measurement approach. New York: Holt, Rinehart, and Winston.

Johnson, E. J., & Meyer, R. J. (1984). Compensatory choice models of noncompensatory processes: The effect of varying context. Journal of Consumer Research, 11, 528-541.

Johnson, E. J., Meyer, R. J., & Ghose, S. (1989). When choice models fail: Compensatory models in negatively correlated environments. Journal of Marketing Research, 26, 255-270.

Klein, N. M. (1983). Utility and decision strategies: A second look at the rational decision maker. Organizational Behavior and Human Performance, 31, 1-25.

Kyrk, H. (1929). Economic problems of family, New York: Harper Brothers Publishers.

Ladd, G. W., & Zober, M. (1979). Comment. Journal of Consumer Research, 6, 85-87.

Lancaster, K. (1971). Consumer demand: A new approach. New York: Columbia University Press.

Lee, J. K. (1993). Utility functions and decisions rules: Implications for consumer decision making. Unpublished doctoral dissertation, The Ohio State University.

Lussier, D. A., & Olshavsky, R. W. (1979). Task complexity and contingent processing in brand choice. Journal of Consumer Research, 6, 154-165.

Manski, C. F. (1975). Maximum score estimation of the stochastic utility model of choice. Journal of Econometrics, 3, 205-28.

Manski, C. F. (1973). A stochastic utility model of choice. Unpublished paper, School of Urban and Public Affairs, Carnegie-Mellon University.

McFadden, D. (1974). Conditional logit analysis of qualitative choice behavior. In P. Zarembka (Ed.), Frontiers in Econometrics (pp. 105-142). New York: Academic Press.

Olshavsky, R. W. (1979). Task complexity and contingent processing in decision making: A replication and extension. Organizational Behavior and Human Performance, 24, 300-316.

Park, C. W. (1978a). A conflict resolution choice model. Journal of Consumer Research, 5, 124-137.

Park, C. W. (1978b). A seven-point scale and a decision-maker's simplifying choice strategy: An operationalized satisficing-plus model. Organizational Behavior and Human Performance, 21, 252-271.

Payne, J. W. (1976). Task complexity and contingent processing in decision making: An information search and protocol analysis. Organizational Behavior and Human Performance, 16, 366-387.

Punj, G. N., & Staelin, R. (1978). The choice process for graduate business schools. Journal of Marketing Research, 15, 588-598.

Ratchford, B. T. (1979). Operationalizing economic models of demand for product characteristics. Journal of Consumer Research, 6, 76-85.

Reiley, M., & Holman, R. H. (1977). Does task complexity or cue intercorrelation affect choice of an information processing strategy?: An empirical investigation. In W. D. Perreault, Jr. (Ed.), Advances in Consumer Research, 4 (pp.

185-191). Atlanta: Associations for Consumer Research, 185-191.

Slovic, P., Fishhoff, B., & Lichtenstein, S. (1977). Behavioral decision theory. Annual Review Psychology, 28, 1-39.

Thurstone, L. L. (1927). A law of comparative judgment. Psychological Review, 34, 272-286.

Tversky, A. (1972). Elimination by aspects: A theory of choice. Psychological Review, 79, 281-299.

Varian, H. R. (1987). Intermediate Microeconomics: A modern approach, New York: W. W. Norton & Company.

Wilkie, W. L., & Pessimier, E. A. (1973). Issues in marketing's use of multi-attribute attitude models. Journal of Marketing Research, 10, 428-441.

Endnotes

1. Assistant Professor, Retail and Consumer Science, Department of Textiles, Retailing and Interior Design.

2. Ratchford (1979) also extended the deterministic model of the modified Lancaster's model to the stochastic case by applying the concept of a "representative" consumer: Differences in choice between the representative consumer and others due to idiosyncratic tastes are regarded as stochastic. Therefore, his approach is different from random utility theory where a stochastic nature is attributed to individual utility level rather than aggregated consumers level.

Using Technology in Teaching Consumer Economics and Personal Finance

This presentation will demonstrate the use of portable computers, LCD panels, and a variety software that can be used in the teaching of either consumer economics or personal finance classes in university education. In addition, the presenter will discuss how to acquire and evaluate high technological equipment and software.

William C. Bailey, University of Arkansas[1]

Background

Technology has become a significant part of the consumer's lifestyle. Home computers, laser printers, personal digital assistants, portable telephones, complex television receivers, video cameras, fax machines, and video tape recorders along with dozens of other technological items fill the middle class household. Many of these hardware items also utilize complex software to write, create graphics, and communicate around the world.

Those who work in the cooperate world are also presented daily with new technology designed to increase their productivity. For some their productivity does increase but for others this high tech equipment simply complicates their work environment. Despite these changes in technology, the presentation of material and information remains fundamentally unchanged in the typical family economics or personal finance classroom in many universities.

There are many reasons for this disparity between the technology of outside world and inside the higher education classroom. These differences are caused fundamentally by discrepancies in economic resources. Many colleges and universities have been or are experiencing budget reductions. There are no funds for the salaries of faculty or staff much less high technological teaching equipment. In some situations in higher education, the teaching budgets are being decreased while research receives increased funding. Teaching has become a lessor priority and no funds are available for hardware or software. In addition, faculty members find themselves without the personal resource of time to learn and develop the interests or skills necessary to develop high technological skills. Few, if any, faculty, receive either funding for additional training in high technology products or the release time necessary to develop skilled use of hardware and software.

Basic Technology

It is imperative that faculty in family economics and personal finance begin to acquire the necessary basic hardware and software to teach their courses using high technology. The basic hardware consist of a computer, LCD panel, and bright, backlit overhead projector.

Computer[2]. The computer should be a laptop portable with the following specifications: (1) Intel 486 CPU at 25 MHZ; (2) 4 MEG RAM or 8 MEG preferable; (3) 1 3.5" drive; (4) 80 MEG hard drive or 120 MEG preferable; (5) mouse, one serial, and one parallel port; (6) separate video and keyboard ports; (7) Windows 3.0 and DOS 6.0 or better. Cost for a unit of configuration can be as low as $1650 or as high as $2250 depending on brand.

Extra features that would be valuable would be a buildin FAX or modem for connection to other computers. The newest portables have slots for cards that can be modems, fax, or LAN connection devices. These would allow the faculty member to demonstrate mainframe software or connection to communications such as Internet.

LCD Panel. LCD types are divided by into two groups,

monochrome and color. Monochrome units begin at $900 and can be as high as $1500 depending on features. Color panels start at $1900 and can go as high as $5000 with more than 1 million colors as well as remote control.

Overhead Projector. Prices for an adequately bright, backlit projector begin at $600 and can go to $1000 depending on company.

All-in-One Units. There are LCD and projector combinations that are high resolution, light, and easy to use. Regrettably, their prices usually begin at more than $5000.

Printer. Printer technology is changing almost daily. Dot matrix printers are the least expensive and are excellent for high speed drafts. Inkjet technology is mid-price choice. They range in price from $200 to $1300. Inkjets come with and without color capability. They produce high quality products but tend to rather slow (1 page per minute) and in some cases, the cost per page can be high. The normally available units are priced from $450 to $1500. There are a wide range of laser printers to chose from but Hewett-Packard has set the standard with a moderate price, high speed printer. Lasers produce the highest quality product and range in price from $550 to $5000. High quality color printers are still expensive with the best products starting at $5500.

Basic Software. Many universities have site license agreements that allows software to be purchased at less than 25% of their list prices. In addition, the decision can be made to be either DOS or Window based. Typically, one should have at a minimum a full-featured word processor, a graphics package with slideshow capabilities, a spreadsheet, a communication package, and database software. Many companies are selling their software in "suites," such as Lotus, Microsoft, and Borland. Each of the parts of the software can exchange data and information with the other. This also lessens learning time since they have many commands in common. A normal installation of software will cost between $500 and $1500 per machine. All of the software should be licensed and registered in order to acquire upgrades and technical assistance.

Advanced Hardware and Software

After acquiring the basics, there are a number of other hardware and software products that the faculty member should consider. Some advanced hardware products are scanners, portable mass storage devices, CD-ROM readers, and portable docking ports.

There are more than 2500 specialized software packages that can be used by family economics and personal finance faculty. For example, OCR (optical character reading) software can allow the teacher to scan into a file any printed page from any sources. This would allow the faculty member to build a teaching data base of articles from the latest journals and to access them using an indexing software package.

For those teaching research methods in family economics, a statistical software package is a necessity. These vary greatly in the complexity of the interface and in statistical sophistication. Many find the new SPSS for Windows an excellent choice in this area.

Acquiring the Necessities

Many individuals are writing grants to internal funding sources, foundations, state education agencies, individuals, and cooperations to purchase the necessary equipment to bring their classrooms into the 21st Century. This takes time and energy but the rewards for the professional and their students can an exceptional increase in the transfer of knowledge and data to their students.

Endnotes
1. Assistant Professor in the Department of Home Economics.
2. The author prefers IBM compatible products to Mckintosh. However, the development of the new PC-Power chip which will run both IBM and Mckintosh software may make the distinction between the two systems obsolete.

Using Technology to Teach Consumer Economics

In order to compete effectively in the information/education marketplace, educators teach the technology necessary to target the consumer, identify consumers' information needs, and provide information vehicles and media that are appealing, informative, and available at the point of need for consumers. Whether communicating by phone or in print, future consumer affairs professionals must enter the marketplace equipped with knowledge of systems and software that will allow them to provide consumer information effectively.

Kathleen Morrow, Syracuse University[1]

Communicating with consumers is a challenge. Consumers are a diverse group with a vast array of informational needs. An average consumer is bombarded with over 2300 messages a day. Thus, consumer educators need to be extremely sensitive to the informational needs of their constituencies and strive to meet those needs through a choice of delivery vehicles that include the many new communications technologies which not only include print but telephone, fax, video and computer links.

As professional educators, it is our duty to develop an awareness and appreciation for the many technological advances that are making future consumer affairs professionals more capable of providing the proper type of information at the appropriate time and place and in a manner easy for the consumer to understand and utilize in their decision making processes.

The first step in communication is to identify and clearly define the audience. Audience identification has become more difficult as the population has become more diverse. One computer application that aids in this process is COMPASS, a geo-demographic target marketing system using census information and purchasing activity data bases to classify consumers into "clusters." The premise of the Claritas, Inc. product is that "birds of a feather flock together." They gather information at the zip+4 (a grouping of 8-12 households) geographical levels from over a 1000 different data bases including TRW, Arbitron, Neilson, R. L. Polk, J. D. Power and a host of others.

Consumer information specialists can use this data base just as marketers do to best determine which consumers are interested in their communication and in what format it should be delivered. Knowing income levels, reading habits, video and TV patterns will allow educators to package materials so that consumers will read or view the informational unit with the highest degree of understanding and application.

Should written communications be the chosen medium, print pieces can now be developed with a high level of professionalism using new software programs such as PageMaker a graphics and layout software package that allow a writer to write, add graphics, shading, change fonts and develop unique layouts. The program is Mac or Dos based and runs with pulldown menus for ease of use. The graphics and clip art files are sufficient for most uses and add to the readability of any consumer print piece.

Although PageMaker is considered the standard of the industry and is easy to learn and use, some background in design and layout is helpful to produce the most professional pieces. Other programs that should also be considered are Quark Express and Corel Draw. Both work on the windows and menu concept and both will produce professional pieces ready for printing. It doesn't matter which program the instructor chooses to include in the curriculum, the point is to encourage

consumer studies students to properly identify the consumer and then develop the most useful, least expensive and most informative piece possible. The new technology and myriad of software can certainly lead to a successful project.

In some cases telephone communication may be the most effective method of educating a chosen consumer audience. Again, consumer students should be familiar with the various customer service systems available. CRIS (Consumer Response Information System) produced by TARP Information Systems is one of the best call management systems in the industry. CRIS allows an organization to gather information from a consumer during an incoming call. Often these are calls generated from 800 lines and companies can catagorize the call as to complaint, information, request, etc. and then take action appropriate to the situation.

Any call management system must allow the telephone agent to "listen" to the consumer and respond in the appropriate manner. The screen flow and layout must be customized for the organization and must be designed for ease of use by the telephone representative.

In addition, it is essential that the information gathered be accessible at any time for presentation in an understandable manner to top management. 800 lines have become an integral component in the planning, promotion and quality control of most major corporations as well as many not-for-profit organizations. Accurate and timely feedback from the consumer information systems is necessary in order for consumer affairs personnel to provide input into marketing, advertising and product development decisions.

Technology is the way of the future. Communicating with the consumer is going to become more difficult in this age of information not less. Future consumer affairs professionals will have to choose between print, cable, network, video, electronic mail and computer links as they determine how best to educate consumers with various informational needs and comprehension levels. As educators in the field of consumer

affairs, we have an obligation to our students to provide the best available technology and software to them so they will be able to better serve consumers. It is up to us, as consumer educators, to assist them in this learning process.

Endnotes
1. Assistant Professor, Department of Environmental Arts, Consumer Studies and Retailing.

Consumers in the Information Age: In-Home Shopping and the Role of Independent Information Agents

With the advent of interactive video/computer technologies and the information superhighway, possibilities for in-home shopping and consumer information-seeking will multiply. This panel debated the potential role for independent for-profit information agents as well as surveying existing information sources accessible by phone or computer.

**Karen Fox Folk, University of Illinois at Urbana-Champaign[1]
Brenda Cude, University of Illinois at Urbana-Champaign[1]
Constance Kratzer, Virginia Polytechnic Institute and State University[2]
Jane Schuchardt, United States Department of Agriculture[3]
E. Scott Maynes, Cornell University[4]**

Vast quantities of information on the one hand and consumers starved for useful information on the other is the problem that Snider and Ziporyn (1992) address in the book <u>Future Shop</u>--how to deliver independent, relevant information to consumers in a time-pressed society. The purpose of this panel was to debate the feasibility of Snider and Ziporyn's predictions and discuss implications for consumer professionals.

Brenda Cude began with an overview of Snider's consumer information utopia which includes an information infrastructure with three components.   The first is a telecommunications system that would include 1) high definition TV incorporating easy-to-use computers with input devices that allow you to speak or handwrite your instructions, and 2) a fiber-optic network reaching into every home.   With this interactive media, independent information agents could deliver information directly to consumers and consumers could do most of their shopping at home.

A second component is private, for-profit information agents who would access basic data about products and purchases and use new technologies to sift that information.   The agents would provide impartial, customized evaluations of goods and services to the consumer for a price--specific recommendations on what to buy, where to buy it, and what price to pay.

The final component of the information infrastructure is information clearinghouses.   These government-sanctioned organizations would collect product information on features, selling costs, reliability, and customer satisfaction which they would sell to independent information agents.

Scott Maynes hailed Snider and Ziporyn as visionaries suffering from poor vision (see Maynes, 1993). Criticisms of independent information agents include: most consumers like shopping away from home; consumers are not willing to pay for independent advice now available; and a British information system experiment similar to Snider's failed (Maynes, 1983).   In addition, there is no evidence of government willingness to fund the product information clearinghouses.   Maynes summarized the problems of providing information to consumers as: 1) redundancy, i.e., duplicate information, 2) retrievability, making it easy for consumers to get just the information they need, and 3) authenticity, verifying the integrity of information obtained.

Karen Folk and Connie Kratzer presented a survey of existing information available to consumers electronically.   Information on employment, financial advice, and insurance is available via 800 and 900 numbers.   However, locating available phone lines on a particular topic is difficult and 900 numbers are quite expensive.   Commercial on-

line computer services and the Internet provide access to employment and real estate listings, career counseling, tax advice, and sources of information such as *Consumer Reports*, *Morningstar* ratings, and travel guides. Problems included locating information quickly, sifting out irrelevant and outdated information, and verifying the independence and quality of available information.

Jane Schuchardt presented a charge to the ACCI membership regarding consumer information. As the National Information Infrastructure (NIT) is built, consumer professionals must make themselves part of the dialogue. Will consumers have equal access to electronic information? Will communities, especially in remote, rural areas, be a contemporary part of the infrastructure? How can electronic readers be sure information is reliable, current, and complete?

ACCI members, representing the consumer interest, are urged to enter the dialogue through ACE (Americans Communicating Electronically). ACE is committed to the provision of networked access to U.S. Government information and services to all Americans. Info centers include libraries, electronic kiosks, shopping centers, and county Extension offices. Members of ACE come from government departments and Congress, community-based public groups, and academia. To join ACE, send an electronic mail message to: letter@ace.usda.gov.

Some of the issues ACCI educators and researchers have a responsibility to address are:

1) Information versus education. Consumers bombarded with electronic information need education to synthesize information and make appropriate decisions.

2) Quality of information. ACCI's Consumer Education Committee could create guidelines for buyer information provided on the Internet, similar to the SOCAP brochure, "Guidelines for Business-Sponsored Materials."

3) Electronic technology as a tool. The NIT is a tool for informing the consumer. Educators must let the needs of people drive the selection of a delivery mode, not vice versa.

During this era of rapid change in information delivery, ACCI educators and researchers have a role in shaping appropriate uses of the NIT. America's consumers need our voice.

References

Maynes, E. S. (1983). Prestel in use: Lessons for Americans. In K. P. Goebel (Ed.), Proceedings of the American Council on Consumer Interests (pp. 275-279). Columbia, MO: American Council on Consumer Interests.

Maynes, E. S. (1993). Book review of Future Shop. Review of Industrial Organization, 8, 639-643.

Snider, J., & Ziporyn, T. (1992). Future shop, how future technologies will change the way we shop and what we buy. New York: St. Martin's Press.

Endnotes
1. Assistant and Associate Professor, respectively, Division of Consumer Sciences.
2. Extension Specialist, College of Human Resources.
3. National Program Leader, Family Resource Management, Extension Service, USDA.
4. Professor Emeritus, Department of Consumer Economics and Housing.

Factors Influencing Urban Rental Budget Shares:
Was There an Upward Trend in the 1980s?

Housing budget shares of urban renters in the 1980-1991 BLS CES were analyzed. There was some upward trend in the rental budget share (RBS) during the 1980s. A regression with dummy variables for year of interview, as well as demographic variables showed that there was an upward trend with the years after 1983 having significantly higher RBS levels than 1980. Blacks had significantly higher RBS levels than whites.

Dong-Hoon Oh, Ohio State University[1]
Brett Oleson, Ohio State University[2]
Sherman Hanna, Ohio State University[3]

Introduction

Housing expenditures are of great interest both for housing policy and for financial counseling, as housing comprises an important part of family budgets. Stone (1990) asserted that over 30% of U.S. households experience what he defines as *shelter poverty*. It is simpler to analyze the expenditures of renters than those of homeowners, so this study will focus on rental expenditures as a proportion of total expenditures.

Rental housing expenditures may vary according to housing preferences which are affected by the household's age, education level, family type, and many other socio-demographic variables. Rental housing expenditures are also affected by market conditions which include rental housing supply, local housing regulations, tax policy (depreciation allowances, loss allowances for rental real estate), and mortgage rates. Rental housing expenditure is defined as the sum of rental living expense (rent), utilities, fuels, public services, and house furnishing & equipment expenditure.

Most previous studies of rental budget share have examined rent as a share of income, as estimates of total expenditures were not available. In this paper Rental Budget Share (RBS) is defined as rental housing expenditures divided by total expenditures. This paper is unique in that it uses a large cross-sectional dataset over a 12 year period. The dataset allows for examination of possible sources of trends in rental budget shares.

Literature Review

Income is an important factor in both the likelihood in being a renter and in the level of rent as a proportion of income. Of the 35.8 percent of all households which were renters in 1991, 67.7% had incomes less than the median income (AHS, 1991). Kengott studied the expenditure patterns of laborers and mill operatives in Lowell, Massachusetts. He discovered that the workers usually set aside between 20 and 25 percent of their total budgets for shelter (Fein & Lane, 1981). In 1868, Herman Schwabe suggested that as total family income increases, the amount allocated to housing increases at a lower rate (Fein & Lane, 1981). This has since been known as "Schwabe's Law".

Household incomes fluctuate substantially for many households (Chang & Lindamood, 1993), so rent as a proportion of income may not represent a household's housing affordability situation very well. Almost 40% of U.S. households spent more than their after-tax incomes in 1990 (Bae, Hanna & Lindamood, 1993). The total spending of a household may be a better hmeasure of lifetime resources than does the income of a particular year.

A renter may pay for utilities separately or they may be included in the rent. Therefore, adding utility payments may be adviseable to insure comparability between households.

Combs and Olson (1990) used utility expenditure together and separately with housing expenditure when they analyzed both expenditures to income ratios.

Few studies have examined rental budget share as a dependent variable. Cebula (1984) estimated a model of housing cost determination, which is not housing budget share model. He found that per capita income and population density strongly and positively impact on housing cost which is compatible with the result of the others' previous studies. Hogan (1983) proposed a urban family budget model. One of his results showed that "living costs in all other regions of the nation are lower than those of the northeast region. Cobas (1978) introduced a method to estimate the family budget by using BLS data. He predicted only the medium family budget.

Methodology

The Consumer Expenditure Survey (CES) program of the Bureau of Labor Statistics has two components: A quarterly interview panel survey, interviewing household every quarter, and a diary or record keeping survey executed by the sample consumer units for two consecutive 1-week periods. This study used data from the interview panel survey. By the BLS's 20 percent sample rotating system, 20 percent of the whole sample is replaced by new households every quarter. The data used in this study have only consumer units who participated in the interview for consecutive four quarters each year from 1980 to 1991. Therefore it is possible to obtain each household's actual yearly expenditures of all consumption categories, rather than estimate annual expenditures based on quarterly expenditures.

Housing refers to all shelter, that is, the dwelling itself together with taxes, insurance, repairs, and maintenance; furnishing and equipment used in the home, housekeeping, supplies; household operation and utilities (fuel, water, telephone, and sewage and trash disposal) (Magrabi, et al., 1991).

The CES interview data set provides detailed information on American households' socio-demographic characteristics as well as their own expenditures. The data source comes from 1980-1991 CES interview tapes. This data is not a time-series data but a cross-sectional data set. The total number of consumer units from the 12 years concatenated data is 9,559. The CES excluded rural households outside metropolitan statistical areas in some of the years, so such households were excluded from this analysis.

For this study, only real rental dwelling households who rent their homes all year and have positive income were retrieved from the data set. That is, rental dwelling households who have their own house were excluded. Renters with incomes of $50,000 or more were also excluded in order to focus on middle income households. Hanna (1984) noted the impact of very low income renters on the rent-income ratio. Even with a rent budget share, very low income renters may receive such large housing subsidies that the budget shares may be distorted. Therefore, in this study, renters with incomes less than $10,000 were excluded from the analysis in order to exclude probable distortion caused by the severe financial difficulty of the extremely poor households. The final sample size of 1,493 was the number of urban rental units who had been interviewed during 4 consecutive quarters for each year from 1980 to 1991.

The purpose of this study is to analyze the rental budget allocation behavior of the urban renters over the period 1980-1991, and to examine the factors affecting urban rental budget share. Rental budget share, the ratio of total rental expenditures over total expenditures, is the dependent variable. Total rental expenditures are calculated from the three expenditure categories as follows:

RENT = RENDWE + UTIL + HOUSEQ
RENDWE = Annual rental living expenses
UTIL = Annual utilities, fuels and public services
HOUSEQ = Yearly house furnishing and equipment

EXPENSE = TOTEXP - RETPEN

TOTEXP = Yearly total expenditure
RETPEN = Social security, retirement, and pension

Rental Budget Share = RENT/EXPENSE

Regression was the primary method of analysis used in this research to investigate factors influencing urban rental budget share of each consumer unit. Many demographic variables and some expenditure variables were used.

Results

Approximately half of renters live in apartments (Garden, high rise, flat); 30% of rental units are single-detached houses and 19% are townhouse/duplex. In terms of family type, 34% of renters represent single family; 28% are husband and wife with children, 16% husband and wife only, 8% one parent and 14% others. The sample of this study consists of 47% married couples, 26% never married, 20% divorced or separated and 7% widowed single consumer units.

Table 1
Distribution of Rental Budget Share (RBS), 1980-1991

Mean	34.3%
Percentiles:	
10th percentile	20.9%
25th percentile	26.8%
Median	33.4%
75th percentile	41.2%
90th percentile	48.5%
n=1,493	

Table 1 shows the distribution of Rental Budget Share. The mean RBS was 34.3% and the median was 33.4%. Ten percent of the households spent 20.9% or less of their budgets on rent, and 25% spent 26.8% or less. Ten percent spent 48.5% or more, and 75% spent 41.2% or more.
Table 2 shows mean levels of rental budget share (RBS) by selected demographic variables, for the total sample and for income groups. Overall, female respondents had a higher mean RBS level than male respondents. The RBS did not differ among four different regions, except in the $20,000 to #29,999 income level, where those in the West had

significantly higher levels than those in the Midwest and South. The RBS tended to increase with age. One person households had higher RBS levels than did larger households.

Compared to married, divorced or separated consumer units, widowed recorded the highest RBS. The rental budget share of single consumer and single parents with children is higher than that of husband and wife consumer units or husband and wife with children consumer units. Black households had higher rental budget share than did white or Asian households. The right side of table 2 shows the mean levels of rental budget share according to income levels. In terms of population size of the city, rental budget share at larger cities is higher than that of smaller cities except those under 75 thousand. This shows that as the city size increases, the rental budget share increases. Especially in the $30,000 to $39,999 income bracket, there was not a big difference by the sex of the reference person. In addition, the $20,000 to $29,999 income category, the RBS in the West region was high compared to other regions. Meanwhile, in the $40,000 to $49,999 income bracket, RBS was not significantly different between White and Black households.
The actual mean RBS increased from 1980 to 1986, decreased until 1988, then increased somewhat until 1990 (Figure 1.) The mean RBS in 1986 (37.5%) was significantly higher than the mean RBS in 1980 (30.4%). It is possible that the trend was partially due to changes in demographic composition of renters, so the regression analysis may provide additional insight into causes of the trend.

Regression Results
The regression results are shown in Table 3. The time trend was similar to the unadjusted trend. The similarity of the actual and predicted trends suggests that the increase in RBS from 1980 to 1986 was not due to changes in the household characteristics or location of the renters, but rather due to supply factors such as tax policies and local housing regulations.

Figure 1. Actual and Predicted Rental Budget Share (left axis) and Rent CPI/Overall CPI, by Year, 1980–1991
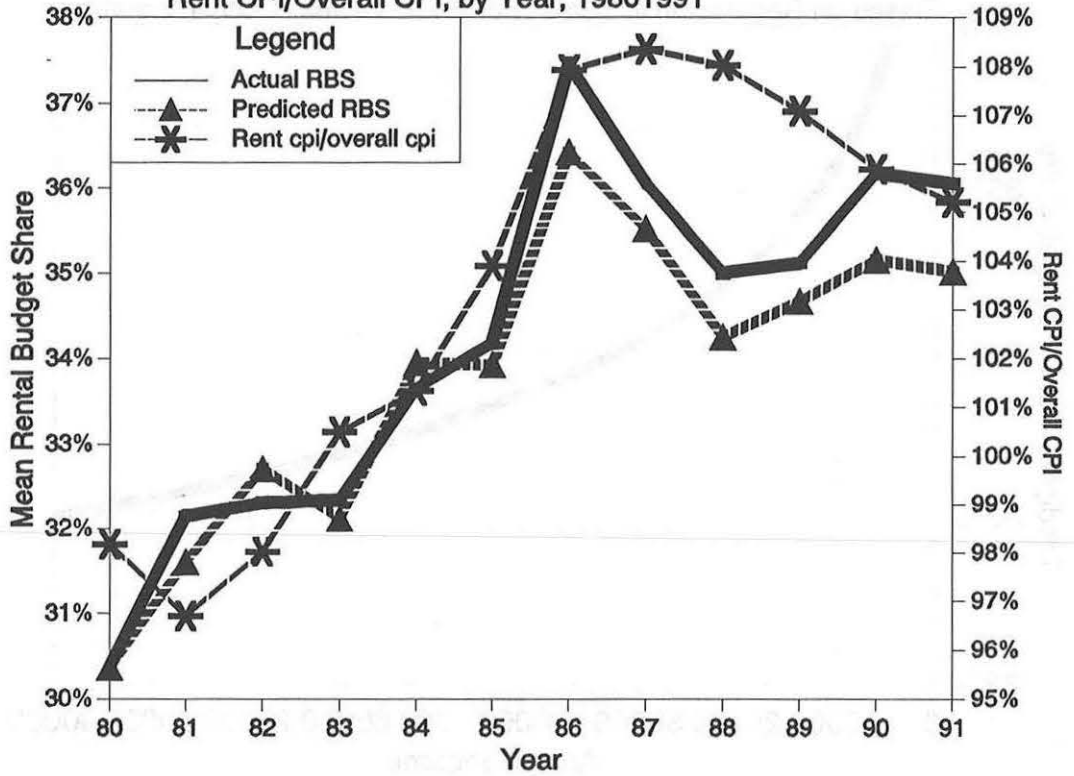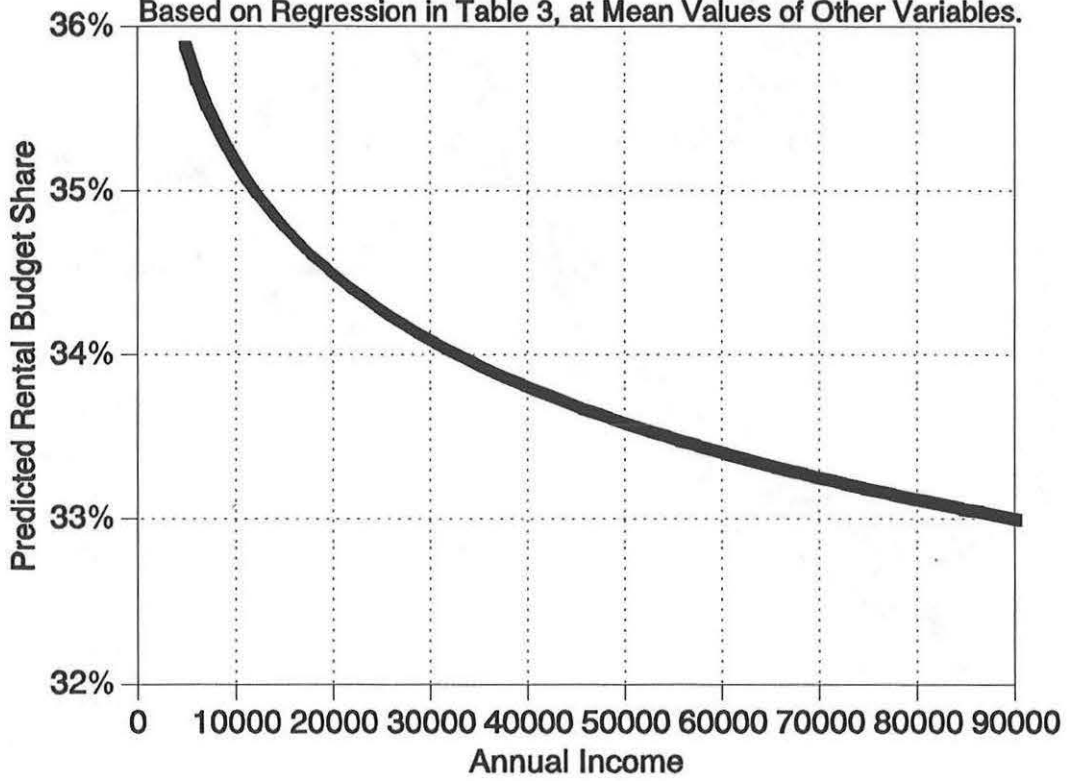
Figure 2. Predicted Rental Budget Share by Annual Income Based on Regression in Table 3, at Mean Values of Other Variables.

Comparison of Mean Levels of Rental Budget Shares (RBS)

Categorical Variables	RBS of Total Sample		$10,000 to $19,999		$20,000 to $29,999		$30,000 to $39,999		$40,000 to $49,999	
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
Sex of Reference Person										
Male	932	32.6	410	33.2	246	32.7	149	32.3	127	30.9
Female	561	37.1	335	39.2	121	34.3	50	32.8	55	34.1
Region										
Northeast	367	34.6	199	36.2	64	33.4	53	31.8	51	33.0
Midwest	354	34.0	173	36.6	93	32.1^{a}	36	30.6	52	31.0
South	373	33.7	202	34.9	95	31.7^{b}	46	32.9	30	33.8
West	399	34.7	171	36.0	115	35.4^{ab}	64	33.5	49	30.2
Age of Reference Person										
≤ 34	743	33.5^{ab}	386	34.4^{ab}	194	33.3^{ab}	98	32.9	65	29.5^{ab}
35 to 49	400	33.6^{cd}	159	35.5^{c}	111	32.9^{cd}	66	31.6	64	32.1
50 to 64	180	36.0^{ac}	84	37.6^{a}	44	36.0^{ac}	21	32.6	31	33.8^{a}
≥ 65	170	37.5^{bd}	116	39.9^{bc}	18	28.6^{bd}	14	32.3	22	35.1^{b}
Building Type										
Detached house	450	33.3^{a}	206	35.2	131	32.3	56	31.4	57	30.5^{a}
Townhouse	279	34.9^{b}	134	36.9^{a}	72	34.3^{a}	37	31.4	36	32.1^{b}
Apartment	729	34.9^{ac}	141	36.4	75	33.8^{b}	44	34.3	39	32.3^{c}
Others	35	28.7^{bc}	14	31.5^{a}	4	25.3^{ab}	0	00.0	2	16.3^{abc}
Marital Status										
Married	693	32.4^{abc}	288	33.6^{abc}	193	32.3^{a}	110	31.9^{ab}	102	29.7^{ab}
Widowed	107	40.4^{ade}	76	41.4^{ade}	10	34.3	6	38.3^{ac}	15	40.4^{acd}
Divorced,Sep.	304	34.6^{bd}	167	36.5^{bd}	70	33.1	39	30.1^{cd}	28	32.9^{c}
Never Married	389	35.6^{ce}	214	36.4^{ce}	94	35.2^{a}	44	34.8^{bd}	37	33.4^{bd}
Population of City										
> 4 million	283	35.3^{ab}	140	36.5^{a}	56	36.7^{abcd}	34	32.3	53	32.9
1.2-4 million	478	34.6^{cd}	240	36.8^{bc}	126	32.6^{ac}	63	33.1	49	30.9
.33-1.19 mil.	263	32.8^{ac}	143	34.6^{b}	64	31.0^{b}	35	30.2	21	30.8
75-329.9 thous.	181	31.9^{bd}	103	32.9^{ac}	44	29.8^{ce}	19	31.0	15	32.2
< 75,000	71	33.2	38	34.7	18	30.2^{d}	6	28.4	9	35.8
Family Size										
1	494	36.6^{abc}	296	37.6^{abc}	107	35.0^{a}	46	33.7	45	36.5^{abc}
2	412	33.3^{a}	184	35.0^{a}	90	32.0^{a}	71	32.2	67	31.5^{a}
3	246	33.1^{b}	108	35.2^{b}	72	32.6	35	31.7	31	29.0^{b}
4 or more	341	33.0^{c}	157	34.2^{c}	98	33.1	47	31.8	39	29.3^{c}
Family Type										
Husband & Wife	243	32.8^{ab}	98	34.1^{a}	56	31.8^{a}	48	31.8	41	32.3^{ab}
H&W w/ children	424	32.0^{cd}	177	32.9^{bc}	128	32.3^{b}	61	32.0	58	28.2^{acd}
Sing.Par. w/ child	122	35.2^{ac}	80	36.6^{b}	29	32.5	9	29.4	4	38.8^{c}
Single Consumer	494	36.5^{bd}	296	37.6^{ac}	107	35.0^{ab}	46	33.7	45	36.5^{bd}
Race of Reference Person										
White	1205	33.8^{a}	587	35.1^{ab}	297	33.3	169	32.1	152	31.7
Black	222	36.6^{a}	132	38.7^{a}	53	33.7	19	35.0	18	31.1
Am.Indian, Esk.	14	37.3	8	37.6	3	36.0	2	40.7	1	31.6
Asian, Pac.Isl.	52	34.3	18	39.9^{b}	14	29.6	9	29.9	11	34.4

* Superscripts at RBS indicate significant differences between groups. For instance, the RBS values for family size of 1 and 2 for the total sample have superscript "a" to the right, indicating that the RBS for 1 person households is significantly different from the RBS for 2 person households.

the rental component of the Consumer Price Index (CPI), relative to the

The actual and predicted patterns for RBS between 1980 and 1991 are similar to the pattern for overall CPI, also shown in Figure 1. In 1980, the rental component of the CPI was 98% of the overall CPI level, but by 1986 the rental component was 108% of the overall CPI level. In 1989 the rental component decreased to 107% of the overall level, then decreased to 106% in 1990 and 105% in 1991 (Economic Report of the President, 1993, 412).

Income had a significant effect on predicted RBS (Figure 2), but at the mean values of other variables, predicted RBS ranged only from about 36% at an annual income of $5,000 to 33% at an annual income of $90,000.

Households with a Black reference person had significantly higher mean RBS level than households with a White reference person, even when controlling for income and other variables. Housing discrimination is a possible explanation for this difference.

Households in small cities had significantly lower RBS levels than those in large cites (1.2 million or over.) Occupation and employment status did not have significant effects except for the reference person being employed.

Conclusions

This paper tested a regression model to ascertain determinants of rental budget shares for urban renters. The results provide evidence that increases in mean rental budget shares between 1980 and 1986 were not due to changes in the demographic characteristics of renters. Government tax policies and local housing regulations may have made rental budget shares higher. The findings in this study could also provide insight into housing assistance policy decisions, as well as to help give financial counselors insight into the housing portion of budgets of moderate income families.

Table 3
Regression of Rental Budget Share (RBS) on Demographic Variables. Renters with Before Tax Income between $10,000 and $50,000 and with 4 consecutive quarters of interviews from the years 1980 to 1991.

Variable	Coefficient	Sig.
Log(Income)	-.009922	.0063
Household size=1	.027745	.0002
Household size=3	.003227	.7109
Household size=4	.001220	.9002
Household size>4	-.002096	.8404
Living in the:		
West	.009349	.2715
Northeast	.007900	.3378
South	.001589	.8459
Less education (Elementary or none)	.002635	.7938
College Education	-.004461	.5243
Black	.030414	.0002
Asian	-.001320	.9318
Other Race	.047127	.09777
Year 1981	.012374	.4083
Year 1982	.023384	.2132
Year 1983	.017553	.3382
Year 1984	.035801	.0550
Year 1985	.035576	.0521
Year 1986	.060532	.0018
Year 1987	.051463	.0047
Year 1988	.038823	.0332
Year 1989	.042968	.0173
Year 1990	.047820	.0087
Year 1991	.046468	.0115
Population of city (Omitted = over 4 million):		
Under 75,000	-.014627	.2986
75,000-329,999	-.022505	.0289
330,000-1.19 mil.	-.018779	.0389
1.2-4 mil.	-.003151	.6956
Reference person job (omitted = have occupation):		
No occupation (except retired)	-.004048	.7579
Retired	-.017095	.3232
Employed	-.020183	.0189
Spouse employed	-.009755	.1765
N = 1493		

References

Bae, M., Hanna, S., & Lindamood, S. (1994). Patterns of overspending in U.S. households. Financial Counseling and Planning, 4, 11-30.

Cebula, R. (1984). The urban family housing budget in SMSAs. Social Science Quarterly, pp. 1157-59.

Chang, Y. R., & Lindamood, S. (1993). Factors related to the risk of household income variability. Financial Counseling and Planning, 4, 47-66.

Cobas, J. A. (1978, December). A method to estimate the Bureau of Labor Statistics family budgets for all standard metropolitan Areas. Social Science Quarterly, pp. 546-52.

Cobas, J. A. (1984, December). Estimating Cost of Living in SMSAs: A Further Note. Social Science Quarterly, p. 1160.

Combs, R.E., & Olson, L. (1990). Differences in housing expenditure/income and utility expenditure/income ratios by selected characteristics of rural home owners. Housing and Society, 17(3), 136-148.

Economic Report of the President. (1993). Washington, D.C.: U.S. Government Printing Office.

Feins, J.D., & Lane, T.S. (1981). How Much for Housing? : New Perspectives on Affordability and Risk. Cambridge, MA.: Abt Books.

Hanna, S. (1984). The impact of high rent expenditures on other consumer expenditures. Housing and Society, 11(3), 136-148.

Hogan, T. D. (1983, June). Estimating the urban family budget with a pooled cross-section/time-series model. Social Science Quarterly, p. 412-16.

Hogan, T. D. (1984, December). The urban family housing budget in SMSAs: comment. Social Science Quarterly, p. 1161.

Magrabi, F. M., Chung, Y. S., Cha, S. S. & Yang, S. J. (1991). The economics of household consumption, New York: Praeger.

Stone, M. E. (1990). One-third of a nation: A new look at housing affordability in America. Washington, D.C.: Economic Policy Institute.

Endnotes
1. Ph.D. student, Department of City and Regional Planning.
2. M.S. student, Consumer and Textile Sciences Department.
3. Professor, Consumer and Textile Sciences Department.

Determinants of Expenditures on Child Care

Data from the 1990-1991 BLS CES were analyzed to estimate determinants of child care cost. One-stage tobit analysis was conducted. A one percent increase in income was associated with $8 more in total child care cost per year. Households with employed wives had $1,133 higher expenditures. For households with nonzero spending, predicted spending increased with age up to age 37, then decreased.

Jaimie Sung, The Ohio State University[1]
Sun-Young Park, The Ohio State University[2]
Sherman Hanna, The Ohio State University[3]

Introduction

Expenditure on child care has attracted an increasing amount of attention for estimating the family budget share and predicting family behavior. Some studies have reviewed the effect of child care cost on women's labor supply in order to predict the mother's decision whether or not to participate in the labor market (Connelly, 1991, 1992; Blue and Robins, 1988, 1989). Others have analyzed child care expenditure as a component of the family budget sharing (Douthitt and Fedyk, 1988; Lino, 1990; Olson, 1983; Espenshade, 1984). However, previous findings had a limitation since most researchers have used the aggregated expenditure categories for estimating the child care cost, instead of separating the child care cost. Kahn and Kameran (1987) found that child care is the fourth largest expenditure category for families after housing, food and taxes.

The purpose of this paper is to 1) examine the expenditure for child care including day care, nursery, babysitting and other home care in the families where at least one child is under age 6; 2) investigate what factors significantly influence child care expenditures; and 3) examine three mean marginal effects of demographic variables on total child care cost.

Literature Review

Heckman (1974) used data from the 1966 National Longitudinal Survey, which investigated the effect of child care costs on the mother's labor supply. The sample included women aged 30-44 with at least one child under the age of 10. The data did not provide information on the child care expenditure, nor did it include the information about whether families used formal child care or informal child care. Heckman found that child care cost had a significant negative effect on the mother's labor supply.

Robins and Spielman (1978) examined the factors that influenced the demand for the paid child care mode in the two parent families with working mothers. They noted that the demand for paid child care varied with the wage rate, indicating that an increase in hourly wage from $1.30 to $3.40 increased the use of paid child care by 28 percent.

Connelly (1991) used the 1984 Survey of Income and Program Participation (SIPP) to investigate the child care expenditure of families with employed mothers. The average weekly expenditure on child care in the analysis ranged from $15 a week to $40. The number of children aged 0-2 and 3-5 were found to be a significant factor related to the probability of paying child care costs. Variables with negative effect on the probability of paying for care were presence of teenager, presence of non-employed adult women and the presence of adult men, whereas the higher level of nonlabor

income had a positive effect on the probability of paying child care cost.

Using the same data, Connelly (1992) used a two-stage procedure, and found that families with children aged 3-5 paid more for child care than families with older children. The non-labor income had a significant positive effect on the probability of purchasing care but the predicted wage of the mother did not. All of the family composition variables showed a significantly negative relationship, indicating that the presence of other potential caregivers lowers the probability of paying for care. The number of school-aged children significantly increased the average cost per hour of child care. The mother's wage rate also revealed a significant positive effect on the amount of paid child care.

Leibowitz, Waite and Witsberger (1988) analyzed NLSY data to estimate the determinants of mother's labor supply and to examine the child care choice of working mothers with preschool children. The logit regression was used for analyzing the child care choice. Living with another adult showed negative effect on paid child care. When the mother's wage was not included in the model, the hours of work increased the paid child care choice. Women living in the South used paid child care more than women in other regions.

Waite, Leibowitz and Witsberger (1991) also focused on the child care cost and its quality using the data from the National Longitudinal Survey of Youth (NLSY), 1985. The parents paid less for care by a relative, and paid more for care the educational program offered. The most interesting finding was that the quality of child care did not increase as the mother's level of education or income increased.

Lehrer (1983) using data from the 1973 National Survey of Family Growth found that a one percent increase in the husband's permanent income increased the use of day-care centers by 1.8% (compared to relative care) and increased the use of baby sitters by 1.8%. A one percent increase in the wife's wage increased the use of organized facilities by 0.26%. When the wife's wage increased from $1.50 to $3.50 per hour, the probability of using an organized facility increased from 0.080 to 0.094. Mother's annual hours of work showed a significantly positive effect on the probability of choosing an organized facility. Having a child aged 3-6 had a positive effect on daycare center use. Women living in the South and West had a higher probability of choosing an organized facility.

Blau and Robins (1988, 1989) estimated the effect of child care cost on the mother's labor supply using the Employment Opportunity Pilot Project of 1980. They estimated the average child care expenditure across families within a same geographical location. It was found that the child care cost had a significantly negative effect on mother's working status and positive effect on the probability of using informal care. The number of children in their study showed the negative effect on probability of mother's working. The women's wage rate had a significantly negative effect on probability of women's employment. The result also indicated that probability of the average mother's employment was sensitive to the price of child care. In the 1989 paper, they investigated how the child care cost affected the transition of the women's employment. They found that higher child care cost had a significant effect on increasing rate of leaving employment and decreasing rate of entering employment.

The child care cost has been used occasionally for the prediction of the wife's labor force participation as an independent variable. However, child care cost in this study will be a dependent variable whereas wife's labor force participation will be used as an explanatory variable.

Methodology

Data Source

This study used the Consumer Expenditure Survey (CES) data from the expenditures tape by the Bureau of Labor Statistics. The data used for this study included only consumer units who participated in the interview for four consecutive

quarters in 1990. For the purpose of this study, only husband-wife families with children aged less than 6 years were included.

Statistical Model

The one-stage tobit model used (Maddala, 1983, 151-160) is defined as

$$y^*_i = \beta X_i + \mu_i,$$
$$y_i = y^*_i \text{ if } y^*_i > 0,$$
$$y_i = 0 \text{ otherwise.}$$

With limited dependent variables, the left-censored tobit model was constructed for the prediction of child care cost. Ten independent variables were originally entered for one-stage tobit model. Three different mean marginal effects for each independent variables were calculated.

Total mean marginal effect for overall samples

$$= \partial E(y)/\partial X_i = \Phi(z)\beta_i$$

Mean marginal effect for latent variables

$$= \partial E(y^*)/\partial X_i = \beta_i$$

Mean marginal effect for the households that already had expenditures

$$= \partial E(y|y^*>0)/\partial X_i =$$
$$\beta_i[1-z(\phi(z)/\Phi(z))-(\phi(z)/\Phi(z))^2]$$

where $\phi(z)$ is the density function of the standard normal distribution and $\Phi(z)$ is the cumulative distribution function of the standard normal distribution.

Basic descriptive

Table 1 shows the definition of the variables and table 2 shows the basic characteristics for the sample of husband-wife families with at least one child under age 6.

Table 1
Definition of Variables.

Variables	Descriptions
TOTCOST	Yearly total child care cost including nursery school, day care, babysitting and homecare
LNINCOME	Log(yearly income)
KIDS0305	Dummy variable, coded 1 if there is a child aged 3-5; else=0
KIDS02	Dummy, coded 1 if there is a child aged 0-2; else=0
WIFEWORK	Dummy, coded 1 if wife is in the labor force; else=0
AGE	Age of reference person
AGESQ	Age squared
LNFAMSIZE	Log(Family size)
WEST	=1 if household lives in the West
SOUTH	=1 if household lives in the South
NEAST	=1 if household lives in the Northeast

The sample size was 531 households, consisting of husband and wife with children under age 6, in the 1990-1991 period. Basic descriptive statistics are shown in table 2.

Table 2
Basic characteristics of Household, Husband-Wife with Children under 6, 1990-1991.

Variables	Mean	(n)
Total Child care cost		
All with child<6	1140.07	531
With expenditures	1834.48	330
Daycare	1774.95	110
Nursery	755.60	118
Baby Sitting&Homecare	843.32	330
Age of Reference Person	33.44	
Wife's Labor Force Participation	64.60%	
Child age 0-2	61.02%	
Child age 3-5	63.09%	
Family income	36111.95	
Region: Northeast		91
Midwest		184
South		123
West		133
Family Size	3.97	

Among the total sample of 531, 62% of the households had child care costs. The mean expenditures for daycare, nursery school, and baby sitting or other home care were $1,774, $756 and $843, respectively. The average total child care cost per household was $1,140 for all households and $1,834 for households which had child care expenditures.

The mean age of a reference person was 33 years. About 65% of households had wives who were in the labor force. Average family income was $36,111. The mean family size was 3.97.

Results and Discussion

Table 3 shows the one-stage tobit regression result with total child care cost as the dependent variable. In table 3, the mean marginal effect of logarithmic income on total child care cost for total samples (n=551) was $788.72. For an easier interpretation, we may look at the effect of a 1% increase in income on total child care expenditures. That is, a 1% increase in income ($361 at the mean) would lead to a $7.89 increase in total child care cost per year. For those who had already child care expenditure (n=330), the predicted increase would be $5.64.

A household with a child aged 3 to 5 would spend, on average, $546.40 more per year compared to other households. Those who had child care expenditures would spend $390.44 more than would households without a child aged 3 to 5. A household with a child under 3 year would spend $371.56 less than the similar households without a child under 3. These findings are with Connelly's (1992) results. Connelly (1992) stated that child care expenditures for children aged of 3 to 5 are higher than are expenditures for other age children.

A household with a working wife would spend $1,133.03 more on child care than would a household with a non-working wife. For those households who had already expenditures, these households would spend $809.60 more compared to other household of non-working wife.

The range of family size was 3 to 7. A household with 4 people would spend $203.11 less than a family with 3 people. For households with some child care spending, households with 4 people would spend $145.13 less than would those with 3 people. Increasing family size from 4 to 5 would reduce predicted child care spending by $145.13 for all households and by $112.57 for those who had some child care spending.

Table 3
Estimates and Marginal Effect of One-Stage Tobit Model.

Variables	β	$\partial E(y)/\partial X_i$	$\partial E(y\|y^*>0)/\partial X_i$	P-value
Intercept	-22047.00	-11900.60	-8503.45	0.000
Lnincome	1461.20	788.72	563.58	0.000
Kids0305	1012.30	546.40	390.44	0.003
Kids02	688.35	371.56	265.50	0.114
Wifework	2099.36	1133.03	809.60	0.000
Ageref	375.39	202.63	144.79	0.023
Lnfamsiz	-1308.00	-706.02	-504.48	0.023
Agesq	-5.23	-2.82	-2.02	0.023
West	404.60	218.40	156.05	0.180
South	296.84	160.23	114.49	0.338
Northeast	-430.30	-232.13	-165.86	0.220
Sigma	2411.20			0.000
Log-likelihood	-3157.00			

Figure 1
Predicted Child Care Expenditures at Mean Values of Other Variables for Households with Expenditures
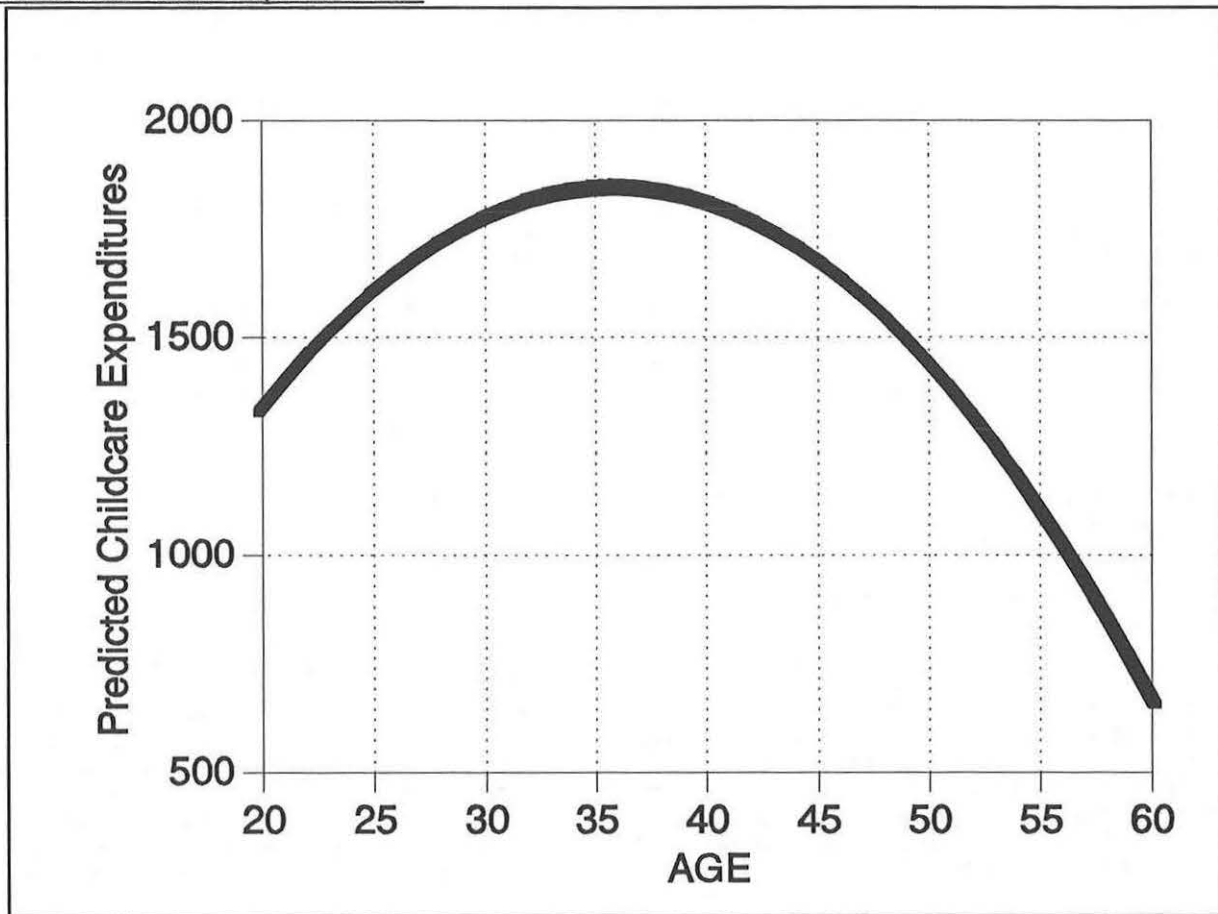
The negative relationship between child care expenditures and family size may be partly due to higher number of employment *hours* of women in smaller families.

Age had a positive curvilinear effect on child care cost with a decreasing rate. For households with child care expenditures, at the mean value of other variables, predicted expenditures increased until age 37, then decreased with age.

Region did not have a statistically significant effect on child care expenditures which was contrasted to Waite et. al.'s finding(1989) as they found women in the South were more likely to pay than those living in other sections.

Implications for Future Research

The mean value of total child care cost including zero expenditure was $1,140, and $1,834 for households only with child care expenditure. The budget shares of total child care expenditures were about 3.18% (n=531) and 4.66% (n=330). These budget shares were, for the households in this sample, greater than that of food away from home, health care, or life insurance, and was also comparable to apparel expenditures. Therefore, additional research on child care expenditures would be important to undertake. The U.S. Bureau of Labor Statistics should also make these different categories of child care expenditures easier to find in their public use tapes, the survey instruments, and in their published reports.

References

Blue, D. M. & Robins P. K. (1988). Child-care costs and family labor supply. The Review of Economics and Statistics. 70(3), 374-381.

Blue, D. M. & Robins P. K. (1989). Fertility, employment, and child-care costs. Demography. 26(2), 287-299.

Browning, M. (1992). Children and household economic behavior. Journal of Economic Literature. 30, September, 1434-1475.

Connelly, R. (1991). The importance of child care costs to women's decision making. In D. M. Blue (Ed.), The economics of child care (pp.87-118). New York: Russell Sage Foundation.

Connelly, R. (1992). The effect of child care costs on married women's labor force participation. The Review of Economics and Statistics. 74(1), 83-90.

Douthitt, R. A. & Fedyk, J. M. (1988). The influence of children on family life cycle spending behavior: Theory and applications. The Journal of Consumer Affairs, 22(2), 220-248.

Espenshade, T. J. (1984). Investing in children. Washington D.C.: The Urban Institute.

Heckman, J. J. (1974). Effects of child-care programs on women's work effect. Journal of Political Economy. 82(2), 136-169.

Heckman, J. J. (1976). The common structure of statistical models of truncation, sample selection and limited dependent variables and a simple estimation for such models. Annals of Economic and Social Measurement. 5(4), 475-492.

Kahn, A. J. & Kamerman S. B. (1987). Child care: Facing the hard choices. Mass.: Auburn House Publishing Company.

Lehrer, E. (1983). Determinants of child care mode choice: An economic perspective. Social Science Research. 12, 69-80.

Leibowitz, A., Waite, L. J. & Witsberger, C. (1988). Child care for preschoolers: Differences by child's age.

Demography, 25(2), 205-220.

Lino, M. (1990). Expenditure on a child by husband-wife families. Family Economics Review. 3(3), 2-18.

Maddala, D.S. (1983). Limited-dependent and qualitative variables in econometrics. Cambridge: Cambridge University press.

Olson, L. (1983). Costs of children. Toronto: Lexington Books.

Robins, P. K., & Spielman, R. G. (1978). An econometric model of the demand for child care. Economic Inquiry, 16, 83-94.

Waite, L. J., Leibowitz, A., & Witsberger, C. (1991). What parents pay for: Child care characteristics, quality, and costs. Journal of Social Issues, 47(2), 33-48.

Endnotes
1. Ph.D. student, Consumer and Textile Sciences Department.
2. Ph.D. student, Consumer and Textile Sciences Department.
3. Professor, Consumer and Textile Sciences Department.

Consumption Patterns of Elderly Households:
An Empirical Analysis Using a Life-Cycle Model

A life-cycle savings model was tested to analyze consumption patterns of elderly U.S. households, the 1990 BLS Interview Survey of Consumer Expenditures. The model implies substantial, planned decreases in consumption after retirement, regardless of income patterns. The empirical analysis suggests the independent effect of age, as modeled by the economic model, is very strong. As the population ages, there will be changes in the composition of consumer spending, and total spending may decrease substantially.

Hui Wang, The Ohio State University[1]
Chiu Fui Joyce Mok, The Ohio State University[2]
Sherman D. Hanna, Ohio State University[3]

The proportion of the U.S. population 65 years of age and older was 8.6% in 1960 (U.S. Bureau of the Census, 1989a, 36) but increased to 12.6% by 1991 (U.S. Bureau of the Census, 1992, 26). By 2080, the percentage is projected to rise to 23% (U.S. Bureau of Census, 1989b, 9). The consequences of such a trend may have important implications for consumer spending patterns. Elderly households normally experience a reduction in income upon retirement, an increase in time available consumption activities, and a cessation of an assortment of job-related expenses. Overall, this adjustment process accompanying retirement is expected to entail significant changes in the final composition of purchases, as well as the household's consumption response to future variation in its income (McConnel & Deljavan, 1983). Elderly households not only spend considerably less than non-elderly households, both in terms of total consumption and most components of spending, but also have substantially lower incomes (Hitschler, 1993).

As such, understanding the determinants of consumption behavior, by the elderly, is of considerable interest for marketing, as well as policy analysis. For example, the level of consumption in early retirement will have an important influence on economic status late in retirement. It may also provide direction for the practical policy issues of allocation of society's scarce resources, such as the allocation of federal resources towards the funds for congregate meals for the elderly.

The purpose of this study is to examine the effects of age and other socio-economic and demographic variables on the consumption patterns of elderly households. A version of the life-cycle model of savings is used to generate hypothesis about consumption patterns.

Review of Literature

According to the conventional life-cycle consumption hypothesis, the rational family adopts a lifetime consumption plan that balances the utility gained from acquiring additional financial assets against expenditures on current consumption across all stages of the life-cycle (Ando and Modigliani, 1963). Previous life-cycle consumption research can be generally classified into two broad classes: descriptive presentations of empirical observations on income, expenditures and savings; and theoretical developments of life-cycle hypothesis (Chen & Chu, 1982).

Hammermesh (1982) found effects of life expectancy on consumption patterns. The results indicated that increased longevity would enable the elderly to maintain, rather than decrease, their consumption levels. However, Stoller (1987) pointed out that due to the uncertainties regarding health and financial security, the elderly people

continued to save.

Crockett (1963) and Goldstein (1965) further confirmed that the elderly not only consumed less, but they allocated lower proportions of their money to apparel service, transportation, and recreation. In contrast, higher proportions of elderly households' total consumption were used for food, housing and medical care. Using the 1972-1973 Consumer Expenditure Survey, Lamale (1973) found that higher proportions of retirees's total current expenditures were used for food, housing and medical care; and less on apparel and upkeep, transportation, recreation, and personal care than did all families, wage earners and clerical workers' family.

In view of the likelihood that retirement status substantially alters consumption choices, McConnel and Deljavan (1983) used a life-stage consumption model which restricted its focus to the relevant range of retirement ages and treated the retired and non-retired elderly groups separately. The findings suggested that retired households committed a smaller proportion of additional income to necessities, a much larger proportion to gifts and contributions, and an equal proportion to transportation in comparison to non-retired households. Consumption patterns also showed that medical care and energy-related expenses emerged as budgetary problems for the average retired households.

Theoretical Background

Since the pioneering articles by Modigliani and Brumberg (1954), the life-cycle hypothesis has been the fundamental analysis for consumption and saving behaviors. Older people generally have shorter life spans, tend to save less and to spend more than younger people. From another point of view, the elderly may have experienced a decrease in income with pension being the major source of money income, and, as such, face the decision of how to allocate money during the late period of the life stage. According to the life-cycle hypothesis, although consumption may vary with time, it is not related directly to transitory changes of income. To maximize satisfaction, households may borrow during the early period of life-cycle to offset debt; repay the debt and accumulate wealth during the middle age, and borrow from savings to adjust for the decreased income during retirement.

Modigliani and Brumberg (1954) used the utility function to analyze consumption patterns for consumers. Consumers are assumed to maximize the total utility with the budget constraint, where utility is the function of total consumption in the present and future periods. The consumption of individuals is the function of resources and the rate of return on capital depending on the age parameter. The simple assumptions of early formulations of the life-cycle model (Ando and Modigliani, 1963) have been extended by many authors (e.g., see review by Hanna, Chang and Fan, 1991).

Theoretical Model

Life-Cycle Consumption Model

Households are assumed to maximize utility through the life-cycle with the budget constraints, where utility is assumed to be a function of total consumption (Modigliani and Brumberg, 1962). Budget constraints are related to the net financial asset, net equity of the home, and after-tax income of that year. Age is reflected by the death rate (Hanna, Chang & Fan, 1991). Using a two-period model, then extended to lifetime, the lifetime utility can be regarded as the utility from year 1 plus utility from year 2. Results of the two-period model can be extended to a lifetime model.

Objective Function

Maximize $T = U(C_t) + U(C_{t+1}) / (1+Q)$
where T = Total lifetime utility
C_t = Consumption in Year t
C_{t+1} = Consumption in Year $t + 1$
Q = Personal discount factor
Constraints C_t = $I - S$
C_{t+1} = $(1+g)I + (1+r)S$
S = Savings in Year t
g = Growth rate in income
r = Real interest rate
I = Year t income

Discounting of utility from future consumption may depend upon personal factors, such as the risk of death or disability. The most common intertemporal utility function used (Hurd, 1989) has constant elasticity and is time separable:

$$\sum \frac{1}{(1+\varrho_i)} \frac{C_i^{(1+\epsilon)}}{(1+\epsilon)} \quad (1)$$

The elasticity of marginal utility with respect to consumption= ϵ. The elasticity of intertemporal substitution in consumption is equal to $-1/\epsilon$. When this type of utility function is used for analysis of risk, relative risk aversion = $-\epsilon$.

It can be shown (Fan, Chang & Hanna, 1993) that the growth rate of consumption will depend on the real interest rate faced by the consumer, the personal discount factor, ϱ, and elasticity of marginal utility with respect to consumption, ϵ.

$$\frac{(C_{t+1} - C_t)}{C_t} = \left[\frac{(1+r)}{(1+\varrho)}\right]^{-\frac{1}{\epsilon}} - 1 \approx \frac{(r - \varrho)}{-\epsilon}$$

Consumers under the age of 60 may face higher real interest rates, either because they have consumer debt or because, in the United States, they can shelter the earnings from their investments from income taxes if in tax sheltered retirement funds. A consumer who has money in a tax sheltered form with some stock equities may have a real rate of return of 6% or more per year. If the personal discount factor is based on the death rate of the consumer (Fan, Chang & Hanna, 1993), then the real growth rate of consumption will be positive, because the annual death rate is approximately 0.1% for consumers under the age of 30 and gradually increases to about 1% by age 60 (U. S. Center for Health Statistics, 1986). The real growth rate of consumption predicted by the model depends on the elasticity of marginal utility with respect to consumption, which has a wide range of theoretical and empirical estimates, with typical estimates in the range of -1 to -10 (Hanna, Chang & Fan, 1991). A value of -1 is often assumed, as it corresponds to a natural logarithm utility function, which is simple to manipulate. This type of utility function would imply that a consumer facing a real interest rate of 6% and a negligible risk of death would optimally plan for real consumption to growth by over 5% per year until age 60.

Elderly consumers who invest conservatively and cannot shelter investment income from income taxes may face lower real interest rates, perhaps near zero. Elderly consumers also face increasing higher death rates, for instance, 3% at age 72 and 6% at age 80 (U. S. Center for Health Statistics, 1986). It is plausible that the personal discount factor, ϱ, is approximately equal to the annual risk of death (Hanna, Chang and Fan, 1991). Given this assumption, a consumer might rationally plan to have decreasing consumption in the future, especially after age 60, as the risk of death starts increasing rapidly. A natural logarithm utility function would imply that real consumption would decrease at approximately the same rate as the annual death rate.

Consumption Function

Household total expenditures are determined by several factors, such as the price of the commodities, the relevant need and taste of consumers, and most of all -- money income. When the price effect is ignored, the study of income-expenditure relationship to estimate various categories of consumer purchases, are the categorical consumption functions (McConnel and Deljavan, 1983).

Total expenditure is a better proxy for permanent income than is current income (Cramer, 1969). However, the allocation of income among different consumption categories is constrained by the level of total expenditures. The estimated expenditure on specific items may bring unambiguous results, which means that an increase expenditure in one item results in a decrease expenditure in another category (Prais and Houthakker, 1955). Using permanent income with a two-stage least square model can

correct the bias produced from correlated error terms in the system equations (Liviatan, 1961)

Consumer demand theory assumes that consumers maximize total utility subject to budget constraints. In empirical analysis, the effects of change in income on expenditure patterns may have different functional forms. In this study, the dependent variable, total consumption, was converted into logarithmic form in order to capture existing nonlinear relationships between the dependent variable and related independent variables (Abdel-Ghany & Schwenk, 1993).

Spending patterns of elderly households are different from those of non-elderly households, both in terms of total consumption and components of spending (Hitschler, 1993). Some spending changes may be due to changes in household composition and preferences, such as decreases in spending on entertainment and increases in cash contributions. However, the focus of this study is on whether total consumption decreases with the death rate as people age. A set of demographic variables will be included in the analysis to control for changes in household composition, etc.

Data and Variables

The data used in this study are from 1990 Consumer Expenditure Interview Survey of the U.S. Bureau of Labor Statistics(BLS). One of the public use tapes from the BLS, the EXPN tape, contains a number of files with information about vehicle purchases and other information, which can allow a researcher to construct a measure of spending which corresponds more closely to consumption than does the published measure of total expenditures provided by BLS. Files from the quarterly expenditures files were merged to construct a file with all households with four quarters of interviews in 1990. For the purposes of this analysis, elderly households were selected. Elderly households were defined as: (1) two-person household (including husband and wife family) with both being 60 or over. (2) single-person household with reference person 60 or over. Elderly

people living in nursing homes or living with people who are less than 60 are excluded from the study. Given these restrictions, the sample size is 185.

The dependent variable is total consumption, which is defined as the sum of the following expenditure categories: food at home, food away from home, alcohol and beverage, shelter which is adjusted for owned housing with or without mortgage, utility, transportation which is adjusted for monthly installment of vehicle purchasing, household operation, household equipment, apparel services, health, entertainment, personal care, reading and education, tobacco, miscellaneous, and cash contribution.

The independent variables used in the estimation comprise five sets of socio-demographic variables; a net financial asset variable, a net equity in home variable, and two income variables. The income variables include: (1) after-tax income which represents the amount households can spend on present consumption, saving, and repayment of the debts and loans, and (2) other income receipts which indicates the total amount of other money receipts excluded from family income. The socio-demographic variables are the age of reference person which is reflected by the death rate, number of earners, household size; and dummy variables for the race of reference person and education level.

Results and Discussion

Empirical Analysis

Table 1 shows the income quintiles, total consumption quintiles, net financial assets quintiles and average propensity to consume of elderly households for single-person households and two-person households. Average propensity to consume was calculated by dividing total consumption by total income (Danziger, Gaag, Smolensky, and Taussig, 1982-1983). Average propensity to consume was generally increasing monotonically with the income quintiles, with some values greater than 1 for both single-person and two-person households. In order to maintain certain levels of consumption, some

elderly households dissaved and spent more than their money income, particularly households in the lowest income quintile, which had a negative and greater than one average propensity to consume. This indicated that they borrowed money to consume, and the money borrowed was insufficient to satisfy the consumption requirement.

Table 1
Distribution of Income, Consumption and Net Financial Assets, and Average Propensities to Consume (APC) of Elderly Households, 1990.

	25%tile	Median	75th %tile
Income			
1 person	4797	7878	11216
2 person	12443	18894	27983
Consumption			
1 person	7828	10704	17348
2 person	13226	17336	26979
Net Financial Assets			
1 person	0	605	12500
2 person	0	1300	24850
APC			
1 person	1.63	1.36	1.54
2 person	1.06	.92	.96

To calculate marginal propensity to consume, the inverse-log regression model was used where the dependent variable total consumption was in the logarithm (lnC) form. Table 2 summarizes the coefficients and significance levels from the regression analyses. Total consumption was significant and positively related to after-tax income, net equity of home, number of earners, family size; and the dummy variables for some college education and college graduate or more. Total consumption was also found to be significant and negatively related to death rate and the dummy variable for Black.
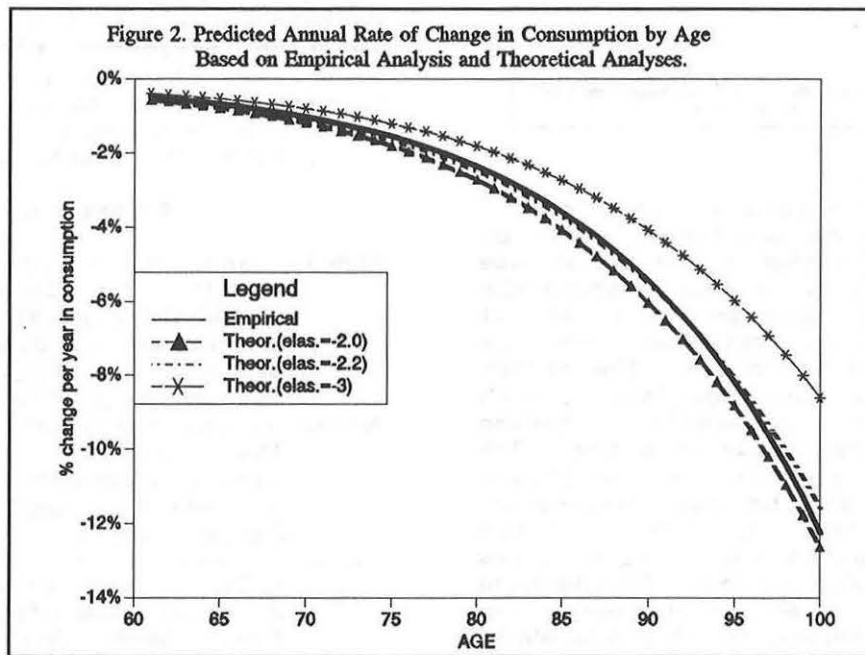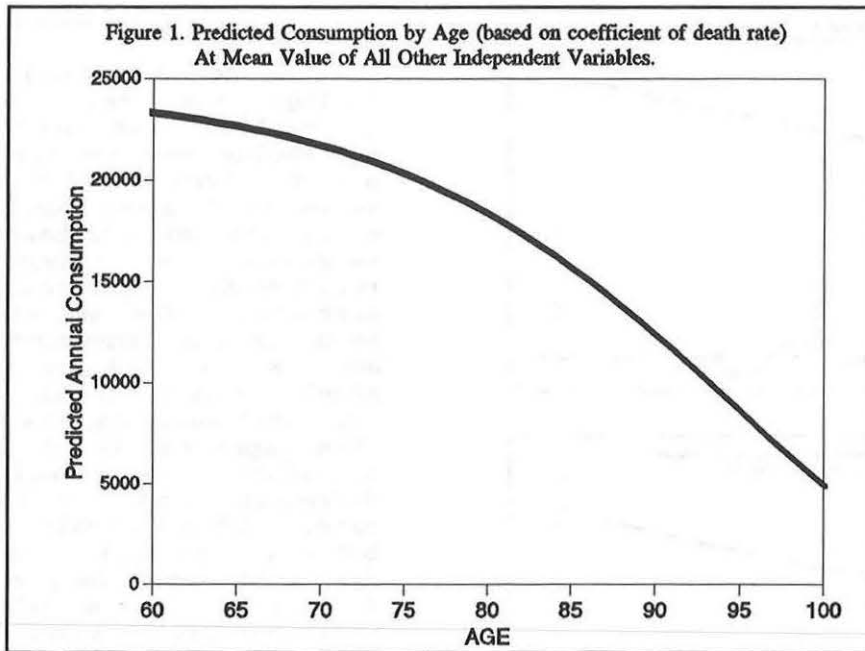
The effect of the death rate on predicted consumption based on the Table 2 regression is illustrated in Figure 1, with the death rate replaced by the equivalent age. The graph suggests that all other things equal (including income and financial assets,) age has a substantial effect on consumption. At the mean values of other va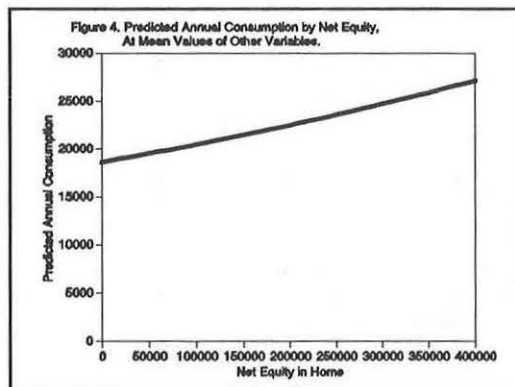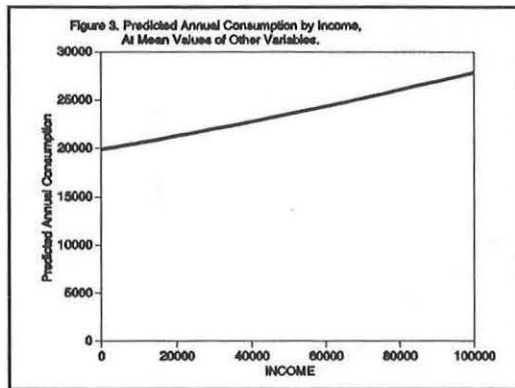riables, predicted annual consumption drops from $23,351 per year at age 60 to $21,734 at age 70, $18,379 at age 80, $12,423 at age 90, and $4,975 at age 100. This effect is consistent with recent versions of the life-cycle model, although the size of the effect is somewhat surprising. Figure 2 compares annual percentage changes in consumption as estimated from the regression presented in Table 2 to the theoretical rates predicted assuming that the personal discount rate depended on the death rate, and assuming a real interest rate of zero. The value of ϵ (the elasticity of marginal utility with respect to consumption) which best matches the empirical results is -2.2.

Table 2
Regression of Total Consumption as a Function of After-Tax Income, Net Financial Asset, and other Demographic Variables, 1990 (n=184).

Dependent Variable is Log(Total consumption)

Independent Variables	Reg. Coeff.	Level
After-tax income	3.38E-6	
Other income receipts	-4.41E-7	
Death rate (% term)	-0.0475***	
Net financial assets	1.03E-6	
Net equity of home	7.37E-7**	
Number of earners	0.1407**	
Race (Black versus other)	-0.2789*	
Family size	0.3163***	
Education level		
<high school	-0.0508	
Some college	0.3722***	
B.S. or more	0.5336***	
Constant	8.9474***	
Adjusted R^2	0.6141	

*significance level<0.1
**significance level<0.01
***significance level 0.001

Increased income was associated with higher consumption, although the effect was not significant and the marginal effect was small, as shown in Figure 3.

Figure 1. Predicted Consumption by Age (based on coefficient of death rate) At Mean Value of All Other Independent Variables.

Figure 2. Predicted Annual Rate of Change in Consumption by Age Based on Empirical Analysis and Theoretical Analyses.

Figure 3. Predicted Annual Consumption by Income, At Mean Values of Other Variables.

Figure 4. Predicted Annual Consumption by Net Equity, At Mean Values of Other Variables.

Higher values of home equity were related to increased levels of consumption, although the effect was not substantial. Figure 4 shows the effect of net home equity on annual consumption, as estimated from the regression in Table 2. The effect of family size was significant, with one person households having predicted consumption at a level 73% of the level predicted for two person households, at the mean values of other variables. The effect of the college education dummy variables was significant and strong. At the mean values of other variables, the predicted consumption of a household whose respondent had a college degree was 70.5% higher than a similar household whose respondent had just a high school diploma. Family size also had a strong, significant effect. At the mean values of other variables, the predicted consumption of a single-person household was 73% of the level of a similar two-person household.

Conclusion

An economic model of life-cycle savings was tested to analyze consumption patterns of U.S. households over the age of 60, using a sample from the 1990 BLS Interview Survey of Consumer Expenditures. The model implies substantial, planned decreases in consumption after retirement, regardless of income patterns. The empirical analysis suggests the independent effect of age, as modeled by the economic model, is very strong. Based on the empirical analysis, the hypothesis in this paper can be verified. Total consumption of elderly households decreases with the average death rate, and the equivalent relationship between consumption and age is as strong as would be predicted from a life-cycle savings model. As the world population ages, there will be some changes in the composition of consumer spending; Total spending may decrease substantially. The utility function parameter estimated, the elasticity of marginal utility with respect to consumption, could allow for predictions and extrapolations to other times and countries.

References

Abdel-Ghany, M. & Schwenk, F. N. (1993). Functional forms of household expenditure patterns in the United States. Journal of Consumer Studies and Home Economics, 17(4), 325-342.

Ando, A. and Modigliani, F. (1963), The life-cycle hypothesis of saving: Aggregate implications and tests. American Economic Review, 53(1), 55-84.

Chen, Y.P. & Chu, K.W. (1982),Household expenditures patterns: The effect of age of family head. Journal of Family Issues, 3(2), 145-159.

Conner, K.A. (1992), Aging America : Issues facing and aging society. Prentice Hall: New York.

Cramer, J.S. (1969), Empirical econometrics. Amsterdam: North Holland Publishing, Co.

Crockett, J. (1983), Older people as consumers. Aging and the Economy, 38(4), 127-153.

Danziger, S., Van Der Gaag, J.,

Smolensky, E., & Taussig, M.K. (1982-1983). The life-cycle hypothesis and the consumption behavior of the elderly. Journal of Post Keynesian Economics, V(2), 208-227.

Fan, X. J., Chang, Y. R., & Hanna, S. (1993). Real income growth and optimal credit. Financial Services Review, 3(1), 45-58.

Friedman, M. (1957) A theory of the consumption function. Princeton University Press. Princeton, NJ.

Goldstein, S. (1965). Changing income and consumption patterns of the aged 1950-1969. Journal of Gerontology, 38(4), 481-490.

Greene, W. H. (1981). On the asymptotic bias of the ordinary least squares estimator of the Tobit model. Econometrica, 49, 505-513.

Hammermesh, D. S. (1982), Life-cycle effects on consumption and retirement behavior and economic studies. National Bureau of Economic Research Working Paper Series, No.976, Cambridge: Mass.

Hanna, S., Chang Y. R., & Fan, X. J. (1991), Prescribing life-cycle savings patterns for households. Paper presented at Academy of Financial Services meeting, Chicago, Illinois.

Hildreth, G.J., & Kelley, E. (1984-1985), Family expenditures before and after retirement: A research model for measuring priorities. International Journal of Aging and Human Development, 20(2), 145-159.

Hitschler, P. B. (1993), Spending by older consumers: 1980 and 1990 compared. Monthly Labor Review, 116(5), 3-13.

Hurd, H.D, (1990), Research on the elderly: Economic status, retirement and consumption and saving. Journal of Economic Literature, 28(June), 565-637.

Lamale, H.H. (1978), Measuring retirees "living costs". Aging and Work, 1(Fall), 3-5.

Liviatan, M. (1961), Errors in variables and Engel curve analysis. Econometrica, 29, 336-362.

McConnel, C.E., & Deljavan (1983), Consumption patterns of the retired household. Journal of

Gerontology, 38(4), 481-490.

Modigliani, F., & Brumberg, R. E. (1954). Utility analysis and the consumption function. In K.K. Kurihara (Ed.), Post-Keynesian Economics. New Brunswick, N.J.: Rutgers, University Press, 1954.

U. S. Center for Health Statistics. Vital Statistics of the United States, 1986.

Prais, S., & Houthakker, H. (1971), The analysis of family budgets. Cambridge, England: Cambridge University Press.

Stoller, E. P., & Stoller, M. A. (1987). The propensity to save among the elderly. The Gerontologist, 27(3), 314-320.

Tobin, J. (1958). Estimation of relationships for limited dependent variables. Econometrica, 26, 24-36.

U.S. Bureau of Census, (1989a), Statistical Abstract of the United States:1989.(109th edition.) Washington, D.C.: U.S. Printing Office.

U.S. Bureau of Census. (1992) Statistical Abstract of the United States:1992.(112th edition.) Washington, D.C.: U.S. Printing Office.

U.S. Bureau of Census. (1989b) Studies in Marriage and the Family. Current Population Reports, Series P-23. No.162. Washington, D.C.: U.S. Printing Office.

Endnotes

1. Ph.D student, Consumer and Textile Sciences Department.
2. Ph.D student, Consumer and Textile Sciences Department.
3. Professor, Consumer and Textile Sciences Department.

Higher Education Expenditures:
Private Household Contributions

This paper attempts to explain the actual costs incurred by students and their households for college. Predictive variables include sociodemographic characteristics, financial attributes of the household, and college attendance factors. Using the 1990 and 1991 BLS Survey of Consumer Expenditures, households reporting both expenditures in the college category and having at least one household member enrolled at least part-time in college were included in the study. Significant predictors of college expenditures were family financial assets, higher education status of household head, and number of children in the household in college.

Barbara M. De Luca, University of Dayton[1]
Margaret M. Sanik, The Ohio State University[2]

Introduction

Approximately 13.5 million students were attending institutions of higher education during the 1990-91 academic year (Hoffman, 1992, p.3). For the 1989-90 academic year, the average annual rate for tuition at public institutions was $1,367; at private institutions the average was $8,174 (p.5). The average annual rate for room and board at public schools was $3,154 and at private schools, $3,882. This sums to $4,521 for one student for one year at public college and $12,056 at a private college. Using these numbers, and assuming costs did not change over the period of 4-years (an unrealistic assumption but quite useful for the purpose of this research), it would have cost an average of $18,084 to support a college student (tuition, room, and board only) at a public college who was a first-year student in fall 1989 and graduated in spring 1993 and $48,224 to support a student at a private institution during the same time period.

Given that median household income in 1989 was $28,906 and median family income was $34,213 (U.S.Department of Commerce, 1990, Tables 1 & 7), one year at a public institution would consume nearly 16% of the median household income and 13% of the median family income. One year at a private institution would consume nearly 42% of the median household income and 35% of the median family income. (The researchers realize the statistical problems with comparing means to medians, but parallel values were unavailable at the time of this printing.) The price faced by college students is not the tuition plus room, board, and books but rather the actual costs incurred by the student and her family. Students report that between 17% and 28% of their college support was contributed by parents (Fife, 1975).

Although considerable investigation has been done into student financial aid, who receives it, who doesn't, how much is received by various households, how much is distributed, and the types and sources of aid, little work has been done to study the dollar value of higher education expenses which is paid directly by families or households, not funded by any financial aid source. It would seem that information regarding private household contribution to higher education would be valuable to those households which are anticipating facing higher education expenses in the future.

Purpose of Study

The purpose of this study is to identify characteristics which can be used to predict the level of college expenses actually incurred by households. Specifically, the intent herein is to determine the effects of household demographic and economic characteristics on actual college expenditures. This study differs from most in that households included in

the survey have both full and part-time students and may have more than one student in the household. Most studies of financial aid and costs of college focus on singular, full-time, undergraduate students.

Literature Review

Results of the 1990 National Post Secondary Student Aid Study (NPSAS:90) (Byce, 1993) show that the percent of dependent students receiving family support did not greatly differ for males (64.3%) and females (63.7%). For independent students, nearly 18% of the males received family support while only about 14% of the females did. In nearly all cases, the percent of dependent students receiving family support increased as dependent student income increased. The proportion ranged from 32% for dependent students with income less than $10,000 to about 81% with income of $100,00 or more. The pattern for family support for independent students was the opposite; as independent student income increased, the percent of students receiving family support decreased.

The proportion of dependent students receiving family support increased as students progressed from first to fourth year. At the fifth year (not graduate), however, the proportion dropped. The same pattern emerged for independent students although the proportions were smaller.

A higher proportion of White, non-Hispanic dependent students received family support than students of other ethnic groups, although Asians were a close second. A higher percentage of students residing on campus received more support than those living off-campus or with parents (Byce, 1992, pp.100-101).

The findings for support for independent students were similar to those for dependent ones except for race. The average amount of family support was highest for American Indians and lowest for Black non-Hispanic students. (Byce, 1993, pp. 102-105). The average amount of family support for both dependent and independent students was highest for those attending private, non-for-profit institutions (p.104).

Using 1987 NPSAS data, Churaman

completed several studies (1992a, 1992b, 1992c) in an effort to identify the effects of various components on the likelihood of making a private household contribution for higher education to a student living in the family and the likely amount of that contribution. In one study, Churaman (1992a) found that the proportion of parents giving money to children for higher education was highest for 2-parent families (74%); the mean amount given was $5,900. Using sequential MANOVA, she found that family type, savings pattern, net worth, family per capita income, private/public school, costs of the particular school, financial aid, and whether or not the student could earn some of the expenses were significant factors affecting the dollar amount of private household contributions by families.

In a separate study, Churaman (1992b) looked at private household contributions in light of public versus private schools and student living arrangements. Regression analyses showed financial aid and school-residence factors (except public school, living off campus) to be significant in explaining expenses paid to college. A third study (Churaman, 1992c) found racial status to be a significant predictor of differences in parental contributions for college students.

Research Objective

The objective of this study is to predict factors which have a significant effect on the annual amount of college expenses contributed by the attendee's consuming unit.

Model

Structure

In this study, total college expenditures are the tuition and fees, room, board, books, and other supplies paid for by the student's consuming unit, i.e. the household in which she resides. This can be thought of as the cost of tuition, fees, etc. minus the sum of contributions made by other private sources (grandparents, other family members, parents of adult children, trusts, etc.), minus scholarships and other reductions made in amounts owed. For

the purposes of this study, this to-
tal differs from the expenses as pro-
jected in the typical financial aid
budget in that other living costs are
excluded. Travel, such as trips
home, is also excluded.

To focus on the expenditures
made by the household, allowance was
made for the characteristics of the
student. As a large number of house-
holds indicated more than one stu-
dent, the presence of more than one
student enrolled in college either
full or part-time, and the number of
fiscal quarters students were in
school were determined to be impor-
tant factors to use. Attention was
also paid to whether the household
member attending college was the
child of the reference person or the
reference person or spouse. In near-
ly 50% of the cases either the refer-
ence person or the spouse was in col-
lege; in 37% of the cases at least
one child was in college. (See Table
1.)

Sample

Data for the BLS Survey of Con-
sumer Expenditures includes informa-
tion on each consuming unit in the
sample, collected each quarter for
five consecutive quarters, on a ro-
tating panel basis. Therefore, some
of the cases are different (new) each
quarter. In the present study, annu-
al expenditures were calculated for
all periods contained on the 1990 and
1991 data tapes. Prices were cor-
rected by quarter and are reported in
constant January 1990 dollars. A de-
scription of the sample can be seen
in Table 1.

Method

Ordinary least square (OLS)
regression analysis was used to pre-
dict the dollar value of college ex-
penses paid directly by the atten-
dee's household. Families were
selected for inclusion in this study
if the "consuming unit" listed ex-
penses in the education category and
the expenses were for a member of the
consuming unit, and the type of
school listed was college or univer-
sity. College expenditures were
defined as the annual total of ex-
penses incurred in the following cat-
egories paid by the consuming unit
(household): tuition, housing, food
or board, rental and/or purchase of

books and supplies.

Variables

Independent variables include
the following:
Financial variables --
income (dollar value),
financial assets (dollar value),
credit debt (dollar value), and
renter or not (renter=1);
Family variables --
hus/wife household (h/w=1),
white (white=1),
professional (occ. of ref/sp=1),
college graduate (ref/sp yes=1);
College attendance variables --
full-time fis. qtrs. (hh.total),
part-time fis. qtrs.(hh.total),
ref/sp in attendance (yes=1),
children in attendance (number),
others in attendance (number).

The dependent variable is dollar
value of college expenses paid dir-
ectly by the consuming unit of the
college attendee; it is continuous.
Table 2 identifies the categories for
which expenses were paid and the mean
value of the payment.

Findings and Discussion

Sample description

Only 352 "consuming units"
claimed to have contributed to the
annual college expenses of someone
living in the household. The income
range of these households was from
-$9,473 to $128,719. Debt level
ranged from $0 to $686,037. Over 85%
of the households were white and
slightly over two-thirds were
husband-wife households. Over 50% of
the households consisted of at least
one professional and college graduate
(either reference person or spouse in
each case). Almost one-half of the
households had either the reference
person or the spouse in college while
slightly over half had no children
attending (Table 1).

College Expenses

A surprisingly low number of
households contributed to college
expenses according to the data. A
possible explanation for this is the
seemingly pervasive acceptance of
financial aid in the form of scholar-
ships, grants, and loans. Of the 351
households paying some college ex-
penses, the total amount paid, the

Table 1
Sample Description (n=352)

Variables	Frequency	Mean (s.d.)	Min to Max
Financial variables			
Income		$35,965 (25,575)	-$9,473 to 128,719
Financial assets		12,108 (26,194)	0 to 211,000
Credit debt		6,443 (37,580)	0 to 686,037
Renter	19.1%		
Family variables			
White	85.5%		
Husband/wife household	68.6%		
Professional	53.7%		
College graduate	51.1%		
College attendance variables			
Full-time quarters		2.11 (2.30)	0 to 11
Part-time quarters		1.96 (2.28)	0 to 16
Reference person or spouse			
0	43.8%		
1	48.3%		
2	8.0%		
Children			
0	54.3%		
1	37.2%		
2	7.1%		
3	1.4%		
Other			
0	91.5%		
1	7.1%		
2	.9%		
3	.3%		
4	.3%		

dependent variable, ranged from $21 to $21,982. This can possibly be explained in that the sample includes full-time as well as part-time students. Expenses for a part-time student attending a local community college could be minimal while those for full-time attendance at a private institution would be substantial. The similarity of means of full-time quarters and part-time quarters (Table 1) suggests similar attendance patterns; the former would increase the maximum and the latter would decrease the minimum.

Most of the households contrib-uted to the tuition or the purchase of books and other required supplies and equipment (Table 2). Only 35 households contributed to housing expenses. This number seems rather low.

Regression Results

Regression results can be seen in Table 3. The equation is significant at the .0001 level. Three of the independent variables were significant (at the .05 los) in predicting dollar value of expenses paid annually by the consuming unit of the college attendee: financial assets, if the

339

Table 2
College Expenses

Expense Category	Mean (s.d.)	Min to Max
Total college costs (n=351)	$2,427 (3,420)	$ 21 to 21,982
Tuition (n=277)	2,084 (2,788)	0 to 15,339
Housing (n=35)	1,533 (1,339)	0 to 5,172
Food or board (n=36)	1,645 (1,709)	100 to 7,937
Rental-books, eqt. (n=5)	84 (57)	27 to 160
Purchase-books, etc. (n=255)	287 (267)	7 to 1,321
Other (n=47)	153 (243)	5 to 1,469

reference person and/or spouse is a college graduate, and the number of children in the consuming unit in college. For every $100 increase in financial assets, the consuming unit will pay $1.45 more of the college expenses. This is not a surprising finding for at least two reasons. First, it would seem that households with greater financial assets would have a greater ability to pay than those with fewer. Second, it is likely that households with greater financial assets are eligible for less financial aid than those with fewer assets and therefore, would be forced to pay some of the expenses out-of-pocket.

If either the reference person or the spouse is a college graduate, the consuming unit will contribute $790 more to annual college expenses than those households in which neither is a college graduate. This finding could be attributed to a mentality held by college graduates as they are more aware of the value of higher education and are willing to pay for their childen to have one.

With each additional child in college, the results indicate that the household will contribute an additional $1,279.84 annually to college expenses. This finding is interesting for several reasons. First, it would seem that the more children

a household has in college, the more financial aid for which the family is eligible and thus, the less they would have to pay out-of-pocket. On the other hand, it seems reasonable to expect that additional children in college mean additional expenses incurred.

Although not significant, several of the other coefficients are interesting. The findings suggest that households with at least one professional will contribute $27.27 less than those with no professionals. They also indicate that husband-wife households will contribute $515.96 more annually to college expenses than would other household types. White households will contribute $677.92 annually more than nonwhite ones. With each additional full-time quarter attended, the annual contribution increases by $66.76. On the other hand, with each additional part-time quarter of college attendance, the annual household contribution will decrease by $150.09.

The F value for the equation, 4.247, is significant at the .0001 level. The equation explains only about .11 of the variance in dollar value of annual household contribution to college expenses.

One major limitation of this study is that the quarters mentioned throughout refer to fiscal quarters,