

A Comparison of Household Budget Allocation Patterns Between Hispanic Americans and Non-Hispanic White Americans

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ABSTRACT: The budget allocation patterns of Hispanic versus non-Hispanic White households are examined. Annual household expenditure data from 1980 to 1992 are constructed from the interview component of the Consumer Expenditure Survey (1980–1992), the Consumer Price Index (1980–1992), and the American Chamber of Commerce Researchers Association (ACCRA) Cost of Living Index (1990). The sample includes 588 Hispanic and 8,444 non-Hispanic White households. A Linear Approximation of the Almost Ideal Demand System with 23 demographic variables is estimated. Findings show that holding other things equal, compared to non-Hispanic White households, Hispanic households allocate significantly more of their budget to food at home, shelter, and apparel and significantly less to food away from home, entertainment, education, health care, and tobacco.

KEY WORDS: consumer demand, ethnicity, expenditure, Hispanics.

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Introduction

Hispanics are the fastest growing ethnic minority group in the United States. The U.S. Bureau of the Census projected that by the year 2010, the Hispanic population in the United States will reach around 40.5 million and become the nation's largest minority group overtaking the African American population (U.S. Bureau of the Census, 1995). In 1994, 26 million persons of Spanish origin resided in the United States, representing a 78% increase since 1980 (U.S. Bureau of the Census, 1995).

The 1990 U.S. Census designated a person as Hispanic if the person self-identified his or her ancestry as Mexican, Puerto Rican, Cuban, or other Spanish origin or culture, regardless of race. In 1990, of the 22 million Hispanics living in the United States, 60.4% were of Mexican origin, 12.2% of Puerto Rican origin, 4.7% of Cuban origin, and the rest of other Hispanic origin (U.S. Bureau of the Census, 1995). Over seven million (about 30%) Hispanic Americans were born in Mexico and Latin America (U.S. Bureau of Census, 1993). The largest segments of the Spanish-speaking population are concentrated in Arizona, California, Colorado, New Mexico, and Texas (Moore & Pachon, 1985).

There are differences among Hispanic Americans of different origins and among Hispanic Americans of the same origin but with different levels of cultural assimilation (Wallendorf & Reilly, 1983; Deshpande, Hoyer, & Donthu, 1986). However, Hispanic Americans tend to share some similarities in terms of values, beliefs, attitudes, culture, and self-perception. These similarities distinguish the Hispanic population from other ethnic and consumer groups (Deshpande, Hoyer, & Donthu, 1986; Segal & Sosa, 1983).

Segal and Sosa (1983) discussed three types of similarities that distinguish Hispanic families from other ethnic consumer groups. The attitudinal similarities are reflected in Hispanic households' strong family ties and paternal leadership, tremendous pride in their culture and heritage, and an emphasis on self-sufficiency and conservation. The cultural similarities are reflected in their dominant Roman Catholic faith, a high priority on home-ownership, closeness to neighbors and communities, and linkage to the Spanish language. The self-perception similarities are reflected in a strong desire to preserve their ethnic identity, their religious and cultural traditions, and their need to be recognized as an important ethnic group, that is different but integrated in mainstream America (Segal & Sosa, 1983).

Attitudinal, cultural and self-perception similarities among His-

panic households facilitate this study of Hispanic Americans as one consumer group. Attitudinal, cultural, and self-perception differences between Hispanic consumers and consumers in other ethnic groups lead to the expectation that Hispanic consumers' economic behavior may be different from that of consumers in other ethnic groups. In addition, Hispanic households may face non-economic constraints, such as language barriers and racial discrimination.

The purpose of this study is to investigate the expenditure patterns of Hispanic households and non-Hispanic White households. The extent of the differences also is analyzed and discussed.

Literature Review

Research interest in the consumer behavior of subcultures in the U.S., including subcultures formed by ethnicity, has increased in recent years. Excluding past descriptive studies that did not control for socioeconomic differences, there have been two types of research in the area of consumption and expenditure behavior of Hispanic consumers: (a) studies testing the theory of cultural assimilation in consumption and expenditure behavior (Wallendorf & Reilly, 1983; Deshpande, Hoyer, & Donthu, 1986), and (b) studies exploring cultural differences among different ethnic groups in terms of their general expenditure patterns (Wagner & Soberon-Ferrer, 1990; Zuiker & Bae, 1993).

Research focusing on the process of cultural assimilation, reflected in the consumption and expenditure behavior of Hispanic households, has compared Hispanic-American households with Hispanic families still living in their native countries (Wallendorf & Reilly, 1983), and with non-Hispanic White families in the U.S. (Deshpande et al., 1986; Wallendorf & Reilly, 1983). Deshpande et al.'s (1986) study also compared strong Hispanic identifiers with weak Hispanic identifiers¹. In these studies, small local samples were used. Wallendorf and Reilly's 1983 study included 102 Mexican-Americans, and the Deshpande et al. (1986) study included 147 Hispanic households. Wallendorf and Reilly (1983) found that at-home food consumption behavior of Mexican Americans was reminiscent of non-Hispanic White patterns several years earlier: Mexican Americans consumed large quantities of red meats, eggs, white breads, and caffeine. Deshpande et al. (1986) found that strong Hispanic identifiers tended to be more brand loyal and had more of a preference for prestige and ethnically advertised brands than both weak Hispanic identifiers and non-Hispanic White

people. Both studies suggested that cultural assimilation was not a simple process. Hispanic Americans were different from both Hispanic households in their native countries and non-Hispanic White households in the United States.

Research focusing on cultural differences in consumer expenditure patterns of Hispanic households and other households typically has used Consumer Expenditure Survey (CE) data to examine the overall pattern of household expenditures. Using the 1980–1981 CE data, Wagner and Soberon-Ferrer (1990) investigated the differences in household expenditures on food at home, food away from home, and apparel among Hispanic, non-Hispanic Black, Non-Hispanic White, and other households in the United States. Controlling for the effects of marital status, gender, occupation, education, home tenure, and region, they concluded that Hispanic households ($n=173$) spent more than other households on food at home, but they spent a similar amount on clothing and food away from home. Zuiker and Bae (1993) investigated expenditure differences in 17 expenditure categories between Hispanic ($n=54$) and non-Hispanic households ($n=1,055$) using the 1990 CE data. They found that Hispanic households spent significantly less on health care, personal care, reading and education, and life insurance, compared to non-Hispanic households. Expenditures for other goods and services were not found to be significantly different.

The present study examines differences in household budget allocation patterns between Hispanic households and non-Hispanic White households. Compared to previous studies, this study is unique in several ways. First, this study proposes a conceptual framework to identify the relationship between ethnicity and household expenditure behavior. Second, using 13 years of CE data makes it possible to obtain a national sample of 588 Hispanic households. Previously conducted studies used smaller samples than the sample in the present study. The sample size in the present study enables the control of a large number of socioeconomic variables. Third, this study assumes that household expenditure decisions on different expenditure categories were made simultaneously. A demand system to investigate systematically household expenditure patterns in 13 expenditure categories is estimated. Fourth, relevant theoretical restrictions concerning consumer behavior, such as adding-up, homogeneity, and symmetry are imposed after statistical testing. The imposition of these restrictions makes the method of analysis fully consistent with neoclassical economic theory.

The results of this study can be used for evaluation of public policy

and marketing research targeting the Hispanic population. In addition, the results can enhance consumer educators' understanding of the unique behavior patterns of Hispanic consumers. Therefore, the needs of this ethnic group may be targeted accurately in the marketplace.

Theory and Hypotheses

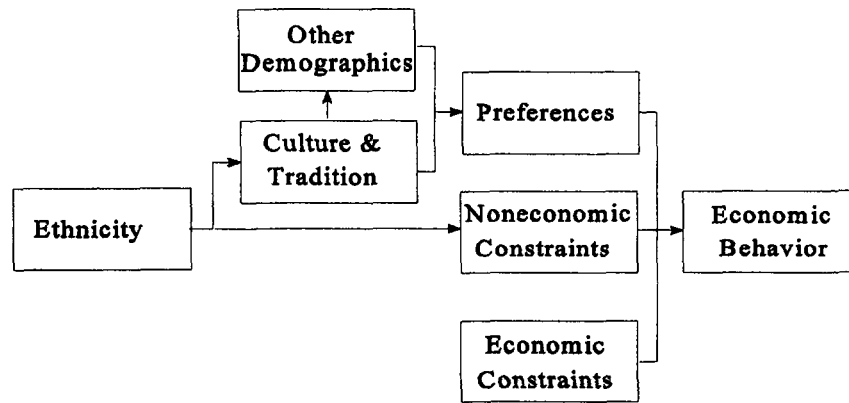
Neoclassical consumer demand theory provides a basic theoretical framework for analyzing household budget allocation patterns using expenditure functions for goods and services. Given a budget constraint and a utility function representing consumer preferences, bundles of commodities that maximize consumer utility subject to the budget constraint are expressed as a function of relative prices of goods, household income, and household preferences (Deaton & Muellbauer, 1980).

Ethnicity may affect household budget allocation patterns in several ways. First, ethnicity reflects culture and tradition that are unique to a particular ethnic group. These unique cultures and traditions may influence an ethnic household's preferences which may affect its economic behavior. Second, culture and tradition may influence an ethnic household's demographic characteristics, such as family size and household composition. These household demographic characteristics may influence a household's preferences which may affect its economic behavior. Third, ethnicity also may cause some households to face noneconomic constraints in addition to traditional monetary constraints. Examples of these noneconomic constraints are language barriers and racial discrimination. These constraints change an ethnic household's choice set and, therefore, change its economic behavior. Based upon these arguments, the present study proposes a conceptual framework to study the relationship between ethnicity and household economic behavior. The conceptual framework is illustrated in Figure 1.

Based upon the conceptual framework and literature review, it is hypothesized that Hispanic households allocate their budget differently from non-Hispanic White households. Since other household demographic variables are controlled in this study, the effect of ethnicity mainly captures the differences in culture and noneconomic constraints.

FIGURE 1

Conceptual Framework: The Relationship Between Ethnicity and Household Economic Behavior



Method

Data Construction

Consumer Expenditure Survey. The major data source used in this study is the Interview Component of the Consumer Expenditure Survey (CE) from 1980 to 1992 (U.S. Bureau of Labor Statistics [BLS], 1980–1989; 1990–1992). The CE data have been collected continuously since 1980 by the BLS. The CE data provide detailed information about household expenditures and demographic characteristics. For this study, households that completed the interview for an entire calendar year were selected. In 1986, the CE data format was changed by the BLS. Therefore, in order to construct a consistent data set, all the expenditure categories were constructed or modified following the category definitions used in the 1990 CE.

Price data. Because the 1980–1992 CE data includes households interviewed in 13 different years, it is important to control for price changes of commodities and services over time. One common approach is to use the overall Consumer Price Index (CPI) to adjust household income to constant dollars (U.S. Bureau of Labor Statistics, 1993). However, over the 13-year period, the price changes for different expenditure categories were different. For example, the price increase over the 13-year period was only about 45% for apparel and upkeep but was as high as 154% for medical care (U.S. Bureau of the Census, 1995). In order to include the differences in price changes, two additional price indices are used: the 1980–1992 CPI and the 1990 ACCRA Cost of Living Index (American Chamber of Commerce Researchers Association, 1990). The CPI, published by the BLS since 1913, is compatible and consistent with the CE because the CPI uses expenditure weights obtained

from the CE. The portion of the CPI used in this study is the region/city-size price indices for selected commodity groups. Four regions in the United States, with three city-size classifications each for the Northeast and the West, and four city-size classifications each for the Midwest and the South, yield a total of 14 region/city-size combinations each year. For the period of 1980–1992, 182 price indices are available for each commodity group.

Because the CPI uses the average prices in 1982–1984 as the base prices, the prices for all commodities and services for all areas are set to be 100 for the 1982–1984 average. Arbitrarily assuming equal prices everywhere in the U.S. in 1982–1984 is not reasonable. Thus, ACCRA data are used to solve this problem. While the CPI provides price data over time, ACCRA publishes price differences among standard metropolitan statistical areas for major expenditure categories. The portion of the ACCRA used in this study is the composite indices for selected commodity groups for the third quarter of 1990. Price information for metropolitan areas that are in the CPI area sample are used for this study (U.S. Bureau of Labor Statistics, 1988).

Data merging. After careful examination of the data available in all three data sources, 13 mutually exclusive summary expenditure categories are selected: (a) food at home, (b) food away from home, (c) shelter, (d) fuel and utilities, (e) household equipment and operation, (f) apparel and upkeep, (g) entertainment, (h) transportation, (i) education, (j) health care, (k) alcoholic beverages, (l) tobacco and tobacco-related products, and (m) personal care. Commodities and services included in each category are summarized in the Appendix. For a more detailed description, refer to 1990 Consumer Expenditure Survey EXPN file documentation (U.S. Bureau of Labor Statistics, 1990).

The first step in data merging is to use the CPI area sample and population weights and the ACCRA price data for the CPI area sample to construct 1990 region/city-size price indices for the 13 commodities and for 14 region/city-size classifications. The second step is to use the CPI region/city-size price indices, combined with 1990 region/city-size price indices created in step one, to construct region/city-size price indices for the 13 commodities, for 14 region/city-size classifications, and for the years 1980 to 1992. Each commodity had 182 different price indices (14 region/city-size classifications each year for 13 years). The third step is to incorporate the created price indices into the 1980–1992 CE data, using the region and city size information for households in the CE sample. Since the CE does not provide city size information for households living in the West, regional indices are constructed for the West. In the final constructed data set, each commodity has 156 different prices.

Because the CPI does not provide price index information for households in rural areas, these households are excluded from this study. (For details of the data construction process and a discussion of strengths and weaknesses of this approach, see Fan, 1996, 1997).

Sample. The total sample size is 10,400 households, of which 222 are Asian American, 1,146 non-Hispanic Black, 588 Hispanic, and 8,444 non-Hispanic White. The ethnic background of the household is based upon the reference person's ethnicity. Households not belonging to any of the above four ethnic groups (such as native American Indians) are excluded from this study since their sample size is too small to form an independent group. For this analysis, the data are not weighted.

Analytical Methods

Assumptions. While this study only deals with monetary budget allocation of households at a given time, it should be recognized that household monetary budget allocation decisions may have interacted with many other simultaneous decisions, such as labor supply, lifecycle consumption allocation, and time allocation. For example, studies have shown that household labor supply behavior significantly impacts expenditures for food away from home and apparel (Dardis, Derrick, & Lehfeld, 1981; Foster, 1988). However, to include every possible decision process simultaneously in one study is not possible. Consequently, in order to justify a model for household monetary budget allocation at a given time, a weak separability assumption is required. In this study, an assumption is made that the household budget allocation decision at a given time is weakly separable from other household decisions. In order to capture the effect of labor supply on household budget allocation patterns, employment status of the household reference person is included as an independent variable.

Model selection. In the past thirty years, economists have developed many forms of demand systems which are consistent with neoclassical theory of consumer behavior. Given the large number of expenditure categories and demographic variables included in this study, a simple but flexible demand system is chosen. The Almost Ideal Demand System (AIDS) and its linear approximation form, LA/AIDS, first introduced by Deaton and Muellbauer in 1980, have gained popularity. The AIDS model

... gives an arbitrary first-order approximation to any demand system; it satisfies the axioms of choice exactly; ... it has a functional form which is consistent with known household-budget data; it is simple to estimate, largely avoiding the need for non-linear estimations; and it can be used to test the restrictions of homogeneity and symmetry through linear restrictions on fixed parameters. Although many of these desirable properties are possessed by one or other of the Rotterdam or translog models, neither possesses all of them simultaneously (Deaton & Muellbauer, 1980).

Partly due to the advantages over the Rotterdam and translog models and partly due to the fact that the AIDS model offers a comparatively parsimoniously parameterized model relative to other more general models, such as the Lewbel model (Lewbel, 1989), the AIDS model is used for analysis.

Due to the number of variables and commodities examined in this study, the full AIDS model is still too complicated to warrant system convergence. Therefore, the LA/AIDS model is used. In the 1980s, the LA/AIDS system was criticized for causing bias in price elasticity estimates due to the use of the Stone Index, but this problem is resolved by Alston, Forster, and Greene (1994) and Pashardes (1993). The corrected formulas for price elasticity estimates are used to correct for the estimation bias.

According to Deaton and Muellbauer (1980), the LA/AIDS is defined as:

$$W_i = \alpha_i + \sum_j \gamma_{ij} \log P_j + \beta_i \log (M/P^*), \quad (1)$$

where W , P and M are budget share, price and total expenditure, respectively, α , β and γ parameters, and i and j expenditure categories, shown in Equation 1. P^* is a price index, commonly computed using the Stone Index, which is defined as:

$$\log P^* = \sum W_i^* \log P_i. \quad (2)$$

The Stone Index is created using mean budget share for each region/city-size combination and thus can be treated as exogenous.

Incorporating demographic variables. The oldest and most commonly used methods of introducing demographic variables into a demand system are demographic translating and scaling (Pollak & Wales, 1981). Demographic translating assumes a close relationship between the effects of changes in demographic variables and the effects of changes in total expenditure, and demographic scaling assumes a close relationship between the effects of changes in demographic variables and the effects of price changes.

The so-called Gorman specification (Gorman, 1976) combines both demographic translating and scaling and thus is more flexible. Lewbel (1985) extended the model described by Gorman (1976) by developing a general method of incorporating demographic effects into a demand system. The general method is designed to introduce functions of demographic variables, prices, and expenditures into the expenditure function of a demand system. This generalized technique permits complicated interactions of demographic variables with prices and expenditures. It encompasses demographic translating, demographic scaling, and generalized Gorman form as specific cases. Empirically, however, the general form is reduced to a specific form to be computationally feasible.

Various computational problems have occurred in empirical estimations, such that some theoretically desirable and flexible functional forms are difficult, or maybe impossible, to execute. After many attempts to execute empirically some of the flexible forms, including the Gorman form and demographic scaling, final convergence is reached using a method similar to Blundell, Pashardes, and Weber's (1993) specification, which is a form of demographic translating. The specification in the current study is realized by allowing two parameters, α and β in the LA/AIDS demand system, to vary with the demographic variables. Specifically, the demand system with demographic variables is specified as:

$$W_i = \alpha_{i0} + \sum_{h=1}^m \alpha_{ih} D_h + \sum_j \gamma_{ij} \log P_j + (\beta_{i0} + \sum_{h=1}^m \beta_{ih} D_h) \log (M/P^*), \quad (3)$$

where D_1, \dots, D_m are demographic variables.

Issues of limited dependent variable. Bias in estimation can happen when a significant number of households does not spend any money on certain expenditure categories, such as tobacco. Several statistical procedures are available for handling this limited dependent variable problem, including the two-stage probit (also known as Heckman's two-stage method), one-stage tobit (also known as Tobin's probit), and two-stage tobit (Greene, 1990; Maddala, 1983). With the two-stage probit method, only households with non-zero expenditures can be included in the demand analysis. This is not appropriate since each equation in the demand system then would have different numbers of observations, and additional model complications would result. Due to its infeasibility in dealing with cross-equation parameter restrictions in a system of equations, single equation one-stage tobit is not an acceptable procedure, either. The only appropriate method is the two-stage tobit procedure. The two-stage tobit method is utilized by estimating a probit equation for each expenditure category at the first stage:

$$\text{Prob}(E_i > 0) = \tau_i(M, P, D), \quad (4)$$

then incorporating the estimated φ_i , which is the density function of the standard normal distribution evaluated at $\tau_i(M, P, D)$ for commodity i , and Φ_i which is the cumulative probability function of the standard normal distribution evaluated at $\tau_i(M, P, D)$ for commodity i , into the second stage demand analysis to correct for limited dependent variable problem (Greene, 1990; Maddala, 1983). Unlike the two-stage probit method, all observations could be retained in the demand analysis with the two-stage tobit.

Specifically, the LA/AIDS system with correction for a limited dependent variable then is specified as:²

$$\begin{aligned} W_i = & \alpha_{i0} + \sum_{h=1}^m \alpha_{ih} D_h + \sum_j \gamma_{ij} \log P_j \\ & + (\beta_{i0} + \sum_{h=1}^m \beta_{ih} D_h) \log(M/P^*) + \sigma_i [\varphi_i - (1 - \Phi_i) \sum_{h=1}^n \tau_{ih} X_h]. \end{aligned} \quad (5)$$

Theoretical restrictions. To maintain the theoretical properties of the demand system, including adding-up, homogeneity and symmetry, the following cross-equation parameter restrictions apply:³

For adding-up:

$$\begin{aligned} \sum_i \alpha_{i0} = 1, \sum_i \alpha_{ih} = 0, \sum_i \beta_{i0} = 0, \sum_i \beta_{ih} = 0, \sum_i \gamma_{ij} = 0, \\ \sum_i \sigma_i [\varphi_i - (1 - \Phi_i) \sum_{h=1}^n \tau_{ih} X_h] = 0, \end{aligned} \quad (6)$$

$$i, j = 1, 2, \dots, k, \quad h = 1, 2, \dots, m.$$

For homogeneity:

$$\sum_j \gamma_{ij} = 0, \quad i, j = 1, 2, \dots, k. \quad (7)$$

For symmetry:

$$\gamma_{ij} = \gamma_{ji} \text{ for all } i, j, \quad i, j = 1, 2, \dots, k. \quad (8)$$

F tests. To test the significance of the Hispanic variable and its interaction terms, reduced models of the LA/AIDS equations without the Hispanic and its related variables are estimated. Joint F tests are performed to test the significance of ethnic effects on household budget allocation patterns after adjusting for other economic and demographic differences. Specifically, the F statistics are formulated as follows:

$$F = \frac{(SSE_R - SSE_F) / (df_R - df_F)}{SSE_F / df_F}, \quad (9)$$

where SSE_F is the sum square errors of the full model, in which all independent variables are included. The SSE_R is the sum square errors of the reduced model, in which the Hispanic and its related variables tested are dropped from the model. The degrees of freedom are denoted as df .

Simulation. To further investigate the ethnic differences in budget allocation patterns, household budget shares are simulated for Hispanic households in the sample as if they were non-Hispanic White households. In other words, for the simulation, all independent variables other than the Hispanic and its related variables are kept unchanged for each Hispanic household in the sample, and budget shares are predicted for each Hispanic household as if it were a White household. Mean predictions for each expenditure category then are computed for comparison. The simulation results provide additional insights into the expenditure patterns of Hispanic Americans compared to non-Hispanic White Americans in the United States.

Variable specification. The same set of income, prices and demographic variables are used for the first-stage probit estimation and the second-stage demand analysis, though the functional forms are different, as discussed in the Method section of this paper. Total expenditures are used as a proxy for household income. Total expenditure is defined as the sum of the 13 expenditure categories discussed in the data section. Compared to the definition of total expenditure in the CE, the total expenditure variable used in this study does not include social security tax, cash contribution, life insurance payment, and net vehicle outlay. Relative prices for each expenditure category are included as explanatory variables. Therefore, it is not necessary to adjust total expenditure for the overall CPI.

Dummy variables indicating the ethnicity of the reference person are used as proxies to measure culture and possible noneconomic constraints faced by ethnic consumers. Four ethnic variables are used: Asian, Black, Hispanic, and non-Hispanic White (base). In addition to these ethnic variables, the following demographic variables are included in the LA/AIDS model: (a) other characteristics of the reference person, including gender, logarithm of age, education, employment status, and occupation; (b) characteristics of the household

(including number of earners, family size, and composition), housing tenure, and region; and (c) a continuous variable from 1 to 13, indicating the year of the interview. Reference categories are noted in Table 1.

Results

Descriptive Statistics

Mean statistics. During the 13-year sample period, household income, household expenditures, and market prices have experienced many changes. Generally prices increased over time, but the rate of increase differed across expenditure categories. On average, tobacco had the largest price increase (209%) during the 13-year sample period, followed by education (177%), and health care (158%). Household equipment and operation (37%) and apparel (45%) had the smallest price increases.

There were also significant price differences across regions and cities. For example, in 1980, the price of shelter in northeastern cities with a population of more than 1.2 million was about 124% higher than that in southern cities with a population of less than 50,000. In 1992, the percentage difference increased to 166%. The price of food at home was only 12% higher for northeastern cities with a population of more than 1.2 million than the price of food at home in southern cities with a population of less than 50,000 in 1980. The percentage difference was about 22% in 1992.

For all households in the sample, the mean nominal total expenditure increased from \$10,989 to \$22,915 between 1980 and 1992, which is a 109% increase. However, the simultaneous inflation equalled most of the income growth. The mean budget shares for shelter and health care increased over the years, and the budget shares for food at home, transportation, and alcoholic beverages declined. The budget shares for other expenditure categories sometimes increased and sometimes decreased over the time period, and no consistent pattern can be identified.

Demographic profiles for Hispanic and non-Hispanic White households are provided in Table 1. Compared to the average non-Hispanic White household, the average Hispanic household in the sample has a reference person that is younger, has less education, is more likely to be a renter, and is more likely to live in the South or the West. The average annual total expenditure for Hispanic households (\$19,850 in

TABLE 1
Demographic Profiles by Ethnicity*

Characteristics	Hispanic Households (n = 588)		Non Hispanic White Households (n = 8,444)	
	%	Means (Standard Deviation) ^b	%	Means (Standard Deviation)
Total expenditure: (in 1992 dollars)		19,850 (12,115) ^b		23,811 (13,832)
Age of reference person:		43.61 (15.54)		49.67 (17.35)
Gender of reference person:				
Female	32.3		30.8	
(Male) ^c	67.7		69.2	
Education of reference person:				
High school graduate	20.4		32.2	
Some college	12.6		21.8	
College graduate or more	10.0		24.8	
(Less than high school)	57.0		21.2	
Employment	32.8		35.8	
Fulltime employed	32.8		35.8	
(Not fulltime employed)	67.2		64.2	
Occupation of reference person:				
White collar	18.9		35.7	
Self-employed	3.9		5.3	
(Others)	77.2		61.0	
Number of earners		1.55 (1.10)		1.39 (1.03)
Household composition:				
Number of members age 5 or younger		0.47 (0.79)		0.21 (0.54)
Number of members 6 to 17 years old		0.97 (1.23)		0.44 (0.86)
Number of members 18 to 35 years old		1.06 (1.05)		0.64 (0.83)
Number of members 36 to 64 years old		0.99 (0.89)		0.92 (0.88)
Number of members age 65 or older		0.20 (0.50)		0.36 (0.64)
Tenure choice:				
Home-owners with mortgage	34.5		47.3	
Home-owners without mortgage	13.9		27.3	
(Renters)	51.6		25.4	
Region:				
Midwest	5.6		30.0	
South	36.1		24.3	
West	41.5		20.0	
(Northeast)	16.8		25.8	

Notes: *The results presented in the text and Tables 1 to 3 were based on unweighted data.

^bStandard deviations are in parentheses when appropriate.

^cCategories in parentheses represent reference categories.

1992 dollars) is lower than the average annual expenditure for non-Hispanic White households (\$23,811 in 1992 dollars). Yet, the average family size is larger for Hispanic households (3.69) than for non-Hispanic White households (2.57). These findings imply that Hispanic households have a substantially lower per capita total expenditure than non-Hispanic households.

Two-sample t tests. To test whether the observed budget allocation patterns for Hispanic households are significantly different from those of non-Hispanic White households, unadjusted two-sample t tests on budget shares are performed. The t test results are summarized in Table 2.

The results of the unadjusted t tests show significant differences in household budget allocation patterns between Hispanic households and non-Hispanic White households. Compared to non-Hispanic White households, Hispanic households allocate a significantly larger proportion of their budget to food at home, shelter, and apparel, and a

TABLE 2
Mean Budget Share Differences Between Hispanic Households and Non-Hispanic White Households

Expenditure Category	Hispanic Households (n = 588)	Non-Hispanic White Households (n = 8,444)	t Value ^a
Food at home	23.6 ^b	16.4	15.589***
Food away from home	3.8	5.6	-10.484***
Shelter	25.1	22.2	4.933***
Fuel and utilities	10.5	10.9	-1.259
Household equipment/operation	4.2	5.7	-7.505***
Apparel	6.0	5.7	2.007**
Entertainment	3.8	5.6	-10.638***
Transportation	13.7	14.3	-1.531
Education	1.3	2.0	-6.491***
Health care	4.8	7.4	-10.076***
Alcohol	1.1	1.5	-4.928***
Tobacco	1.0	1.5	-6.770***
Personal care	0.8	1.2	-2.993***

Notes: ^aExcept for apparel, all t statistics reported are based upon unequal variances since the null hypothesis of equal variances is rejected at $\alpha = 0.05$ level.

^bdenotes percentage of budget share.

***significantly different at 99% level

**significantly different at 95% level

*significantly different at 90% level

significantly smaller share to food away from home, household equipment and operation, entertainment, education, health care, alcohol, tobacco, and personal care. These *t* tests, which are not adjusted for households' economic and demographic characteristics, show significant differences between Hispanic and non-Hispanic White households in terms of observed budget allocation patterns. In later stages of the analysis, differences in household characteristics are taken into consideration. By controlling for household characteristics other than ethnic background, the effects of ethnicity are isolated and analyzed.

LA/AIDS. The LA/AIDS demand system is estimated using an iterative seemingly unrelated regression (ITSUR) method, with the PROC MODEL procedure in SAS (SAS Institute, Inc., 1988). The R^2 s range from 0.10 to 0.47, with food at home, shelter, utilities, transportation and health care having R^2 s higher than 0.30, and education having the lowest R^2 (0.10), followed by alcohol (0.11). Due to space limitations, only selected results are reported in this paper. Full estimation results of the LA/AIDS demand system are available from the authors upon request.

F tests and simulation. If Hispanic households in the sample were non-Hispanic White households, would their expenditure pattern be significantly different? Simulation results answering that question and the results of *F* tests are reported in Table 3.

If the Hispanic households in the sample were non-Hispanic White households, their budget allocation pattern would be significantly different. Compared to the Hispanic households, they would allocate significantly less of their budget to food at home, shelter, and apparel and significantly more of their budget to food away from home, entertainment, education, health care, and tobacco.

Regarding the categories for which Hispanic households would spend proportionately *more* than non-White Hispanic households, Hispanic households in the sample allocate an average of 23.6% of their total budget to food at home, 25.1% to shelter, and 6.0% to apparel. If they were non-Hispanic White households, they would allocate only 21.8%, 22.6%, and 5.2% to these expenditure categories. Comparing Hispanic percentages with the simulated non-Hispanic White percentages shows percentage differences of 23% (food at home), 10% (shelter), and 13% (apparel). Regarding the categories for which Hispanic households spend proportionately *less* than non-Hispanic White households, if Hispanic households in the sample were non-Hispanic White, they would allocate 4.2% versus 3.8% of their budget to food away from home (an 11% difference), 4.9% versus 3.8%

TABLE 3

Simulation Results: Adjusted Budget Share Differences Between Hispanic Households and Non-Hispanic White Households (with F-test Results)

Expenditure Category	Hispanic Households	If Hispanic were Non-Hispanic White Households	F Value
Food at home	23.6*	21.8	36.713***
Food away from home	3.8	4.2	3.430**
Shelter	25.1	22.6	13.982***
Fuel and utilities	10.5	11.0	2.140
Household equipment and operation	4.2	4.4	1.666
Apparel	6.0	5.2	10.999***
Entertainment	3.8	4.9	17.472***
Transportation	13.7	13.8	1.287
Education	1.3	1.6	2.520*
Health care	4.8	6.2	19.562***
Alcohol	1.1	1.3	0
Tobacco	1.0	2.3	81.452***
Personal care	0.8	0.9	NA

Notes: *denotes percentage of budget share.

***significantly different at 99% level

**significantly different at 95% level

*significantly different at 90% level

to entertainment (a 29% difference), 1.6% versus 1.3% to reading and education (a 23% difference), 6.2% versus 4.8% to health care (a 29% difference), and 2.3% versus 1.0% to tobacco (a 130% difference).

Discussion

Interpretation of Results

Differences in income, prices, and demographic characteristics other than ethnicity explain part of the budget allocation differences between Hispanic households and non-Hispanic White households. For example, after controlling for income, prices, and demographic variables other than ethnicity, the differences between budget shares for food at home, food away from home, shelter, entertainment, education, and health care between these two ethnic groups have decreased. The differences in two expenditure categories, household equipment and operation, and alcohol, become insignificant. However,

the differences in apparel and tobacco have increased. Overall, the budget shares for 8 of the 13 expenditure categories remain significantly different between Hispanic and non-Hispanic White households: food (at home and away from home), shelter, apparel, entertainment, education, health care, and tobacco.

This result supports the original hypothesis that Hispanic households allocate their budget differently, compared to non-Hispanic White households. Hispanic households allocate significantly more money to food at home, shelter, and apparel and less to food away from home, entertainment, education, health care, and tobacco, compared to non-Hispanic White households, other things controlled. Spending more money on food at home is consistent with Wagner and Soberon-Ferrer's (1990) findings. However, spending less money on food away from home and spending more money on apparel conflict with Wagner and Soberon-Ferrer's (1990) findings. Compared to Zuiker and Bae's 1993 study, the finding on health care expenditure is consistent. Inconsistencies are found regarding food at home, food away from home, shelter, apparel, entertainment, education, and tobacco with Zuiker and Bae's (1993) study.

Since income, prices, and other demographic variables are controlled in this study, the effect of ethnicity can be attributed to cultural differences and differences in noneconomic constraints. In the Hispanic culture, emphasis is placed on family value and togetherness (Segal & Sosa, 1983). Family-oriented consumption and expenditures, such as food at home and shelter, therefore, are important to Hispanic households. Hispanic households may be less likely than non-Hispanic White households to spend money on eating frequently in exclusive restaurants where the atmosphere is less conducive to bringing a family than the atmosphere in other restaurants (Wagner & Soberon-Ferrer, 1990). The same argument may explain that Hispanic Americans are less likely than non-Hispanic Americans to attend expensive entertainment events, such as concerts and operas.

Segal and Sosa (1983) also discussed a tendency of Hispanic consumers to spend disproportionate amounts of money on high-quality, status items. Marketing experts have suggested that most Hispanic immigrants have come to the U.S. from poorer countries to seek a better life than they had in their country of origin. Thus, Hispanic immigrants may be attracted to the status symbols of that better life, such as a house and clothing that Hispanic immigrants perceive as being better than they had in their countries of origin. (Segal & Sosa, 1983). This rationale helps explain the higher budget shares for shel-

ter and apparel of Hispanic households, compared to non-Hispanic White households.

Noneconomic constraints may help explain the differences between Hispanic and non-Hispanic White households in terms of budget share for health care and education. Language barriers and racial discrimination may prevent some Hispanic consumers from getting medical assistance due to lack of information and problems with communication. In their study of 3,935 Mexican Americans, Estrada, Trevino, and Ray (1990) found that Mexican Americans experienced a variety of problems related to language barriers and racial discrimination when seeking medical assistance. These problems included: care not being available when needed, 6.5%; not knowing where to go (for medical care), 5.8%; the staff not speaking Spanish, 3.9%; the staff being disrespectful, 2.8%; and there not being Hispanic staff members, 2.3%. Their findings indicate the existence of language barriers, lack of information, and perceived discrimination. Solis, Marks, Garcia, and Shelton (1990) also reported that speaking English has an important effect on Hispanic consumers' preventive care behavior. They argued that language represents an access factor and that the ability to speak English increases the extent to which Hispanics can attain institutional access effectively.

Though no empirical evidence for education exists in the literature, it is possible that the same kinds of barriers apply to Hispanic consumers' access to education. There is no literature which suggests reasons to explain the low budget share for tobacco by Hispanic consumers.

Implications

The results of this study have important theoretical and practical implications. This research has proposed a conceptual framework to study the relationship between ethnicity and household budget allocation patterns. The results support the hypothesis based upon the proposed conceptual framework.

This study also has practical implications for public policy, consumer education, and marketing research. To improve service to Hispanic consumers, public policy designed to enhance the likelihood of Hispanic consumers' learning the English language is crucial. English language education should be made available to Hispanic consumers, especially to those with low socioeconomic status. Hospitals and educational institutions should have bi-lingual staff in order to

enhance accessibility to Hispanic consumers. Public education also is needed to teach the general public to be aware of and to respect Hispanic culture and, therefore, to reduce and eventually eliminate racial discrimination in society.

For consumer educators and financial planners, an understanding of the unique economic behavior of Hispanic consumers is the first step toward improving service for Hispanic consumers. When helping Hispanic consumers who have acquired excessive debt, it is crucial to consider their culture and tradition when making financial suggestions.

Due to high birth and immigration rates, the Hispanic market is considered the leading growth market in the United States. The results of this study can be beneficial for marketing practice. By understanding and recognizing ethnic differences in budget allocation patterns, marketing managers can identify market segments for products and communicate information to specific market segments to increase market efficiency, especially in areas where the proportion of minority population is high. In addition, special consumer needs can be identified, and product design can be customized for Hispanic consumers.

Limitations and Suggestions for Future Research

This study is subject to several limitations. First, the price data, incorporated into the CE data as control variables, are imperfect. Given that the expenditure categories are highly aggregated, consumers are very likely to shop in different stores, buy different combinations of commodities of the same category, and, therefore, pay different prices. In research, there is a tradeoff between obtaining an overall picture of household expenditure pattern and obtaining expenditure information on specific commodities. Future research should approach from both perspectives and test the same hypothesis using aggregated *and* non-aggregated commodities. Second, although there are reasons to believe that Hispanic households share many common characteristics, empirical studies also have shown that considerable diversity exists within this ethnic group. The sample size in this study does not allow division of the sample by country of origin. Also, the degree of language barriers and cultural association are not measured directly because the data set does not provide information about whether the Hispanic household is first, second, third, or other generation immigrants. Comprehensive data are desirable to allow

researchers to look further at the dynamics of ethnic effects on consumer economic behavior. Future research also is needed to employ different demand systems in order to eliminate possible bias caused by model specification.

Notes

1. Research conducted by Deshpande et al. (1986) grouped Hispanics into two categories. One group was the strong Hispanic identifiers which identified themselves as "very strongly" or "strongly" with their ethnic group (p. 216). The second group was the weak Hispanic identifiers which did not identify strongly with their ethnic group. Deshpande et al. (1986) referred to this measure as Strength of Ethnic Identification. Explanations were not provided as to why non-Hispanic White respondents were not grouped into the same two categories as their Hispanic counterparts.
2. From page 222 (Maddala, 1983), we have

$$\begin{aligned}
 E(y_i) &= Prob(y_i > 0) * E(y_i | y_i > 0) + Prob(y_i \leq 0) * E(y_i | y_i \leq 0) \\
 &= \Phi_i \Sigma \beta_{ih} X_h + \sigma_i \varphi_i \\
 &= \Sigma \beta_{ih} X_h [1 - (1 - \Phi_i)] + \sigma_i \varphi_i \\
 &= \Sigma \beta_{ih} X_h - \sigma_i (1 - \Phi_i) (\Sigma \beta_{ih} X_h / \sigma) + \sigma_i \varphi_i \\
 &= \Sigma \beta_{ih} X_h + \sigma_i [\varphi_i - (1 - \Phi_i) \sum_{h=1}^n \tau_{ih} X_h],
 \end{aligned}$$

using $\sum_{h=1}^n \tau_{ih} X_h$ as an estimate for $\Sigma \beta_{ih} X_h / \sigma_i$. This approach is similar to Greene (1990, pp. 729, 732). However, Greene's formula appears to contain a mistake.

3. Asymptotic X^2 tests were performed to test the homogeneity and symmetry restrictions (Judge, Hill, Griffiths, Luetkepohl, & Lee, 1988, page 458; SAS/ETS User's Guide: Version 6, page 64–65). Both restrictions were not rejected at $\alpha = 10\%$ level (p-values were 0.5 for homogeneity and 0.5 for symmetry).

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Appendix

Descriptions of Expenditure Categories

Variables	Description
Food at home	(1) Food and non-alcoholic beverages at grocery stores; (2) Food and non-alcoholic beverages at convenience or specialty stores; (3) Food prepared by consumer units on trips.
Food away from home	(1) Food on board, including at school; (2) Catered affairs; (3) Food on out-of-town trips; (4) Dining out at restaurants, etc. (excluding alcoholic beverages); (5) Meals received as pay; (6) School meals.
Shelter	(1) Rent of dwelling, including parking fees; (2) Lodging away from home; (3) Housing for someone at school; (4) Ground rent; (5) Fire and extended coverage; (6) Homeowner's insurance; (7) Property taxes; (8) Mortgage interest; (9) Penalty charges on special or lump-sum mortgage payment; (10) Parking; (11) Repair or maintenance services; (12) Contractor's labor and material costs; (13) Construction materials; (14) Management and upkeep services for security; (15) Tenants' insurance; (16) Rent received as pay.
Fuel and utilities	(1) Fuel oil; (2) Gas, bottled or tank; (3) Coal; (4) Wood and other fuels; (5) Electricity; (6) Natural gas; (7) Telephone services; (8) Water and sewerage services; (9) Trash and garbage collection; (10) Septic tank cleaning.
Household equipment and operation	(1) Household textiles including linens, curtains, drapes, slipcovers, and decorative pillows; (2) Household furniture includes living room, dining room, bedroom, nursery furniture, porch, lawn, and other outdoor furniture; (3) Floor covering includes installation and replacement of wall-to-wall carpets, room size rugs and other soft floor coverings; (4) Household appliance and other equipments; (5) Baby sitters, day care fees, care of invalids, house cleaning, and maintenance; (6) Other households services include termite and pest control products, repair of household appliances and other household equipment, furniture repair, rental and repair of lawn and garden tools, rental of other household equipment.
Apparel	(1) Men's, boys', women's, and girls' apparel; (2) Footwear; (3) Other apparel products and services.
Entertainment	(1) Fees and admissions; (2) Television, radio, sound equipment; (3) Other entertainment supplies; (4) Subscriptions for newspapers, magazines, and book and record clubs.
Transportation	(1) Vehicle maintenance and repair; (2) Gasoline and motor oil; (3) Vehicle insurance; (4) Vehicle rent; (5) Public transportation.
Health care	(1) Health insurance; (2) Medical services; (3) Prescription drugs and medical supplies.

APPENDIX (Continued)

Variables	Description
Education	(1) Books; (2) School supplies; (3) Tuition.
Alcohol	(1) Alcoholic beverage at home; (2) Alcoholic beverage away from home.
Tobacco	(1) Tobacco products.
Personal care	(1) Electric personal care appliances; (2) Personal care services; (3) Rent or repair of electric personal care appliances, wigs, and hairpieces.