Ethnic Differences in the Demand for Physician and Hospital Utilization among Older Adults in Major American Cities: Conspicuous Evidence of Considerable Inequalities

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SCHOLARS INTERESTED IN THE USE OF HEALTH services by elderly Americans have for some time called for the recognition of the marked heterogeneity that exists in the aged's health behavior (e.g., Kovar 1977, 1986; Shanas and Maddox 1985; Soldo and Manton 1985). Although that call has been heard, it has not been heeded (Wolinsky and Arnold 1988). In addition to lingering vestiges of the more general age/homogeneity assumption, which asserts that all elderly exhibit the same health behavior, more specific but equally troubling homogeneity assumptions remain intact.

A regretfully notable example in the gerontological literature of the latter is the "cutting the deck" (or analysis of variance) approach (see Wolinsky and Arnold 1988, 74) that has traditionally surrounded the role of ethnicity. Indeed, Jackson (1967, 1985) has noted that despite long-standing evidence in the social sciences of the general importance of ethnicity to other outcomes, such as fertility, voting, and occupa-

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tional attainment, its incorporation into causal models of the elderly's behavior is a rather recent phenomenon characterized by three developmental periods. Prior to 1960 nonwhites were simply excluded from the analyses. During the 1960s and 1970s whites were compared and contrasted with blacks (typically by the inclusion of a single dichotomous variable tapping only additive effects), with nonwhite/nonblack individuals excluded from the analysis. By the late 1970s growing interest in the Hispanic subpopulation led to a racially based trichotomy of whites, blacks, and Hispanics. Although this represented an advance of sorts (if only by expanding the number of cuts made in the deck), it resulted in what may be called a Hispanic homogeneity trap. It assumed that the marked cultural diversity within the Hispanic subpopulation was relatively unimportant.

This assumption, particularly in regard to the use of health services among older adults, is erroneous (see U.S. Department of Health and Human Services 1985). For example, Travino and Moss (1984) have shown that the annual rate of physician utilization ranges from a low of 6.6 among Puerto Rican elderly to a high of 10.8 among Cuban elderly. And Schur, Bernstein, and Berk (1987) have shown that among those with a usual source of care, 83.2 percent of Cubans receive their care in a doctor's office, compared to 48.9 percent of Puerto Ricans. Thus, it would seem prudent to disaggregate the Hispanic subpopulation into three more culturally distinct groups. This disaggregation would result in five subpopulations for comparative purposes: Puerto Rican, Cuban, Mexican, black, and Anglo-Americans. To date, no studies have been published using this approach to examine either the additive (as traditionally modeled) or interactive (and theoretically more plausible) effects of ethnicity on the use of health services by elderly Americans.

The purpose of this article is to provide the initial report on just such a study. Its basic design involves the estimation of the behavioral model of health services utilization separately within each of the five ethnic subpopulations of elderly Americans. The overall fit and individual parameter estimates (including a set of dummy variables to differentiate between middle age, preretirement, young-old, old-old, and oldest-old individuals) are then compared and contrasted. This approach permits the identification of both the additive (revealed by differences in the intercepts) and interactive (revealed by differences in the regression coefficients) effects of ethnicity on the contact and vol-

ume measures of physician and hospital utilization available in the Health Interview Surveys (HISs) conducted by the National Center for Health Statistics (NCHS).

Conceptual Model

The Behavioral Model of Health Services Utilization

The behavioral model of health services utilization was first presented by Andersen in 1968, and subsequently revised with his colleagues (Aday and Andersen 1974, 1975; Aday, Andersen, and Fleming 1980; Aday, Fleming, and Andersen 1984; Andersen and Newman 1973). Because it is one of the better-known conceptual frameworks within which the demand for health care has been assessed, it need not be described here at great length (for a detailed, historical review, including its application to the special case of the elderly, see Wolinsky 1990). Basically, the behavioral model views the use of health services as a function of the predisposing, enabling, and need characteristics of the individual.

The predisposing component reflects the fact that some individuals have a greater propensity to use health services than others. Based on current characteristics, such propensities can be predicted prior to the onset of a specific illness episode. The predisposing component is further subdivided into three dimensions, including demographics, social structure, and health beliefs. The demographics dimension is typically measured by age, sex, marital status, and family size. These indicators tap the individual's relative life-cycle position. The social structural dimension is typically measured by employment, education, and ethnicity. These characteristics tap the individual's location in the social structure and the behavioral patterns (i.e., lifestyles) to which people in such positions become socialized. In addition, these characteristics are also thought to influence one's life chances. The health beliefs dimension is typically measured by a series of questions about attitudes toward medical care, physicians, and disease. When taken together, the three dimensions of the predisposing component represent the sociocultural element of the behavioral model.

The enabling component reflects the fact that although the individual

may be predisposed to use health services, he or she must nonetheless have some means for obtaining them. It is the enabling component, then, that contains those factors which make health services available to the individual for consumption. This component is further subdivided into two dimensions. The first consists of familial resources. It is typically measured by income, the presence of health insurance, and having a regular source of care. These measures tap the individual's ability to provide for him or herself. The second dimension consists of community resources. They are important because an individual's ability to pay for health care is relevant only if there are appropriate services that can be conveniently purchased. Typical indicators of community resources are physician- and hospital-bed-to-population ratios, as well as the geographic location and population density of the place of residence. When taken together, the two dimensions of the enabling component represent the economic element of the behavioral model.

Although the predisposing and enabling components are necessary conditions for the use of health services, they are not sufficient ones. To use health services, the individual must have or perceive some illness (or its possibility). This need is the most immediate cause of health services use. Need is further subdivided into two dimensions. The first represents the amount of illness that the individual perceives exists. It is typically measured by a self-assessed, global measure of health status. In contrast, the second dimension represents professionally evaluated need. In the absence of physicians' assessments, activity limitations due to health reasons are routinely used as oblique proxies for evaluated need in large-scale surveys. It has been shown that, especially among the elderly, limited activity provides a more objective assessment of need than perceived health, which yields a more global and subjective evaluation (see Liang 1986; Wolinsky et al. 1984). When taken together, these indicators tap the individual's recognition that a health problem either exists or is in the making.

The last component of the behavioral model is the outcome of primary interest—the use of health services. Andersen (1968) identified two types of utilization behavior in which individuals engage: discretionary and nondiscretionary behavior. The former represents those health services whose use is primarily a function of individual choice. In contrast, the latter represents those health services whose use is primarily determined by the health care provider. Discretion in health services utilization can be seen as a continuum. An example from the

most discretionary end would be going to see the dentist. Such decisions are most likely to be a function of the individual's values and available income. In contrast, an example from the least discretionary end would be whether an individual is hospitalized. Such decisions are most likely to be made by the physician, acting as a fiduciary agent for the individual. Physician utilization falls somewhere on the discretionary side of the middle, because initial visits for an illness episode will likely be a function of perceived need (a decision made by the individual), while follow-up visits (of which there are generally fewer) will likely be a function of the practice pattern of the provider (i.e., a decision made by the physician). Thus, one would expect that the salience of the predisposing and enabling components would be at their peak for discretionary utilization, and at their ebb for nondiscretionary utilization.

The Special Case of the Elderly

Ward (1978, 1985) has argued that the behavioral model is particularly relevant for studying the health and social services utilization of the elderly subpopulation. He notes two important reasons. First, the model identifies mutable factors that facilitate the discussion and formation of public policy. Second, there are significant correlations between the sociodemographic factors and the use of health services among the elderly. Thus, Ward argues that gerontological health services research could significantly benefit from the adoption of the behavioral model.

Despite this relevance, Ward (1978) also identifies two important shortcomings in applying the behavioral model to the special case of the elderly. The first of these involves the failure to consider how organizational factors associated with the bureaucratic nature of service delivery settings can serve as a barrier to utilization. In particular, Ward suggests that because older people are more cautious and fatalistic, it may be harder for them to penetrate the bureaucracies associated with the remarkably fragmented American health care delivery system. The second shortcoming is that social networks are not given much of a role in the behavioral model. Because research on the elderly suggests that these networks might contribute significantly to the decision to use health services, Ward argues that the "lay referral" system needs to be included.

Similarly, McKinlay (1985) and Wolinsky et al. (1983) also raise some issues about the straightforward application of the behavioral model to the special case of the elderly. They express some concern that predominantly demographic models may not be as appropriate as more psychosocial models for the aged population (see also Rakowski and Hickey 1980). In a somewhat different vein, Wolinsky and Coe (1984) suggest, and present preliminary evidence to the effect, that the behavioral model's economic component may have lost much of its salience in the wake of Medicaid and Medicare. That is, they posit that these federal entitlement programs may have leveled much of the discriminating ability of socioeconomic status.

Nonetheless, the behavioral model has become the dominant paradigm for studying the health and health behavior of the elderly. Indeed, during the 1980s numerous studies have used the behavioral model (for a detailed review see Wolinsky and Arnold 1988). In general, these studies find that: (1) the need characteristics are the major determinants of the use of health services; (2) the amount of variance explained by the model is not large (R^2 of less than .25); and, (3) the effects of the predisposing and enabling characteristics are quite modest, if not substantively unimportant (contribution to overall R^2 of less than .05). Moreover, the behavioral model has explained less of the variance in the elderly's use of health services than it has for the general population in the United States.

Modifications That Facilitate Assessing Ethnic Differentials in Health Services Use

Although the behavioral model has been used to study the health and health behavior of elderly Americans with some success, two further modifications would considerably facilitate its use in assessing ethnic differentials. The first involves the manner in which ethnicity is incorporated into the model. Traditionally, ethnicity has been included as one of the indicators of the social structural dimension of the predisposing component. In typical regression analyses, this amounts to one (or a set of) dichotomous variable(s) whose parameter estimates reflect additive differences between ethnic groups. Such analyses assume that the effects of the other predisposing, enabling, and need characteristics are the same for each of the ethnic groups under study. That

assumption ignores the accumulated evidence of how different causal structures emerge when various outcomes are assessed within separate ethnic groups (Jackson 1985).

One way to avoid this problem is first to drop ethnicity from the regression analysis, and then estimate the behavioral model separately among the different ethnic groups. Using this approach, the additive effects of ethnicity can be determined by comparing and contrasting the intercepts obtained for each ethnic group. This strategy yields essentially the same information as the more traditional approach described above. In addition, it allows the interactive effects to be determined. This is done by comparing and contrasting the regression coefficients for the same independent variables (such as age, income, or perceived health) across the different ethnic groups. Thus, the approach that we use allows the tacit assumption of equivalent effects across ethnic groups to be submitted to empirical testing.

The second modification of the behavioral model that would facilitate assessing ethnic differentials in health services utilization involves the measurement of the community-level resources of the enabling component. In the traditional approach this is accomplished using physician- and hospital-bed-to-population ratios, as well as the geographic location and population density of the place of residence. Although these indicators do tap the availability of resources to the community as a whole, they are insensitive to the degree of access that any particular ethnic group may have. And as Ward (1978) has noted, the "culture" of the health care delivery system may serve as a barrier to the use of services.

One way to compensate for this problem is to introduce ethnicity-specific indicators of the health care resources available in the community. Such an approach would be based on Blau's work describing how the social structure of communities influences the interaction among and between the members of its various subpopulations (see Blau 1977, 1982; Blau, Beeker, and Fitzpatrick 1984; Rytina et al. 1988). Blau and his colleagues argue that the relative frequency of all types of intergroup relationships depends on the opportunities for contact which exist between or among the groups. These opportunities are determined by the structure of the society, as reflected in the degree of relative participation of the various subpopulations.

With regard to health care, this suggests that the use of health services by members of a particular ethnic group will be sensitive to the

number of its members who work in the health care delivery system, and the nature (or prestige) of their employment therein (see Aguirre et al. 1989). Thus, the proportional representation of ethnic groups among physicians and the degree of ethnic concentration in any particular health care occupation(s), such as ancillary workers, would likely be more central to ferreting out ethnic differentials in the demand for health services than would more general access measures. Moreover, the identification of any significant effects of ethnic-specific supply factors on the use of health services would have considerable implications for health manpower policy.

Method

Design

The design of this study involves the estimation of the behavioral model of health services utilization, as modified above, separately within each of the five ethnic subpopulations. To provide sufficiently large samples, the 1976 through 1984 Health Interview Surveys (HISs) conducted by the National Center for Health Statistics (NCHS) were pooled. To ensure that no biases were introduced by this procedure, a set of dummy variables was used to estimate period effects on an annual basis. Their inclusion (not shown here) did not alter the effects of the predisposing, enabling, and need characteristics on health services utilization. Accordingly, the pooling procedure does not jeopardize the analysis presented here or its subsequent interpretation.

The pooling procedure resulted in a data set consisting of 998 Puerto Rican, 1,183 Cuban-, 2,329 Mexican-, 12,096 black, and 93,491 Anglo-Americans aged 45 years or more who resided in the 31 largest standard metropolitan statistical areas (SMSAs), and for whom only one major racial or ethnic background code had been entered. The study is restricted to major American cities because they are the smallest local areas identified in the HIS public-use tapes that facilitate subsequent linkage to U.S. Census Bureau and other data sources on the areal characteristics of the local health care delivery systems. From this HIS-based data set, disproportionate stratified random sampling based on ethnicity was performed in order to obtain working files of approximately 1,000 respondents representative of each subpopulation, and

thus reduce computational expenses. The resulting samples included 877 Puerto Rican, 1,003 Cuban-, 1,026 Mexican-, 1,128 black, and 991 Anglo-Americans on whom complete information was available. Because our focus is on the comparison of parameter estimates across ethnic subpopulations, the data are not differentially weighted.

The HIS is an ongoing annual survey that first began in 1956 as authorized by P.I. 84-652. To this day, the HIS remains the principal source of all "official" statistics on the health and health services utilization of the United States. A detailed description of the history, design, and logistics of the HISs can be found in several readily available publications of the National Center for Health Statistics (1975, 1985) under whose jurisdiction it falls. Suffice it to say here that the HIS's multistage sampling process results in 52 weekly replicated samples. These are pooled at the end of the calendar year, providing data on the approximately 110,000 individuals who reside in the 42,000 selected households. This pooled sample is fully representative of all individuals from all places during all seasons. It is, therefore, unnecessary to adjust the pooled data for seasonal and geographic fluctuations.

Data

Table 1 contains the means, standard deviations, and coding algorithms of the predisposing, enabling, need, and utilization measures by ethnic group. The measures of the predisposing characteristics include sex (being female), marital status (being widowed), education, employment status, family size (living alone), an index of age culture (i.e., the proportion of the respondent's same ethnic group in the SMSA that are of the same age grade), and a set of dummy variables differentiating age grades (the omitted or reference category is middle age [45 to 54 years old]). All of these measures are taken from the HISs, with the exception of the age-culture index, which is used to reflect the existence of an ethnic-specific age subculture (Rose 1965). It was compiled from the U.S. Census Bureau's *Current Population Characteristics* series.

The measures of the enabling characteristics include having a telephone, family income, and whether or not one lives in the central city of the SMSA. Those measures are taken from the HISs. The remaining measures of the enabling characteristics were taken or derived from three alternative sources. Hospital bed and primary care physician sup-

ply data were extracted from the Bureau of Health Professions' *Area Resource File*, which is a compendium of data aggregated at the SMSA and county level. Both of these measures are expressed per 1,000 residents of the SMSA. The percentage of the respondent's ethnic group in the SMSA with incomes falling below one-half of the median Anglo income in that SMSA was derived from the U.S. Census Bureau's *Detailed Population Characteristics* series, and is used as an indicator of relative socioeconomic inequality (see Plotnick 1975).

The two remaining measures of the enabling characteristics were constructed from a special analysis of ethnic-specific health manpower estimates derived from the 1980 decennial census (see Kapantais 1985). One of these is the relative, proportional representation of physicians in the SMSA whose ethnicity matches that of the respondent. This index is calculated by normalizing the percentage of physicians in a particular SMSA who are (for example) black to the percentage of blacks in that SMSA. The resultant proportion becomes the value used for blacks, with similar computations used to obtain the values for the respondents of other ethnicities. Because the census data do not permit further disaggregation of the Hispanic subpopulation, the aggregate, relative Hispanic proportions are used as proxies for the Puerto Rican, Cuban, and Mexican-American subpopulations.

The other measure of the enabling characteristics is the concentration of the respondent's ethnic group in the SMSA in the 19 health care occupations listed in the 1980 decennial census. This index is calculated by first converting the ethnic-specific frequency distributions into proportional distributions. Then, a standard concentration formula (see Loether and McTavish 1975) is applied to compute the index value, which ranges between 0 (reflecting full concentration in just one occupation) and 1 (reflecting relative deconcentration). Both the proportional representation of physicians and occupational concentration indices are used to tap the cultural affinity of the local health care delivery system for the respondent's ethnic group. We expect that (a) the greater the proportional representation of the ethnic group among physicians, and (b) the more diversely the ethnic group is represented within the 19 health care occupations, the more likely its members will be to use health services, and to use them more often (see Aguirre et al. 1989).

The need characteristics are measured by two indicators. One is the respondent's perceived health status. The other is the existence of lim-

TABLE 1
Means, Standard Deviations (in parentheses), and Coding Algorithms of the Predisposing, Enabling, Need, and Utilization Measures, by Ethnic Group

Variable	Coding algorithm	Ethnic group: Puerto Rican	Cuban	Mexican	Black	Anglo
Predisposing characteristics						
Female	1 = yes 0 = no	.534 (.499)	.556 (.497)	.533 (.499)	.580 (.494)	.547 (.498)
Widowed	1 = yes 0 = no	.123 (.329)	.132 (.338)	.108 (.311)	.206 (.404)	.134 (.341)
Education	number of years	7.311 (4.346)	9.559 (4.247)	7.775 (4.438)	9.687 (3.718)	11.714 (3.211)
Employed	1 = yes 0 = no	.387 (.487)	.451 (.498)	.515 (.500)	.461 (.499)	.481 (.500)
Lives alone	1 = yes 0 = no	.147 (.355)	.123 (.328)	.094 (.293)	.200 (.400)	.164 (.370)
Age culture	see note A	.071 (.027)	.084 (.038)	.056 (.022)	.072 (.024)	.096 (.024)
Age group 2	1 = 55–64 years 0 = other age	.281 (.449)	.294 (.456)	.284 (.451)	.332 (.471)	.336 (.472)
Age group 3	1 = 65–74 years 0 = other age	.135 (.342)	.244 (.430)	.120 (.325)	.191 (.393)	.225 (.418)
Age group 4	1 = 75–84 years 0 = other age	.029 (.168)	.087 (.282)	.052 (.221)	.070 (.256)	.092 (.289)
Age group 5	1 = 85 or older 0 = other age	.012 (.109)	.014 (.116)	.012 (.109)	.017 (.130)	.019 (.136)
Enabling characteristics						
Telephone	1 = yes 0 = no	.809 (.394)	.941 (.236)	.929 (.257)	.926 (.262)	.969 (.173)
Income	$10,000s of 1979 dollars	1.097 (.699)	1.222 (.732)	1.375 (.705)	1.169 (.783)	1.610 (.785)
Central city of SMSA	1 = yes 0 = no	.737 (.440)	.453 (.498)	.428 (.495)	.799 (.401)	.309 (.462)
Percentage below 1/2 of the median white income	see note B	.444 (.093)	.363 (.083)	.296 (.050)	.450 (.054)	.234 (.039)
Hospital bed supply	short-term beds/1,000	5.020 (.429)	5.463 (.617)	4.323 (.562)	4.875 (.658)	4.804 (.715)
Primary care physician supply	physicians/ 1,000	.210 (.050)	.328 (.114)	.267 (.039)	.208 (.059)	.224 (.059)

continued

TABLE 1 (Continued)

Variable	Coding algorithm	Ethnic group: Puerto Rican	Cuban	Mexican	Black	Anglo
Enabling characteristics (continued)						
Proportional representation of physicians by ethnicity	see note C	.616 (.816)	.839 (.800)	.397 (.528)	.300 (.098)	1.217 (.148)
Occupational concentration in health care by ethnicity	see note D	.893 (.019)	.909 (.030)	.867 (.027)	.785 (.050)	.905 (.012)
Need characteristics						
Limited activity due to health	1 = some 0 = none	.379 (.485)	.268 (.443)	.257 (.437)	.353 (.478)	.278 (.448)
Perceived health status	1 = excellent or good 0 = fair or poor	.579 (.494)	.730 (.444)	.734 (.442)	.624 (.484)	.799 (.401)
Utilization measures						
Physician contact in past year	1 = yes 0 = no	.775 (.418)	.757 (.429)	.659 (.474)	.763 (.426)	.755 (.430)
Volume of physician visits	actual number of visits among users, truncated at 13 or more	6.340 (4.749)	5.393 (4.450)	4.955 (4.333)	5.642 (4.338)	4.621 (4.000)
Hospital contact in past year	1 = yes 0 = no	.156 (.363)	.123 (.329)	.103 (.304)	.135 (.342)	.129 (.335)
Volume of hospital nights	actual number of nights among users, truncated at 15 or more	9.833 (4.965)	8.096 (4.745)	7.836 (4.959)	9.613 (4.912)	7.881 (5.000)

Notes: A. Proportion of the respondent's same ethnic group in the SMSA that are of the same age group (i.e., 45–54, 55–64, 65–74, and 75 or more).

B. Proportion of the respondent's same ethnic group in the SMSA that are below one-half of the median income of Anglos in that SMSA.

C. Relative proportional representation in the occupational category of physicians of the respondent's same ethnic group in the SMSA (i.e., proportion of same ethnicity physicians in the SMSA/proportion of same ethnicity residents in the SMSA).

D. Concentration of the respondent's same ethnic group in the SMSA in the 19 health care occupations, where 0 equals maximum concentration (i.e., limited to only one occupation), and 1 equals an uninhibited distribution (i.e., equivalent across the 19 occupations).

ited activity due to health reasons. Following current standards (see Wolinsky and Arnold 1988), both are dichotomized. They reflect the recognition of some underlying health problem(s) warranting (or at least stimulating) the use of services.

Physician and hospital utilization are measured by both contact and volume indicators. The contact measures indicate whether a physician was seen (or a night was spent in the hospital) during the 12 months preceding the interview. The volume measures indicate how many physician visits occurred (or nights were spent in the hospital) during the same period. Following current standards (see Wolinsky and Arnold 1988), the analysis of the volume measures are restricted to those who had one or more visits to the doctor (or nights spent in the hospital). To adjust for the positively skewed distributions, the volume measures are truncated such that 13 or more visits to the doctor are statistically treated as 13 visits, and 15 or more nights spent in the hospital are statistically treated as 15 nights (see Wolinsky and Coe 1984).

Statistical Issues

Two aspects of the statistical method used herein warrant further comment. First, a careful preliminary analysis was made to determine that the assumptions of ordinary least squares (OLS) regression had not been violated. This included examining all univariate, bivariate, and multivariate relationships for distributive normalcy, additivity, linearity, and multicollinearity. Standard procedures (Hartwig and Dearing 1979; Heise 1975; Lewis-Beck 1981) revealed no significant, patterned violations of those statistical assumptions. Accordingly, we are confident about the parameter estimates obtained.

Second, we use OLS techniques on the dichotomous physician and hospital contact measures. Although other strategies have been developed to increase the efficiency of OLS regression with dichotomous outcomes, they were not selected for the following reason. It has long been shown that when the dependent dichotomy ranges between 0.25 and 0.75 in reasonably large samples (i.e., approaching 1,000 or more), logistic and OLS regression do not differ substantially (Goodman 1975; Knoke 1975). Moreover, Gilbert (1981) and Cleary and Angel (1984) have more recently reported evidence that the "safe" range is most likely as large as 0.10 to 0.90 in such samples. Therefore, given the minimal split on the two contact measures of .22 and .10 (for physician

and hospital contact, respectively), and the minimal sample size (for those analyses) of 877, we are confident about the robustness of the parameter estimates. Nonetheless, because the hospital contact measure is at the margin, we replicated that model using probit analysis. The results (not shown here) are entirely consistent with the OLS estimates reported below.

Results

Ethnic Differences in the Overall Fit of the Model

Table 2 contains the explained variances (R^2) obtained from the hierarchical application of the predisposing, enabling, and need characteristics of the behavioral model to the contact and volume measures of physician and hospital utilization. Consistent with the causal sequence specified in the behavioral model (Wolinsky 1978), the need characteristics are entered into the equation first, followed by the enabling characteristics on the second step, and by the predisposing characteristics on the final step.

Physician Contact. Panel A of table 2 contains the results from modeling physician contact. An important pattern clearly emerges. For all of the minority subpopulations the need characteristics explain 2.6 to 3.5 times as much of the variance in physician contact as they do for the Anglo majority. Moreover, for all of the minority subpopulations, the need characteristics by themselves explain more than the need, enabling, and predisposing characteristics combined do for the Anglo subpopulation. Furthermore, when all three sets of characteristics are taken into consideration, nearly twice as much of the variance in physician contact is explained for all of the minority groups than is explained for the majority group, which is primarily due to the differential importance of need.

There are potentially two plausible interpretations of this differential impact of the need characteristics on physician contact rates across these ethnic subpopulations. One is that the two measures of need—activity limitations due to health reasons and perceived health status—mean remarkably different things to minority individuals than they do to majority individuals (see Angel and Gronfein 1988). This interpretation,

TABLE 2
Explained Variances (R^2) Obtained from the Hierarchical Application of the Need (N), Enabling (E), and Predisposing (P) Characteristics of the Behavioral Model to the Contact and Volume Measures of Physician and Hospital Utilization, by Ethnic Group*

Ethnic group	Number of cases	R^2 levels obtained at each model stage		
		N	$N + E$	$N + E + P$
A. Physician contact				
Puerto Rican	877	.084	.092	.107
Cuban	1,003	.068	.073	.092
Mexican	1,026	.065	.075	.107
Black	1,128	.062	.069	.094
Anglo	991	.024	.030	.054
B. Number of physician visits				
Puerto Rican	690	.283	.310	.328
Cuban	769	.194	.222	.275
Mexican	672	.256	.269	.276
Black	872	.172	.177	.212
Anglo	758	.134	.142	.154
C. Hospital contact				
Puerto Rican	877	.066	.082	.097
Cuban	1,003	.028	.038	.049
Mexican	1,026	.056	.061	.070
Black	1,128	.063	.069	.084
Anglo	991	.059	.063	.068
D. Number of hospital nights				
Puerto Rican	137	.122	.214	.267
Cuban	130	.029	.107	.227
Mexican	105	.092	.152	.229
Black	155	.109	.163	.206
Anglo	132	.170	.281	.313

* Consistent with current standards in the field, only those respondents with physician (or hospital) contact are included in the analysis of the volume of physician (or hospital) utilization (see Wolinsky and Arnold 1988).

however, appears unlikely in this case. The consistency of the differential across the dissimilar cultural minorities is simply too marked.

The alternative interpretation which we favor is that the differential impact of the need characteristics reflects the fact that minority individ-

uals' contact with physicians is both more predictable, in general, and more predictably dependent, in particular, on need than is that of majority individuals. Whether or not an older Anglo-American adult sees a physician during a given 12-month period is more random and less related to need than it is for older minority Americans. This indicates that the health behavior of minority elderly is more constrained (i.e., primarily reactive). And that implies considerable inequalities in the health care delivery system, regardless of the origin of the constraints.

To avoid confusion, we note here that in the original interpretation of the behavioral model, the greater predictive power of the need characteristics was taken to be indicative of a more equitable health care delivery system (see Andersen 1968). In noncomparative analyses of an entire population, that interpretation remains accurate. Our focus, however, is on the differential predictive power of the need characteristics across the ethnic subpopulations. Any such occurrences reflect inequalities. In these data, those inequalities favor Anglo-Americans.

Physician Visits. A very similar pattern emerges from the results of modeling the number of physician visits (among those with at least one visit), as shown in panel B of table 2. The need characteristics explain 1.3 to 2.1 times as much of the variance in the volume of physician utilization for minority elderly as they do for majority elderly. Moreover, for all of the minority subpopulations, the need characteristics by themselves explain more of the variance than the predisposing, enabling, and need characteristics combined do for the Anglo subpopulation. And when all of the characteristics are included, they explain 1.4 to 2.1 times as much of the variance in the number of physician visits among the minority subpopulations as they do among the Anglo subpopulation.

The most plausible interpretation of this pattern is, again, that the volume of physician utilization among minority elderly is both more predictable, in general, and more predictively dependent, in particular, on their need for health care than it is for their Anglo counterparts. Although the annual number of physician visits is much less of a random factor among older Anglo adults than whether they have any physician contact at all, it is still a relatively more random factor than that among older minority adults. Thus, when taken together, the first two panels of table 2 clearly record that older minority adults use physician services much more consistently in response to need than do older Anglo adults. Again, this pattern of the differential predictive power of

the need characteristics is interpreted as conspicuous evidence of considerable inequalities in the health care delivery system.

Hospital Contact. The results reveal rather different patterns with respect to hospital utilization. Panel C of table 2 contains the results from modeling hospital contact. Here, the only significant difference involves the more random behavior of the Cuban subpopulation in comparison to the others. Although the need characteristics alone account for at least 5.6 percent of the variance in hospital contract for each of the other subpopulations, need accounts for less than 3 percent of the variance among the Cuban-Americans. Similarly, although the predisposing, enabling, and need characteristics combined account for at least 7 percent of the variance for each of the other subpopulations, these same factors account for less than 5 percent of the variance among the Cuban-Americans. Thus, at all stages in the hierarchical modeling process for hospital contact, the behavioral model exhibits more limited utility among the Cuban subpopulation.

Hospital Nights. Panel D of table 2 contains the results of modeling the number of nights spent in the hospital (among those spending at least one night there). Although the interpretation of these data must be more tentative given the markedly reduced sample sizes, an interesting two-part story does emerge. The first part involves the Cuban subpopulation. Here again, the need characteristics are relatively unimportant predictors, explaining less than 3 percent of the variance, compared to at least 9 and as much as 17 percent of the variance for the other subpopulations. Similarly, although the introduction of the enabling characteristics brings the explained variance up to 10.7 percent for the Cuban subpopulation, the comparable levels for the other ethnic groups range from 15.2 to 28.1 percent. The introduction of the predisposing characteristics, however, is another matter. They bring the explained variance for the Cuban subpopulation up to 22.7 percent, which is much more in line with that of the others. Thus, the predisposing characteristics are far more important for the Cuban subpopulation in both absolute and relative terms. Further discussion or interpretation of whether this occurs because the predisposing characteristics have larger or more consistent effects among Cuban-Americans must await the examination (see below) of the individual parameter estimates.

The second part of the pattern to panel D involves the Anglo subpopulation. For them, both the need and the enabling characteristics

are considerably more important than they are for the other ethnic groups. Either separately or in combination, the need and enabling characteristics account for at least one-third more of the variance among the Anglo subpopulation than among the other ethnic groups. Further discussion or interpretation of whether this occurs because the need and enabling characteristics have larger or more consistent effects among Anglo-Americans must also await the subsequent examination of the individual parameter estimates.

Reconciling the Differences. At first glance the different results shown in table 2 may appear somewhat confusing. That is, although there is consistent and conspicuous evidence of ethnic differentials favoring the Anglo subpopulation with respect to physician utilization, this is not the case for hospital utilization. These results can, however, be brought into sharper focus by recalling that hospital utilization is nondiscretionary, and that physician utilization, although mixed, has much more of a discretionary element to it. Thus, when the characteristics and attendant attributes of the individual are more important, as in physician utilization, the use of health services by minority elderly is far more sensitive to need than it is for majority elderly. In contrast, when the decision to use health services is most likely to be up to the judgment of the physician, as in hospital utilization, the use of health services is rather comparable across the ethnic subpopulations. This general pattern appears to be consistent with the long-standing assumption suggesting that minority elderly may either be more likely (a) to delay seeking a physician's care until their health conditions necessitate it, or (b) not to seek a physician's care for less-serious maladies compared to their majority counterparts (see Riessman 1974; Stahl and Gardner 1976). Either case would produce results much like those shown in panels A and B of table 2. That is, to delay seeking care until it is mandatory, or to decide not to seek care for minor ailments strengthens the causal link between the need characteristics and physician utilization because it reduces the variability of the response to need. This is especially true here inasmuch as the dichotomous measures of the need characteristics maximize the contrast between those in good vs. poor health.

The Emergent Theme. A single theme emerges from these data. There is conspicuous evidence of considerable inequalities across ethnic subpopulations in the demand for health services among older Americans. The need characteristics explain 2.6 to 3.5 times as much of the

variance in the number of physician visits for the minority subpopulations as they do for the Anglo majority. This means that physician utilization for minority elderly is more dependent on and sensitive to need than it is for majority elderly. The most plausible interpretation of this evidence is that the health behavior of minority elderly is more constrained, leaving them with fewer options.

Although the nature of those constraints cannot be distilled from these data, all conceivable explanations involve the recognition that minority elderly are disadvantaged relative to their Anglo counterparts. Indeed, the recognition of the relative disadvantage of minority elderly holds regardless of whether the explanation of the differential is assumed to lie in health beliefs and behavior (cf. Stahl and Gardner 1976; Wolinsky 1982), methodological artifacts in health status assessment (cf. Andersen, Mullner, and Cornelius 1987; Angel and Gronfein 1988; Manton, Patrick, and Johnson 1987), or economic and cultural access barriers (cf. Davis et al. 1987; Long 1987; Wilkinson and King 1987). Unfortunately, there is no easy way to reduce these differentials, inasmuch as they cannot be dealt with in isolation from the discontinuities and inequities that permeate our ethnically stratified society (see Miller 1987).

Ethnic Differences in the Effects of the Predisposing, Enabling, and Need Characteristics

Tables 3, 4, 5, and 6 contain, respectively, the unstandardized regression coefficients and their standard errors obtained from modeling physician contact, the number of physician visits, hospital contact, and the number of nights spent in the hospital separately for each of the ethnic subpopulations. Following standard conventions, asterisks indicate whether these coefficients are significantly different from zero at the 0.5 level or beyond. Note, however, that our focus is on differences in these regression coefficients across the ethnic subpopulations. Statistically significant ethnic differences exist when the regression coefficient for a given independent variable on a particular dependent variable in one subpopulation falls outside of the 95 percent confidence interval (defined as +/− 1.96 standard errors) of the regression coefficient for the same independent variable on that same dependent variable in another subpopulation, and vice versa. Thus, our analysis focuses on

within-row comparisons of the regression coefficients and their standard errors.

Using an example from table 3, the parameter estimates associated with being female when predicting physician contact for both Puerto Rican and Anglo-Americans fall outside of the 95 percent confidence interval of the regression coefficient associated with being female among Mexican-Americans, and vice versa. Thus, although being female has a statistically significant, positive effect on physician contact for each of the ethnic subpopulations, among Mexican-Americans that effect is statistically greater than it is among Puerto Rican and Anglo-Americans. Female Mexican-Americans are more likely to have contacted a physician during the past 12 months than are female Puerto Rican or Anglo-Americans. In contrast, the effects of being female among Cuban or black Americans are no different than those among their Puerto Rican, Mexican, or Anglo counterparts.

In the above example, all of the regression coefficients were significantly different from zero. This does not have to occur, however, for the differences between the coefficients to be significant. Indeed, significant ethnic differences can occur even when the effect of a given variable is not significantly different from zero in any of the subpopulations. Using another example from table 3, consider the effects of being in the old-old age group (ages 75 to 84) vs. the omitted category of being middle-aged on physician contact. Although this effect is not significant for any ethnic group, the noneffect (i.e., insignificant coefficient) for Mexican-Americans significantly differs from the noneffects for the Cuban, black, and Anglo subpopulations, and the noneffect for the Anglo group is significantly different from that of the Puerto Rican subpopulation. Therefore, old-old Anglo-Americans have significantly more physician visits than do their Mexican and Puerto Rican American counterparts.

All possible ethnic comparisons involving the coefficients shown in tables 3, 4, 5, and 6 (and their 95 percent confidence intervals, which for simplicity are not shown in the tables) were made both manually and by computer algorithm. Given space constraints and a desire for clarity, however, only those reflecting meaningful substantive themes have been selected for discussion here. There are five major ethnic differences that meet this criterion. These include: (1) differences in the relation between limited activity and the number of physician visits; (2) the relation between age-group membership and the number of physi-

TABLE 3
Unstandardized Regression Coefficients (and their standard errors in parentheses) Obtained from Modeling Physician Contact, by Ethnic Group

Independent variable	Ethnic group				
	Puerto Rican	Cuban	Mexican	Black	Anglo
Predisposing characteristics					
Female	.076**	.098***	.137***	.091***	.071*
	(.029)	(.029)	(.031)	(.027)	(.030)
Widowed	−.037	.010	.038	.013	−.031
	(.048)	(.046)	(.055)	(.034)	(.049)
Education	−.002	.000	.001	.009*	.007
	(.004)	(.003)	(.004)	(.004)	(.005)
Employed	.023	.023	.043	−.002	−.011
	(.036)	(.035)	(.036)	(.032)	(.034)
Lives alone	.041	−.059	.048	.084**	.062
	(.043)	(.047)	(.055)	(.034)	(.045)
Age culture	−1.166	.274	−5.290**	1.333	.201
	(1.555)	(1.628)	(2.075)	(1.502)	(1.397)
Age group 2	−.042	.010	−.128	.034	.071*
	(.061)	(.064)	(.069)	(.040)	(.034)
Age group 3	.034	.082	−.183	.052	.105
	(.100)	(.102)	(.116)	(.079)	(.064)
Age group 4	−.108	.157	−.256	.127	.186
	(.147)	(.150)	(.145)	(.116)	(.101)
Age group 5	−.158	.011	−.156	.116	.027
	(.174)	(.175)	(.188)	(.143)	(.139)
Enabling characteristics					
Telephone	.060	.016	.116*	.019	.076
	(.038)	(.058)	(.057)	(.048)	(.079)
Income	.005	−.014	.046	.053**	.057**
	(.025)	(.022)	(.024)	(.020)	(.022)
Central city residence	−.029	−.008	−.035	.013	.014
	(.036)	(.027)	(.030)	(.031)	(.030)

continued

TABLE 3 (Continued)

Independent variable	Ethnic group				
	Puerto Rican	Cuban	Mexican	Black	Anglo
Enabling characteristics (continued)					
Percentage below 1/2 median Anglo income	.408 (.233)	.025 (.280)	.020 (.322)	.161 (.254)	.271 (.464)
Hospital bed supply	.006 (.041)	−.044 (.046)	−.013 (.031)	−.007 (.023)	−.002 (.021)
Primary care physician supply	.404 (.425)	.093 (.330)	−.427 (.500)	.081 (.217)	−.074 (.249)
Proportional representation of physicians	.027 (.020)	.012 (.023)	.008 (.036)	.217 (.162)	−.175 (.122)
Occupational concentration in health care	−.011 (.881)	−.398 (.866)	−.068 (.650)	−.358 (.316)	.628 (1.491)
Need characteristics					
Limited activity	.187*** (.035)	.135*** (.036)	.178*** (.039)	.176*** (.032)	.114*** (.034)
Perceived health status	−.104** (.033)	−.126*** (.035)	−.141*** (.037)	−.123*** (.030)	−.089* (.038)
Intercept	.488 (.722)	1.243 (.682)	1.038 (.670)	.568 (.326)	.024 (1.325)
R^2	.107	.092	.107	.094	.054
N of cases	877	1,003	1,026	1,128	991

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

cian visits among black Americans; (3) differences in the relation between perceived health and hospital contact; (4) differences in the intercepts for the number of nights spent in the hospital; and (5) differences in the relation between limited activity and the number of

TABLE 4
Unstandardized Regression Coefficients (and their standard errors in parentheses) Obtained from Modeling the Number of Physician Visits (among those with visits), by Ethnic Group

Independent variable	Ethnic group				
	Puerto Rican	Cuban	Mexican	Black	Anglo
Predisposing characteristics					
Female	.408	.009	−.024	.202	.383
	(.327)	(.308)	(.321)	(.290)	(.302)
Widowed	.161	.185	−.412	.708	−.583
	(.522)	(.477)	(.517)	(.369)	(.489)
Education	−.081	−.111**	−.006	−.076	.029
	(.042)	(.037)	(.036)	(.042)	(.050)
Employed	−.690	−1.460***	−.092	−.938**	−.091
	(.404)	(.380)	(.372)	(.357)	(.349)
Lives alone	−.031	.747	.229	.499	.092
	(.469)	(.505)	(.549)	(.363)	(.447)
Age culture	−10.359	−2.303	23.624	61.488***	−2.568
	(18.913)	(16.882)	(24.303)	(16.378)	(13.957)
Age group 2	−.727	.178	1.106	.997*	.142
	(.696)	(.668)	(.765)	(.439)	(.352)
Age group 3	−.122	.756	1.769	2.401**	.539
	(1.131)	(1.057)	(1.305)	(.872)	(.645)
Age group 4	−.845	.260	2.556	3.936**	.764
	(1.645)	(1.539)	(1.585)	(1.262)	(.999)
Age group 5	−4.744*	.332	.902	4.344**	2.402
	(1.948)	(1.787)	(1.882)	(1.513)	(1.402)
Enabling characteristics					
Telephone	.470	−1.081	.909	.642	.959
	(.425)	(.623)	(.653)	(.527)	(.844)
Income	−.902**	.289	−.096	.182	.120
	(.286)	(.233)	(.244)	(.222)	(.219)
Central city residence	−.246	.871**	.301	.140	.053
	(.410)	(.290)	(.314)	(.341)	(.299)

continued

TABLE 4 (Continued)

Independent variable	Ethnic group: Puerto Rican	Cuban	Mexican	Black	Anglo
Enabling characteristics (continued)					
Percentage below 1/2 median Anglo income	−1.372 (2.747)	2.586 (2.884)	−6.394 (3.405)	−2.845 (2.785)	−3.303 (4.673)
Hospital bed supply	−.476 (.470)	−.901* (.465)	−.160 (.318)	−.235 (.247)	.121 (.212)
Primary care physician supply	−.061 (4.966)	2.895 (3.427)	1.432 (5.548)	2.343 (2.418)	.005 (2.457)
Proportional representation of physicians	.065 (.217)	−.024 (.229)	.262 (.392)	.678 (1.756)	2.241 (1.230)
Occupational concentration in health care	13.051 (10.129)	6.432 (8.790)	6.174 (6.961)	.087 (3.464)	1.263 (14.929)
Need characteristics					
Limited activity	2.425*** (.374)	1.571*** (.355)	2.995*** (.380)	1.598*** (.342)	1.589*** (.332)
Perceived health status	−2.479*** (.369)	−1.943*** (.360)	−2.172*** (.362)	−2.085*** (.316)	−2.349*** (.369)
Intercept	.374 (8.249)	5.091 (7.021)	−.565 (7.657)	2.087 (3.549)	.617 (13.252)
R^2	.328	.275	.276	.212	.154
N of cases	690	769	672	872	758

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

TABLE 5
Unstandardized Regression Coefficients (and their standard errors in parentheses) Obtained from Modeling Hospital Contact, by Ethnic Group

Independent variable	Ethnic group				
	Puerto Rican	Cuban	Mexican	Black	Anglo
Predisposing characteristics					
Female	−.032	−.008	.014	−.024	−.008
	(.026)	(.023)	(.020)	(.022)	(.023)
Widowed	.041	.010	−.025	.012	.011
	(.042)	(.036)	(.036)	(.028)	(.038)
Education	−.005	.001	.000	.009**	.000
	(.003)	(.003)	(.002)	(.003)	(.004)
Employed	−.023	−.031	−.021	−.054*	−.022
	(.031)	(.027)	(.023)	(.026)	(.026)
Lives alone	−.000	.067	.060	.039	−.013
	(.038)	(.037)	(.036)	(.028)	(.035)
Age culture	.830	2.151	−1.055	1.036	.529
	(1.359)	(1.277)	(1.360)	(1.215)	(1.081)
Age group 2	−.036	.073	−.003	.046	.005
	(.053)	(.050)	(.045)	(.033)	(.026)
Age group 3	−.059	.140	−.004	.080	.034
	(.088)	(.080)	(.076)	(.064)	(.049)
Age group 4	.075	.192	−.047	.101	.037
	(.128)	(.118)	(.095)	(.094)	(.078)
Age group 5	−.158	.248	−.027	.036	.159
	(.152)	(.137)	(.123)	(.116)	(.108)
Enabling characteristics					
Telephone	.036	−.042	.025	−.014	−.072
	(.033)	(.046)	(.038)	(.039)	(.061)
Income	−.044*	.010	−.002	.029	.013
	(.022)	(.017)	(.016)	(.016)	(.017)
Central city residence	−.088**	.018	−.022	.041	.022
	(.031)	(.021)	(.020)	(.025)	(.023)
Percentage below 1/2 median Anglo income	−.377	.005	−.030	−.091	.145
	(.203)	(.219)	(.211)	(.206)	(.359)

continued

TABLE 5 (Continued)

Independent variable	Ethnic group				
	Puerto Rican	Cuban	Mexican	Black	Anglo
Enabling characteristics (continued)					
Hospital bed supply	.006	−.025	.015	−.000	.012
	(.036)	(.036)	(.020)	(.018)	(.017)
Primary care physician supply	−.543	−.277	−.182	−.165	.036
	(.371)	(.259)	(.328)	(.175)	(.192)
Proportional representation of physicians	.004	.024	.016	.050	−.003
	(.018)	(.018)	(.024)	(.131)	(.094)
Occupational concentration in health care	.724	−.240	.093	−.095	.318
	(.770)	(.680)	(.426)	(.255)	(1.153)
Need characteristics					
Limited activity	.133***	.090***	.101***	.084**	.094***
	(.030)	(.028)	(.026)	(.026)	(.027)
Perceived health status	−.061*	−.025	−.063**	−.123***	−.126***
	(.029)	(.028)	(.024)	(.024)	(.030)
Intercept	−.160	.299	.079	.091	−.199
	(.631)	(.535)	(.439)	(.264)	(1.025)
R^2	.097	.049	.070	.084	.068
N of cases	877	1,003	1,026	1,128	991

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

nights spent in the hospital. (The interested reader can obtain a more detailed and complete review of the results by writing to the senior author.)

Limited Activity and the Number of Physician Visits. Ethnic differences in the effects of limited activity on the number of physician visits is the first theme. Although significant effects were found for each eth-

TABLE 6
Unstandardized Regression Coefficients (and their standard errors in parentheses) Obtained from Modeling the Number of Nights Spent in the Hospital (among those with hospital episodes), by Ethnic Group

Independent variable	Ethnic group				
	Puerto Rican	Cuban	Mexican	Black	Anglo
Predisposing characteristics					
Female	−.847	−1.157	−2.292*	−.289	.315
	(.869)	(.909)	(1.089)	(.888)	(1.001)
Widowed	−.086	3.897**	−.061	−.500	−.713
	(1.353)	(1.286)	(1.633)	(1.113)	(1.375)
Education	−.089	−.158	.085	.078	.165
	(.121)	(.104)	(.127)	(.114)	(.144)
Employed	.082	−.294	.264	−.450	−.139
	(1.094)	(1.194)	(1.284)	(1.184)	(1.184)
Lives alone	.550	−2.146	2.557	−.076	.436
	(1.270)	(1.327)	(1.615)	(1.041)	(1.388)
Age culture	−.942	−32.023	−8.154	−60.932	2.667
	(46.574)	(47.559)	(97.563)	(51.886)	(43.483)
Age group 2	.901	.343	.249	.089	.758
	(1.841)	(1.990)	(2.987)	(1.288)	(1.164)
Age group 3	1.266	−2.018	.793	−1.285	.730
	(2.807)	(3.054)	(5.068)	(2.666)	(1.968)
Age group 4	−1.985	−4.860	.173	−3.160	1.937
	(3.976)	(4.260)	(6.263)	(3.937)	(3.006)
Age group 5	10.493	−5.207	−1.732	2.038	−1.514
	(6.978)	(4.550)	(7.117)	(4.706)	(3.569)
Enabling characteristics					
Telephone	−.127	−.372	2.771	−2.212	.158
	(1.138)	(1.654)	(2.208)	(1.517)	(1.974)
Income	.409	.085	.815	.228	−.494
	(.924)	(.713)	(.923)	(.648)	(.695)
Central city residence	2.257*	.851	−.511	−.667	.223
	(1.093)	(.895)	(1.039)	(1.185)	(.878)
Percentage below 1/2 median Anglo income	10.264	5.740	−7.888	−14.114	−16.295
	(6.657)	(10.954)	(11.717)	(8.388)	(15.526)

continued

TABLE 6 (Continued)

Independent variable	Ethnic group				
	Puerto Rican	Cuban	Mexican	Black	Anglo
Enabling characteristics (continued)					
Hospital bed supply	.715	−4.254**	−.624	−.412	2.144**
	(1.326)	(1.623)	(1.174)	(.752)	(.706)
Primary care physician supply	10.500	15.400	2.416	−6.367	−.539
	(12.927)	(12.139)	(22.630)	(7.143)	(7.608)
Proportional representation of physicians	.685	1.547	.185	−3.743	−3.598
	(.725)	(.906)	(1.284)	(5.128)	(3.791)
Occupational concentration in health care	−68.100*	62.338*	35.600	−11.862	131.419**
	(31.317)	(26.572)	(28.474)	(10.122)	(49.610)
Need characteristics					
Limited activity	2.142*	.012	1.740	1.730	4.339***
	(1.094)	(.952)	(1.247)	(1.038)	(.974)
Perceived health status	−2.314*	−1.340	−1.844	−1.965*	−.573
	(1.042)	(.928)	(1.131)	(.953)	(1.029)
Intercept	58.246*	−27.546	−27.134	36.083**	−117.264**
	(26.204)	(20.389)	(35.417)	(11.260)	(43.504)
R^2	.267	.227	.229	.206	.313
N of cases	137	130	105	155	132

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$.

nic subpopulation, the effects for Puerto Rican and Mexican-Americans were significantly larger than those for Cuban, black, and Anglo-Americans. The magnitude of those differences, approximately one physician visit per person per year, is also substantively important. It is not clear from these data, however, what such differentials represent. The interpretation that we favor is that among the Hispanic subpopula-

tions, Puerto Rican and Mexican-Americans face greater socioeconomic disadvantages than their Cuban-American counterparts, because a disproportionately larger number of the latter are émigrés with professional backgrounds. As a result, Puerto Rican and Mexican-Americans may find themselves in more physically oriented and lower-paying occupations that accrue fewer and less substantial retirement benefits. And if the vicious relation between lower socioeconomic status, greater incidence of acute illnesses leading to chronic conditions, and subsequent downward drift in socioeconomic status holds (see Wolinsky 1988), this would make them more likely to consume physicians' services in response to health-related activity limitations, and to remain in the labor force longer than Cuban-Americans.

Age-Group Membership and Physician Visits among Blacks. The second theme involves the effects of age-group membership among blacks on the number of physician visits. Relative to the middle-aged referents, the preretirement, young-old, old-old, and oldest-old black Americans have progressively and significantly greater numbers of physician visits (by 1.0, 2.4, 3.9, and 4.3 visits, respectively). Not only is this pattern unique among the ethnic groups, with only one exception there are no significant age-group effects of any sort among any of the other ethnic subpopulations. Thus, age is a salient factor only for elderly black Americans. This may reflect the more intense levels of age-graded morbidity thought to exist among black elderly. That is, within age-groups, elderly black Americans are presumed to be overrepresented in terms of more serious and limiting health problems. This is unlikely to be adequately captured by reliance on the standard indices of need included in the HISs because of their poor sensitivity to severity (see Manton, Patrick, and Johnson 1987). If this is the case, then the findings presented herein actually underestimate the magnitude of the ethnic differentials in the effect of need on the demand for health services.

Perceived Health and Hospital Contact. Differences in the effect of perceived health on hospital contact constitute the third theme. Significant effects, such that those who perceive their health to be problematic are more likely to be hospitalized, are found for all but the Cuban subpopulation. The magnitude of the effects for black and Anglo-Americans, however, is significantly greater than it is for Puerto Rican and Mexican-Americans. This differential, and its interpretation, is remarkably consistent with that described above for the effects of

limited activity. Whereas Puerto Rican and Mexican-Americans are more likely to consume more physician visits when their physical activity is limited (presumably because of socioeconomic-related dependencies on their need to work in the more physically based occupations to which they have greatest access), they are significantly less likely than their Anglo and black counterparts to be hospitalized based on their self-assessed health status, net of their physical activity limitations. That is, because of their disadvantaged status (which is not adequately captured by the crude economic indicators used herein), Puerto Rican and Mexican-Americans do not have the luxury of responding as readily to health problems that do not result in limitations in their physical activity as do their Anglo and black counterparts.

The Intercepts for the Number of Nights Spent in the Hospital. The fourth theme involves the differences in the intercepts obtained from modeling the number of nights spent in the hospital. These intercepts indicate that, all other things being equal, and relative to their Cuban and Mexican-American counterparts, Puerto Rican and black Americans have longer, average, annually aggregated lengths of stay when hospitalized, and Anglo-Americans have shorter such stays. Two interpretations, both consistent with those presented above involving differences in the effects of limited activity and perceived health, appear somewhat plausible. One is that these differences reflect the greater severity of conditions for which Puerto Rican and black Americans are hospitalized, in contrast to Anglo-Americans being hospitalized for less-severe health problems. This would be consistent with Manton, Patrick, and Johnson's (1987) lament that the case mix of health problems faced by black Americans, and presumably also by Puerto Rican Americans, is not adequately captured by the standard need indices available in the HISs. Thus, those effects emerge here as differences between the intercepts. The other interpretation is that because of these differences in the case mix of health problems, black and Puerto Rican Americans may have more hospital episodes than their Anglo counterparts. Unfortunately, the limited number of cases with multiple hospital episodes effectively precludes such an assessment in these data. The plausibility of both of these interpretations, however, is limited by the fact that it is Puerto Rican and black Americans who are disadvantaged with respect to hospital episodes, not Puerto Rican and Mexican-Americans as was consistently the case with respect to physician utilization.

Limited Activity and the Number of Nights Spent in the Hospital. Differences in the effects of limited activity on the number of nights spent in the hospital is the fifth theme. Significant effects, such that limitations in physical activity resulted in spending more nights in the hospital, were found for Puerto Rican and Anglo-Americans. Only the effect for Anglos, however, significantly differed from the noneffects obtained from the Cuban, Mexican, and black subpopulations. Moreover, the effect for Anglo-Americans was significantly greater than the effect for Puerto Rican Americans. This indicates that, for all intent and purposes, limited activity is only associated with the duration of hospital stays for Anglo-Americans. As such, it probably reflects their greater relative socioeconomic status (again, not well captured by the crude measures available in the HISs) that provides them with more opportunity to remain in the hospital longer when they are admitted for conditions having concomitant limited activity. Such an interpretation (essentially involving a third-order interaction between limited activity, socioeconomic status, and being an Anglo-American) is entirely consistent with Wilkinson and King's (1987) cogent discussion on understanding the commingled effects obtained when race is used as a predictor variable.

Discussion

Four issues emerge from the results presented above that warrant further discussion. The first involves the absence of any support for Blau's (1977, 1982; Blau, Beeker, and Fitzpatrick 1984; Rytina et al. 1988) theory. Based on his logic, we had expected an individual's use of health services to be sensitive to the participation and concentration rates of that individual's ethnic group in the various health care occupations. This, however, was not the case. Indeed, the proportional representation of physicians failed to register a significant effect for any ethnic subpopulation on any measure of health services utilization. Moreover, the occupational concentration index yielded a significant effect among Puerto Rican, Cuban, and Anglo-Americans, but only on the number of nights spent in the hospital. And those effects were marginal, and of inconsistent sign.

There are two possible explanations of the failure to demonstrate empirical support for Blau's theory. The first is that the theory does not

hold, or at least that it does not hold with respect to health services utilization. The former is unlikely, inasmuch as some evidence already exists to support the application of the theory to rates of intermarriage (see Blau, Beeker, and Fitzpatrick 1984; Rytina et al. 1988). Therefore, the theory cannot be globally refuted. Although the latter possibility is more plausible, we do not favor it either. The application of the theory to the use of health services merely represents the substitution of different outcomes of interest. And there is no a priori reason to expect that health services utilization uniquely lies beyond the scope of the theory (see Aguirre et al. 1989). What then plausibly accounts for the absence of empirical support for the theory in these data? We believe that the answer lies in the crudity with which the participation and concentration measures have been constructed. That crudity lies not with the operationalization process, but with the catchment area. We were forced to use participation and concentration rates at the SMSA level, because that is the smallest areal unit for which such data are currently available. SMSA-based rates may not be sufficiently sensitive to reflect an individual's real access to providers from his or her ethnic group. A more accurate assessment in future studies might involve constructing those rates at the neighborhood level.

The second issue that warrants further discussion is the absence of equitable access to health care. Aday and Andersen (1981) have argued that if the major (if not sole) predictors of health services utilization are the need characteristics, then the health care delivery system is most equitable. Under such circumstances, equity is approximated because the people who need health services are the ones who are using them. In previous studies, Aday and her associates have consistently found that this is fundamentally the case. And on the basis of those findings, they have concluded that no new programs targeted to any particular social groups are necessary to relieve any remaining inequities (see Aday, Andersen, and Fleming 1980; Aday, Fleming, and Andersen 1984).

The data presented here show that the need characteristics are, indeed, the primary determinants of health services use. At the same time, however, these data show very clearly that need is far more important in predicting the demand for physicians' services among minority elderly than it is among majority elderly. And that differential predictability means that access to the health care delivery system is inequitable. Thus, despite the assertions of Aday and her colleagues to

the contrary, there is sufficient evidence to warrant the development of new programs targeted toward the elimination of the access inequities faced by minority elderly. The successful elimination of those ethnically based inequities would be reflected in equivalent coefficients (both unstandardized regression and multiple correlation coefficients) subsequently obtained across the ethnic subpopulations.

The third issue that warrants further discussion involves the complexity of resolving the observed inequality in access to the health care delivery system. Miller (1987) has noted that ethnically based inequalities in health and health behavior cannot be considered apart from similar differentials in other aspects of American life. That is, he argues that inequalities like those documented here are unfortunately nested within the larger pattern of inequalities that permeate all social institutions. As a result, reducing or eliminating the ethnically based differentials in health services utilization requires addressing the underlying issues of "poverty, deprivation, and social exclusion" (Miller 1987, S500) that are embedded in American society.

Because those issues are not likely to be addressed in the current political climate, Miller (1987) reluctantly, pragmatically, and ironically proposes more limited changes directly targeted toward the health care delivery system. He advocates extending and expanding Medicaid services (i.e., raising income eligibility limits and encouraging the use of primary and preventive services) coupled with mandatory employer provision of medical insurance (regardless of firm size). As important as such modifications would be, however, Miller notes that they would only serve to maintain the dual system of health care coverage currently in place. Moreover, the additional costs of such changes are not likely to be well received in the current economic climate. Therefore, it is unlikely that these inequalities will be resolved in the near future.

The fourth issue that warrants further discussion involves the implications for accepting ethnic heterogeneity. Jackson (1967) has long documented differences in health beliefs and health behaviors between elderly Anglo and black Americans. More recently (Jackson 1985), she has encouraged the tripartite comparison of Anglo, black, and Hispanic Americans. Travino and Moss (1984), and Schur, Bernstein, and Berk (1987), however, have shown that the dramatic variation in the use of health services by Puerto Rican, Cuban, and Mexican Americans is concealed when these groups are left aggregated under the broad rubric of Hispanic Americans. In consort with their findings, the results pre-

sented here underscore the need to consider the health and health behavior of the five different ethnic groups separately. Not only are there ethnic differences in the use of health services, there are also important ethnic differences in the determinants of such health behavior.

Focusing on five rather than three ethnic groups, however, merely results in "cutting the deck" a few more times (see Wolinsky and Arnold 1988). That is, it continues to honor the tacit assumption that homogeneity of health behavior exists within ethnic groups. Accordingly, it merely asserts that we have not yet discovered the right way and number of cuts to make in the deck. Such logic assumes uniformity in cultural continuity and ignores the individual variations in culturally transmitted health beliefs and behavior that are related to factors like ethnic identification, period and circumstances of immigration, and assimilation status (see Gelfand 1982; Petersen 1987). Without taking these and other issues that focus on the heterogeneity within any social grouping of individuals into account, future research on ethnic differences in health and health behavior will have limited utility.

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