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The Demand for Individual Housing Attributes

INTRODUCTION

The analyses presented in Chapter 6 consider the determinants of total housing expenditures by St. Louis households. A major theme of this book, however, is that housing services are not a single-valued commodity. Housing units are probably as heterogeneous as households, and heterogeneous households appear to demand specific housing attributes or collections of housing attributes. Consequently, it is more meaningful to view the demand for housing as the demand for a collection of distinct attributes than as the demand for a single homogeneous commodity.

This chapter presents single-equation estimates of household demand for individual attributes. The quantities of particular attributes consumed by households depend on household income and on several socioeconomic variables which describe their size, structure, and employment status. Household income describes the household's budget constraint, the general limitation of its consumption of both housing and other goods. In general, the socioeconomic variables describing family structure are interpreted as measures of the household's tastes for the various attributes of housing services. The socioeconomic variables used to describe the household are the same as those used in predicting household decisions to move, and to purchase or rent in Chapter 4, and in the full model of housing expenditures in Chapter 6.[1]

[1]A serious omission from the demand functions presented in this chapter is the price of housing attributes, their complements, and substitutes. Prices are seldom included in cross-section studies, because intrametropolitan prices for specific attributes are difficult to observe and quantify. Several related NBER studies are exceptions to this convention. These studies have analyzed variations in "gross prices" by workplace and income class. As noted in Chapter 2, the concept of the gross price of housing incorporates both the travel and housing (contract) costs incurred in consuming housing. Thus, the price of housing

The analysis in this chapter considers household demand for twenty-one separate housing attributes and deals extensively with the important differences in black housing consumption resulting from racial discrimination in housing markets.

Ours is not the first attempt to analyze the demand for housing attributes. Martin David gave limited recognition to the heterogeneity of both the housing stock and household demand for housing services in his analysis of 847 renter and 697 owner-occupant households from the 1955 Survey of Consumer Finances.[2] David obtained ordinary least-squares estimates for two measures of housing services: housing quantity measured by the number of rooms; and housing quality measured by rent per room. His analysis indicates that the consumption of these two dimensions of housing services responded differently to variations in income and family size. In particular, his findings indicate that households: (1) spend less on housing at each level of income as family size increases; and (2) that this reduction is achieved by consuming less housing quality while increasing consumption of quantity.

EMPIRICAL ANALYSES OF THE DEMAND FOR HOUSING ATTRIBUTES

Single-equation estimates have been obtained by least-squares for all of the twenty-one attributes or components of the bundle of residential services included in the value and rent equations in Chapter 8. These

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attributes defined in this manner varies with the workplace location of the occupant. These differences in anticipated housing and transportation costs for consuming different types of housing can be used in traditional econometric demand functions. See Gregory K. Ingram, John F. Kain, and J. Royce Ginn, *The Detroit Prototype of the NBER Urban Simulation Model* (New York: National Bureau of Economic Research, 1973), Chap. 8 ("Tests of Gross Price Effects and Estimation of Submarket Demand Parameters") and Appendix B ("The Choice of Housing Types by San Francisco Households"); Gregory K. Ingram, "A Simulation Model of a Metropolitan Housing Market" (Ph.D. diss., Harvard University, 1971); John M. Quigley, "Residential Location: Multiple Workplaces and a Heterogeneous Housing Stock" (Ph.D. diss., Harvard University, 1972).

Chapter 8 of the Ingram-Kain-Ginn volume summarizes research by Stephen K. Dresch based on Detroit households, and Appendix B presents research by H. James Brown and John F. Kain for a sample of San Francisco households. Ingram's research is based on an analysis of the housing choices of Pittsburgh households.

By comparison with related NBER studies, the smaller size of the present St. Louis sample, its relatively limited geographic coverage, its oversampling of poverty households—and especially the oversampling of black households—make it impractical for us to include intrametropolitan variations in housing prices in our demand equations. Some compensation for this omission is provided by a more elaborate description of the housing bundles actually consumed by the households included in this sample.

[2]Martin David, *Family Composition and Consumption* (Amsterdam: North-Holland Publishing Co., 1962).

twenty-one housing attributes include five measures of dwelling-unit quality and amenity, four measures of dwelling-unit and parcel size, seven variables that describe the quality of the neighborhood and of services provided, and five structure types.

The empirical analyses of the demand for individual housing attributes can be divided logically into two parts. First, we present attribute demand equations for a pooled sample of owner and renter households. We include in this pooled sample all renters and all owners of multifamily units, as well as owners of single detached housing. The second section considers the effects of housing market discrimination on the demand for housing attributes by black households. Because of the evidence, presented in Chapters 5 and 6, that racial discrimination distorts black tenure decisions, this analysis, which involves the estimation of separate attribute demand equations for black and white households, is also based on pooled owner and renter samples. Appendix G presents a companion discussion of attribute demand equations estimated separately for owners and renters.

The sample of renters used for the ordinary least-squares estimates of the demand for housing attributes is the same as that used in Chapter 7 for the housing expenditure models. Both the pooled sample and the separate white and black samples include the owner-occupants of multifamily units in addition to the owner-occupants of single detached units used to estimate the expenditure models.

There is one further complication. Data on the achievement levels of neighborhood schools and the number of reported crimes are not available for suburban properties. Therefore, the demand equations for school quality and crime are based on central-city households only. No statistical problems arise from this different treatment of these two attributes, since the assumption of independence of demand for individual attributes justifies the use of different samples in their estimation. Even so, these sample differences should be kept in mind in interpreting the individual equations. Adding the suburban properties increases the total sample size by less than two-hundred observations. However, it adds a disproportionately large amount of information on high-income white households, on high-quality neighborhoods, and on high-quality dwelling units. This is particularly true for the owner-occupant sample.

With one exception, equations are estimated for all twenty-one attributes and for all three samples. First-floor area is only meaningful for single-family units; therefore, the analysis of equations for first-floor area is limited to the sample of owner-occupied single-family units.

A weakness of the attribute demand equations in this chapter is their single-equation character. The ordinary least-squares estimates assume that the demand for each attribute is independent. Yet there is reason to believe that the demands for the several housing attributes are

interrelated. Although we do not fully understand the nature of this interdependence, it appears that some form of simultaneous-equation estimation, in which the demand for the several attributes is jointly determined, would be more appropriate. Chapter 10 presents some limited efforts to deal with these problems of interdependence.

THE DETERMINANTS OF THE DEMAND FOR HOUSING ATTRIBUTES

The variables used to explain the demand for attributes by renters and owner-occupants are nearly the same as those used in the full models of housing expenditure in Chapter 7 and in the models of the decisions to own or rent in Chapter 5. We did, however, omit the number of school-age children and the age of the head for households with children, adding a dummy variable to identify families headed by males forty-five or older. Since the specification already includes dummy variables for families (1) headed by a female less than forty-five, and (2) headed by a female older than forty-five, the reference category (intercept) becomes families with children headed by a male less than forty-five.

All equations are estimated by ordinary least-squares; the simple linear specification is employed throughout, although the family-size variable is expressed in logarithms. The attribute demand equations for owner and renter households are presented in four tables, corresponding to the four categories, or clusters, of housing attributes used in Chapter 8: (1) dwelling-unit quality, (2) size of the dwelling unit and parcel, (3) neighborhood characteristics, and (4) structure types. Table 9-1 presents the means and standard deviations of the attributes for the pooled sample.

The ordinary least-squares estimates that describe the determinants of demand for twenty-one attributes of residential housing—five measures of dwelling-unit quality and amenity, four measures of dwelling-unit size, seven neighborhood attributes, and five structure types—are shown in Table 9-2.

Chapter 8 indicates that all five attributes of dwelling-unit quality are highly valued in the St. Louis housing market. The income coefficients of the attribute demand equations in Table 9-2 indicate that an additional five-thousand dollars of annual income increases household consumption of interior quality by about .13 units (on the index scale 1 to 5) and increases consumption of exterior quality by about .10 units. The attribute prices indicate that an additional unit of interior quality costs about $1.31 per month in the rental market, the market price of exterior

TABLE 9-1
Means and Standard Deviations of Individual Attributes for All Occupied Dwellings

Attributes	Mean	Standard Deviation
Dwelling-unit quality		
Interior	4.06	.69
Exterior	2.64	.62
Newness (year built)	1914	24.28
Hot water	.94	–
Central heating	.79	–
Dwelling-unit size		
Rooms	4.71	2.12
Baths	1.12	.48
First-floor area (000's sq. ft.)[1]	1.08	.44
Parcel area (000's sq. ft.)	4.294	12.161
Neighborhood attributes		
Adjacent units	3.10	.83
Block face	3.16	.90
Median schooling	9.33	1.24
Percent white	65.16	44.71
Miles from CBD	4.52	3.07
School quality[2]	9.79	.60
Crime[2]	9.80	8.16
Structure type		
Single detached	.400	–
Duplex	.024	–
Row house	.048	–
Flat	.305	–
Apartment	.165	–

[1]Single detached units only.
[2]City sample only.

quality being about $4.77 (Table 8-2). Additional income has only a marginal impact on the probability of occupying a unit that has hot water and central heating, probably because virtually all owner-occupied units in this sample possess these amenities. Households with larger incomes consume newer units.

Additional education also increases household demand for the attributes of dwelling-unit quality. Retired households consume more interior and exterior quality and newer units than their incomes and family compositions would suggest. Job stability increases the demand for these attributes very slightly.

TABLE 9-2
Least-Squares Estimates of the Demand for Housing Attributes by All Household

Independent Variables	Dwelling-Unit Quality and Amenity				
	Interior Quality	Exterior Quality	Hot Water	Central Heating	Year Built
Race	−.404[1]	−.529[1]	−.102[1]	−.132[1]	−13.90[1]
Income	.026[1]	.019[1]	.002[4]	.006[2]	.94[1]
Education	.054[1]	.050[1]	.008[1]	.030[1]	1.80[1]
Years on current job	.007[1]	.006[1]	.000	.003[2]	.28[1]
Retired	.206[1]	.138[1]	−.001	.016	6.01[1]
None employed	−.090[4]	−.080[4]	−.050[4]	−.046	−.16
More than one employed	−.009	.018	.015	.046[3]	−2.76[2]
Families					
Number of persons	−.191[1]	−.098[1]	−.007	−.026[4]	−3.45[1]
Female head < 45 years	−.028	−.173[2]	.044[4]	−.041	−3.50[1]
Female head > 45 years	−.027	.082	.026	.155[2]	3.95[1]
Male head > 45 years	.025	.072[4]	.014	.027	5.14[1]
Household types					
Single female < 45 years	−.229[3]	.058	−.048	−.051	−.01
Single female > 45 years	−.103[4]	.052	.012	−.072[4]	.38
Single male < 45 years	−.440[1]	−.221[2]	−.038	−.139[3]	−9.94[2]
Single male > 45 years	−.223[1]	−.141[3]	−.195[1]	−.142[2]	−5.35[1]
Couple, head < 45 years	−.082	.010	−.012	−.037	3.90[1]
Couple, head > 45 years	−.054	.044	.005	.021	−1.00
Constant	2.44[1]	2.155[1]	.877[1]	.482[1]	1894[1]
R^2	.311	.392	.115	.155	.272

In the five demand equations for dwelling-unit quality, 21 of the 30 coefficients representing household types are negative, including 12 of the 13 which are larger than their standard errors. For families with children, increases in family size reduce the demand for these measures of dwelling-unit quality.

Income, education, and retirement are associated with increases in dwelling-unit size, although two of these three coefficients are not significant in the parcel-area equation. These three household characteristics are also strongly associated with increases in demand for the several attributes of housing quality and neighborhood attributes. The relationship is weaker for the public-service attributes—school quality, and neighborhood crime—but this partially reflects the omission of suburban observations, as well as measurement error.

The households' expected distance of residence from the central

Dwelling-Unit Size				Neighborhood Attributes		
Rooms	Baths	Parcel Area	First- Floor Area[6]	Adjacent Units	Block Face	Median Schooling
−.009	.017	−.24	−.092[2]	−.768[1]	−.865[1]	−.390[1]
.122[1]	.031[1]	.75[1]	.037[1]	.024[1]	.029[1]	.060[1]
.061[1]	.011[2]	.05	.007[4]	.054[1]	.068[1]	.085[1]
.016[2]	.002	−.03	.0003	.006[1]	.007[1]	.011[1]
.606[1]	.087[3]	.81	−.025	.162[2]	.133[3]	.344
−.272[4]	−.045	.24	.075	−.005	.055	.028
.222[3]	−.060[2]	−3.29[1]	−.143	−.004	.031	−.073
.836[1]	.167[1]	−2.06[1]	−.013	−.083[3]	−.104[2]	−.271[1]
.072	.142[2]	.64	−.011	−.118[4]	−.106[4]	−.049
.016	.034	1.74	.215[3]	.270[3]	.096	.240[4]
−.800[1]	−.206[1]	−1.01	.108[3]	.099[4]	.102[4]	.380[1]
−.340	.109[4]	−4.77[3]	−.099	−.201[4]	−.119	−.091
−.183	.058[4]	−2.81[2]	.148[3]	−.025	−.024	−.192[4]
−.014	.210[2]	−7.10[1]	−.109	−.320[2]	−.364[2]	−.531[2]
−.136	.032	−3.14[4]	.193[2]	−.182[4]	−.093	−.420[2]
−1.040[1]	−.014	−5.35[1]	.010	−.049	−.033	−.167
−.042	−.006	−4.05[1]	.121[2]	.002	.066	−.266[2]
2.758[1]	.713[1]	3.43[3]	.701[1]	2.624[1]	2.533[1]	8.262[1]
.240	.167	.104	.316	.354	.410	.213

(Continued)

business district increases more than a mile and a half for each thousand-dollar increase in income and each additional year of schooling. Similarly, increases in income and education raise the likelihood of living in single detached housing. This is to be expected, since this structure type is more available in the owner than in the renter market, and since our analysis of home ownership suggests that ownership is more attractive for higher-income households. In addition, retired households are far more likely to occupy single detached units.

The effects of family size and composition on the consumption of dwelling-unit quality, dwelling-unit size, and neighborhood quality are quite consistent. The family-size variables in Table 9-2, however, indicate a clear pattern of substitution of dwelling-unit size for dwelling-unit quality. Similar results are obtained for the separate renter and owner equations in Appendix G. As family size increases, households with

TABLE 9-2 (Concluded)

Independent Variables	Neighborhood Attributes			
	Percent White	Miles from CBD	School Quality[5]	Neighborhood Crime[5]
Race	−86.41[1]	−1.31[1]	−.778[1]	112.8[1]
Income	−.08	.16[1]	.007[4]	.030
Education	.07	.17[1]	−.011[2]	−1.458[2]
Years on current job	.14[2]	.02[2]	.004[2]	−.617[1]
Retired	1.76	.62[2]	.079[4]	−3.364
None employed	−3.66[4]	−.05	−.038	.085
More than one employed	.08	−.35[3]	−.009	−5.915[4]
Families				
Number of persons	−1.77[4]	−.41[2]	−.059[3]	1.845
Female head < 45 years	−.56	−.38	.034	−3.861
Female head > 45 years	.54	.41	.138[4]	31.45[2]
Male head > 45 years	3.04[3]	.80[1]	.039	−2.979
Household types				
Single female < 45 years	−3.00	−1.13[3]	−.068	6.752
Single female > 45 years	−2.10	−.53[4]	−.059	9.617[4]
Single male < 45 years	−8.52[2]	−2.02	−.286[1]	19.47[4]
Single male > 45 years	−7.37[2]	−1.10[2]	−.195[2]	30.32[1]
Couple, head < 45 years	1.75	−.75[3]	−.127[4]	−2.291
Couple, head > 45 years	−2.53[4]	−.57[3]	−.100[3]	−5.721
Constant	94.52[1]	2.43[1]	8.149[1]	71.69[1]
R^2	.851	.241	.442	.503

NOTE: Table notes *1* through *4* indicate significance of *t* ratios for coefficients (two-tailed test).

[1] > .01. [3] > .10. [5] City sample only.

[2] > .05. [4] *t* ratio greater than 1.0. [6] Single detached units only.

children consume less quality of dwelling unit and neighborhood but more rooms. The nonlinear (logarithmic) effects of the number of children suggest that, on the average, an increase in family size from two to four persons increases dwelling-unit size by .58 rooms, a further increase from four to six persons increases dwelling-unit size by .34 rooms, and another increase from six to eight persons increases dwelling-unit size by only .24 rooms.[3] All of the dummy variables describing household types

[3]With the benefit of hindsight, it is fairly evident that we made a mistake in this section of the analysis in using the logarithm of the number of persons to represent the size of families with children. The logarithm was selected on the basis of experimentation with alternative functional forms for the analyses in Chapter 5. Evidence of collinearity led us to modify that specification for the attribute demand equations. Variables reflecting number of

Structure Type				
Single Detached	Duplex	Row House	Flat	Apartment
$-.155^{1}$	$-.018^{3}$	$.051^{1}$	.029	$.043^{3}$
$.012^{1}$	$-.000$	$-.001$	$-.008^{2}$	$-.002$
$.010^{2}$	$-.004^{2}$	$-.006^{2}$	$-.016^{1}$	$.019^{1}$
$.007^{1}$	$-.001^{4}$	$-.001^{4}$	$-.004^{2}$	$-.002^{4}$
$.211^{1}$	$-.014$	$-.022^{4}$	$-.164^{1}$	$-.026$
$-.056$	.007	.022	$-.136^{2}$	$.134^{1}$
$-.038^{4}$	$-.003$	$-.012$	$.048^{4}$	$-.001$
$.050^{3}$	$.019^{3}$	$-.003$	$-.032^{4}$	$-.033^{4}$
$-.062$	$-.032^{4}$	.019	$.085^{4}$	.024
$-.032$	$-.039^{4}$	$-.076^{3}$	$-.084$	.073
$-.056^{4}$	$-.011$	$-.018$	.004	$.094^{1}$
$-.291^{1}$	$.063^{3}$	$-.018$	$-.082$	$.267^{1}$
$-.223^{1}$	.003	$.028^{4}$	$.058^{4}$	$.126^{1}$
$-.227^{2}$	$-.008$	.032	$-.021$	$.190^{1}$
$-.042$	$-.018$	$.111^{1}$	$-.034$	$-.006$
$-.245^{1}$	$.062^{2}$	.002	$-.031$	$.191^{1}$
$-.053^{4}$	.011	$-.009$	$-.018$	$.051^{4}$
$.244^{1}$	$.071^{1}$	$.108^{1}$	$.586^{1}$	$-.074^{4}$
.156	.024	.053	.042	.094

have negative coefficients in the number-of-rooms equations, though only one is statistically significant. That one indicates that young couples consume about one room less than their incomes, education, and labor-force attachments would imply.

children and age were omitted, and a dummy variable was added to identify households headed by males under 45 years of age. In the original specification, including both the number of school-age children and the logarithm of the number of persons, the combined coefficients allowed for a much more progressive effect of increases in family size on housing consumption. The logarithm of the number of persons used in Table 9-2 increases less rapidly than the untransformed variable. We suspect that the effect of increases in family size on housing consumption is probably larger than the coefficients in Table 9-2 indicate.

Parcel area behaves more like a quality variable than a dwelling-unit size variable. Evaluation of the coefficient of the logarithm-of-number-of-persons variable in the parcel-area equation in Table 9-2 reveals that a six-person family consumes 1,428 fewer square feet of parcel area than a three-person family. Single individuals living alone and couples also consume much less parcel area; for example, young single males consume 7,000 fewer square feet of parcel area than the reference household.

The dummy variable for black households reveals consistent differences between races in the consumption of the twenty-one housing attributes measured in our sample of St. Louis households. For all five attributes of dwelling-unit quality and for all six attributes of residential neighborhoods, the race coefficient is large and highly significant statistically. On the basis of the dwelling-unit quality regressions, it would require an additional fifteen-thousand dollars in annual income for black households to offset the differences in consumption of either interior quality or housing age; black households would need an additional twenty-eight-thousand dollars in annual income to offset the differences in exterior quality consumption. The differences are even larger for the measures of neighborhood attributes. Black households with otherwise similar household characteristics are less likely to occupy single detached or duplex housing than whites—a finding that is hardly surprising in light of our analysis of home ownership. However, there appear to be no systematic racial differences in household demand for the measures of dwelling-unit size.

RACIAL DIFFERENCES IN THE DEMAND FOR HOUSING ATTRIBUTES

Analyses presented in Chapter 7 indicate that black renters and owners spend less on housing than white households of similar income, education, labor attachment, and family structure. Similarly, Chapters 5 and 6 have presented evidence that black households are less likely to be homeowners than comparable white households, and that black movers are less likely to purchase homes than comparable white movers. Finally, the race variables in the demand equations presented so far in this chapter consistently bear negative signs, indicating that black households consume less dwelling-unit and neighborhood quality than white households of similar characteristics.

By including dummy variables for the race of the head of the household, the attribute demand equations presented in Table 9-2 test whether there are systematic differences in the consumption of housing

attributes by white and black households. The coefficients of this race dummy indicate that black households consume substantially less dwelling and neighborhood quality than whites, but that there are only small differences in the demand by white and black households for rooms or bathrooms. If a difference exists, it appears that black households consume more of these latter attributes.

Systematic exclusion of black households from white neighborhoods would provide a sufficient explanation for these differences in the behavior of white and black households. As a result of discrimination, the housing supply available to black households may differ systematically from that available to white households of similar income, education, labor-force attachment, family size, and family structure. If black households are systematically excluded from the best neighborhoods, the housing supply available to them simply includes too few high-quality units (Table 9-3).

Use of the race dummy to represent the effects of housing-market discrimination is, of course, quite restrictive. It would be surprising if a pervasive limitation on black residential choice of the kind we have depicted affects black demand for housing services in such a simple way. Therefore, in this section, we follow the convention used in preceding chapters and estimate separate attribute demand equations for black and white households. These separate equations should provide a better understanding of how housing-market discrimination modifies the housing consumption patterns of black households. In addition, they provide a further test of the hypothesis that the most serious impacts on black welfare result from the limitations imposed by discrimination on the types of housing available to black households.

THE DEMAND FOR DWELLING-UNIT QUALITY BY BLACK HOUSEHOLDS

Attribute demand equations for the five measures of the quality of individual dwelling units and structures are presented in Table 9-4 for black and white households. The most striking feature of these equations is the overall consistency in the behavior of black and white households that they indicate. With few exceptions, the effects of income, education, labor-force attachment, family size, and other characteristics of black households on the consumption of housing quality are qualitatively the same as the effects upon white households.

The interior- and exterior-quality equations exhibit highly consistent behavior for black and white households. The constant in both equations for whites is considerably larger than the constant in the

TABLE 9-3
Means and Standard Deviations of Individual Attributes for White and Black Pooled Tenure Types

Attributes	Whites		Blacks	
	Mean	Standard Deviation	Mean	Standard Deviation
Dwelling quality				
Interior	3.25	0.59	2.67	0.72
Exterior	2.86	0.91	2.20	0.84
Newness (year built)	1921	24.82	1902	16.90
Hot water	0.99	-	0.86	-
Central heating	0.85	-	0.67	-
Dwelling-unit size				
Rooms	4.82	2.25	4.49	1.82
Baths	1.14	0.53	1.08	0.38
First-floor area (000's of sq. ft.)[1]	1.69	1.56	2.14	2.47
Parcel area (000's of sq. ft.)	5.18	14.81	2.55	1.88
Neighborhood attributes				
Adjacent units	3.40	0.70	2.50	0.73
Block face	3.51	0.77	2.47	0.72
Median schooling	9.56	1.32	8.89	0.90
Percent white	94.58	16.60	7.62	19.10
Miles from CBD	5.20	3.44	3.19	1.44
School quality[2]	8.29	0.51	7.48	0.36
Crime[2]	53.07	49.40	168.67	71.82
Structure type				
Single detached	0.473	-	0.257	-
Duplex	0.029	-	0.015	-
Row house	0.028	-	0.087	-
Flat	0.283	-	0.349	-
Apartment	0.151	-	0.195	-

[1]Single detached units only.
[2]City sample only.

comparable equation for blacks. In the interior-quality equation, this difference—in fact, .37—is not very different from the value obtained for the race coefficient in the corresponding pooled equation, .40.

Income and education are statistically significant at the .01 level in both the interior- and exterior-quality equation. For black households, the coefficients of income in these equations are twice as large as the

TABLE 9-4
Least-Squares Estimates of the Demand for Dwelling-Unit Quality by White and Black Households

	Interior Quality		Exterior Quality		Newness (Year Built)		Hot Water		Central Heating	
Variables	White	Black	White	Black	White	Black	White	Black	White	Black
Income	0.023[1]	0.054[1]	0.018[1]	0.036[1]	0.958[1]	0.143	0.002[4]	0.020[1]	0.006[2]	0.024[2]
Education	0.058[1]	0.040[1]	0.048[1]	0.048[1]	2.288[1]	1.070[1]	0.003[4]	0.014[2]	0.028[1]	0.026[1]
Years on current job	0.007[1]	0.008[2]	0.005[1]	0.008[2]	0.328[1]	0.142[4]	−0.000	0.002[4]	0.004[1]	0.003[4]
Retired	0.237[1]	0.166[4]	0.090[4]	0.244[2]	5.963[2]	3.658[4]	−0.017	0.068[4]	0.048[4]	−0.014
None employed	−0.150[4]	−0.004	−0.048	−0.047	−1.398	−2.370	−0.009	−0.029	0.056	−0.084
More than one employed	−0.026	−0.035	−0.011	0.026	−3.215[3]	0.123	−0.018[4]	0.027	0.016	0.041
Number of persons	−0.167[1]	−0.246[1]	−0.116[1]	−0.080[4]	−4.500[2]	−1.785	−0.009	−0.008	−0.024	−0.047[4]
Female head < 45 years	0.070	−0.054	−0.100	−0.226[2]	−3.115	−5.002[4]	0.013	0.093[4]	−0.002	−0.076
Female head > 45 years	−0.108	0.103	0.107	0.089	5.937	1.846	−0.098[3]	0.078	0.120	0.170[4]
Male head > 45 years	0.012	0.067	0.056	0.121[4]	5.754[2]	5.090[3]	0.011	0.010	0.016	0.072
Single female < 45 years	−0.411[1]	−0.009	−0.009	0.169	−4.179	5.066	−0.062[4]	−0.010	0.039	−0.156[4]
Single female > 45 years	−0.080	−0.127	0.103[4]	−0.019	0.444	−0.753	−0.010	0.068	−0.022	−0.168[3]
Single male < 45 years	−0.357[1]	−0.539[2]	−0.259[2]	−0.124	−13.48[2]	−2.782	−0.001	−0.107	−0.079	−0.265[4]
Single male > 45 years	−0.244[2]	−0.196[4]	−0.091	−0.228[4]	−5.488[4]	−5.158[4]	−0.065[2]	−0.417[1]	−0.048	−0.323[1]
Couple, head < 45 years	−0.130[4]	0.077	−0.008	0.051	1.356	10.06[3]	0.005	−0.062	−0.034	0.010
Couple, head > 45 years	−0.066	−0.010	0.018	0.104	0.044	−2.560	−0.004	0.004	0.032	−0.021
Constant	2.54[1]	2.17[1]	2.216[4]	1.499[1]	1889[1]	1890[1]	0.961	0.602[1]	0.487[1]	0.364[1]
R^2	0.215	0.171	0.181	0.202	0.183	0.091	0.036	0.159	0.093	0.199

NOTE: Table notes indicate significance of t ratios for coefficients (two-tailed test).
[1] >.01 [3] > .10.
[2] >.05. [4] t ratio greater than 1.0.

same coefficient for whites. To some extent, this is compensated for in the interior-quality equation by the education coefficient, which is larger in the equation for whites than in the one for blacks. The education coefficients are the same in the exterior-quality equation. The four variables which describe the household's labor-force attachments have the same signs in the black and white equations, and several are statistically significant. Interior and exterior quality increase with the household's job tenure, are higher for retired households than for those still in the labor force, and are lower for unemployed households. Moreover, both interior and exterior quality decline as family size increases, and these substitutions appear to be particularly pronounced for blacks. The dummy variables describing household types are generally consistent and plausible in sign and magnitude.

Only 1 percent of the pooled sample of dwelling units occupied by whites lack hot water. It is, therefore, surprising that the hot-water equation for whites has any explanatory power whatsoever. By comparison, 14 percent of the dwelling units occupied by black households do not have hot water. As the hot-water equation for black households indicates, the consumption of this amenity increases rapidly with increases in income and education. Increased job tenure and retirement similarly reduce the likelihood that a household will lack hot water.

Central heating is not as universal as hot water: 9 percent of white-occupied structures and nearly a third of black-occupied structures lack it. In the equations for both whites and blacks, the probability of living in a unit without central heating declines fairly rapidly with income, years of schooling, and job tenure. The compromises made by larger families are again evident; as family size increases, the probability of having central heating declines. At the same time, the smallest households, single individuals living alone and couples, are more likely to live in units that do not have central heating.

RACIAL DIFFERENCES IN THE DEMAND FOR DWELLING-UNIT SIZE

The similarities between the dwelling-unit-size equations for blacks and whites are greater, if anything, than those in the dwelling-unit-quality regressions. Of 68 pairs of coefficients in Table 9-5, the signs for both races agree in 46 cases. In none of the deviate cases are both coefficients as large as their standard errors.

For both races, the number of rooms increases rapidly with income, education, and job tenure. The coefficients of income and job tenure are similar in the two equations. Similarly, the retirement variable has a

TABLE 9-5
Least-Squares Estimates of the Demand for Dwelling-Unit Size by Black and White Households

Variables	Number of Rooms		Number of Baths		First-Floor Area[5]		Parcel Area	
	White	Black	White	Black	White	Black	White	Black
Income	.124[1]	.108[1]	.033[1]	.010[4]	.038	.014[3]	.822[1]	.103[2]
Education	.065[2]	.042[4]	.018[1]	−.003	.014	−.006	.110	.009
Years on current job	.015[3]	.019[3]	.001	.003[4]	−.001	.006[2]	−.070[4]	.011
Retired	.653[2]	.480[3]	.082[4]	.053	−.044	.040	.317	.497[4]
None employed	−.354	−.246	−.095	−.019	.408[3]	.097[4]	−1.298	.235
More than one employed	.107	.462[2]	−.096[2]	.055[4]	−.166	−.011[4]	−4.269[1]	−.287[4]
Number of persons	.819[1]	.865[1]	.168[1]	.156[1]	−.014	−.001	−3.182[1]	.046
Female head < 45 years	−.099	−.001	.178[3]	.087[4]	−.021	−.019	.578	−.235
Female head > 45 years	−.304	.180	−.128	.070	.235	.157[3]	1.236	1.319[1]
Male head > 45 years	−.799[1]	−.799[1]	−.207[1]	−.184[1]	.106[3]	.069[4]	−1.327	−.504[4]
Single female < 45 years	−.483	−.101	.150[4]	.037	−.150	−.038	−7.716[3]	−.315
Single female > 45 years	−.325[4]	.063	.061	.015	.166[3]	.034	−4.434[2]	−.373
Single male < 45 years	−.078	.165	.136[4]	.363[3]	−.126	−.062[4]	−10.44[1]	−.908[4]
Single male > 45 years	.184	−.663[4]	.130[4]	−.157[4]	.150[4]	.317[1]	−4.358[4]	−.789[4]
Couple, head < 45 years	−1.117[1]	−.881[3]	−.026	−.009	−.037	.323[4]	−7.527[1]	−1.333[2]
Couple, head > 45 years	−.209	.401[4]	−.021	.058	.151[1]	.053	−5.633[1]	−.395[4]
Constant	2.801[1]	2.770[1]	.643[1]	.931[1]	.633[1]	.763[1]	4.727[3]	2.174[1]
R^2	.237	.258	.195	.135	.315	.195	.109	.097

NOTE: Table notes *1* through *4* indicate significance of *t* ratios for coefficients (two-tailed test).

[1] > .01. [3] > .10. [5] Single detached units only.

[2] > .05. [4] *t* ratio greater than 1.0.

large and positive coefficient in both the white and black equations. Unemployment reduces the number of rooms consumed, and the presence of additional wage earners increases it. Additional wage earners have a larger effect for black households. In contrast to the housing-quality equations, the coefficient of the logarithm of the number of persons is large and positive.

The sign pattern of the number-of-bathrooms equations in Table 9-5 is virtually identical to that of the rooms equations. However, the coefficients in the white equation are much larger than comparable ones in the black equation, a difference reflecting no doubt the underlying tenure choices and the aspects of quality represented by additional bathrooms.

The first-floor-area equations exhibit behavior similar to that described for the number-of-rooms variable. It should be recalled, however, that the floor-area equations are estimated for single-family detached units only, and that the sample includes only 103 black households. Small sample size may be responsible for the relatively few statistically significant coefficients in the black equation.

The effects of the exclusion of black households from the suburbs are clear from the parcel-area equations. The constant of the white equation is 4,700 square feet as contrasted to 2,200 square feet in the black equation. Moreover, although the coefficients of income and education are positive in both equations, the income coefficient is eight times as large in the white equation as in the black equation, and the white education coefficient, .110, is more than ten times as large as the black education coefficient.[4] Neither, however, is as large as its standard error. Similarly, the coefficient of family size is large, significant, and negative (−3.18) in the white equation and is essentially zero in the black equation.

WHITE AND BLACK DEMAND FOR NEIGHBORHOOD ATTRIBUTES

The fourteen equations in Table 9-6 describe the demand for seven neighborhood attributes by white and black households in St. Louis. The separate black and white equations are again very similar in terms of

[4]A similar difference in black and white income coefficients is evident in Table 9-4. The white coefficient in the newness equation is nearly nine times as large as the comparable black coefficient. In contrast, the black income coefficient exceeds the white coefficient in the interior-quality, exterior-quality, hot-water, and central-heating equations. Dwelling-unit age, like parcel area, is an especially difficult to modify housing attribute. By comparison, improvements in the remaining quality attributes are far more easily accomplished.

structure. Both black and white households demand higher quality in adjacent units and block face, better schools, lower crime rates, and greater distance from the CBD, as their incomes, education, and years on current job increase. Retired white and black households consume more of these attributes than their current income and education would indicate; unemployed households consume less. Single-person households and couples consume less neighborhood quality than families, but the consumption of neighborhood quality declines as family size increases.

RACIAL DIFFERENCES IN THE DEMAND FOR STRUCTURE TYPES

In Chapters 3 and 4, we hypothesized that the lower probability of home ownership of black households results from their confinement to neighborhoods where there are relatively few dwelling units that are suitable for home ownership. Undoubtedly, there are many features of a dwelling unit which make it more or less desirable for home ownership. Structure type is clearly an important consideration. Unless households are willing to undertake the headaches of being resident landlords, home ownership in the United States implies occupancy of a single-family detached structure or a row house. Interest in condominiums, particularly for retirement and recreation purposes, is growing, but few households consider the ownership of a single apartment unit an alternative to owning a one-family house. The strong association between tenure type and structure type is evident from the fact that whereas 72 percent of owners reside in single detached units, only 12 percent of renters choose this structure type. Moreover, 84 percent of single-family units are occupied by owner-occupants. The proportion of sample white households living in single-family units is nearly twice as large as the proportion of black households. The differences for the entire St. Louis metropolitan area are larger still; in 1960, 71 percent of white households lived in single detached dwelling units as contrasted to 34 percent of black households.[5]

The single detached structure-type equations for both races are quite similar. For both blacks and whites, the probability of occupying a single detached unit increases with income, but the income coefficient in the equation estimated for blacks is about two and a half times larger than the income coefficient in the equation for whites (Table 9-7).

Years on current job and retirement have positive coefficients in

[5]U.S. Bureau of the Census, *U.S. Censuses of Population and Housing: 1960, Census Tracts,* Final Report PHC (1)-131 (GPO, 1962), H-1, H-3.

TABLE 9-6
Least-Squares Estimates of the Demand for Neighborhood Attributes for Black and White Households

	Quality of Adjacent Units		Quality of the Block Face		Median Schooling	
Variables	White	Black	White	Black	White	Black
Income	.025[1]	.022[4]	.027[1]	.041[1]	.060[1]	.047[2]
Education	.057[1]	.043[1]	.081[1]	.040[1]	.108[1]	.033[2]
Years on current job	.006[2]	.006[4]	.008[2]	.006[4]	.016[1]	.003
Retired	.165[3]	.123	.110[4]	.157[4]	.489[1]	.006
None employed	−.007	−.025	.019	.118	.132	−.122
More than one employed	−.080[4]	.125[4]	−.010	.093[4]	−.205[2]	.176[3]
Number of persons	−.121[2]	−.032	−.118[2]	−.105[4]	−.317[1]	−.201[2]
Female head < 45 yrs.	−.194[4]	−.108	.049	−.266[3]	.134	−.166
Female head > 45 yrs.	.311[4]	.267[4]	−.058	.193[4]	.334	.240[4]
Male head > 45 yrs.	.071	.170[4]	.069	.236[3]	.390[2]	.434[1]
Single female < 45 yrs.	−.270[4]	−.080	−.258[4]	.060	.043	−.184
Single female > 45 yrs.	−.025	−.041	.020	−.103	−.258[4]	−.109
Single male < 45 yrs.	−.480[1]	.009	−.449[4]	−.124	−.797[2]	.068
Single male > 45 yrs.	−.192[4]	−.164	−.054	−.176	−.397[4]	−.456[3]
Couple, head < 45 yrs.	−.103	.039	−.051	−.015	−.479[2]	.792[1]
Couple, head > 45 yrs.	−.048	.106	.077	.062	−.351[2]	−.013
Constant	2.664[1]	1.843[1]	2.446[1]	1.822[1]	8.059[1]	8.325[1]
R^2	.143	.103	.190	.127	.185	.184

Variables	Percent White		Miles from CBD		School Quality[5]		Neighborhood Crime[5]	
	White	Black	White	Black	White	Black	White	Black
Income	−.099	−.065	.154[1]	.102[1]	.009[4]	−.006	−.178	−.692
Education	.202	−.091	.238[1]	.053[2]	.019[2]	.008[4]	−.610	−2.028[4]
Years on current job	.129[3]	.153[4]	.025[3]	.010[4]	.008[1]	−.001	−.472[3]	−.872[2]
Retired	.827	3.338	.840[2]	−.047	.093[4]	.040	.420	−11.08
None employed	−6.995[2]	−1.818	−.650	.067	−.145[4]	.003	17.46[4]	−14.25[4]
More than one employed	.738	−1.071	−.541[2]	.159	−.011	.031	−1.824	−8.702[4]
Number of persons	−.337	−4.496[2]	−.566[2]	−.158[4]	−.082[3]	−.029	1.424	3.481
Female head < 45 yrs.	−3.882[4]	1.383	−.364	−.424[4]	.156[4]	−.058	−17.05[4]	7.687
Female head > 45 yrs.	5.540	.693	.655	.554[3]	.484[2]	−.034	7.393	38.10[2]
Male head > 45 yrs.	2.292[4]	4.712[4]	.828[2]	.871[1]	.117[4]	−.062	.308	−8.182
Single female < 45 yrs.	−4.913[4]	−1.967	−1.744[3]	−.256	−.058	−.120	25.14[3]	−14.24
Single female > 45 yrs.	−1.156	−3.860	−.900[3]	.102	−.023	−.122[4]	3.232	18.83[4]
Single male < 45 yrs.	−11.88[1]	−.423	−2.783[1]	−.176	−.316[2]	−.201[4]	24.64[3]	2.433
Single male > 45 yrs.	−4.063[4]	−13.31[2]	−1.340[2]	−.581[4]	−.197[3]	−.169[4]	5.902	66.10[1]
Couple, head < 45 yrs.	.100	7.342[4]	−1.371[2]	.770[3]	−.097	−.192[4]	1.967	−14.10
Couple, head > 45 yrs.	−.004	−8.236[2]	−.814[3]	.163	−.058	−.168[2]	−5.664	−5.186
Constant	92.37[1]	11.65[2]	2.031[1]	1.929[1]	8.009[1]	7.541[1]	62.44[1]	196.2[1]
R^2	.037	.042	.178	.202	.068	.025	.044	.101

NOTE: Table notes *1* through *4* indicate significance of *t* ratios for coefficients (two-tailed test).

[1] > .01.

[2] > .05.

[3] > .10.

[4] *t* ratio greater than 1.0.

[5] City sample only.

TABLE 9-7
Least-Squares Estimates of the Demand for Structure Type by Black and White Households

	Single Detached		Duplex		Row House		Flat		Apartment	
Variables	White	Black	White	Black	White	Black	White	Black	White	Black
Income	.010[1]	.026[1]	−.000	−.000	−.000	−.016[1]	−.007[3]	−.014[4]	−.001	−.001
Education	.014[2]	−.000	−.004[2]	−.004[4]	−.006[1]	.000	−.019[1]	−.009[4]	.019[1]	.015[2]
Years on current job	.010[1]	.002	−.002[2]	.001[4]	−.000	−.003[2]	−.006[1]	.001	−.002[4]	−.001
Retired	.268[1]	.110[4]	−.040[3]	.030[4]	−.005	−.074[4]	−.207[1]	−.068	−.028	−.035
None employed	−.150[4]	−.006	−.037[4]	.053[2]	.014	−.012	−.061	−.150[4]	.243[1]	.038
More than one employed	−.058[4]	−.019	.004	−.014	−.025[3]	.054[4]	.059[4]	.026	−.000	−.017
Families										
Number of persons	.019	.108[2]	.028[2]	−.001	−.003	.008	−.024	−.046	−.024	−.062[4]
Female head < 45 years	.011	−.124[4]	−.035	−.040[4]	−.020	.046	.102[4]	.090	−.036	.058
Female head > 45 years	.029	−.012	−.060	−.016	−.045	−.172[3]	−.206[4]	−.077	.202[4]	.014
Male head > 45 years	−.049	−.048	−.022[4]	.012	−.014	−.053[4]	.013	−.023	.090[2]	.114[4]
Household types										
Single female < 45 years	−.415[1]	−.094	.052[4]	.064[4]	−.024	−.016	−.050	−.135	.331[1]	.176[4]
Single female > 45 years	−.282[1]	−.075	.025	−.036[4]	−.002	.066[4]	.068[4]	.024	.212[1]	−.053
Single male < 45 years	−.309[2]	.032	−.009	.004	.027	.016	−.016	−.083	.220[2]	.083
Single male > 45 years	−.050	.029	−.005	−.044[4]	−.019	.345[1]	.069	−.246[3]	.025	−.093
Couple, head < 45 years	−.281[1]	−.145[4]	.054[3]	.080[2]	.027	−.096[4]	−.032	−.018	.213[1]	.156[4]
Couple, head > 45 years	−.096[4]	.055	.014	.009	−.009	−.016	.010	−.096	.072[4]	.004
Constant	.232[2]	.060	.080[2]	.042[4]	.107[1]	.169[2]	.612[1]	.582[1]	−.110[3]	.082
R^2	.147	.101	.027	.060	.021	.127	.055	.038	.129	.078

NOTE: Table notes indicate significance of t ratios for coefficients (two-tailed test).
[1] > .01. [3] > .10.
[2] > .05. [4] t ratio greater than 1.0.

both equations, though the size of the coefficient is much larger in the equation for whites than in the equation for blacks. Similarly, the coefficients of the unemployment and more-than-one-member-employed variables, negative in both the black and white equations, are larger in absolute value in the latter. Number of persons is positive in both equations; however, in the equation for whites, the coefficient is smaller than its standard error and is only about a sixth as large as the coefficient in the equation for blacks.

The coefficients for the older single females and younger single females are statistically significant in the white equation (.01 level) and are very large—−.42 and −.28, respectively. The same coefficients are negative in the black equations but are much smaller. The dummy variable for young couples is also negative in both the white and black equations—−.28 in the white and −.14 in the black.

Duplexes, which provide housing for relatively few white and black households, are disproportionately the choice of larger families with moderate incomes. The equation for row houses, which fulfills this function for black households, has a relatively large and significant income coefficient and a positive, though insignificant, coefficient for the number of persons.

Flats serve small low-income families. Income, education, years on current job, and retirement are negatively related to the occupancy of flats by both black and white spending units. The effect of these variables is smaller in the equation for blacks, a result that is consistent with the more limited range of choices available to black families in the housing market. Apartments also appear to be selected by disproportionately large numbers of small families, particularly better educated and more affluent ones. This is true of both white and black households, but is most pronounced for whites. Not surprisingly, apartments are especially attractive to individuals living alone and to couples. In the apartment equation for whites, all six dummy variables for single individuals and couples are positive, and all but three are statistically different from zero at the .01 level. The results for blacks are not quite so consistent; two of the variables—those identifying older males and older females—have negative though insignificant coefficients.

RACIAL DISCRIMINATION AND THE DEMAND FOR HOUSING ATTRIBUTES

The separate attribute demand equations for white and black households reveal that the patterns of signs and the relative magnitudes of coefficients are generally similar between races, but that the absolute

magnitudes of individual coefficients are often different. We conclude that these consistent differences result largely from systematic differences in the housing supply available to blacks. It would appear that good-quality units located in good neighborhoods are in particularly short supply to black households.

Since we are persuaded that the supply of many kinds of housing attributes is restricted for black households, the demand equations estimated for blacks show only how socioeconomic forces affect consumption, given this restricted access to the urban housing supply. To estimate the consumption of housing services by black households in the absence of these systematic distortions, we solve the behavioral equation for whites using the socioeconomic characteristics of the black population. This provides at least crude estimates of the extent to which disparities between races in the consumption of these attributes can be attributed to differences in income and household characteristics and the extent to which they result from other factors.

Table 9-8 summarizes these estimates. The first column indicates the mean values of the twenty-one attributes actually consumed by the sample of black households. The second column presents the estimates obtained by solving the behavioral equations estimated for whites using the average characteristics of the black sample.

The estimates in Table 9-8 indicate the striking difference between the observed consumption of housing attributes by blacks and that implied by income and household characteristics. The differences in the consumption of dwelling-unit quality and neighborhood quality are quite pronounced. For all five measures of dwelling-unit quality and for all seven neighborhood attributes, consumption by blacks is considerably lower than that implied by socioeconomic characteristics alone.

The comparison indicates, for example, that the average black household occupies a unit sixty-five years old and that an otherwise identical white household ("black estimated") would occupy housing fourteen years newer. Similarly, the exterior quality consumed by black households is less than nine-tenths as large as that estimated in the absence of housing-supply limitations. Likewise, there are large discrepancies in the consumption of interior quality and of hot water and central heating.

Black households consume barely three-quarters of the level of adjacent quality enjoyed by comparable whites; their neighborhoods have lower median schooling level and significantly lower levels of public services, as measured by schools and crime, than they would if housing supply were unrestricted.

On the average, black households reside more than a mile closer to the city core and live on blocks of lower residential quality than the

TABLE 9-8
Estimated Values of Housing Attributes Obtained from Solving the White Attribute Demand Equations Using Mean Values of the Black Sample

Attributes	Attribute Values		
	Black Actual	Black Estimated	White Actual
Dwelling-unit quality			
Interior	2.67	2.90	3.25
Exterior	2.20	2.73	2.86
Newness (year built)	1902	1916	1921
Hot water	0.86	0.97	0.98
Central heating	0.67	0.81	0.85
Dwelling-unit size			
Rooms	4.49	4.47	4.82
Baths	1.08	1.04	1.14
First-floor area (sq. ft.)[1]	2,142		
Parcel area (sq. ft.)	2,550	2,276	5,185
Neighborhood attributes			
Adjacent units	2.50	3.24	3.40
Block face	2.47	3.32	3.51
Median schooling	8.88	8.98	9.56
Percent white	7.62	93.88	94.58
Miles from CBD	3.19	4.39	5.20
School quality[2]	7.48	8.26	8.28
Crime[2]	168.7	55.40	53.07
Structure type			
Single detached	0.257	0.406	0.473
Duplex	0.015	0.046	0.029
Row house	0.087	0.043	0.028
Flat	0.349	0.326	0.283
Apartment	0.194	0.160	0.150

[1]Single detached units only.
[2]City sample only.

demand implied by their socioeconomic characteristics would indicate in an unrestricted market. The difference in the percent-white estimation reveals the extent of ghetto confinement. Blacks live in the ghetto (or in areas 92 percent black); otherwise identical whites live in areas 94 percent white. Although the comparison is absurd in the aggregate (blacks were 16 percent of the population of the St. Louis metropolitan area in 1970), the figures illustrate the extent of geographical confine-

ment of the black population apparently unrelated to socioeconomic status.

Similarly, black households consume only 63 percent of the single detached housing enjoyed by comparable whites, and only a third of the duplex accommodations. In contrast, they occupy twice as many row houses, and slightly more flats and apartments. Table 9-8 illustrates that black households occupy units of roughly the same size as white households of similar characteristics; in fact, they consume slightly more rooms and bathrooms and slightly larger parcel areas.

The picture that emerges from these comparisons, especially when viewed in relation to the expenditure models of the previous chapter and the price discrimination results of Chapter 6, is highly consistent but not very encouraging. Black households pay higher prices for housing attributes; they devote fewer resources to the consumption of housing, partially in response to price but apparently also in response to the unavailability of higher-quality units in better living environments. Thus, they buy slightly larger units, but overall they divert resources away from housing consumption, largely because many important attributes of residential quality are not readily available to them.

SUMMARY

The analyses presented in this chapter have dealt with the demand for individual housing attributes. We have considered the consumption of some twenty-one attributes of housing by sample households, including renters, owner-occupants of single detached structures and the owner-occupants of multifamily structure types. Besides investigating the influence of family income, size, composition and labor-force attachment upon the consumption of residential space, we have considered the influence of these factors upon the consumption of residential and neighborhood quality. The analysis in this chapter considers the demand for these attributes by the combined sample of renters and owners. In Appendix G, the analysis is conducted separately for owners and renters.

The results document a fairly comprehensive picture of households' choices among the attributes of housing bundles. Households with larger incomes and more education are seen to choose higher-quality dwelling units, located further from the CBD. They also consume more of the attributes of neighborhood quality and prestige and units of slightly larger physical size.

In contrast, at the same income, larger households consume substantially more of the attributes of physical size, particularly dwelling-

unit size, and less of the attributes of dwelling-unit and residential quality. These findings are consistent, both in the regressions estimated separately by tenure type (Appendix G) and in the pooled regressions reported in this chapter.

When the analysis is conducted separately by race, the findings indicate that for households with similar socioeconomic characteristics, blacks consume considerably smaller amounts of dwelling-unit quality and amenities and desirable neighborhood attributes. However, separate analyses for white and black households indicate that the effects of income, education, labor-force attachment, and family composition upon the demand for housing attributes are qualitatively similar for both groups. The differences that remain are consistent with the hypothesis that black households face systematic restrictions in the housing supply available to them. Increases in family income, for example, raise the consumption of interior and exterior quality, central heating, and hot water by both black and white households. Similarly, additional income increases the demand for rooms, bathrooms, and living area by both races and has similar effects upon the demand for desirable neighborhood attributes.

The systematic differences in the demand for housing attributes by black and white households seem to reflect differences in the elasticity of the supply of certain housing attributes in the ghetto and in the unconstrained white market. For housing attributes that can be more easily supplied in the black submarket (for example, numbers of rooms, baths, and living space), the effect of income does not differ for white and black households. For attributes, such as lot size or newness, which are not easily produced in the ghetto or by expansion along its periphery, large differences in demand are obtained between comparable white and black households.

These systematic differences resulting from the geographical constraints on residential location for blacks are summarized in Table 9-8. The table suggests that in the absence of supply restrictions, black households would consume substantially higher-quality and newer units of about the same size that they currently do. Moreover, on the basis of their socioeconomic characteristics, the analysis indicates that black households would choose more single detached units with better schools and better neighborhoods.