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Intra-Urban Residential Mobility:
A Review and Synthesis

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ABSTRACT: THIS PAPER PROVIDES A CRITICAL REVIEW AND SURVEY
OF THE AVAILABLE EVIDENCE ON INTRA-URBAN HOUSEHOLD MOBIL-
ITY AND A SYNTHESIS OF THE THEORETICAL CONTRIBUTIONS OF
SOCIAL SCIENTISTS TO UNDERSTANDING THE DETERMINANTS OF
LOCAL MOBILITY. THE ANALYSIS ATTEMPTS TO RECONCILE THESE
PERSPECTIVES AND THE EMPIRICAL EVIDENCE INTO A UNIFIED
THEORY OF THE MOBILITY DECISION BASED ON MEASURABLE CON-
CEPTS, AND IT PRESENTS SOME IMPLICATIONS FOR EMPIRICAL RE-
SEARCH.

1. Introduction

The mobility of labor in response to economic and other incentives has
been studied by economists and other social scientists in the United States and
abroad. Most of the theoretical and empirical work has been concerned with
inter-regional or inter-urban mobility. In such a context, it is natural to view
relocation decisions by workers as investment decisions made in the expecta-
tion of higher private returns. Indeed, a recent review by Greenwood [1975] of
the geographical mobility of labor in the United States focuses heavily on the
analogy between labor mobility and capital investment.

However, most of the observed mobility behavior of American house-
holds is not of an inter-regional character; it consists of movement from origins
to destinations within the same county or within the same metropolitan area.
Despite the high incidence of mobility, surveys indicate that 40 percent of those
who are heads of households in the United States are living within 25 miles of

their birthplaces, and almost two thirds are living within 100 miles of their birthplaces [Lansing and Mueller 1967].

This paper focuses on the determinants of short-distance moves within an urban context. The outcomes of these decisions are critical to understanding changes in the spatial character of regions and of metropolitan areas. For example, residential mobility is the proximate cause of changes in the composition and character of urban neighborhoods. The redistribution of the local population reflects changes in the pattern of housing demands and in the network of transportation flows within urban areas. Thus, an understanding of the determinants of residential mobility is not only of intellectual interest to social scientists but also of immediate, practical importance to planners and local officials. This paper presents a descriptive survey of the available evidence on intra-urban mobility and a synthesis of the theoretical contributions by social scientists to understanding the process of residential mobility. Much of the evidence we review has been presented by demographers, economists, geographers, and sociologists. ''Truth-in-packaging,'' however, requires us to admit that this paper is the work of economists—members of a discipline better noted for tendencies toward imperialism than for interdisciplinary inquiry.

Section two is primarily descriptive. It provides a review of the basic facts on residential mobility for the nation as a whole, as available from public sources. Section three summarizes the theoretical perspectives for the analysis of mobility advanced in the social science literature. We outline briefly the major theoretical constructs that purport to explain the incidence of residential mobility. Section four presents a catalog of the empirical regularities reported by a great many researchers, plus our attempt to synthesize and reconcile diverse findings. Most of the results discussed are derived from special surveys sampling households within a single urban area, a particular region, or occasionally in the nation as a whole. Section five presents an attempt to reconcile these theories and the empirical evidence into a unified view of the mobility decision based on measurable concepts. Although this synthesis is from the perspective of economic science, the model does not appear to be radically inconsistent with the contributions of other disciplines. Section six presents some concluding remarks and implications for research.

The basic argument of this paper, which covers our review of more than a hundred empirical studies, is that there are many inconsistent findings on the correlates of residential mobility in urban areas. Surprisingly, however, this ambiguous evidence is not inconsistent with the current state of the theory of mobility—suggesting the largely tautological nature of the theory itself.

The principal feature of the model developed in section five is the distinction between equilibrium and disequilibrium models of behavior. The perspective presented in that section is also distinguished by a treatment of the roles of information, search, and moving costs, and by a formulation of the theory in terms of measurable phenomena.

We wish to emphasize that this paper does not offer the last word on this important issue; also, we offer no new empirical evidence. While many of our remarks may appear to be critical, we hope that our discussion will stimulate the search for improvement in the theoretical model and provide an improved basis for empirical application.

We have purposefully limited the scope of this paper, concentrating solely on the determinants of individual household mobility rather than on the implications of mobility for the growth and decline of urban areas or for neighborhood succession. Thus, we give only passing mention to such important, but tangential, topics as "filtering" in the housing markets and neighborhood "tipping" as related to racial or demographic composition.[1]

2. Some Basic Numbers

National data collected by the Current Population Survey, the Decennial Census, and (more recently) by the Annual Housing Survey indicate the incidence of mobility in the nation as a whole and document the relative importance of long-distance migration and short-distance mobility since World War Two.

Table 1 summarizes the incidence of mobility in the U.S. population by race and sex for 1970-1975. Almost half the population made at least one residential move during that five-year period. Some 19 percent of the total population (and 45 percent of the population of "movers") changed residences within the same metropolitan area. Intra-urban mobility accounted for three times as many moves as inter-urban migration.

The summary figures reported in Table 1 underestimate the overall mobility level in the population, since multiple moves within the period are ignored.[2] The table reveals few differences by sex, but some striking contrasts by race.

TABLE 1

DISTRIBUTION OF MOVES BY TYPE, RACE, AND SEX, 1970-1975,
PERCENT OF POPULATION AGED 5 YEARS AND OLDER

| | Race | | Sex | | |
	White	Black	Male	Female	Total
Non-movers	52	48	51	52	52
Movers:					
Inter-urban	7	4	7	6	6
Rural-urban	3	2	3	3	3
Urban-rural	4	2	4	3	4
Rural-rural	10	9	10	10	10
Intra-urban	18	29	19	19	19
Within central cities	6	22	7	8	8
Within suburbs	8	4	8	8	8
Central city-suburbs	3	2	2	2	2
Suburb-central city	1	1	2	1	1
Other and not reported	6	6	6	7	6

Source: U.S. Bureau of the Census, Current Population Reports, *Population Characteristics*, Series P-20, No. 285, October, 1975, pp. 6-8.

[1] For a recent statement of the analytical and policy issues involved in "filtering," see Muth [1973] or Breuggeman [1975]. The most complete analysis of neighborhood "tipping" is found in the review paper by Schelling [1971]. Note also that we ignore several dynamic models of urban areas, such as the NBER model [Ingram *et al.* 1972] or the Urban Institute model [de Leeuw and Struyk 1975] because they only consider household mobility in an admittedly arbitrary and mechanical manner.

[2] The table underestimates the relative importance of intra-urban mobility to the extent that multiple movers are more likely to have made several short-distance moves than several long-distance migration decisions.

Blacks appear to be about seven times as likely to make intra-urban moves as to relocate between cities or regions. Within urban areas, the mobility rate of the black population is substantially higher than that of whites.[3]

An examination of the length of tenure at a household's current address provides a different perspective on residential mobility. Table 2 presents the distribution of years of tenure for U.S. households for 1973, the latest year for which household data are available. (Note that multiple moves are also ignored in this table.) The numbers indicate that about one out of every five U.S. households had relocated within the previous 12-month period. Fully 40 percent of U.S. households moved within the previous three and a half years, and almost two-thirds had moved within a period of eight and a half years. There is little difference between the length of tenure of households in metropolitan areas and in non-metropolitan areas; within metropolitan areas there is little overall difference between central city and suburban residents.

There are, however, pronounced differences between owners and renters, both within central cities and suburbs and between these two areas. Within metropolitan areas, renters are about four times more likely to have relocated than owners during the previous three and a half years. The difference between black and white mobility rates noted in Table 1, thus, partly reflects the higher proportion of black renter households.

For both owners and renters, suburban households have fewer years of tenure; 59 percent of central-city renters and 23 percent of owners moved within the past three and a half years, but fully 70 percent of suburban renters and 29 percent of owners made relocation decisions within the previous three and a half years. Thus, the similarity in the overall rates of mobility in central cities and suburbs is due to the different distribution of owners and renters

TABLE 2
LENGTH OF TENURE AT CURRENT ADDRESS, PERCENT OF U.S. HOUSEHOLDS

	Years				
	Less than 1	1 to 3.5	3.5 to 8.5	8.5 to 13.5	13.5 to 23.5
All households	19	21	23	12	14
Outside SMSA's	18	21	21	12	14
Inside SMSA's	20	21	23	13	14
Central cities	20	21	24	12	13
Owners	8	15	23	15	21
Renters	32	27	24	9	6
Suburbs	19	22	23	12	15
Owners	10	19	25	15	20
Renters	41	29	19	6	3

Source: U.S. Department of Commerce, Bureau of the Census and U.S. Department of Housing and Urban Development. 1975. *Annual Housing Survey: 1973*, Part D.

[3] Comparable data are available at the aggregate level for Canada and Great Britain. The overall level of mobility in Canada over a comparable period (47.4 percent) is about the same as in the United States. About half of the mobile population in Canada relocated within the same political jurisdiction in 1966-1971, and only 9 percent of the moving population relocated across provincial boundaries. In Great Britain, where the propensity to move is only two-thirds as high as in the United States and Canada, 31 percent of the moves over the period 1966-1971 were within the same urban area. See Ministry of Industry, Trade, and Commerce [1974] and Office of Population Censuses and Surveys [1974].

between the two types of areas. Suburban owners and renters have been much more mobile than their counterparts in the central cities.

Examination of the distribution of those households classified as recent movers in 1973[4] (the 19 percent of U.S. households that had relocated during the previous year) by origin and destination reveals two important facts:

1. Some 24 percent of all moves appear to have been made by families whose head of household changed in the same year. Thus, roughly a quarter of all moves appear to be associated with major changes in household status—separation, divorce, death, or the formation of new households.

2. More than half of all residential moves by intact households (54 percent, or 41 percent of all moves) were from origins in metropolitan areas to destinations in the same metropolitan areas.

When the intra-urban moves by intact households are disaggregated by origin and destination, we find that 18 percent of all moves (and about two-fifths of the moves by this group) were within the central cities of metropolitan areas and another 14 percent of all moves were from one suburban location to another within the same metropolitan area.[5]

Throughout the post-war period, the overall level of mobility and its intra-urban component has been relatively unchanged, despite the tremendous suburbanization of households. Table 3 indicates the annual mobility rates for the population (age 1 year and over) for the period beginning in 1947. The table reports that in any of these years, 18 to 20 percent of the population had relocated, a proportion that is the same for metropolitan and non-metropolitan households. The second part of the table indicates that the overwhelming proportion of these moves in each year were within the same county.

In 1947, for example, 18.3 percent of the metropolitan population changed residences and 12.7 percent moved within the same county. Thus, about 70 percent of those moving to new urban residences stayed within the same county. This figure had declined to 66 percent by 1970. For moves to central-city locations, the proportion of intra-county moves is even larger, averaging about 75 percent during the entire period.

This evidence makes it clear that the intra-metropolitan component of household mobility has represented the largest fraction of all residential relocation during the entire post-war period, with important consequences for the spatial distribution of economic activity in urban areas. Furthermore, there is evidence of differences in mobility behavior among demographic groups, while overall rates of mobility have remained relatively constant. Therefore, models of residential mobility must account for differences among groups and regularities over time.

3.   Theoretical Perspectives on Mobility

Scholars in different disciplines have approached the study of mobility from two distinct perspectives. An examination of the moving behavior of

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[4]U.S. Department of Housing and Urban Development [1975].

[5]Again, these data are for 1973 and are derived from the U.S. Department of Housing and Urban Development [1975]. More detail on the distance of residential moves is available from special samples. For example, Butler *et al.* [1969], present evidence that 28 percent of all household moves are within the same "neighborhood" and that 61 percent are to a destination within five miles of the previous dwelling unit.

TABLE 3
PERCENT OF U.S. POPULATION MOVING IN A ONE-YEAR PERIOD, 1947-1970[a]

| | Percent movers | | | | | Percent movers within the same county | | | | |
| | Metropolitan[b] | | | | Non-metropolitan[c] | Metropolitan[b] | | | | Non-metropolitan[c] |
	Total	Central city	Suburbs	Total		Total	Central city	Suburbs	Total	
1947	20.0	. . .[d]	. . .	18.3	24.0	13.6	. . .	. . .	12.7	16.1
1948	18.8	. . .	. . .	17.8	22.2	13.0	. . .	. . .	12.7	15.3
1949	18.7	. . .	. . .	18.5	21.4	13.1	. . .	. . .	13.3	13.8
1950	21.0	. . .	. . .	21.3	23.7	13.9	. . .	. . .	14.7	14.8
1951	19.8	. . .	. . .	20.5	19.7	13.2	. . .	. . .	14.2	12.0
1952	20.1	. . .	. . .	20.7	22.9	13.5	. . .	. . .	14.4	14.2
1953	18.6	. . .	. . .	18.6	20.9	12.2	. . .	. . .	12.5	12.7
1954	19.9	. . .	. . .	20.2	22.1	13.3	. . .	. . .	13.9	14.0
1955	20.5	. . .	. . .	20.5	23.8	13.7	. . .	. . .	14.2	14.7
1956	19.4	. . .	. . .	19.4	21.7	13.1	. . .	. . .	13.7	13.7
1957	19.8	20.4	17.7	19.0	21.0	13.1	15.5	11.3	13.3	12.8
1958	19.2	20.0	17.0	18.5	20.2	13.1	15.4	10.9	13.1	13.0
1959	19.4	19.7	17.8	18.7	20.4	12.9	14.9	11.1	12.9	13.0
1960	20.0	20.8	17.9	19.3	21.2	13.7	16.1	11.8	13.8	13.5
1961	19.1	. . .	. . .	. . .	. . .	13.0	. . .	. . .	. . .	. . .
1962	19.4	20.6	17.8	19.2	19.8	12.6	15.2	10.8	13.0	12.0
1963	19.6	21.7	19.0	20.3	18.4	13.0	16.2	11.6	13.9	11.4
1964	20.1	21.6	18.6	20.0	20.3	13.4	16.1	11.7	13.8	12.6
1965	19.3	21.0	18.3	19.6	18.7	12.7	15.9	11.2	13.4	11.4
1966	18.3	19.3	17.5	18.3	18.3	11.6	13.8	10.5	12.0	10.9
1967	18.8	19.5	18.2	18.8	18.8	11.8	14.2	10.6	12.2	11.0
1968	18.3	18.7	17.6	18.1	18.6	11.7	13.8	10.5	12.0	11.2
1969	18.4	19.3	17.7	18.4	18.3	11.7	14.1	10.7	12.2	10.7

[a]From March or April 1 of the year noted to March 31 or April 30 of the following year.
[b]Prior to 1957, the term "metropolitan" refers to urban areas as defined by the U.S. Department of Commerce.
[c]Prior to 1957, the term "non-metropolitan" refers to all rural non-farm areas as defined by the U.S. Department of Commerce. Commencing with 1957, it is a separate classification.
[d] . . . indicates data not available.
Source: Current Population Reports, *Population Characteristics*, Series P-20, Nos. 22, 28, 36, 39, 47, 49, 57, 61, 73, 82, 85, 104, 113, 118, 134, 141, 150, 156, 171, 188, 193, 210.

individual households in an urban context is of principal concern to demographers, economists, sociologists, and many geographers. An alternate approach, of major concern to many geographers and planners, and to some sociologists, has emphasized the areal correlates of movement between origin and destination pairs in an urban area. The latter studies, including many ecological studies focusing on aggregate data, usually analyze asymmetric matrices of movements by "origin and destination," with the objective of parsimonious description of spatial interactions.[6]

Our review focuses on the first class of analyses, those concerned with the determinants of the household decision to move. We consider the latter studies only to the extent that they provide additional evidence, based on "contextual effects," bearing on the household decision process. As noted in Section Four,

[6]Much of the analysis of so-called "gravity models" fits this taxonomy. See Carrothers [1956] for a bibliographic review. The recent, more sophisticated, but essentially mechanical models of this sort were reviewed by Tobler [1975]. We also exclude so-called "entropy" models for the same reason [Wilson 1970].

ecological studies by Moore [1971], Wolpert [1966], and L.A. Brown and Holmes [1971], among others, provide some evidence on the role of neighborhood externalities in influencing mobility decisions.

Much of the theoretical literature that provides the conceptual description and underpinnings of the mobility process has been produced by sociologists and geographers. Consequently, much of this literature is framed in terms of household "satisfaction." Unfortunately, often only a loose theoretical perspective on the decision-making process is implicit in most of these behavioral descriptions of the household's decision to move.

A concise conceptualization of the mobility process was provided by Rossi [1955]. He suggests the household's decision of whether or not to move is based on housing "dissatisfaction," household characteristics, and exogenous circumstances, e.g., factors causing forced moves. Having decided to move, the household searches for a new dwelling unit using both formal and informal information channels, and chooses a new home based on desired characteristics determined by household "needs." The theme emphasized by Rossi is that "the major function of mobility [is] the process by which families adjust their housing to the housing needs that are generated by the shifts in family composition that accompany life cycle changes (p. 9)." Thus, Rossi's formulation of the process concentrates on adjustment to changes.

Speare et al. [1974] provide a more elaborate theoretical description, emphasizing as Rossi did the theme of adjustment to dissatisfaction. They view the mobility (and migration) decision "as the result of an ongoing decision-making process for which three stages can be distinguished: (1) the development of a desire to consider moving, (2) the selection of an alternate location, and (3) the decision to move or stay (p. 175)."

In cases of voluntary mobility, the desire to consider moving results from an increase in dissatisfaction beyond some tolerance level.[7] Dissatisfaction can result from a change in household needs or in locational amenities. Implicit in this theory is the corollary that highly "satisfied" households do not consider moving—even when, if the household were to look, it would discover that the benefits to be gained from moving would be high relative to the costs. Mobility, moreover, is only one possible response to dissatisfaction. Households could reduce dissatisfaction by other changes in current circumstances.

According to this analysis, residential satisfaction is assumed to depend on household characteristics and aspirations, housing unit characteristics, locational characteristics, and the household's social bonds with neighbors and the neighborhood. The dissatisfaction that ultimately results in moving behavior is the direct result of "changes in the needs of a household, changes in the social and physical amenities offered by a particular location, or a change in the standards used to evaluate these factors (p. 175)." Factors such as age, income, and duration of residence are not considered to affect directly the decision to move; rather, the decision-making process works through satisfaction.

The second stage in their model is search for an alternate dwelling unit. This process is restricted to areas with which the household has some familiar-

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[7]Morrison [1972] suggests that such a threshold is a function of household characteristics such as the education or occupation of the head.

ity. The desired outcome of the search process for the household is some idea of the expected level of satisfaction at alternative destinations. This is determined by household characteristics, societal-level factors (social and economic factors largely beyond the control of the household), and the household's range of experience. Once the alternate dwellings have been evaluated, the household makes its decision to move on the basis of (1) the magnitude of its dissatisfaction at the current location, (2) the expected satisfaction with the alternate location, and (3) the costs of moving. Part of the process involves, as mentioned above, revising the household's expectations as a result of searching and thus, perhaps, a revision of the household's current satisfaction.

This model by Speare *et al.* [1974] is partly an extension of geographers' approaches to mobility models. A representative model is outlined by L.A. Brown and Moore [1970]. They view the mobility decision in two phases: (1) the decision to seek a new residence, and (2) the choice of where to relocate. The household at a particular location is exposed to "stresses." It chooses a response to reduce or eliminate these stresses. Clark and Cadwallader [1973] suggest that this locational stress is created in part by problems of accessibility to other parts of the city, neighborhood decay, and changes in socio-economic status, among other variables. Other researchers emphasize the stresses emanating from changes in housing needs, which may result from life cycle effects [L.A. Brown *et al.* 1970; Moore 1972; Wolpert 1964, 1965, 1966]. These authors suggest that stress can be reduced (and "place utility," the satisfaction associated with a particular dwelling unit, increased) by the household in three ways: adjusting its desires, restructuring its environment, or relocating.

The decision to relocate is constrained by the information available to the household (its "awareness space"). The normal contacts of a household—through the commercial activities, personal and recreational activities, and the daily trip to work—define its "activity space," which is the major source of household information. A secondary source of information—the indirect "contact space"—depends on more general forms of communication, such as newspapers. Together, these stimuli define the "awareness space" of the household and directly affect the decision to relocate [L.A. Brown and Longbrake 1970, 1969; Clark 1969; Moore 1970; Moore and L.A. Brown 1970]. L.A. Brown and Longbrake [1970] also suggest that search behavior is time-dependent; therefore, the stresses the household faces are modified as a result of the search process. The household finally makes its decision to relocate or abandon the search, based on its aspirations [Moore 1972] and on its evaluation of alternate available place utilities.

Several economists have approached the problem of explaining intra-urban mobility as well, though often with perspectives drawn from the migration literature. For example, Fredland [1974] posits a model in which households obtain satisfaction (utility) from living in a particular housing unit, but there are costs associated with it. The net present value of living in that unit is compared with that of the best available alternate dwelling unit. The household will move if the expected gain exceeds the moving cost. By contrast, and more in the spirit of the sociological work, H.J. Brown [1975] has related moving to changes in life-cycle, income, work place, and housing market conditions.

As we have noted, these theoretical statements provide a rich taxonomy of

the household decision-making process, and they do present a complex description of the calculus of household choice. However, these theories provide little in the way of specific hypotheses or verifiable propositions—indeed, it is hard to conceive of how a household's choices about residential mobility could fail to be consistent with these *a priori* descriptions.[8]

4. Review of Findings

In contrast to the concern with changes that are explicit or implicit in the existing theoretical framework, most empirical research has emphasized the role of variables measuring the current status of households, rather than changes in their status, in motivating residential mobility decisions. Partly as a result of this misdirection, much of the research reported by individual scholars is highly ambiguous, or at least difficult to interpret. In addition, there seem to be two other difficulties in reconciling the empirical evidence provided by previous researchers, regardless of relationship of that evidence to the current theory.

First, the measure of mobility analyzed varies greatly. Researchers have examined the *ex-ante* probability of moving by previously existing households or the *ex-post* probability of moving by households in existence at the end of the period of analysis. The period of analysis often varies. Also, the measure of mobility is sometimes truncated (for example, researchers have analyzed the propensity of individuals to move in a single year, in three years, or in five years, or the frequency of one or more moves in a given period by households in existence at the end of the period, among other possibilities).[9] Sometimes, a distinction is made in the literature between "retrospective" and "prospective" mobility, to distinguish between samples of longitudinal data for which the units of observation are households existing at the end of the observation period and samples for which the observations are households existing at the beginning of the period of analysis.[10]

Since household formation and dissolution almost invariably result in residential movement, this distinction has important consequences for evaluating results. For example, Duncan and Hauser [1960] complain that "household movement (rates) confound the moves of intact households with the moves of households which are undergoing formation, dissolution, or change in composition (p. 108)." To a large extent these definitional difficulties are understandable. They result from data sets with differing coverage available to individual researchers. However, these inconsistencies of definition make it difficult to compare the results of different studies or to resolve apparent discrepancies in the findings.

A further distinction in defining the choice problem for households (and the sample definition for statistical purposes) is often made between voluntary and involuntary (forced) moves. However, there is no consensus about which

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[8]An exception to this statement may be found in the paper by Sarbagh *et al.* [1969] that provides a list of general hypotheses, some of which are empirically verifiable.
    [9]Other researchers have analyzed the "desire" or "intention" to move, expressed in several ways. We do not review this strand of analysis, since the link between intentions and observed behavior is seldom traced.
    [10]Sometimes, the term "prospective mobility" is also used to describe research about the mobility intentions of existing households. Again, this review ignores that body of literature, except where the desire to move is reflected in observed behavior.

kinds of moves are involuntary.[11] In addition to these definitional questions, several researchers suggest that there are important regional differences in mobility behavior [Albig 1932; Duncan and Hauser 1960; Schnore and Pinkerton 1966]. Care must be taken in generalizing from the analysis of a single metropolitan region.

An additional difficulty in evaluating mobility research is that much, although not all, of the analysis has been in terms of simple two- and three-way cross-tabulations, even though it may be more plausible to consider a straightforward multivariate approach. An analysis of contingency tables often leads to arbitrary categorizations—as when continuous variables such as age or income are of interest. In addition, complex multi-dimensional tables may be required to control for the influences of several variables simultaneously. For many of these problems, multiple correlation and regression techniques seem more appropriate. However, as noted below, many of the behavioral hypotheses have been loosely framed in terms of the life cycle of households—a concept not quantifiable in a simple way, either by a naive application of contingency tables or by the use of multivariate techniques.

THE FAMILY LIFE CYCLE

There is widespread agreement that the most important determinant of intra-metropolitan mobility is the family life cycle, but far less agreement on the definition and measurement of that cycle. As suggested by the data presented in Section Two, certain more-or-less common changes in household composition affect the propensity to move of household units. The most obvious changes—household formation and household dissolution—are most likely to result in decisions to relocate.

Several taxonomies concerning the stages of household progression, from formation through dissolution, have been suggested by researchers. For example, Hawley [1971] conceptualizes its influence on mobility in the following scenario:

> The young couple usually starts married life in an apartment, moves to a small house as children begin to appear, shifts to a larger home in the suburbs as the family reaches maximum size, and returns to small residential quarters, often in the central city, when the children leave to establish homes of their own (pp. 180-181).

Table 4 provides a representative list of life-cycle definitions utilized in analyses of household mobility.

There is little evidence which permits a comparative analysis of alternate definitions of "the" life cycle; there appears to be no study attempting to distinguish among alternative definitions. Furthermore, the differences in these definitions are indicative of the difficulty in applying the concept to quantitative analysis. The dimensions typically used to categorize the life cycle include the number of family members, their ages, blood (or other) relationships, or some

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[11]Rossi [1955] considers moves resulting from the following types of reasons involuntary: (1) eviction or the destruction of the dwelling unit; (2) marriage, divorce, or separation; (3) job changes involving long-distance shifts, and (4) severe losses in income. Clark [1970] cites, as examples of involuntary moves, those resulting from a divorce or severe loss of income. Although disagreement exists about whether certain kinds of moves are involuntary, most observers agree that moves resulting from a family's perception that its housing space is inadequate are considered as voluntary ones.

TABLE 4
TAXONOMIES OF THE HOUSEHOLD LIFE CYCLE

Stage of the life cycle	Glick	Lansing and Kish	Abu-Lughod and Foley
1	Pre-marriage	Young single	Pre-marriage
2	Married, awaiting birth of first child	Young married, no children	Married, pre-child
3	Married, awaiting birth of last child	Married with child under 6 years	Child-bearing
4	Married, awaiting marriage of first child	Married with all children over 6 years	Child-rearing
5	Married, awaiting marriage of last child	Older married with children	Child-launching
6	Married, before the death of one spouse	Older married without children	Post-child
7	Widowhood	Older single	Widowhood

Source: Glick, P.C. 1947. Lansing, J.B., and L. Kish. 1957. Abu-Lughod, J., and M.M. Foley. 1960.

combinations such as age of the household head and number of children. In investigating this complex interaction, some scholars report the relationship between age, say, and the propensity to move without holding other life-cycle components constant; others report relationships *ceteris paribus*. Still another problem in interpreting the influences of the family life cycle on mobility is that some results are reported for levels of life-cycle influences and others for changes in these life-cycle characteristics.

Marital Status. Consider marital status, for example. Fredland [1974], using regression analysis on a sample of households from the Philadelphia-Trenton area, finds the never-married less likely to move than the ever-married. G.S. Goldstein [1970], using regression methods to analyze a sample of San Francisco households, confirms this finding. Other research, based on survey data from Rhode Island, by Speare *et al.* [1974] finds that the mobility rate of those currently married is lower than that of those who are divorced or separated; also, that this rate decreases with duration of marriage (controlling for age and tenure type). Speare and his colleagues also report that the mobility rate increases with the number of previous marriages. Maisel [1966], using census data (the 1960 Public Use Sample) for households residing in SMSA's in the western states, finds that a couple is less likely to move than a single person, and that a widowed person is less likely to move than a couple. Chevan's analysis [1971] of household data from Philadelphia-Trenton indicates that mobility rates decline sharply during the early years of marriage, and more slowly after the tenth year. G.S. Goldstein [1970] and Maisel [1966] also find that married couples without children are more mobile than those with children.

By contrast, there is substantial agreement that recent changes in marital status increase household mobility. Pickvance [1973] found that most households move in the first year of marriage, a finding confirmed by Speare *et al.*

[1974] using mobility rates, and by three researchers using regression techniques—Morrison [1972], analyzing a national sample of households; Fredland [1974], analyzing Philadelphia households; and H.J. Brown [1975], analyzing San Francisco households. The dissolution of a marriage through separation or divorce leads to more frequent movement [Morrison 1972; Fredland 1974; H.J. Brown 1975]. Fredland and Brown found an effect only for owners, not for renters. Kain and Quigley [1975] reported a 99-percent mobility rate for St. Louis households formed during a three-year period.

Age. The most consistently reported result is the inverse relationship between the age of the household head and mobility—using simple tabulations of mobility rates for a wide variety of special samples of households [Abu-Lughod and Foley 1960; H.J. Brown and Kain 1972; Butler et al. 1964; Goldscheider 1965; Rossi 1955; Speare 1974; Speare et al. 1974; Van Arsdol et al. 1968]—as well as regression analysis [Fredland 1974; G.S. Goldstein 1970; Kain and Quigley 1975; Maisel 1966; Morrison 1971, 1972; Weinberg 1975].

Long [1972] reported an independent effect of age and life cycle based on an analysis of a national sample of households; but Okraku [1971], analyzing San Juan households, found an effect of age only in the household's expansion phase. In addition, Fredland [1974] found that age affected mobility at a declining rate—i.e., the regression coefficient on age is negative but the coefficient on age-squared is positive, and the net effect is negative over the relevant range—and that the age of the household head is not as important for homeowners as for renters in determining mobility.

Sex. The sex of the household head also seems to play a role, although the exact effect is unclear. Goldstein and Mayer [1964] examined simple mobility rates among Rhode Island households and found that ''short distance migration . . . has been heavily female (p. 12).'' Kain and Quigley [1975] found higher mobility rates in St. Louis for households headed by older females (with or without children) than for other households. Fredland [1974] reported that male unmarried renters were more mobile than females, but that female unmarried homeowners were more mobile than males.

Household Size. There is an ambiguous relationship between mobility and household size, perhaps because of definitional differences among researchers. Rossi [1955], analyzing simple mobility rates, and Weinberg [1975], using regression analysis, both found that mobility rates increased with family size. H.J. Brown and Kain [1972], using mobility rates, and Maisel [1966], using regression, found decreasing mobility with larger family sizes. H.J. Brown and Kain still find this tendency when controlling for income, education, and age of the head. Fredland's results [1974], using regression analysis, are mixed. He found a family of two to four persons more mobile than a single person or a larger family unit. Okraku [1971] asserts that family size has a positive effect on mobility, but only in the household's perception of dwelling unit adequacy.

Household Composition. More important, perhaps, than the number of household members is variation in the composition of households. Kain and Quigley [1975] reported a slight increase in mobility with household size, holding the number of workers and school-aged children constant in a regression, but a slight decrease in mobility with the number of school-aged children, holding the number of persons and workers constant. This finding is confirmed

by Long [1972], who found that for households headed by males and females, the presence of school-aged children restricted mobility. The incremental effect of an additional child beyond the first one was typically less than the first. However, Long did not find any systematic relationship between the number of children and local mobility. Speare et al. [1974] also found that the presence of school-aged children decreased mobility for homeowners, but not for renters. However, Morrison [1972] reported that additional children did not lead to decreased mobility; the results of analyses by Fredland [1974] and by Butler et al. [1964] suggest that family composition is not very important in determining mobility.

Changes in family size are highly correlated with mobility. Both H.J. Brown [1975] and Weinberg [1975], analyzing household data from the San Francisco Bay area, discovered that increases and decreases in family size increased mobility significantly, both for owners and renters. Fredland's results [1974] confirmed this. Chevan's analysis [1971] indicated that for any given marriage duration, the birth of children was associated with higher rates of moving, and that mobility rates were highest around the period of the first birth. Similarly, Fredland found that the birth of a child lead to increased mobility, and that the effect was greater for renters than for owners.

OTHER HOUSEHOLD CHARACTERISTICS

In addition to these components of the life cycle of households, a body of research findings suggests several other correlates of residential mobility.

Tenure. First, there is persuasive evidence that renters are more likely to move than home-owners (Table 2), even when many other influences are held constant [Abu-Lughod and Foley 1960; H.J. Brown and Kain 1972; G.S. Goldstein 1970; Kain and Quigley 1975; Morrison 1971, 1972; Okraku 1971; Pickvance 1973, 1974; Rossi 1955; Speare et al. 1974; Weinberg 1975]. These correlates may have little or nothing to do with causality, however, since the transaction costs of owning are substantially higher than those of renting.

A widely held rule of thumb, and some serious research, suggests that renting is cheaper than owning for those who move within three or four years of initial occupancy [Shelton 1968]. From this viewpoint, it appears that tenure type is itself endogenous; otherwise identical households assessing their probabilities of moving higher than average are simply self-selected into rental units. This point is discussed in more detail in Section 5.

Prior Mobility. Second, a body of descriptive evidence suggests that prior mobility is strongly correlated with current mobility. Observations of this type recall the chicken-egg controversy.[12]

Race. Researchers examining simple mobility rates often conclude that non-whites are more mobile than whites, but many analysts do not control for socio-economic or tenure characteristics.[13] Using regression techniques,

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[12]For example, one result reported consistently for diverse samples of households—including Dutch households [Morrison 1967], Mexican families [Land 1969], and many analyses of the behavior of U.S. households [S. Goldstein 1954, 1958; Morrison 1967, 1971a, 1971b]—shows a substantial number of "chronic movers." As reported in studies on mobility rates [Speare 1970; Speare et al. 1974] and in regression analyses [Land 1969; Morrison 1967], recent movers are more likely to move again. Alternately, mobility declines with the length of residence. Duration of residence seems to be important, even controlling for age [Morrison 1971b]; but Speare [1970] found no effect for owners (mobility declined with duration for renters).

[13]See Butler and Kaiser [1971] and McAllister et al. [1971] for a discussion of this point.

the results range from no effect of race on mobility for unmarried indi-
viduals [Fredland 1974] and nonwhites in general [Morrison 1971], to a sub-
stantially lower probability of moving for black owners [Kain and Quigley'
1975]. Weinberg [1975] has found *ceteris paribus* that Negro and Spanish-
surname males have lower mobility rates than white males or females, even
when a longer period of adjustment (two years) is taken into account. More-
over, he reported that the mobility behavior of households in several non-white
racial groups (Negro, Oriental, and Spanish-surname) differed in important
respects.

Income. Income and education are two demographic characteristics with
effects that are difficult to disentangle. The reported results for the effects of
income are simply inconsistent. Abu-Lughod and Foley [1960] stated from
their examination of simple mobility rates that movers have lower incomes
than non-movers. H.J. Brown and Kain [1972], using cross-tabulation, re-
ported that mobility by income appeared to have an inverted U-shape—with
mobility the highest in the middle-income range, a result supported by Wein-
berg's regression analysis [1975]. Pickvance [1973], using mobility rates, and
Kain and Quigley [1975], using regression analysis, found that mobility de-
creased with income. Fredland's results [1974] suggest a slight increase in
mobility with income. The effects of changes in income are clearer. H.J.
Brown [1975] reported that rising income increased mobility for owners and
renters (decreases seemed to have no effect), but the measure of income
change employed was quite crude.

Education. Investigations of the independent effect of education using
mobility rates report that more education is associated with higher mobility
[Abu-Lughod and Foley 1960; H.J. Brown and Kain 1972; S. Goldstein and
Mayer 1964], or that it had no effect [Long 1972; Morrison 1972; Speare *et al.*
1974]. Likewise, the results of regression analysis suggest either that there is a
slight positive effect [G.S. Goldstein 1970], or no systematic effect [Kain and
Quigley 1975; Weinberg 1975]. One explanation for the ambiguous results for
income and education is their typically high correlation, even in micro data.

Occupation. Questions about the effect of occupation on mobility are tied
up with social mobility, career patterns, socio-economic status, and work-
place stability. The occupation of the head of the household is generally a poor
predictor of mobility [Berghorn and Naugle 1973; Goldstein and Mayer 1964;
Long 1972; Morrison 1972]. Weinberg [1975] suggested that it makes more
sense to think of occupation as affecting the stability of employment at a
particular workplace, which in turn affects residential mobility. Some sociol-
ogists believe that socio-economic status and upward social mobility play an
independent role in moving behavior, but there is no agreement on the im-
portance of these factors.[14]

Workplace Location. There is no consensus on the effects of accessibility,
workplace location, and workplace change on subsequent mobility. Johnston
[1971] has remarked recently that "whether a change of work place is asso-

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[14]Leslie and Richardson [1961] think that career patterns and upward mobility play a more important role than the
life cycle, at least in forming the desire to move. Whitney and Grigg [1958] state that 90 percent of local moves are
status-related. Moore [1966] suggests that people of lower status are more mobile than others. Goldscheider [1966]
writes that the elderly of lower socio-economic status are less mobile, but Ross [1962] and Butler *et al.* [1964] assert
that class or status are unimportant in local mobility.

ciated with a change of residence is at present only a matter of speculation (p. 327)." Sociologists, using mobility rate analysis, often conclude that accessibility and work-related reasons provide only minor impetus for residential mobility [Goldstein and Mayer 1964; Speare et al. 1974; Stegman 1969; Thibeault et al. 1973; Zimmer 1973].

On the other hand, economists find that there is a much stronger relationship. H.J. Brown [1975] reported that a decrease in accessibility (measured in time or distance) increases mobility for both owners and renters. Similarly, H.J. Brown and Kain [1972], using cross-tabulation, and both H.J. Brown [1975] and Weinberg [1975], using regression analysis, found that the probability of a residential move is significantly greater when there has been a change of workplace within the same metropolitan area.

Similar evidence comes from an examination of changes in employment status. A change in employment status seems to affect mobility, although the direction of that effect is unclear. Weinberg [1975] reported that becoming unemployed raised mobility and becoming employed lowered it. Fredland [1974] found the opposite (for renters).

Retiring seems to increase mobility [Brown 1975; Fredland 1974]. Morrison [1972] reported that unemployed men had higher mobility rates than those who were employed. Kain and Quigley [1975] discovered that households with retired heads and ones with more than one worker were both less likely to move than others. H.J. Brown [1975] reported curious results for the unemployed: residential mobility increased for renters, but decreased for owners as the number of months of unemployment rose. Also, G.S. Goldstein [1970] found that residential mobility declined with length on the job.

These results in particular must be evaluated with care. Sampling error is likely to be high due to the small fraction of households in the categories examined in each data base.

ECOLOGICAL ANALYSES AND ENVIRONMENTAL CHARACTERISTICS

Many of these findings about the correlates of individual household mobility are supported by ecological analyses—using mobility rates reported by census tracts or other geographical units as observations. For example, Varady [1974] found that racially mixed neighborhoods typically have higher mobility rate than all white ones; Moore's analysis [1969b] of Brisbane indicated that mobility was inversely related to the average age of census-tract populations and was directly related to the proportion of renter-occupied units.

Several ecological analyses suggest that neighborhood characteristics per se are correlated with household mobility. Stegman [1969] and Morrison [1972] believe that considerations of neighborhood quality dominate those of accessibility and housing-unit quality, respectively. Clark [1970] considers neighborhood factors to be very important, while Zimmer [1973] rejects dissatisfaction with the neighborhood as unimportant. Overall, it does appear that there are differential effects of individual and household factors on residential mobility in different areas [Speare et al. 1974].

Little work has been done on the specific neighborhood factors affecting mobility behavior. Droettboom et al. [1971] stated the effect of crime and

violence on local mobility for a national sample of households was small, but Greenberg and Boswell [1972] asserted that the perception of deterioration—especially as related to a fear of crime—was an important motivation for mobility among households in New York City. Boyce [1969] and Moore [1972] reported that low evaluations of housing and neighborhood quality lead to greater mobility. Overcrowding within a dwelling unit also tends to increase mobility [Fredland 1974; Goodman 1974].

Housing market considerations also seem to matter. Grigsby [1963] stated that, in principle, mobility should be affected by the price and availability of alternate dwellings. Weinberg [1975] has found that the tightness of the housing market (as measured by mortgage rates) is inversely related to household mobility. The distribution of public services and taxes in relation to the distribution of income and wealth may also provide motivations for mobility, at least according to an analysis by Aronson and Schwartz [1973].

5. A Synthesis

Our view of residential mobility is close to that expressed by Rossi [1955], although it is framed in the language of utility maximization. In our view, a useful model of residential mobility must be based on measurable concepts, regardless of whether they are called "stress," "dissatisfaction," or factors which decrease "place utility."

The mobility model developed in this section relies on one very simple concept: if the dollar value of the benefits derived by moving to a new dwelling unit exceed the costs associated with that move, a household will be more likely to move. Below, we expand this concept and suggest a measure of the benefits to be gained from moving. Even though the model is explicitly economic in character, we believe that its implications are quite general and that it can be used to quantify the notion of "dissatisfaction" for empirical testing. In the next section, we suggest how this model might be operationalized.

The conventional economic models of residential location [Alonso 1964; Muth 1969] derive the equilibrium pattern of residential location and housing consumption[15] for urban households in a frictionless and static environment—in a world of perfect information, with zero transaction costs and with no moving costs. The results derived from such models are "equilibrium" in the sense that under unchanged conditions, no household has an incentive to move. Given that a particular household does decide to move in this idealized world, its choice of location is a straightforward application of the same theory.

What, then, governs the decision to move in such a frictionless world? The decision to move in an Alonso-Muth world would be perfectly predicted by changes in any of the parameters which taken together define a household's equilibrium, or utility-maximizing, consumption of housing services:

1. Movements along the demand curve for housing services (caused by changes in the price of housing relative to other goods).
2. Shifts in the demand curve itself (caused by changes in income or other demand determinants).

[15]"Housing services" is a conceptual measure for the flow of consumption services provided by the attributes of a dwelling unit and its associated micro-environment. For details, see de Leeuw and Struyk [1975], Aaron [1972], or Kain and Quigley [1975].

3. Changes in the prices or costs of transportation relative to other goods. Two factors make this model of the decision to move excessively simple. There is considerable friction in the real world (the costs of moving are not small), and households do not possess perfect information about the prices and availability of housing units.[16] Even if households possessed perfect information about market opportunities, so there would be no "search costs" associated with mobility, the monetary costs of relocation are substantial.[17]

There are at least two components of these relocation costs, the costs of moving household possessions and the out-of-pocket costs particular to each type of tenure.[18] For renters, these transaction costs also include any rent discounts attributable to long-term occupancy in any particular dwelling unit which are foregone by moving.[19]

The existence of substantial transaction costs (the monetary costs noted above plus more general psychic costs) immediately suggests that having chosen an equilibrium location, households will systematically "drift" out of equilibrium without choosing to relocate; i.e., their observed consumption of housing services will deviate from their equilibrium consumption—the amount of housing freely chosen in a frictionless world on the basis of preferences, incomes, and relative prices.

Households drift out of equilibrium as marginal changes in prices or demand render their dwellings less than optimal, given current household characteristics and housing conditions. Changes in prices occur exogenously to the household; changes in demand result from changes in household tastes, income, or other characteristics.

In principle, the loss suffered by a household by not moving is measurable. That loss would be the amount of money required at the current residential location and quantity of housing consumed required to make the household as well off as it would be if it were currently consuming its preferred quantity of housing services at the optimal location. This amount of money, the income equivalent of the disequilibrium, is a cardinal measure of the "dissatisfaction" or "stress" attributable to housing consumption. In the appendix, we illustrate the derivation of the disequilibrium for various demand functions for housing.

In common with the approach of Speare *et al.* [1974], our simple model

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[16]A third consideration is that the appropriate measure of housing services is more complex than is implied by the simple location model—in particular, a significant element in housing services is distinct from those services provided by a dwelling unit, a structure, or a parcel. This broader concept of the notion of housing, termed "neighborhood services" by de Leeuw and Struyk [1975], complicates the measurement problem in making empirical statements about the propensity to move. See Section Six.

[17]A recent paper by Muth [1974] emphasizes the importance of moving costs in affecting housing choice and in explaining variations in the income-housing expenditure relation over the life cycle. Throughout the analysis, however, Muth assumes that the decision to move is itself a completely random event. In fact, his analysis assumes that "moves . . . are exogenous to the decision of how much housing to consume" (p. 108).

[18]For homeowners, these latter costs include brokers' fees, the costs of title search, and other closing costs. Empirical evidence suggests that for homeowners, these may be on the order of 10 to 20 percent of annual housing expenditures [Shelton 1968]. For renters, these costs include foregone interest (or liquidity constraints) resulting from security and lease deposits, and the like.

[19]Long-term occupancy by tenants can result in significant cost savings to landlords—not only a reduction in painting and redecorating expenditures, but also a reduction in the expected vacancy rate of rental units. In a competitive market, even with perfect information on the part of landlords, some or all of these savings should be passed along to tenants. There is some empirical evidence on the relative magnitude of the reductions in gross rent attributable to long-term occupancy. Kain and Quigley [1975] report small but statistically significant discounts in the market rents of otherwise comparable dwelling units attributable to long-term occupancy (about half a percent for each year of residence). More generally, the first annual housing survey reports that the average market rents paid by recent movers are 8 percent higher than those paid by non-movers. See U.S. Department of Housing and Urban Development [1975]. Variations in the magnitude of transactions costs constitute one reason why mobility rates for otherwise comparable households may differ across metropolitan areas. For example, in metropolitan areas with high vacancy rates (where the general vacancy rate is higher for any rental unit), one may expect landlords to offer larger monetary discounts for long-term tenancy.

implies that each household has a "threshold level of dissatisfaction" that governs local mobility. However, this threshold is measured in dollars. The threshold for each household will vary if the equivalent monetary cost of moving differs for households of different characteristics. In addition, some households may have higher rates of time preference and, thus, may discount the future losses arising from currently non-optimal housing consumption more heavily. Households who can project major changes in housing demand, or who can forecast the timing of a job-related move, discount losses in utility over a shorter time. This suggests why, for example, households that expect to move frequently typically choose rental units.

Empirically, however, increases in the gap between equilibrium levels of housing consumption and current levels (as well as decreases in moving costs) should be associated with increased residential mobility for otherwise comparable households. Our analysis further suggests that holding housing prices, transport costs, and incomes constant, there is little reason to expect residential mobility to be associated with particular demographic characteristics of households, except to the extent that such characteristics are good indicators of expected changes in housing demand. On the other hand, there is strong reason to expect mobility to be associated with any changes in household demographics that shift the demand curve for housing services.

In addition to neighborhood services and transactions costs, one additional element is needed in a realistic model of intra-urban residential mobility: information. The analysis so far has assumed perfect information about housing prices, transport prices, and vacancies on the part of all those in the housing market. In reality, housing-market information is of two types: (1) exogenous information that households can obtain more or less "free" and passively from newspapers, bulletin boards, and the like and (2) information that households obtain by investing resources in an active search. Variations in the costs of obtaining information, in the housing market institutions, and in the degree of segmentation in the housing market provide an additional reason why observed mobility rates for otherwise comparable households may differ across metropolitan areas.

Imperfect information and uncertainty destroy the perfect correspondence between mobility and the magnitude of moving costs relative to the level of dissatisfaction with the current dwelling unit. For any level of moving costs, each household has some prior estimate of the distribution of available houses and their associated prices.[20] Given this prior distribution, the household must decide whether to invest resources in a search. That decision depends on the cost of a search and of a move, and on the initial level of housing consumption. A vacancy will be searched if the *expected* gain from the investment in search minus the cost of a move is greater than the cost of a search.

Suppose, having made this calculation, that the household searches one vacancy. This investment of resources revises the household's prior distribution of housing prices and availability. If the gain that could be realized from moving to that unit should happen to exceed the costs of move, the household might move to the sampled unit. However, any search also results in

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[20]This may be thought of as the household's "awareness space" in the terminology of L.A. Brown and Moore [1970].

a revision of the household's prior estimate of the distribution of available housing and housing prices. Thus, even if the potential gain from a move resulting from a particular search does exceed the cost of that move, the household may decide to search yet another vacancy.

It will do this if the expected *gain* (based upon the *revised* distribution) minus the cost of an additional search is positive. Thus, if the realizable gain from a single search exceeds moving costs, the household will either move or continue search.[21] Conversely, if the realizable gain does not exceed the moving costs, the household will not move. It may decide, however, on the basis of its posterior distribution to sample an additional dwelling unit.

In this context, the role of free information (i.e., a passive search by reading bulletin boards or classified advertisements) becomes clear. It is a method by which prior notions about the distribution of housing prices are revised. As with any sampled vacancy, the household may decide to move to the advertised unit, to remain in its current unit, or to invest in active search because its prior estimate of the distribution of units has been revised.

The lack of perfect information implies that the mobility threshold and the search threshold may vary considerably, even for otherwise identical households with the same moving costs. This factor introduces a stochastic element into an otherwise deterministic model. Thus, it should still be true that the *probability* of searching and the *probability* of moving will be greater for households with lower moving and transaction costs, and for households with larger ''gaps'' between their equilibrium and current levels of housing consumption.

This analysis can again be contrasted with the model of Speare *et al.* [1974], which asserts that highly satisfied households do not consider moving—even when, if the household looked, it would discover high benefits to be gained from moving and low costs. It is true that a household whose level of housing consumption is close to equilibrium will have a lower probability of engaging in an active search. However, any information that revises the prior distribution of housing prices (e.g., free information) or that changes search or moving costs will affect the expected gain from investing in a search. Thus, we may expect that even highly ''satisfied'' households may find it profitable to engage in search activity.

6.   Concluding Remarks and Implications for Research

The theoretical perspective developed in Section Five is useful in evaluating the sometimes inconsistent body of empirical literature on the correlates of moving behavior reviewed in Section Four. The most consistent finding of that literature is the importance of variables measuring *changes* in household characteristics relative to those measuring levels.

We interpret this as evidence that mobility is a response to changes in the demand for housing services. Our theoretical perspective is also consistent with the finding that mobility is responsive to changes in neighborhood public services, that mobility is lower for owners than for renters, and that mobility is

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[21]Flowerdew [1976] summarizes alternative decision rules in this search process. He emphasizes, however, the simplest set of fixed stopping rules.

inversely related to the length of tenure. Our analysis further suggests that much of the ambiguity in the reported results about the influence of particular levels of household characteristics (family size, income, and the like) arises because these variables have not been related explicitly to the demand for housing services or to the costs of moving.

Empirically specifying a model of residential mobility based on the costs and benefits of moving is possible at several levels of aggregation. The benefits of moving are measured by the gain to the household of eliminating any discrepancy between observed and equilibrium housing consumption. The gain might be measured in several ways. For example, as illustrated in the Appendix, the gain could be measured as the income equivalent of the disequilibrium, conditional on the demand curve for housing services. Alternatively, if the demands for particular components of housing services can be specified (e.g., the demands for space, quality, and locational attributes),[22] the benefits can be measured as deviations from equilibrium consumption in several dimensions.[23]

From this perspective, much of the existing empirical work on mobility—regressions relating the probability of moving to income and to household demographics—can be viewed as specifications of a reduced-form equation relating moving propensities to those demographic changes—in income, family size and composition, and so on—which change the equilibrium demand for residential housing, rather than as specifications of the structural equation including explicit measures of the benefits and costs of moving. Our analysis suggests that a model explicitly including these costs and benefits would go a long way toward resolving apparent inconsistencies in the empirical literature.

APPENDIX

This appendix indicates how the income equivalent of disequilibrium, the cardinal measure of dissatisfaction discussed in Section Five, can be inferred from market information using several familiar representations of household preferences and demand functions. The income equivalent (E) is defined as the amount of additional income that would make the household as well off at its initial position (without moving) as it would be if it moved to its equilibrium position.

If the household utility function is known, the Hicksian income equivalent (E_H) can be estimated in a straightforward manner. For illustration, assume the utility function is Cobb-Douglas in housing (H) and other goods

$$U = H^b(Y - P_H H)^{1-b} \tag{1}$$

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[22]Several recent studies of housing demand [King 1976; Straszheim 1975] have estimated such demand curves for components of the housing bundle.
[23]The former strategy, relying on a demand curve for a single valued commodity, "housing services," has the advantage of relative simplicity in empirical work; but it assumes that all components of "housing services" are fully capitalized into market prices and that households are indifferent to different housing configurations which rent at the same price. The second strategy is clearly more difficult to implement empirically. An analysis by Goodman [1976] measures disequilibrium (and the incentive for relocation) in several dimensions as the difference between observed household consumption of, say, dwelling unit space and the average consumption of space by households of the same socio-demographic group.

where Y is household income, P_H is the price of housing and b is a constant, $0 < b < 1$. This implies an equilibrium demand function

$$P_H H = bY = R \tag{2}$$

where the household spends a fixed fraction of income on rent (R). Consider a household initially consuming H_o with income Y_o. The income (Y^*) required to make the household as well off as if it moved and adjusted its housing consumption to its equilibrium level (H^*) is, from Equation 1,

$$(H_o)^b(Y^* - P_H H_o)^{1-b} = (H^*)^b(Y_o - P_H H^*)^{1-b} \tag{3}$$

or, in terms of rent,

$$Y^* = \left[\frac{R^*}{R_o}\right]^{b/(1-b)} \cdot [Y_o - R^*] + R_o \tag{4}$$

Thus the income equivalent is[24]

$$E_H = Y^* - Y_o = \left[\frac{bY_o}{R_o}\right]^{b/(1-b)} \cdot [(1 - b)Y_o] + R_o - Y_o \tag{5}$$

Alternatively, if the household demand function (but not the utility function) is known, say $P_H = D(H)$ the Marschallian income equivalent (E_M) is a straightforward calculation.[25] It is simply the difference in consumer surplus between enjoying the equilibrium level of housing services, H^* at rent R^*, and the initial position (consuming H_o at rent R_o),

$$E_M = \left[\int_0^{H^*} D(H)dH - R^*\right] - \left[\int_0^{H_o} D(H)dH - R_o\right] \tag{6}$$

For example, if the demand curve for housing services is log-linear,

$$\log H = \log K + a \log Y + b \log P_H, \tag{7}$$

substitution into Equation 6 yields

$$E_M = \left[\int_{H_o}^{H^*} \left(\frac{H}{KY^a}\right)^{1/b} dH\right] - R^* + R_o \tag{8}$$

or, in terms of rent,

$$E_M = \left(\frac{b}{b+1}\right)(R^* - R_o^{\frac{b+1}{b}} R^{*-\frac{1}{b}}) - R^* + R_o. \tag{9}$$

The discussion in Section Five argues that those households for which the present value of this income equivalent exceeds moving costs are more likely to make intra-urban relocation decisions. For example, if moving costs, discount rates, and time horizons are the same, this implies an empirical specification of the form

$$p^i = f(E^i), f' > 0 \tag{10}$$

where the probability of move by the ith household (p^i) is a monotonic function of the income equivalent or measure of "dissatisfaction" (E^i).

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[24]Similarly, if the utility function is Stone-Geary,

$$U = (H - \theta_1)^b(Y - P_H H - \theta_2)^{1-b}. \tag{N1}$$

the income equivalent is

$$E_H = \left[\frac{b(Y_o - P_H\theta_1 - \theta_2)}{R_o - P_H\theta_1}\right]^{b/(1-b)} \cdot [(1 - b)(Y_o - P_H\theta_1 - \theta_2)] + R_o + \theta_2 - Y_o \tag{N2}$$

[25]This measure of the income equivalent is, of course, the traditional consumer surplus measure, an approximation to the Hicksian equivalent. See Willig [1976].

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