

THE EFFECTS OF SOCIAL SUBAREAS IN URBAN RESIDENTIAL MOVEMENT: AN ANALYSIS OF RESIDENCE HISTORIES¹

William H. Frey, Center for Studies in Demography and Ecology
Department of Sociology, University of Washington

Areal factors have been used in various ways in studies of metropolitan residential movement. Some have used an ecological approach showing, for example, that those areas with high mobility rates can be characterized by certain social and demographic characteristics (Moore, 1969). Other studies have focused on the demographic effects of net migration on a region by looking at the net movement from various social and economic subareas (Goldstein, 1965). A third type of analysis looks at the characteristics of movers from social and demographic areas of various types (Rossi, 1955). Although the first two types of studies are useful in determining broad structural patterns of change in an urban area, they give little in the way of clues as to which individuals are doing the moving. The third type of study which looks not only at areal characteristics but at individual factors as well, allows one to differentiate between the effects of each on mobility. This type of study is least represented in the literature due to the difficulty in obtaining relevant data for both characteristics of the individual and place of origin.

Utilizing residence histories and census tract data, this analysis will investigate the influences of areal and individual characteristics as mobility determinants in the state of Rhode Island. The state generally represents the greater Providence metropolitan area--a medium-sized, mature northeast urban center which has undergone significant population decline in its central city area. Areal influences on movement will be assessed here in terms of small social subareas (census tracts).

AREAL INFLUENCES

Perhaps the most noteworthy physical characteristic in this regard is neighborhood density. The density criterion measured by "population per square mile" has proved successful in the explanation of mobility at the aggregate level particularly for a mono-nuclear city around which population density tends to exhibit a negative exponential relationship with the distance from the city center (Moore, 1971). This is in part explained since areas of greatest density are disproportionately composed of apartments, multiple family dwellings, and rented housing which generally attract the more mobile segments of the population. However, other studies suggest some very real environmental components associated with neighborhood density which could predispose one to movement (Lansing and Hendricks, 1967).

There is some agreement among writers on mobility that social areal characteristics are of more importance than either locational or physical characteristics (Abu-Lughod and Foley, 1960; Rossi, 1955). Shevky and Bell (1955) and more recent factorial ecologists (see Berry, 1970) have found urban regions to be differentiated according to dimensions of socio-economic status, family status, and minority status. This study will fo-

cus on the first two of these dimensions in addition to the past turnover status of urban subareas as social areal factors.

One might look at the household and housing characteristics usually associated with certain socio-economic status areas. In general upper socio-economic household heads are more likely to live in owned, single-family dwellings and are usually further along in the life cycle than are household heads from lower class areas. Since each of these characteristics are related to lower mobility levels, one might expect generally lower residential movement originating in higher socio-economic neighborhoods.

Aside from the compositional effects associated with the mobility of each status-linked area, one might look at mobility behavior of individual households because of their residence in these status areas. For example, it is reasonable to assume that lower and middle status neighborhoods are the source areas of those households which are upwardly mobile both socially and residentially.

One further consideration is the changing class status of areas within the metropolitan community. According to the filtering model (Grigsby, 1963), a few residents of medium or high income areas tend to vacate their dwellings due to obsolescence of the neighborhood location. As the process gets under way, other long-time residents react to the same stimulus or to the undesirability of new arrivals into the neighborhood.

There is also a segregation of residential areas by family status within the larger metropolis. A simplified model suggests that low family status areas will be inhabited by renters, apartment dwellers, and young people--all characteristics shown to be highly related to mobility. High family status areas will consist mostly of homeowners, single-family unit dwellers and families with children--characteristics associated with infrequent movers (Johnston, 1971). Aside from these compositional effects, the family status of a neighborhood has environmental influences on mobility incidence. In Rossi's (1955) study, the full families that resided in low family status areas showed higher mobility than any other household type.

The interest here in neighborhood turnover status stems again from Rossi's work which shows that when the socio-economic status of an area is taken into account, families in high turnover areas are more likely to move than those in low turnover areas.

Although Social Areal Analysis and other factorial ecologies isolate what appear to be independent social dimensions of urban areas, intercorrelations and interactions exist between them, many times in regularly predictable

patterns. Also, it is possible that each of the social characteristics might have quite different mobility effects among various urban locations. In light of these issues, the following questions are relevant: (1) Which social areal factors are most important in the determination of the incidence of residential mobility, given the fact that various interdependencies exist? (2) To what extent do areal determinants operate differently in the explanation of mobility incidence for zones of various population densities? (3) What are the relative effects of individual level determinants, on the one hand, and areal determinants, on the other, in the explanation of mobility incidence?

DATA AND TABULATION TECHNIQUE

This study utilizes two data sources: residence histories as well as 1960 and 1970 census tract data. The residence histories were collected from a probability sample of Rhode Island adults who were interviewed in 1967 and 1968 as part of a survey undertaken by the Brown University Population Research Laboratory (see Organic & Goldstein, 1970).

A residence history was obtained from each person interviewed that included every place of residence since birth. For purposes of this study, the portion of the residence history used was only that between 1955 and 1967 since our measures of the areal characteristics associated with each residence were obtained from the 1960 and 1970 census and it was felt that these measures could not be inferred to residences before 1955. Portions of the residence histories were excluded in the following instances: when the individual was not residing in the state; and those years of residence before age eighteen. The former exclusion was made since the focus of the study is only on intra-urban mobility; the latter was made since most moves made prior to age 18 were probably decided by parents.

The data were tabulated utilizing a technique wherein the residence history of each respondent is divided into one-year life segments and these segments were the units of analysis. Since 13 years of a respondent's residence history can be included in the analysis, it is possible for a single respondent to contribute thirteen segments or analysis units to the study; hence although 2,233 survey respondents provide the source of information in the form of residence histories, the actual analyses are based on 22,644 one-year life segments. Although the original survey constituted a probability sample of Rhode Island adults in 1967-68, the population of one-year segments does not comprise a representative sample for the analogous population in 1955-67 because of death and out-movement of previous Rhode Island residents and due to memory failure associated with the residence histories themselves. Each segment was classed as mobile or non-mobile depending upon whether a move had taken place during the segment year examined. Tabulations in the analysis, then, will be presented in terms of "mobility rates"---(move segments/total segments) X 100---for categories associated with the indepen-

dent variables.

This data source is unique in that census tract locations were recorded for each residence in the histories. Here it is possible to categorize the one-year segments by census tract characteristics and to analyze the effects of these characteristics on mobility incidence.

The social areal characteristics used to classify tracts represent measures of socio-economic status, change in socio-economic status, family status, change in family status, and turnover status. These measures are based on 1960 and 1970 census tract data for the state of Rhode Island (U.S. Bureau of the Census 1960; 1970). Further details on these measures are given in Appendix A.

In addition, the state has been partitioned into three zones based on levels of population density for towns in the state. In general, zone 1 refers to central city areas and industrial satellites; zone 2 includes immediate suburbs to a large extent; and zone 3 refers to towns of lowest population density which characterize areas on the periphery of the metropolitan area. In a crude sense, the density index can also be considered a level of urbanization index.

ANALYSIS

Overall Mobility Incidence Undertaken first will be analyses directed toward answering the question regarding which areal factors are most important in the determination of mobility incidence. The investigation will center around the tract characteristics just discussed. Table 1 shows unadjusted mobility rates associated with the various areal characteristics. Highest levels of movement are shown for areas of low socio-economic and low family status, high turnover status and in areas of downwardly changing family and socio-economic status. Higher rates are also shown for zones of greater density. The strongest relationships are seen for the areal factors: family status and socio-economic status.

The adjusted rates in Table 1 are presented in an attempt to control for intercorrelations among tract characteristics. This is a modification of the dummy variable regression technique proposed by Andrews, Morgan and Sonquist (1967) as multiple classification analysis.

Two sets of adjusted rates are shown in the Table. The first set includes the zone index as an independent variable and the second does not. The first set shows rather dramatically that when all social areal characteristics are taken into account, the zone of origin has virtually no independent effect on mobility incidence. In both multivariate analyses, the family status factor still predominates as the most important mobility determinant, but the adjusted rates for low family status areas are reduced. Less importance is attributed to socio-economic status which is now on a par with turnover status. The bottom

Table 1

MOBILITY RATES AND CONTRIBUTIONS TO MOBILITY EXPLANATION
BY TRACT CHARACTERISTICS

Population: One-year Segments in Zones 1, 2, and 3.

Adjusted rates are adjusted for all tract characteristics

Tract Characteristic	Mobility Rates			Number
	Unadjusted	Adjusted ^a	Adjusted ^b	
Socio-economic status				
High	8.2	8.4	8.4	6,968
Medium	8.4	9.4	9.4	8,359
Low	12.7	11.4	11.4	7,317
	Eta .0701	Beta .0411	Beta .0406	
Change in socio-economic status				
Upward	8.8	9.3	9.3	6,979
Moderate	9.3	9.7	9.8	7,333
Downward	10.9	10.1	10.1	8,332
	Eta .0303	Beta .0110	Beta .0111	
Family status				
High	7.2	7.9	7.9	7,301
Medium	9.2	9.6	9.6	8,362
Low	13.1	11.9	11.9	6,981
	Eta .0799	Beta .0546	Beta .0535	
Change in family status				
Upward	8.9	8.9	8.9	5,616
Moderate	9.0	9.5	9.5	9,126
Downward	11.1	10.6	10.6	7,902
	Eta .0344	Beta .0230	Beta .0231	
Turnover status				
High	11.9	11.6	11.6	5,905
Medium	10.1	9.7	9.7	8,042
Low	8.0	8.5	8.5	8,697
	Eta .0524	Beta .0419	Beta .0420	
Zone				
Zone 1	11.8	9.7		9,878
Zone 2	8.5	9.8		7,815
Zone 3	7.5	9.7		4,951
	Eta .0632	Beta .0025		
Overall	9.7			26,444

Tract Characteristic	Contributions to Mobility Explanation ^c	
	Percentage of Total Variance	Percentage of Explained Variance
Socio-economic status	.14	13.6
Change in socio-economic status	.01	1.0
Family status	.64	62.1
Change in family status	.07	6.8
Turnover status	.17	13.6
Zone	.00	0.0
Total	1.03	100.0

^aIncludes tract characteristic, zone.

^bExcludes tract characteristic, zone.

^centered in a stepwise manner as follows: family status, socio-economic status, turnover status, change in family status, change in socio-economic status, zone.

Table 2

ADJUSTED MOBILITY RATIOS FOR ZONES BY TRACT CHARACTERISTICS

Ratios are computed from mobility rates adjusted for all tract characteristics.

Tract Characteristic	Overall	Mobility Ratios ^a		
		Zone 1	Zone 2	Zone 3
Socio-economic status				
High	.87	.92	.89	1.05
Medium	.97	.85	1.06	.92
Low	1.18	1.10	1.12	1.23
	Beta .0406	Beta .0418	Beta .0208	Beta .0287
Change in socio-economic status				
Upward	.96	.85	1.13	1.04
Moderate	1.01	1.04	1.04	.89 ^b
Downward	1.04	.91	.89	2.16 ^b
	Beta .0111	Beta .0303	Beta .0281	Beta .0454
Family status				
High	.81	1.19	.76	.97
Medium	.99	.89	1.27	.95 ^b
Low	1.23	1.04	1.24	3.43 ^b
	Beta .0535	Beta .0312	Beta .0757	Beta .0728
Change in family status				
Upward	.92	.95	.82	.99
Moderate	.98	.91	1.07	.91
Downward	1.09	1.08	1.01	1.50
	Beta .0231	Beta .0308	Beta .0271	Beta .0490
Turnover status				
High	1.20	1.28	1.02	1.07
Medium	1.00	.97	1.15	.89
Low	.88	.81	.88	1.03
	Beta .0420	Beta .0683	Beta .0340	Beta .0210

^aThe mobility ratio is defined as: $\frac{\text{The mobility rate for the category (e.g., high SES status)}}{\text{The mobility rate for the subpopulation (e.g., Zone 3)}}$

For example, the adjusted ratio for high SES status tracts in the overall population is equal to (from Table 1): $\frac{8.4}{9.7} = .87$

^bBased on less than 100 cases

Table 3

CONTRIBUTIONS TO MOBILITY EXPLANATION BY TRACT CHARACTERISTICS AND BY TRACT CHARACTERISTICS WHEN INDIVIDUAL HOME OWNERSHIP STATUS AND AGE/MARITAL STATUS ARE CONTROLLED

Tract Characteristic	Percentage of Variance Explained by		
	Tract Character- istics Only	Individual Home Owner- ship Status and Age/ Marital Status	Tract Characteristics in Addition to Home Own- ership & Age/Marital Status
Socio-economic status	.49	11.38	.05
Change in socio-economic status	.09	11.38	.05
Family status	.64	11.38	.05
Change in family status	.12	11.38	.01
Turnover status	.27	11.38	.11

portion of the Table shows, however, the combined factors explain a low percentage of the total mobility variance.

Mobility Incidence for Metropolitan Zones It has been suggested that social areal factors will affect mobility differently in various urban locations. In Table 2, zone-standardized mobility ratios are presented which allow one to compare mobility differentials of each areal factor across zones.

Looking at turnover status, its overall direct relation to mobility can be seen particularly in segments located in zone 1. The pattern is quite different in zones 2 and 3, which display much smaller differentials. The overall inverse relation of family status with mobility is not exactly duplicated in each of the three zones but two general patterns are evident: the pattern of a U-shaped mobility relation in zone 1 and the pattern of an approximately inverse mobility relation in zones 2 and 3. The overall socio-economic status-mobility differential is not replicated in each of the three zones. However, in all instances, the lower socio-economic tracts display highest mobility. Differing patterns across zones are shown also for the factor, change in socioeconomic status; the zone 2 differential exhibits a pattern exactly opposite to the overall trend. Although there is deviation from the overall differential in the change in family status factor, the general association of mobility with declining area status can be seen in all three zones.

These findings might be summarized as follows: areal factors individually or as a group display a disappointingly low level of explanation toward mobility incidence. The family status of an area goes farthest toward explaining mobility variance in the overall analyses, and the other factors show differentials in expected directions. The overall rates mask quite different patterns across the three urban zones; turnover status is the most successful areal mobility determinant in zone 1 with family status dominating in zones 2 and 3. This suggests that whatever environmental effects social areal characteristics have on mobility, operate within specific zonal locations in the urban area.

Areal and Individual Influences on Mobility Individual level factors were not taken into account in the preceding analyses, and it is conceivable that the areal mobility differentials, though small, result more from individual related characteristics than from environmental effects. Further tabulations from these data (not shown) indicate that there is a tendency for the areal categories which scored high on mobility to be composed disproportionately of high mobility-related individual level characteristics.

Perhaps the clearest way to show the effects individual factors have on the areal differentials is to look at the relative percentages of mobility variance explained by areal factors when individual effects have been taken into account. In the first column of Table 3 is shown the percentage of

variance explained by each areal factor alone; in the second column it can be seen that 11.38% of mobility variance is explained by two individual level factors--home ownership and age/marital status, a life-cycle factor.² The third column in the Table shows the percent of variation explained by areal factors in addition to that in the second column.

It is apparent that the individual level determinants contribute far more to the explanation of individual mobility incidence than do the areal determinants; moreover when areal effects are controlled for age/marital status and home ownership, the additional variance contributed by the areal factors is negligible. Tabulations (not shown) demonstrate this to be the case within each zone as well. Hence the areal mobility differentials shown earlier are in large part a function of individual and household determinants.

EVALUATION

A major finding in this investigation is that areal characteristics (at the census tract level) are weak mobility determinants. When individual and household determinants are taken into account, the areal effects on mobility are negligible. However, within the small percentage of variation explained by areal factors, the findings show that the effect of an area's turnover status is greater in densely populated central city locations and that the family status of an area predominates in the suburban zones.

This investigation has significant implications for those who wish to isolate relevant areal and environmental factors characteristic of high mobility areas. Our results suggest that at the minimum such investigations should stratify areas by aggregate measures of variables that are also successful individual mobility determinants (for example, home ownership and age/marital status) and, if possible, individual level data should be obtained. Although our data (not shown) indicate that social areas may have some contextual effects on individual and household mobility, such influences on aggregate movement are minimal in comparison to the compositions of areas with regard to the major individual level determinants.

In regard to ecological mobility patterns in the urban area, the results presented here suggest that aggregate net movement patterns observed for various socio-economic and family status areas are not a consequence of selective out-movement due to the social environment. Those aggregate differentials may in part result from the composition (for example: age, home ownership) associated with the socio-economic and family status areas or alternatively from differences in the "drawing power" of certain social areas in terms of selective in-movement.

Finally the analysis supports the contention that whatever influence the social environment does exert on mobility is differentiated by zonal location in the urban area. Further research

with this data will focus on determinants of zonal destinations for intra-urban movers.

FOOTNOTES

1. This paper is part of a larger study of residential mobility and migration to be published in the forthcoming monograph Residential Mobility, Migration and Metropolitan Change by Alden Speare, Jr., Sidney Goldstein and William H. Frey (Ballinger Press). The work was supported by United States Public Health Grant HS-00246 from the National Center for Health Services Research and Development. The data were collected by the Population Research Laboratory of Brown University. The author is grateful to the collaborators in the larger study for their helpful comments on this paper.
2. The factor, home ownership consists of two categories: owners and renters. The life-cycle factor, age/marital status, consists of five categories: never married individuals and ever married household heads aged 18-29, 30-44, 45-64, and 65 and over. The explained variance attributed to these factors in Table 3 are based on dummy variable regression analyses.

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APPENDIX A: DESCRIPTION OF TRACT CHARACTERISTICS

The following are descriptions of the indices used as tract characteristics based on 1960 and 1970 census measures. In Tables 1, 2 and 3 the units of analysis are one-year life segments created from residence histories which were collected from a probability sample of Rhode Island adults in 1967 and 1968. The segments represent single years of residence for these individuals between 1955 and 1967. Since census tract locations were recorded for each segment, it was possible to categorize each residence by the tract characteristics below. Tract characteristic scores for segments representing intercensal years (e.g., 1962) were linearly interpolated from the tracts' 1960 and 1970 scores. In all Tables each tract characteristic is recoded into three categories such that roughly one-third of the tracts in 1960 fall in each.

Socio-economic Status Index

Tract score is defined as the standard score of the following:

Average of (a) Standard score of percent families earning less than \$4,000 a year in 1960 and \$5,000 a year in 1970; (b) Standard score of percent males reporting occupations other than operatives, service workers, or laborers; (c) Standard score of percent persons 25 years and older who have completed high school. The 1960 standard scores are relative to other R.I. tracts in 1960. The 1970 standard scores are relative to other R.I. tracts in 1970.

Change in Socio-economic Status Index

Tract score is the difference of the 1960 score from the 1970 score on the Socio-economic Status Index.

Family Status Index

Tract score in 1960 is defined as the standard score (relative to other R.I. tracts in 1960) on the measure: married couples with children under 18 divided by all occupied dwelling units.

Tract score in 1970 is defined as the standard score (relative to other R.I. tracts in 1970) on the measure: Husband-wife families with children under 18 divided by all occupied dwelling units.

Change in Family Status Index

Tract score is the difference of the 1960 score from the 1970 score on the Familism Status Index.

Turnover Status Index

Tract score is defined as a number of persons not residing in the same house five years ago divided by population five years of age and over multiplied by 100.