TRENDS IN SOCIOECONOMIC RESIDENTIAL SEGREGATION

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INTRODUCTION

Previous research on trends in residential segregation has focused on segregation based on race, indicating that a high level of residential segregation between blacks and whites persists in cities in the United States despite gradual decreases in recent decades (Taeuber, Taeuber 1965; Sorensen et al 1975; Van Valey et al 1977). Others examined residential segregation based on differences in socioeconomic status (Duncan, Duncan 1955a; Uyeke 1964; Erbe 1975; Farley 1977). Only Simkus (1978) has examined changes in the level of socioeconomic segregation over the census interval 1960-1970.

In this paper I assess changes in residential segregation based on socioeconomic status over the three decennial census intervals, 1940-1970. This period, including four decennial census years, is long enough to determine if minor shifts in socioeconomic segregation found for recent decades are part of longterm shifts, or are small fluctuations in a relatively stable residential pattern.

For the present analysis, data limitations preclude any explicit test of hypotheses derived from urban theory, but it has important implications for the theory of increasing societal scale as applied to the urban social environment (Greer 1962; Shevky, Bell 1955; Wilson, Wilson 1945; Hunter 1978; Berry, Kasarda 1977 Ch 4). An argument can be made that as the urban environment grows in size and complexity, increasing in scale, urban dwellers might have increasing motivation to carve out small homogeneous niches that are free from the uncertainties of the larger urban environment (St John 1981). This implies that residential segregation intensifies with increasing scale. We can view the homogeneous communities emerging in modern mass society as an adaptation to the scale of the urban environment. They allow urban residents to reduce the vagaries and gradations of the urban environment to fewer discrete categories. For their residents, *local community* defines "... an area relatively free of intruders ... where potential friends are to be found ... or cultivated. They minimize the prospects of status insult, and simplify the innumerable daily decisions dealing with spatial activities." (Berry, Kasarda 1977 78). Residential segregation should be positively related to increasing urban scale if this argument is correct. Longitudinal data presented here can only be suggestive as to the accuracy of this hypothesis.

DATA AND METHODS

This study applies longitudinal data for the interval 1940-1970 in which census tracts are the areal units for which residential segregation is calculated. Census tracts are small areas, averaging 4000 population, are relatively homogeneous, fixed, and with relatively stable boundaries. They are conceived to approximate urban neighborhoods (US Census Bureau 1970).

Most studies of residential segregation, whether they focus on race or on socioeconomic status, have been cross-sectional for a single point in time. Others that have included more than one point in time have not been truly longitudinal studies because they calculated the level of segregation existing in urban areas on the basis of all existing census tracts for each point in time. Because the Census Bureau continues to tract more territory as cities expand, and because they change the boundaries of some census tracts, such studies tend not be be based on comparable units over time. This would not be a problem if newly tracted areas had population compositions identical to older areas, or if tract boundary changes were random. But newly tracted areas tend to be suburban and quite different from older areas; and tract boundaries are often changed to preserve tract homogeneity, which is certainly *not* a random event.

To make this study truly longitudinal, three longitudinal data sets spanning all of parts of the 1940-1970 period have been constructed. The census tracts in each data set are limited to those in existence at the earliest date. This insures that for each data set, the urban area tracted is identical for all census dates. The tract boundaries also have been adjusted so that they remain constant over time. There are four types of boundary adjustments: 1) add

two or more tracts together at time 1 to equal a tract boundary at time 2; 2) divide a tract at time 1 into two or more tracts at time 2; 3) add two or more tracts together at time 1 to equal the area included by two or more tracts at time 2; 4) parcel portions of tracts at time 2 into a single tract at time 1. Adjustments 1, 2, and 3 can be exact, while adjustment 4 depends on a tract population being evenly distributed both heterogeneously and geographically. Only adjustments 1, 2, and 3 were needed to compile longitudinally comparable data for the 1940-1970 and the 1960-1970 periods. Compiling data for the 1950-1970 period required adjustment 4 because the suburban tracts of 1950 underwent considerable realignment before 1960, but were stable between 1960 and 1970.

The latter adjustment required tedious "hands-on" manipulation of data, which therefore was confined to one large metropolitan area, Chicago. The first data set comprises the 1940-1950-1960-1970 figures for 722 census tracts in an area for the central city of Chicago, holding consistent boundaries throughout the period. The second data set incorporates the figures for 1950-1960-1970, based on 1950 boundaries for 1021 census tracts including the central city and a substantial component of Chicago suburbs, including Gary, Hammond, and East Chicago, in Indiana. The third data set for 1960-1970 for 1218 census tracts adds more of Chicago's Illinois suburbs. The choice fell on Chicago because the census tract boundaries, particularly in the central city, have been more stable than in other comparable cities.

We will examine three types of socioeconomic residential segregation, based on three variable categories: 1) education; 2) occupation; and 3) family income. The census tract data contain information on educational composition of the adult population from age 25, and occupational composition of the male labor force with only minor classification differences. Family income data were collected only from 1950. From 1960 to 1970; tract socioeconomic composition can be determined separately for whites and nonwhites, allowing examination of trends in socioeconomic segregation separately for racial groups. It is instructive to examine these trends because the racial composition of the Chicago metropolitan area, especially the central city, has changed considerably during the period. The change has important implications for trends in socioeconomic segregation in the total population.

The measures of residential segregation reported here are based on the Duncan and Duncan (1955a,b) index of segregation. The index indicates how much persons with a particular trait, such as college education, are segregated from those with other traits relevant to the overall variable, in this case, education. The indexes of segregation for the several traits of the overall variable can be weighted and summed to produce an overall measure of the segregation based on a variable. Bogue and Bogue (1976) argue that the *relative index of segregation* (RIS), and the relative index of segregation for a *variable* (RISV) are influenced by population composition, and are therefore undesirable for longitudinal analysis of segregation where the population composition changes over time. The present analysis relies on relative measures of segregation which adjust the index of segregation (IS) and the index of segretation for a variable for changes in population composition. The calculation of the three measures, *index of segregation (IS), relative index of segregation (RIS),* and the *relative index of segregation for a variable (RISV)* are as follows: **Index of Segregation:**

$$IS = .5 \sum_{k=1}^{t} \left| \left[(c_i^k / C_i) - (c_v^k / C_v) \right] \times 100 \right|$$

v = general category, as *education.*
i = subcategory, as *college, high school, grade school* in education.
c = cell count, persons.
C = total count, persons.

The *Index of Segregation* is adjusted to yield a *Relative Index of Segregation (RIS)*: For each variable, v, let Q be the ratio;

$$Q = C_i / C_v$$

For $Q \leq .5$, $RIS = IS / (1 - Q)$;
For $Q > .5$, $RIS = IS / Q$

The *Relative Index of Segregation for a Variable*:

$$RISV = \sum_{i=1}^{m} (RIS \times Q)$$

m = total characteristics, i, in variable.

TABLE 1. LONGITUDINAL SEGREGATION INDEXES BY INCOME LEVEL (RIS) AND INCOME (RISV) FOR CHICAGO, 1950-1970

Family Income (Quartiles)	Relative Index of Segregation (RIS) Tracted 1940; 722 tracts			Tracted 1950; 1021 tracts		Tracted 1960; 1218 tracts	
	1950	1960	1970	1950	1970	1960	1970
High	32.4	39.4	40.8	32.7	42.5	40.1	41.5
Medium high	22.5	21.4	23.6	21.8	22.8	19.5	21.1
Medium low	11.4	14.2	14.7	14.1	14.7	17.9	18.7
Low	27.4	30.1	29.6	28.1	31.7	29.8	31.8
Income RISV	**19.9**	**22.0**	**22.8**	**21.3**	**23.4**	**20.8**	**21.7**

TABLE 2. LONGITUDINAL SEGREGATION INDEXES BY EDUCATION LEVEL (RIS) AND EDUCATION (RISV) FOR CHICAGO, 1940-1970

Education Levels	Relative Index of Segragation (RIS)	Tracted 1940; 722 tracts			Tracted 1950; 1021 tracts		Tracted 1960 1218 tracts	
	1940	1950	1960	1970	1950	1970	1960	1970
College 4+	39.6	37.2	38.2	42.3	39.6	41.5	38.9	39.4
College 1-3	30.8	29.5	23.2	23.8	26.8	23.1	23.7	22.2
High school 4	27.1	17.3	14.5	12.8	15.9	14.0	14.8	14.2
High school 1-3	10.6	8.4	8.3	13.0	9.7	15.5	10.1	15.7
Elementary 8 [a]	15.8	14.3	13.0	15.7	15.1	18.3	14.5	18.4
Elementary 5-7 [b]	24.8	21.5	19.7	20.8	22.4	27.0	32.4	34.6
Elementary 1-4	36.2	29.5	29.0	26.8	31.0	33.1	36.2	33.2
None	50.6	42.3	29.9	28.0	43.7	31.8		
Education RISV	**22.3**	**18.8**	**17.0**	**18.6**	**19.6**	**21.1**	**18.6**	**20.9**

[a, b,] 1940 elementary grade categories are: [a] 7-8; [b] 5-6.

TABLE 3. LONGITUDINAL SEGREGATION INDEXES BY OCCUPATION LEVEL (RIS) AND OCCUPATION (RISV) FOR CHICAGO, 1940-1970

Occupation Levels	Relative Index of Segregation (RIS)	Tracted 1940; 722 tracts			Tracted 1950; 1021 tracts		Tracted 1960 1218 tracts	
	1940	1950	1960	1970	1950	1970	1960	1970
Professional	30.4	28.8	27.7	32.0	30.0	29.2	27.2	27.0
Managerial	28.1	28.2	32.4	30.8	28.9	32.1	31.4	30.0
Sales [a]	--	28.3	30.5	28.7	28.1	28.0	28.0	26.2
Clerical	19.8	9.3	11.3	11.1	11.9	13.4	14.8	14.1
Craftsmen	16.9	18.3	20.1	19.3	18.6	19.5	19.2	19.1
Operatives	21.2	19.9	21.6	23.8	20.9	26.4	22.5	25.7
Service	23.8	34.0	31.7	23.0	23.8	19.4	23.8	19.6
Laborers					34.1	28.4	31.7	23.0
Occupat. RISV	**22.3**	**18.8**	**17.0**	**18.6**	**23.2**	**24.0**	**23.6**	**23.2**

[a] No Sales category in 1940.

RESULTS

Measures of residential segregation calculated for levels of family income are shown in Table 1, which shows a clear trend of increasing economic residential segregation. For both territorial bases, the segregation of income levels (RIS) increased consistently over time except for medium high income in the central city longitudinal data. When the economic information is summarized in single overall measures of segregation (RISV) the increasing economic segregation is again apparent. Consistent increases are found in all territorial bases. The pattern of segregation by level of income conforms to a U-shape; the extreme levels of income are more segregated than the mid-levels. The extremes also display greater increase over time.

Data for residential segregation based on education differences are shown in Table 2. These data indicate that trends in the level of educational segregation are less consistent over time than those for economic segregation. The summary measures of segregation (RISV) indicate that segregation increased somewhat between 1950 and 1970 when calculated for the data that is based longitudinally on the area tracted for 1950-1970, for the central city plus major suburbs. For the 1940-1970 data for the central city, there is no consistent increase. And when segregation is calculated by level of education, there are many exceptions to the trend of increase. In fact, levels of educational segregation in the central city remained fairly stable for the period.

Stability over time rather than consistent increase or decrease also describes trends in occupational segregation in Chicago from 1940-1970, as shown in Table 3. Summary measures of occupational segregation (RISV) display no substantial fluctuation. Examination by occupation levels (RIS) also reveals no consistent change.

The data presented to this point indicate that economic segregation increased in Chicago during the 1940-1970 period, while segregation based on education and occupation remained stable with relatively little change. It is income, and not education or occupation that is directly tied to the housing market. The considerable discrepancy that exists between income, education, and occupation as measures of socioeconomic status necessitates that many people with high education and prestigious occupations cannot afford housing in residential areas consistent with their other socioeconomic status characteristics. The life styles people wish to pursue are dependent on their financial capacity.

The absence of clear trends in educational and occupational residential segregation in Chicago from 1940 to 1970 may be at least partly the result of Chicago's changing racial composition. So far, all measures of segregation that have been reported pertain to the total population, both white and nonwhite living in the particular tracted area. However, the proportion of Chicago's population that is nonwhite has increased considerably in the 40-year interval, particularly in the central city area tracted in 1940 which conforms closely to the actual political boundaries of Chicago proper. The population ratios are shown in Table 4. If the level of socioeconomic segregation among the growing nonwhite population is lower than it is among the declining white population, then socioeconomic segregation in each group could increase over time while decreasing for the total metropolitan population.

There is considerable support for the proposition that there is less socioeconomic segregation among the nonwhite than the white population. For example, blacks receive less return in neighborhood quality defined in terms of the socioeconomic status of neighbors, and for their own socioeconomic resources than whites (Villemez 1980). Presumably, this results from middle and upper class blacks being "channeled" into predominantly black neighborhoods through housing market practices. Blacks may be reluctant to move into higher quality neighborhoods if those neighborhoods are predominantly white (Farley et al 1978). They may also fail to take advantage of known and affordable housing opportunities in white neighborhoods for fear that they will not be socially accepted (Farley 1980). Whites may actively try to prevent blacks from gaining access to housing in their neighborhoods, maintaining the strict lines of racial residential segregation (Berry, Kasarda 1977).

TABLE 4. POPULATION SHIFTS FOR CENSUS TRACTED AREAS FOR CHICAGO, 1940-1970

Tracted 1040 722 tracts	Total population	Nonwhite population	Percent nonwhite
1940	3 384 833	281 188	8.3
1950	3 591 523	509 422	14.2
1960	3 484 517	835 775	24.0
1970	3 312 402	1 143 375	34.5
Tracted 1950 1021 tracts			
1950	5 082 697	596 034	11.7
1970	5 836 702	1 334 375	22.9
Tracted 1960 1218 tracts			
1960	6 564 286	1 019 772	15.5
1970	7 606 379	1 404 716	18.5

Source: 1940 and 1950 data, Social Development Center, Community and Family Study Center. 1960 and 1970 data, US Census Bureau, 1977a,b.

Moreover, when upper and middle class blacks do move into white neighborhoods, they are frequently of higher socioeconomic status than their new neighbors (Denowitz 1980). These factors may all contribute to relatively lower levels of socioeconomic segregation among the black population. In turn, as the proportion of Chicago's nonwhite population increases, they may also contribute to a lower level of socioeconomic segregation in the total population, even though socioeconomic segregation might be increasing in both the white and nonwhite populations considered separately.

Segegation indexes for family income, education, and occupation, calculated separately for whites and nonwhites are shown in Table 5. The relative index of segregation for family income indicates a higher level of economic residential segregation in 1970 than in 1960 for both whites and nonwhites. Furthermore, economic segregation among nonwhites was higher in both 1960 and 1970 than among whites. This particular finding, though contrary to what was expected, is consistent with the previous result that economic segregation in the total population did increase consistently over time. This is an example in which changing racial composition contributes to a higher overall level of socioeconomic segregation.

TABLE 5. SEGREGATION INDEXES FOR INCOME, EDUCATION, & OCCUPATION FOR WHITE & NONWHITE CHICAGO POPULATION

Family Income (Quartiles)	Relative Index of Segregation			
	White		Nonwhite	
	1960	1970	1960	1970
High	23.5	25.2	28.7	32.5
Medium high	11.9	12.4	18.3	21.6
Medium low	17.7	18.6	11.3	11.4
Low	22.2	25.2	24.4	30.7
Income RISV	**18.4**	**19.7**	**20.1**	**23.4**
Education				
College 4+	38.6	38.2	42.0	47.8
College 1-3	23.8	21.6	24.8	27.0
High school 4	13.7	14.7	16.3	14.8
High school 1-3	10.7	15.4	9.8	13.0
Elementary 8	15.1	19.7	10.7	15.1
Elementary 5-7	20.1	27.5	15.1	19.5
Elementary 1-4	30.5	34.8	21.4	23.4
None	38.9	35.4	26.8	30.6
Education RISV	**18.4**	**20.9**	**15.9**	**18.6**
Occupation				
Professional	25.4	24.8	41.1	41.1
Managerial	29.2	27.7	35.4	33.9
Sales	26.0	24.7	30.6	31.2
Clerical	14.5	13.5	21.9	19.8
Craftsmen	17.1	18.6	15.9	16.5
Operatives	23.0	25.0	13.0	15.8
Service	19.8	17.4	19.7	18.7
Laborers	26.7	21.1	21.3	22.7
Occupation RISV	**22.0**	**21.9**	**19.2**	**20.7**

Residential segregation based on education increased significantly within both the white and the nonwhite populations between 1960 and 1970. In addition, there was a higher level of educational segregation within the white population than within the nonwhite population in both 1960 and 1970. In fact, the 1970 level of educational segregation among nonwhites was only slightly greater than the 1960 level among whites. Thus, because the proportion of the total population that is nonwhite increased between 1960 and 1970, increases in the level of educational segregation calculated for the total population are lower than increases calculated for each race separately.

The 1960 and 1970 results for occupational

segregation calculated within races are virtually identical to those for educational segregation. The only difference is that the level of occupational segregation calculated for the white population remained the same between 1960 and 1970, instead of increasing. The evidence presented here provides support for the notion that the changing racial composition of Chicago did influence the level of socioeconomic segregation calculated for the total population, independently of changing levels of socioeconomic segregation within each racial group.

CONCLUSION

These findings have important implications for the theory of increasing societal scale as it is applied to urban areas. First, it must be noted that this research does not constitute a direct test of the theory. It deals specifically with only one case, and no attempt has been made to measure an increase in scale. Before the theory can be tested adequately, more cities need to be examined and measures of increasing scale should be introduced. However, Chicago does represent a case to be examined, and is a city that did undoubtedly increase in scale over the course of the study period, given that population size and organizational complexity are two dimensions of scale.

But the data for Chicago do not indicate that a clear trend of clustering in homogeneous enclaves accompanied its increasing scale. The failure to find this trend may be largely a result of changing racial population composition. It may also be due to the failure of the theory of increasing scale to account adequately for urban residential patterns. The further possibility exists, that socioeconomic status is being replaced by other criteria as the basis for residential segregation. Life styles, stage in the life cycle, and ethnic pluralism may be cross-cutting socioeconomic status as determinants of residential location. If this is the case, we may find that segregation lays a foundation for homogeneous clustering as an adaptation to an urban environment that is increasing in scale. The establishment of this foundation might be responsible for the persistent levels of socioeconomic segregation found throughout the 1940-1970 period. However, once this foundation is established, life styles, stage in the life cycle, and ethnic pluralism may take over as more salient bases for segregation. The emergence of lifestyles and life cycle based communities as total living packages, and the rebirth of ethnic identity in the 1970's might well be symptoms of this trend. If this is the case, then residential segregation as an adaptation to increasing urban scale should focus on new sets of discriminatory criteria other than socioeconomic status. Furthermore, because life styles are largely purchasable commodities, especially in terms of living arrangements, increased segregation as an adapatation to increasing urban scale is likely to be concentrated among the middle and upper classes. To examine this possibility on a large scale would require census tract or comparable demographic data for socioeconomic status cross-classified by stage in the life cycle and life style variables.

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