

***Sprawl and segregation:
A study of U.S. metropolitan areas***

Len Sprishen
Senior Economics Thesis
The College of New Jersey

Introduction

Urban sprawl, long a reality of the American landscape, has in recent times become a focus of attention. In 1970, only 25 percent of the nation's offices were located in the suburbs, and yet today, that figure is over 60 percent (Powell, 2000). Additionally, segregation, though having decreased between 1980 and 2000, remains an important issue in the United States (U.S. Census Bureau, 2000). These circumstances, coupled with the lack of transportation choices in metropolitan areas, have prevented a large number of city residents from accessing jobs located in the suburbs, as well as drastically limited the housing choice for lower income residents. While it may be difficult in practice to separate white flight from the various definitions of sprawl, some contend that the consequences are the same: an isolated base of blacks and Hispanics develops in central city neighborhoods and declining suburbs. These individuals are unable to develop wealth through home ownership, due to the falling property values or lack of access to credit. The result of this isolation results in chronic unemployment, failing schools, and increased crime (Orfield, 1999).

The purported effects of sprawl have created great problems in housing, both in costs and in decreased homeownership. Blacks and Hispanics are increasingly left in the urban core, and as bigger and bigger homes continue to be built in the suburbs, the opportunities for the former groups to own a home and increase their wealth are very infrequent. The persistent housing gap that exists between blacks and whites is chiefly attributed to income differences (Collins and Margo, 2001). This in turn leads to the difficulties that blacks and Hispanics have in accumulating the down payment for a home, which is typically very substantial (Gyourko, et. al, 1999). Finally, discrimination exists in both the mortgage markets and during the search process. This discrimination severely limits the options that minorities have in both selecting and

paying for their homes (Yinger, 1995). As a result, many minorities continue to remain in the city center. This situation thereby presents an entire host of social problems that impact the city, and the suburbs as well.

Because of these very worrying possibilities, we need to better understand the impact of suburbanization (or sprawl) on racial segregation. Earlier studies by Duncan and Duncan (1957) in Chicago, as well as Taueber and Taueber's (1965) racial turnover profile of ten major cities concluded that racial change within neighborhoods was largely unidirectional in cities. Once blacks entered a neighborhood, their proportion increased steadily until the area was predominantly black (Denton and Massey, 1991). Those neighborhoods that remained racially mixed were simply stuck in a transitory phase. However, more recent work has shown that this transition is much more rapid than initially understood. White flight is an enormous factor in density change, and those regions with high proportions of black or Hispanic residents lost density faster than those with lower proportions of these minority groups (Fulton et. al, 2001). Economist Anthony Downs and urban scholar David Rusk have asserted that where there is a sprawling metropolitan area with a substantial presence of minorities, not only will there be racial segregation, but concentrated poverty (Powell, 2000).

Such serious consequences suggest that sprawl may be largely responsible for creating the segregated core, and the retreat of middle-class whites to the suburbs further exacerbates the difficulties of those left in the inner city. In recent population studies, sprawl is simply defined as land consumption at a faster rate than population expansion (Fulton et. al, 2001). This paper adopts a technically similar definition of sprawl, using SMSA data on segregation in large metropolitan areas, along with several other variables that are detailed in the Data and Methods section, and tests the hypothesis that white flight and sprawl is creating a segregated base of

blacks and Hispanics, confining them to inner city neighborhoods with little hope of egress. The lack of transportation and limited housing options, combined with discrimination in employment, housing and educational opportunities, has operated to concentrate and isolate racial minority communities in the central cities from economic opportunities now located in the suburbs (Powell, 2002).

Background

Although this paper defines sprawl as land consumption at a faster rate than population expansion sprawl Galster et al (2001) propose a series of alternative definitions. Galster argues urban sprawl is one name for many conditions attached to patterns of residential and nonresidential land use, to the process of extending the reach of urbanized areas, to the causes of particular consequences of land use, and to the consequences of those practices (Galster et. al, 2001). Galster notes that sprawl receives blame for seemingly every bad aspect of contemporary urban life. Despite the largely conceptual nature of his work, the study did attribute racial and income segregation of neighborhoods to sprawl, although it did not provide any evidentiary support. The study further broke down sprawl into eight distinct dimensions of land use patterns, specifically density, continuity, concentration, clustering, centrality, nuclearity, mixed uses, and proximity. Land areas that scored low on one or more of these dimensions, as derived by a special algorithm, were considered sprawling (Galster et. al, 2001). In fact, the combination of these dimensions was the very definition that Galster and his team developed. Despite all of Galster and his colleagues' efforts, they themselves conceded that their approach was flawed. Because their definitions of sprawl incorporated a fixed physical area, they failed to account for growth in outer-ring suburbs. Additionally, their definitions on the whole conflict with those of

Fulton, which is the basis for this paper's analyses.

Almost as important as sprawl's characteristics is the study's nod toward the causes of sprawl, such as high dependence on the automobile, isolation of the poor in the inner city, the spatial mismatch between jobs and housing, and loss of environmental qualities (Galster et. al, 2001). The conclusions drawn by the study's team were important to the future of sprawl studies, and for policymakers seeking remedies to sprawl's problems, one of which appears to be segregation. In this paper, the actual segregation and sprawl levels are taken from SMSA data, where sprawl is seen as a change in the amount of developed land, holding population constant (Fulton et. al, 2001). In addition to Fulton, the U.S. Census Bureau's website provided important statistical data on metropolitan areas, along with various indices which measured segregation levels for the years 1980, 1990, and 2000.

Definitions aside, studies have confirmed the sprawl pattern in the United States. An analysis of the density trends in every metropolitan area in the United States between 1982 and 1997 reveals that most metropolitan areas are adding urbanized land at a much faster rate than they are adding population (Fulton et. al, 2001). This increase totaled 47 percent between the said time frame, during which the population grew only by 17 percent. The Fulton study also found that demographic characteristics have strong influences. Many of the fastest sprawling metropolitan areas, in the South outside Florida, also have among the highest concentrations of Black residents in the nation. Most also have very small foreign-born populations (Fulton et. al, 2001). Again, however, the evidence is merely suggestive. Other data show that the inevitable white flight that has occurred in these areas resulted in extremely rapid density loss between 1982 and 1997, leaving an isolated core of segregated blacks in the city centers. The study additionally found that metropolitan areas with many native-born Hispanic residents sprawl more

than those without as many native-born Hispanics, all else being equal, and have a similar effect as the black populations (Fulton et. al, 2001).

City-specific studies have pointed to the debilitating effects of sprawl and the accompanying white flight. The city of Albuquerque, for example, has adopted in recent years a very pro-business attitude, creating opportunities for the middle-class and developing to suit its according needs (Powell, 2000). However, with all this, the city has failed to address the employment problems within poor communities, creating an affordable housing crisis and confining poor people of color to impoverished and segregated neighborhoods (Powell, 2000). Government policy is also a significant cause in concentrating blacks and Hispanics. In the United States, each generation, a new ring of suburbs is built at the edge of metropolitan areas, as a central city or an inner ring of suburbs becomes isolated and declines (Orfield, 1999). It is difficult to value this cost, but in the clearest sense, the increase of property wealth in outer suburbs and stagnancy or decline of central city and inner-suburban values represents, in part, an intra-regional transfer of tax base (Orfield, 1999). As such, the loss of value in older, poorer communities is one of the costs of economic polarization and urban sprawl (Orfield, 1999).

Other demographic studies have further confirmed the high probabilities of ethnic and racial transition given the increased proportion of a minority group. As neighborhood tracts with multiple minority groups became more common during the late 1970s and early 1980s, multivariate models showed that white loss was increased by the presence of multiple minority groups, by a higher minority proportion, and by location near existing minority areas (Denton and Massey, 1991). However, this study also showed that the simple presence of ethnic minorities in small numbers, even of blacks, no longer precipitates rapid neighborhood turnover (Denton and Massey, 1991). Thus, the growing complexity of metropolitan areas reflects a wide

variety of factors, including the cessation of large-scale black migration from south to north and the increase in Hispanic immigrants from abroad. This indicates that the pace of white population loss, although certainly more rapid in some areas than others, is not drastically affected by the mere presence of blacks or other minority groups in a neighborhood (Denton and Massey, 1991). Still, even this relatively older study concluded that white loss inevitably follows from the presence of multiple minority groups (Denton and Massey, 1991). This white population loss increased the process of ghetto expansion, concentrating minority housing while practices of racial steering (Newburger, 1981), discrimination by financial institutions (Dedman, 1989), and highly prejudiced real estate policies and covenants ensured that minority groups were thereby locked in place (Galster, Freiberg, and Houk, 1981; Denton and Massey, 1991).

Besides lending and mortgage practices, other federal policies have hastened suburban development and encouraged racial segregation, most notably the large federal commitment to road building (Powell, 2002). Powell contends that the construction of highways has been chiefly beneficial to middle-class whites, making suburban living easy and affordable, and consequently moving the employment and production base of many cities in the form of businesses. The federal government has spent over \$652 billion for highway construction, as well as additional billions for infrastructure and maintenance for suburban areas (Rusk, 1999). Thus, the middle class has the freedom to live at greater distances from the workplace, and the highways have made it advantageous for businesses to move to the suburbs, instead of improving existing urban plants. A car then becomes almost a prerequisite to earn money, but meanwhile, roughly 50 percent of the African-American residents in Philadelphia and Boston do not have a car, while in New York City, that number is 69.3 percent (Powell, 2002). These levels still must be compared to the white rates of car ownership, however. Additionally, racial exclusion on a

local level has been a mainstay of suburban development, with municipalities in new subdivisions or incorporated suburbs drafting explicitly racially discriminatory ordinances (Denton and Massey, 1993). This exclusionary mentality dates from World War II, when the then current sprawl patterns created a racially charged boundary between the city and the suburbs.

A 1990 study found that only 33 percent of white metropolitan residents lived in central cities, as opposed to 67.8 percent of African-Americans (Powell, 2002). Powell writes that the move to the suburbs, facilitated by the highways mentioned above, as well as the movement of jobs overseas, has deprived many cities of their working-class employment base. Studies found that in the 20-year period from 1967 to 1987, Philadelphia lost 64 percent of its manufacturing jobs, while Chicago lost 60 percent, New York City lost 58 percent, and Detroit lost 51 percent (Powell, 2002). In absolute numbers, these percentages represent the loss of 160,000, 326,000, 520,000, and 108,000 jobs, respectively, totaling more than one million lost. The actual total proportion of metropolitan manufacturing jobs located in central cities fell from 63.3 percent to 46.2 percent in 1980, and continued to fall throughout the 1980s and 1990s (Jargowsky, 1997). Cities tend to capture both high-end professionals and low-end workers, and because of a lack of transportation and limited housing options, many city residents cannot gain access to employment opportunities that have moved to the suburbs (Powell, 2002).

Gentrification has been heralded as a solution to these consequences of sprawl, a process of citywide change that results in large-scale displacement of residents and greater chances for opportunities. However, what gentrification mainly does is drive out lower-income residents due to the cost structure shift of housing, and typically results in the involuntary displacement of a racial minority (Powell, 2002). Instead, more effective solutions to the problem have been

posited in the form of mixed-income housing, in-fill building, and federated regionalism that provides racial minority residents with access to opportunity (Powell, 2002).

Although this paper focuses exclusively on American metropolitan areas, it is worth mentioning that urban sprawl is a major problem overseas, particularly in densely populated cities in the United Kingdom. There, inner cities suffer acute abandonment, sprawl is encouraged by hidden government subsidies, and social exclusion inevitably results (Power, 2001). Ethnic minorities, overwhelmingly concentrated in cities, are also greatly over-represented in the poorest wards; 70 percent of minority households live in the 10 percent poorest neighborhoods (SEU, 2000). The preponderance of cars and the difficulty for poor households to obtain the means for such transportation further exacerbate the problems of sprawl. More affluent residents flee the city centers and create constant demand for new buildings, while the old ones fall into disrepair and thus fail to attract moderately-paid workers, creating a concentrated minority poor (Power, 2001). This lack of social mixture and income variety create a situation that is not entirely different from the Powell study detailed above, and a distinct similarity runs through both nations' sprawl problems.

Besides sprawl (or white flight), neighborhood preferences may cause increases in racial segregation (Schelling, 1978; Clark, 1991). Thus, the Schelling segregation model has been put forth as a building block in understanding preferences, choices, and patterns. The separation patterns are likely to be enforced by preferences for living and socializing with neighbors of similar class and interests, and by mobility behavior that emphasizes short-distance relocations (Clark, 1991). Clark confirms that the Schelling description of preferences is largely correct, and the likelihood of equilibria is small, if it exists at all. Note that if racial groups sort themselves according to preferences, then development at the periphery will be unrelated to segregation.

Clark also finds that the dynamics of change that come from preferences are determined more by whites' decisions than by blacks' or Hispanics' decisions. Finally, the data in the analysis suggest that it is unrealistic to expect large levels of integration across neighborhoods in view of the known differences in income and wealth (Clark, 1991).

Despite the fact that much of the work on sprawl has focused on its apparently overwhelming negative aspects, it is critical to recognize the beneficial consequences that can result from a sprawling city. Regulations on housing construction can in fact raise costs and house prices, which in turn may reduce homeownership rates. However, due to persistent sprawl in the U.S., homeownership rates have increased across all racial groups in the past few decades. In 1920, the average homeownership rate for white males was 47.5 percent, while for blacks, it was 24.64 percent (Kahn, 2001). By 1990, this 22.86 percent gap had closed to 17.97 percent, since the white homeownership rate had increased to 74.25 percent and the black homeownership rate had increased to 56.28 percent (Collins and Margo, 2001). The relevant factors that contribute to this gap have been cited earlier: income differences, accumulation of wealth for the down payment, and discrimination in the mortgage and real estate markets. Associated with these things, sprawl was seen as degrading the quality of life in the center city and the suburbs by increasing center-city poverty and vehicle dependency, congesting suburban roads and schools, and threatening open space by reducing farming (Kahn, 2001). And yet, for three measures of housing consumption (number of rooms, unit square footage, and homeownership rates), the black/white consumption gap is found to be smaller in more sprawled areas, a particularly important finding given the backlash against suburban growth in recent times (Kahn, 2001).

Sprawl reduces this gap in unit size and ownership rates because increased fringe

urbanization leads to a greater supply of land for development, which increases affordability (Kahn, 2001). Also, as jobs move to the fringe in older, sprawling, metropolitan areas, the durable inner-city housing stock becomes even cheaper, and because of the white tendency to work in the suburbs, blacks face less market competition (Kahn, 2001). Simply put, as whites move into the newest housing, they vacate older, more affordable residences that become filled by minorities. Mathematical models found that blacks living in sprawled metropolitan areas live in larger housing units and are more likely to own a home than observationally identical black households in less sprawled areas (Kahn, 2001). It therefore appears that anti-sprawl legislation, which reduces new housing, will have a detrimental effect, raising the price of homes and decreasing consumption.

However, there is in fact a delicate balance, as the quality of life for minorities could decline in sprawling areas if suburban growth leads to less access to jobs and increases income segregation (Kahn, 2001). Thus, the same issues of access and minority concentration and segregation appear once again, and there develops a tradeoff between gains in housing consumption versus losses in employment opportunity. Certainly, this area merits much further investigation, and sprawl itself requires close scrutiny before it is written off as a terrible facet of modern life, yet given the preponderance of studies, surveys, and mathematical analyses, it looks that urban sprawl does in fact segregate minorities and pose serious problems not just for them, but for all those involved in the sprawl phenomenon.

Data and Methods

To analyze the relation between sprawl and segregation, we collected data on segregation, sprawl, unemployment rate, per-capita income, population change, and percentage

black (Hispanic) by SMSA. The essential formulation was that segregation, the dependent variable, was a function of the others. The values for segregation of blacks and Hispanics, unemployment rate, and percentage black and Hispanic were for the year 2000, and sprawl and population change levels were measured over the period 1982-1997. Per capita income was measured for the period 1998-2000. Segregation was measured independently by the U.S. Census through a feature called the dissimilarity index. Working off of the idea of “evenness,” that is, the differential distribution of the subject population, dissimilarity measures the percentage of a group’s population that would have to change residence for each neighborhood to have the same percentage of that group as the metropolitan area overall. The index ranges from 0.0, complete integration, to 1.0, or complete segregation. The specific formula for this index is: $(1/2) \sum (b_i/B - w_i/W)$, where:

b_i = the black population in the i th real unit, such as a census tract

B = the total black population of the large geographic entity for which the index is being calculated

w_i = the white population in the i th real unit, such as a census tract

W = the total white population of the large geographic unit for which the index is being calculated.

The final summation is over the component of real units, like the aforementioned census tracts. By simply changing notation, this index is able to measure the segregation of any one racial group from any other racial group, and its value is statistically independent from the size of the groups used in its computation. This index data was collected for 40 metropolitan cities in regard to the black population, and 33 for the Hispanic.

A second key variable, change in developed land (or sprawl), was collected from the

2001 study by Fulton et. al. Fulton employs data developed by the USDA that classifies land as developed or underdeveloped using 800,000 sample sites from around the United States. If land is being consumed at a faster rate than population growth, then a metropolitan area can be characterized as sprawling (Fulton et. al, 2001). If population is growing more rapidly than land is being consumed for urbanization, then a metropolitan area is considered to be “densifying.” While imperfect, this definition does provide a useful basis from which to relate land resources and population density. It is expressed as a percentage value in the tables below. In addition to his measurement of sprawl, Fulton’s work provided the percentage increase or decrease in population that each city experienced, during the same time frame as its sprawl change. Both values were drawn for the year 2000, also as a percentage increase or decrease. Data on per capita income was obtained from the U.S. Census Bureau for the period 1998-2000, and the data on the unemployment rate and the percentage minority were obtained from the Bureau of Labor Statistics, all for the year 2000, and all for the specific metropolitan area. Because some of the data were drawn from the same source for both minority populations, the values frequently overlap, but due to fewer observations for the Hispanic segment, some normally identical variables will take different values. Tables 1 and 2 below report means and standard deviations for each variable in both data sets.

Analysis

Table 3 reports the results of a regression with the dissimilarity index for the black population across SMSAS as the dependent variable. Because population change is correlated with changes in developed land and per capita income is correlated with the unemployment rate, we employ a two-step estimation process. First, we regress changes in developed land on

changes in population, and then we regress the unemployment rate on per capita income. Second, we use the unexplained variation in the change in developed land and income in the regression with the dissimilarity index as the dependent variable. The results show that sprawl is not a significant variable in affecting segregation levels. The output (column 1) suggests that holding population constant, change in developed land (sprawl) is irrelevant in determining a metropolitan area's overall segregation. This finding runs entirely contrary to the works of such social scientists as John Powell, who have written that suburban sprawl concentrates and isolates minorities in the city center. The regression output for the Hispanic population (column 1) shows the exact same thing; changes in developed land have no effect on segregating Hispanics in metropolitan areas. This is indeed rather startling news, given the preponderance of scholarly literature that has blamed suburban sprawl, both directly and indirectly, for limiting minorities and creating a host of social problems. In fact, most of Powell's work focuses on both vehemently criticizing sprawl and its propagators, as well as devising alternatives to sprawl and on instituting programs to better the quality of life for those victimized by sprawl. However, the statistical data for 73 observations suggests that Powell is incorrect in heaping vitriol on sprawl, and indicates that other variables are responsible for creating the segregated core.

In the regression for the black population, population change is significant at the .01 level in determining overall segregation, suggesting that higher population growth, holding developed land constant, reduces the amount of segregation. This contradicts Denton and Massey, and Fulton, who suggested that as the population increases in one area, there is greater racial turnover, and consequently greater segregation. In fact, the opposite occurs. In high growth SMSAs, potential residents are able to choose among a large number of new neighborhoods without a well-established racial character. As a consequence, racial segregation falls. The same

result appears in the Hispanic population regression, also significant at the .01 level. As a city's population increases, the level of segregated Hispanics decreases, as the large majority of non-Hispanic residents elect to move further away from the minority centers.

The percentage of blacks in each city had a very strong impact on segregation. This is consistent with the arguments of Denton and Massey, Fulton, Clark, and even the early Taueber and Taueber study. The greater the black population, the less tolerance the white population will have, as evinced by the Schelling model. Thus, because the dynamics of change chiefly come from whites' decisions, the latter will move away and segregate the black population. Denton and Massey also pointed out that once blacks enter an area, they will continue doing so until the population change is largely unidirectional in terms of race. The very significant values obtained at the .01 level do strongly suggest that more blacks simply equals more segregation in metropolitan areas. For the Hispanic population equation, an increase in the relative size of the Hispanic population is associated with an increase in the Hispanic dissimilarity index. The size of the effect is similar to the effect of the relative size of the black population on the black dissimilarity index. However, in the Hispanic equation, the estimate is imprecise and, therefore, not significant.

Finally, per capita income proved insignificant in both regressions, while the unemployment rate was insignificant in impacting black segregation, but was significant at the .1 level for Hispanics. The data suggested that a higher unemployment rate entailed less segregation for Hispanics. This is a more difficult result to explain, but perhaps if the unemployment rate climbs, which is expressed for all city residents, then white citizens are not immediately able or willing to move away from an area that has a high Hispanic population. Thus, they remain in the same area and contribute to its integration. Moreover, the residential

preferences of whites towards Hispanics, as elaborated upon in the Schelling model, support the aforementioned contention through higher tolerances towards Hispanic residents, as whites are not as intent on moving away.

Another series of regressions was then run to further explore the impact of sprawl on segregation. The same aforementioned equations were utilized, only this time without change in developed land factored in. This was done in order to verify whether sprawl really did not have an impact on segregation, as it would be premature to simply say so. Control on developed land may still be an issue affecting segregation, so simply removing the sprawl variable should give another indication as to its significance. The results in column 2, next to the original regressions, proved virtually identical. Population change was still significant and negative, and this further supports the contention that it is population change that is driving segregation, and not sprawl, as is often claimed.

Conclusion

The regression results in this study provide strong support that suburban sprawl is not responsible for segregating either the black or Hispanic population. Instead, the results pointed to other variables such as population change, percentage minority, and unemployment rate in explaining the levels of segregation in metropolitan areas. These results were consistent with many previous sprawl studies, and seemed especially to support the works of Denton and Massey, Fulton, and Clark. However, they cast doubt on the claims of Powell, who points to sprawl as a key cause of urban segregation. Even after we remove from the analysis changes in developed land, the effect of changes in population remains. Larger statistical samples need be taken in future mathematical analyses to validate the findings in this paper, along with more

precise and narrower area-specific measures of minority percentages, per-capita income, and unemployment rates. However, the R-Square values obtained seem to point to causes other than sprawl as being responsible for creating the segregation in cities, and the potential problems that go with it.

References

- Clark, W.A.V., 1991. "Residential Preferences and Neighborhood Racial Segregation: A Test of the Schelling Segregation Model." *Demography*, Vol. 28, No. 1, February, p. 1-19.
- Collins, W., Margo, R., 2001. "Race and Home Ownership: A Century-Long View." *Explorations in Economic History*, forthcoming.
- Dedman, B., 1989. "Blacks Denied S&L Loans Twice as often as Whites." *Atlanta Journal and The Atlanta Constitution*, Sunday, January 22, p. 1, 10A.
- Denton, N.A., Massey, D.S., 1991. "Patterns of Neighborhood Transition in a Multiethnic World: U.S. Metropolitan Areas, 1970-1980." *Demography*, Vol. 28, No. 1, February, p. 41-63.
- Denton, N.A., Massey, D.S., 1993. *American Apartheid: Segregation and the Making of the Underclass*. Cambridge: Harvard University Press.
- <http://enceladus.isr.umich.edu/race/calculate.html>
- Fulton, W., Pendall R., Nguyen, M., Harrison, A., 2001. "Who Sprawls Most? How Growth Patterns Differ Across the U.S." *The Brookings Institution Survey Series*, July, p. 1-23.
- Galster, G., Freiberg, F., Houk, D.L., 1981. "Racial Differentials in Real Estate Advertising Practices: An Exploratory Case Study." *Journal of Urban Affairs* 9: p. 199-215.
- Galster, G., Hanson, R., Ratcliffe, M.R., Wolman, H., Coleman S. and Freihage, J., 2001. "Wrestling Sprawl to the Ground: Defining and Measuring an Elusive Concept." *Housing Policy Debate*, Vol. 12, No. 4, p. 681-717.
- Gyourko, J., Linneman, P., Wachter, S., 1999. "Analyzing the Relationships among Race, Wealth, and Home Ownership in America." *Journal of Housing Economics*, Vol. 8, No. 2, p. 63-89.
- Jargowsky, P.A., 1997. *Poverty and Place: Ghettos, Barrios, and the American City*. New York: Russell Sage Foundation.
- Kahn, M.F., 2001. "Does Sprawl Reduce the Black/White Housing Consumption Gap?" *Housing Policy Debate*, Vol. 12, No. 1, p. 77-86.
- Newburger, H., 1981. "The Nature and Extent of Racial Steering Practices in U.S. Housing Markets." Unpublished Manuscript. Department of Economics, Bryn Mawr College.

- Orfield, M., 1999. "Metropolitics: A Regional Agenda for Community and Stability." *Forum for Social Economics*, Vol. 28, No. 2, p. 33-49.
- Powell, J., 2000. "How Sprawl Makes Us Poor." *The Albuquerque Tribune*, Wednesday, March 22. Text taken from Internet.
- Powell, J., 2000. "Race, Poverty, and Urban Sprawl: Access to Opportunities Through Regional Strategies." *The Institute on Race & Poverty*, p. 1-14. Text taken from Internet at: www1.umn.edu/irp/publications/racepovertyandurbansprawl.html.
- Powell, J., 2002. "Sprawl, Fragmentation, and the Persistence of Racial Inequality: Limiting Civil Rights by Fragmenting Space." *Urban Sprawl: Causes, Consequences, and Policy Responses*, Urban Institute Press, p. 73-114.
- Power, A., 2001. "Social Exclusion and Urban Sprawl: Is the Rescue of Cities Possible?" *Regional Studies*, Vol. 35, No. 8, p. 731-742.
- Rusk, D., 1993. *Cities without Suburbs*. Washington, D.C.: Woodrow Wilson Center Press.
- Schelling, T., 1978. *Micromotives and Macrobehavior*. New York, Norton.
- Social Exclusion Unit (SEU), 2000. "Minority Ethnic Issues in Social Exclusion and Neighborhood Renewal." SEU, London.
- Vandegrift, D., Yoked, T., 2003. "Obesity rates, income and suburban sprawl: an analysis of US States." *Health & Place*, forthcoming.
- www.bls.gov
- www.census.gov/hhes/www/housing/ressest/tab5-4.html
- www.census.gov
- Yinger, J., 1995. *Closed Doors, Opportunities Lost: The Continuing Cost of Housing Discrimination*. New York: Russell Sage Foundation.

Table 1: Means and Standard Deviations (Black population)

Variable	Mean	Std. Dev	Minimum	Maximum
<i>Segregation</i>	0.641	0.113	0.399	0.846
<i>Unemp. Rate</i>	3.515	0.968	2.000	5.300
<i>Population Change</i>	20.453	17.033	-8.000	72.900
<i>Change in dev. land</i>	36.398	13.359	13.000	81.500
<i>Black Population</i>	30.620	19.539	3.500	81.600
<i>Per Capita Income</i>	32,969	5,479	25,741	46,586

Segregation= level of SMSA integration for the year 2000, as defined by the dissimilarity index

Unemployment Rate= percentage of SMSA population unemployed for the year 2000

Population Change= percentage increase or decrease in SMSA population for period 1982-1997
Change in developed land= change in amount of developed land, holding population constant, for period 1982-1997

Black (Hispanic) Population= percentage of SMSA population that is either black or Hispanic for year 2000

Per Capita Income= level of average household income by SMSA, for period 1998-2000

Table 2: Means and Standard Deviations (Hispanic Population)

Variable	Mean	Std. Dev	Minimum	Maximum
<i>Segregation</i>	0.512	0.102	0.303	0.676
<i>Unemp. Rate</i>	2.504	1.626	2.000	5.300
<i>Population Change</i>	16.876	18.246	0.400	72.900
<i>Change in dev. land</i>	32.845	16.443	-1.400	81.500
<i>His. Population</i>	25.169	15.253	1.700	65.800
<i>Per Capita Income</i>	22,466	16,543	26,056	46,586

Segregation= level of SMSA integration for the year 2000, as defined by the dissimilarity index

Unemployment Rate= percentage of SMSA population unemployed for the year 2000

Population Change= percentage increase or decrease in SMSA population for period 1982-1997

Change in developed land= change in amount of developed land, holding population constant, for period 1982-1997

Black (Hispanic) Population= percentage of SMSA residents that are either black or Hispanic for year 2000

Per Capita Income= level of average household income by SMSA, for period 1998-2000

Table 3: Regression Outputs (Black Population)

	1	2
Variable	Parameter Estimate	Parameter Estimate
<i>Intercept</i>	0.53853*** (8.57)	0.53508*** (8.84)
<i>Income</i> (Residual)	0.00000153 (0.60)	0.00000169 (0.68)
<i>Population Change</i>	-0.00233*** (-2.76)	-0.00231*** (-2.79)
<i>Unemp. Rate</i>	0.01802 (1.28)	0.01927 (1.48)
<i>Black Population</i>	0.00282*** (4.00)	0.00279*** (4.09)
<i>Change in</i> (Residual) <i>developed land</i>	-0.00033323 (-0.26)	—————
	F-Value= 10.42 Pr>F= <.0001 R-Square= 0.6050 Adj. R-Sq.= 0.5469	F-Value= 13.36 Pr>F= <.0001 R-Square= 0.6042 Adj. R-Sq.= 0.5590

t-statistics in parentheses
 ***= significant at .01 level
 *=significant at .1 level

Table 4: Regression Outputs (Hispanic Population)

Variable	Parameter Estimate	Parameter Estimate
<i>Intercept</i>	0.94414*** (3.86)	0.92262*** (3.93)
<i>Income</i> (Residual)	-0.00000578 (-1.13)	-0.00000571 (-1.14)
<i>Population Change</i>	-0.00332*** (-2.82)	-0.00325*** (-2.85)
<i>Unemp. Rate</i>	-0.10940* (-1.79)	-0.10662* (-1.79)
<i>Hispanic Population</i>	0.00221 (1.50)	0.00259** (2.12)
<i>Change in</i> (Residual) <i>developed land</i>	-0.00102 (-0.48)	_____

F-Value= 2.25	F-Value= 2.89
Pr>F= <.098	Pr>F= <.053
R-Square= 0.4133	R-Square= 0.405
Adj. R-Sq.= 0.230	Adj. R-Sq.= 0.265

t-statistics in parentheses
 ***= significant at .01 level
 ** = significant at .05 level
 *=significant at .1 level

