Title
Where Youth Live: Economic Effects of Urban Space on Employment Prospects

Authors
O'Regan, Katherine M.
Quigley, John M.

Publication Date
1997-05-01

Where Youth Live: Economic Effects of Urban Space on Employment Prospects

Katherine M. O'Regan

Yale University

John M. Quigley

University of California, Berkeley

May 1997

UCTC No. 358

The University of California Transportation Center
University of California at Berkeley

The University of California Transportation Center

The University of California Transportation Center (UCTC) is one of ten regional units mandated by Congress and established in Fall 1988 to support research, education, and training in surface transportation. The UC Center serves federal Region IX and is supported by matching grants from the U.S. Department of Transportation, the California Department of Transportation (Caltrans), and the University.

Based on the Berkeley Campus, UCTC draws upon existing capabilities and resources of the Institutes of Transportation Studies at Berkeley, Davis, Irvine, and Los Angeles; the Institute of Urban and Regional Development at Berkeley; and several academic departments at the Berkeley, Davis, Irvine, and Los Angeles campuses. Faculty and students on other University of California campuses may participate in Center activities. Researchers at other universities within the region also have opportunities to collaborate with UC faculty on selected studies.

UCTC's educational and research programs are focused on strategic planning for improving metropolitan accessibility, with emphasis on the special conditions in Region IX. Particular attention is directed to strategies for using transportation as an instrument of economic development, while also accommodating to the region's persistent expansion and while maintaining and enhancing the quality of life there.

The Center distributes reports on its research in working papers, monographs, and in reprints of published articles. It also publishes *Access*, a magazine presenting summaries of selected studies. For a list of publications in print, write to the address below.

University of California Transportation Center

108 Naval Architecture Building
Berkeley, California 94720
Tel: 510/643-7378
FAX: 510/643-5456

A previous version of this paper was presented at the conference on Taxation, Resources, and Economic Development, Lincoln Institute, Cambridge, MA, October 10-12, 1996. We are grateful to Christian Redfearn for research assistance. Support for this research has been provided by the Fisher Center for Real Estate and Urban Economics and by the Transportation Center, University of California, Berkeley.

Where Youth Live:
Economic Effects of Urban Space on Employment Prospects

Abstract

This paper summarizes and synthesizes a series of empirical analyses investigating the role of urban space in affecting minority employment outcomes. It adds to the considerable (but inconclusive) literature by broadening the focus beyond transportation and the "friction of space," and by expanding the data available for spatial research. The empirical analyses share a common framework linking "access" to youth labor market performance. The first set of results is based on aggregate data relating access to employment outcomes for black youth at the metropolitan level. Access is broadly defined to include traditional measures of geographic distance, as well as measures of social isolation or social access. Metropolitan areas in which the black poor are more spatially isolated are also found to have higher black youth unemployment rates. The second body of evidence relies on the same type of metropolitan measures, combined with individual data on youth living with at least one parent. When individual and family characteristics are controlled for, and white and Hispanic youth are also considered, metropolitan measures of social access exert distinguishable effects upon youth employment -- youth living in urban areas in which they have less residential contact with whites or the non poor are less likely to be employed. The final piece of analysis links the individual records of such youth to tract level measures of access, both social (neighborhood composition variables) and geographic (job access measures). This is accomplished through the creation of a unique data set at the Bureau of the Census. Again, after controlling for individual and family characteristics, the residential conditions of youth affect their employment. Ceteris paribus, youth living in census tracts with fewer employed adults, with fewer whites, and which are further from jobs are less likely to be employed. Results suggest that the overall effects of space on employment outcomes are substantial, explaining between ten and forty percent of the observed racial differences in employment in four urban areas examined. Of this "spatial" effect, the bulk arises from social/informational measures; job access appears to play a much smaller role. However, when measured more precisely, at the census tract level, job access does have a significant effect on youth employment. This effect is less important than other spatial influences. Spatial influences are less important in explaining outcomes than are differences in human capital.

I. Introduction

The linkage between urban space and minority employment has been a subject of intense study and controversy for the past three decades. During this period, there have been massive relocations of jobs within and between metropolitan areas, substantial increases in spatial concentrations of demographic groups (especially the urban poor and minority households), and major changes in transportation systems.

Despite the importance of the topic and its obvious policy implications, there is yet no consensus on the effects of spatial residential patterns on employment outcomes for minority households (see Jencks and Mayers, 1990, and Kain, 1992 for reviews). The uncertain conclusions of empirical studies and the associated statistical evidence arise from ambiguity about the nature of "spatial influences" themselves as well as limitations in data availability and statistical technique.

This paper summarizes a series of empirical analyses addressing the linkage between urban space and minority youth employment. The empirical analyses are based on a common framework linking "access" to labor market success. The perspective is broader than the traditional economic concept of transportation costs and the "friction of space." The empirical analyses we summarize are based upon increasingly more precise measures of the relevant concepts, which are obtained when aggregate measures of outcomes are replaced by individual outcomes and when single measures of spatial access at the metropolitan level are replaced by multiple measures of spatial interaction at the neighborhood level. The first body of evidence presented is based on aggregate information relating access to employment outcomes at the metropolitan level. The second set of results is based upon micro data on individuals and their employment outcomes linked to metropolitan-level information on access. The third body of evidence is based upon micro data on individuals combined with neighborhood level information on several dimensions of access. The results suggest that the effects of "access" on "outcomes" are substantial, but with improved measurements, they are also seen to be more complex.

Finally, the results provide credible evidence that the linkage has a causal mechanism, not merely one of association. The latter finding gives more importance to the policy conclusions of the work.

II. Space and Employment Access

The original work purporting to demonstrate the linkage between residential location and employment outcomes was based purely upon the costs of commuting between residences and work sites. In essence, the theoretical argument was that more expensive circuitous commutes would increase the reservation wages of spatially isolated workers, causing them to forego employment. As a result, the employment probabilities of minority workers who were forced by

discrimination in the housing market to live in spatially isolated neighborhoods would be lower than the probabilities of otherwise identical workers not similarly constrained (Kain, 1968).

Much of the original empirical work was characterized by this precise but narrow interpretation of the accessibility of residences to workplaces. Early studies measured access by airline distance (Kain, 1968; Offner and Saks, 1971; Leonard, 1987); others relied upon commute time (Ihlanfeldt and Sjoquist, 1990, Ihlanfeldt, 1993). Still others used employment centrality (Harrison, 1972). All of these measures focus strictly on the geographic distance between the individual and job location.

However, several different "frictions of space" are involved in the job matching process, and traversing physical distance is only one of them. Learning of job opportunities through residence-based social networks -- indeed even recognizing that work is a valuable activity by observing neighborhood "role models" -- are emphasized by non economists as concomitants of the concentration of minorities and poverty in central city areas (Wilson, 1987). This broader perspective focuses on the social isolation or social access of disadvantaged populations. It emphasizes, for example, the possibility that youth lack the residence-based networks so helpful for obtaining employment (Ihlanfeldt, forthcoming). Although clearly grounded in spatial relationships, this concept of social access is distinct from transport access, and measures of social access may not be correlated highly with measures of physical distance or transportation costs.

III. Metropolitan Measures of Access and Employment Outcomes

The social isolation of disadvantaged households suggests an alternative approach to measuring access, one which focuses on the social context of minorities and the poor. Consider, for example, an index of the residential segregation of households. The "Exposure Index," one of several measures of segregation commonly used by demographers and sociologists (see, for example, White, 1986 and Miller and Quigley, 1990), is a direct measure of the residential contact between and among groups. Specifically, the exposure to a given demographic group is the probability that a randomly selected person residing in the same neighborhood (say, census tract) is a member of the given group. The index measures directly the extent to which members of any group are isolated from or exposed to contact with members of other groups.[1] We use two versions of this index, calculated by Massey and Eggers (1989) at the metropolitan level for black individuals. First, the "general exposure to poverty" index measures the probability that a black poor person comes into contact with poor people (and is thereby exposed to networks containing poor individuals). Second, the "within-race" index focuses more narrowly on contact between black poor and other blacks.

Our premise is that black youth unemployment is greater when "access" to jobs is lower, with access defined as spatial isolation measured at the level of the metropolitan area. We test this

using aggregate data for large MSAs, incorporating both traditional measures of physical access, and the Exposure Index as a measure of social or informational access. We regress black youth unemployment rates on each of these measures, and several other MSA characteristics which are expected to affect black youth unemployment (white youth unemployment, percent of employment in manufacturing, percent of the population which is black). Models I and II in Table 1 present results for logarithmic regressions for all black youth, using the general exposure index and the within-race index, respectively.

Employment concentration is expected to have a negative coefficient, while travel time and poverty exposure are expected to have positive coefficients. After controlling for local economic conditions and population composition, the measures of exposure have the expected signs, and are statistically significant. Black youth unemployment rates are lower in MSAs where the black poor are less isolated from the non poor population. Other measures of access are insignificant.

Other implications of this notion of access can be examined with these data by distinguishing the central city from the suburbs. A larger concentration of employment in central cities increases physical access for youth residing in central cities, but not for youth living in the suburbs. Long commute times reflect more decentralized employment, which decreases access for youth residing in the central city but not for youth residing in the suburbs. And while the measures of exposure are metropolitan wide, in fact high levels of poverty exposure are indicative of isolated central city blacks who are much more socially isolated than non-central city blacks.

Regressions which consider the unemployment of central city black youth separately from the unemployment of suburban youth are reported in columns III through VI. The coefficients for the exposure index are consistent with this broader concept of access. Both measures of exposure significantly increase the unemployment rates for black youth who live in central cities, but do not exert a significant impact on the employment prospects for black youth who live in the suburbs.

These findings are limited by the level of aggregation of the analysis. Unemployment rates for black youth are higher in MSAs with spatially isolated black populations. This could, of course, arise because other population characteristics are responsible for both outcomes or because spatial isolation is itself a product of poor employment outcomes.

IV. Metropolitan Measures of Access and Individual Measures of Employment Outcomes

To control for population characteristics at the individual level, we created a micro data set containing a sample of youth, their families and their employment outcomes. These data were extracted from the 1990 Census Public Use Micro Sample for large MSAs.[2] We focus on the employment of youth residing with parents. Thus, household residential location is not determined by employment outcomes of youth. To consider employment outcomes for white, black and

Hispanic youth, we use the Exposure Index at the metropolitan level for each of these groups: for each MSA we have measures of white, black and Hispanic exposure to two groups, whites and non poor.

The effect of exposure on youth employment is estimated in two stages. In the first stage, we relate youth employment probabilities, p_i, to a vector of individual and family characteristics, X. The model also includes race and ethnicity-specific effects which vary by MSA:

$$(1)\quad \log\left[p_i / (1 - p_i)\right] = \alpha X_i + \sum_j \beta_{1j}\, w_i\, M_j + \sum_j \beta_{2j}\, b_i\, M_j + \sum_j \beta_{3j}\, h_i\, M_j$$

M_j is a set of MSA dummy variables, with a value of one if individual i resides in metropolitan area j and zero otherwise. This vector is interacted with a series of race/ethnicity dummy variables: w_i for whites, b_i for blacks, and h_i for Hispanics. The set of parameters β_{rm} (for r = 1,2,3 races and m= 1,2,...,73 MSAs) represents the shift in the logit of employment probability depending on the race of the individual and the metropolitan area in which that individual resides.

The key finding from estimating equation (1) is that, after controlling for individual characteristics, the employment probabilities of "otherwise identical" white, black and Hispanic youth vary significantly across metropolitan areas. (Appendix A lists the individual and household characteristics, X, which are included in the estimation.)

The set of coefficients, β_{rm}, reflecting metropolitan differences is highly significant in affecting individual outcomes. In the second stage, we analyze the determinants of these metropolitan differences:

$$(2)\quad \beta_{rm} = \gamma Z_m + \delta E_{rm} \quad .$$

Z_m is a vector of MSA characteristics expected to influence local labor market outcomes, and E_{rm} is the race/ethnicity-specific exposure index, and β_{rm} is the set of coefficients estimated in equation (1). The results are presented in Table 2.

To control for local labor market conditions, again we include measures of local employment conditions, the adult white unemployment rate and the percent of employment in business services. These factors are highly significant in each model estimated -- particularly the variable measuring adult unemployment, which summarizes aggregate economic conditions in the metropolitan area.[3] We also include race-specific intercepts to capture systematic differences across groups. Finally, we include the exposure indices. Model I reports the results using the appropriate access index based on each race/ethnicity group, but where the influence of access is constrained to be common across groups. Model II reports coefficients on the Exposure Index that

are race-specific. For all groups, exposure to whites significantly increases youth employment probabilities. Similarly, exposure to poverty significantly decreases youth employment probabilities.

V. Neighborhood Measures of Access and Micro Measures of Employment Outcomes

A comparison of the results in Tables 1 and 2 suggests that the link between spatial isolation and employment outcomes does not arise because measurable household and individual characteristics are omitted. On the contrary, it seems clear that the spatial configuration which isolates minority households within metropolitan areas "matters" in explaining employment outcomes for minority youth. However, measurement of spatial and social isolation at the metropolitan level is rather blunt indeed. Much of the theory underlying these spatial effects is presumed to operate at the level of the block, neighborhood, or census tract.

To conduct the analysis at the level of the neighborhood, where social interaction takes place, where social isolation is felt, and where transport access is well defined, we created a unique data set at the Bureau of the Census. This data set contains all records of non Hispanic white, black and Hispanic youth (aged 16 to 20) residing with at least one parent in the four largest metropolitan areas in the state of New Jersey (Newark, Bergen-Passaic, Middlesex, and Monmouth). The data set consists of all records on youth and their families from the 1990 Census, more than 28,000 observations. The most important aspect of the data set is that each record is coded by census tract, which establishes a link between data on individual youth and their neighborhoods (census tracts).

These data are sufficient to provide a direct test of the importance of neighborhood and concentration effects upon youth employment outcomes. The social isolation resulting from the concentration of minorities and the poor in central city areas manifests itself in neighborhoods (i.e., census tracts) through disproportionate representation of the poor, the unemployed, the welfare dependent, etc. If concentration matters, measures of neighborhood composition represent this.

Clearly, while contributing to metropolitan aggregates, census tract measures of geographic isolation vary substantially within metropolitan areas. For example, Figure 1 illustrates the intra metropolitan variation in spatial isolation of minority households. For two metropolitan areas in New Jersey, Bergen-Passaic and Monmouth (both MSAs are data points in the inter metropolitan analyses reported in Table 2), the figure reports the cumulative frequency distribution of the Exposure Index computed at the level of the census tract. The figure also reports, for each metropolitan area, the Exposure Index computed at the metropolitan level. (This is the measure used in the analysis reported in Tables 1 and 2.) For Bergen-Passaic as a whole, for example, the value of the metropolitan Exposure Index is about 0.3. That is, the average black lives in a census

tract with a population which is 30 percent white. However, about a third of the black population lives in census tracts which are less than five percent white, while ten percent of the black population lives in census tracts which are more than 85 percent white. Clearly, the social isolation of the "typical" black in the MSA conveys only limited information. There is a great deal of variation in the exposure to whites of black households within these two metropolitan areas. This is also the case for the other two MSAs, Newark and Middlesex. Similarly, there is a great deal of variation in the exposure to whites of the Hispanic population in all four MSAs.

In addition, we compute a measure of transport and access to metropolitan work sites for each census tract.[4] Transport access is measured by an index of employment "potential" derived from the assumption that worktrip destinations are generated by a Poisson process (see Appendix B). Figure 2 presents frequency distributions of the transport access experienced in two of these metropolitan areas by race. The differences in access are much less pronounced, on average, by race, but there are substantial differences in the access to jobs available to individuals of the same race and to those of different races.

The individual data are used to relate youth employment probabilities, p_i, to individual and family characteristics (analogous to the models presented in Table 2) where we now control directly for tract characteristics:

$$(3)\quad \log [p_i / (1 - p_i)] = \alpha X_i + \beta A_i + \gamma N_i \quad ,$$

where X_i is a vector of relevant individual and family characteristics, A_i is a measure of employment access, and N_i is a vector of neighborhood characteristics. Individual and family characteristics are similar to those used previously and are listed in Appendix A.

Preliminary analysis with a larger set of neighborhood variables established that one measure of racial composition (percent white) and four measures of tract poverty or employment levels (percent: poor; on public assistance; unemployed; and adults working) are consistently important in affecting employment outcomes. Since the appropriate functional form for these variables is not known a priori, we estimated a series of models to test for non-linearities. There is some evidence that the relationship is complicated, but no simple non-linear representation is superior to the inclusion of continuous measures of neighborhood attributes. We report results using continuous measures.

The model is estimated for youth in all four metropolitan areas, with specific intercepts for each. MSA-specific coefficients are also estimated for all tract variables. Table 3 reports a variety of models which include the job access measure and various neighborhood variables. Panel A includes results for the estimation of employment probabilities, while Panel B summarizes results for the estimation of the probability of idleness (i.e., not working and not in school).

Model I of Panel A reports estimates of youth employment probabilities as a function of neighborhood access measures, individual, and household characteristics. (Again, the measures used in the regression are reported in Appendix A.) Access has a significantly positive effect on youth employment in three of the four MSAs; Monmouth is the exception.

Models II through VI include job access, but introduce other neighborhood characteristics (percent white, percent on public assistance, and the percent of adults not at work). The inclusion of these neighborhood variables have somewhat different effects across urban areas. For Newark, transport access is no longer significant in any of the models. For Monmouth, once any neighborhood variables are included, the measure of job access is highly significant. For Bergen-Passaic, the coefficient on job access and its significance are unaffected by neighborhood variables, while their inclusion causes mixed results for Middlesex: in some cases, job access remains significant, but in instances where the percentage of adults not at work is included in the model, job access becomes insignificant.

While neighborhood variables clearly affect youth employment probabilities, the effects are different across MSAs. However, the variable measuring the percent of adults not at work -- perhaps the best measure of social access -- is consistently significant in each model for each MSA.[5]

In Panel B we report similar results using youth idleness as the dependent variable. Not surprisingly, factors which affect school status play a larger role in predicting idleness. For example, job access decreases in significance, while neighborhood racial and poverty characteristics have a consistently significant effect. These characteristics may more directly affect school status, while the presence of working adults is more relevant for employment status.

VI. Exogeneity in a Model of Neighborhood Influences

Framing the model in terms of individuals and their neighborhoods raises the question of whether neighborhoods are exogenous to employment outcomes.[6] It is worth noting that the measure of job access employed in the statistical models is not computed from the observed commuting patterns of teenagers. Nor is it computed with reference to the location of jobs which might be "suitable" for teenagers (Ihlanfeldt and Sjoquist, 1990). Rather, it is calculated from observations on the worktrip patterns of all resident workers -- adults and teenagers -- within the entire urban area.

Perhaps a more serious source of concern is the choice of neighborhood by household. By selecting youth living with at least one parent, we can presume that the residential choice is made by the parent. To the extent that factors affecting parents' employment prospects underlie this choice, and these are correlated with youths' prospects, we control for parents' employment status in the statistical model. However, to the extent that household choices about residential location

are influenced by parents' perceptions about the effect of neighborhood characteristics on youth employment and idleness, simultaneity remains an issue. And to the extent that omitted from our model are family or individual variables correlated with neighborhood variables, the results may be misleading.

We adopt two approaches to analyze the exogeneity of neighborhood; the first is informal, and the second relies upon a formal statistical test. The main source of potential endogeneity is households' choice of neighborhood based on their concern about the effect of neighborhood influences on youth employment and idleness. To the extent that this occurs, youth who have lived in a neighborhood longer should be more strongly influenced by neighborhood characteristics than are newer residents. To test for this difference in the relative size of the impacts, we stratified the sample into those youth who had moved in the last five years ("movers") and those who had not ("non movers"). In the stratified models of youth employment probabilities, coefficients on neighborhood variables remained the same or declined for movers; they remained the same or increased for non movers. In the stratified models of youth idleness, however, the coefficients on neighborhood variables are higher for non movers. Thus, at least for the analysis of youth employment, the statistical results are more consistent with contemporaneous spatial influences, rather than merely sorting over space.

The second test of endogeneity leads to similar conclusions. The most general models of employment and idleness include three of the four measures of neighborhood characteristics. To test formally for endogeneity, we create instruments for each of these variables and include both sets of variables in the statistical model. This permits a test of the joint significance of the instruments. The hypothesis that the neighborhood variables are jointly exogenous can be tested using standard likelihood ratios. (This is the standard Hausman test.)

As instruments, we use census tract measures correlated with each of the four neighborhood indicators but not themselves determinants of employment outcomes. Each of our measures uses information on household and neighborhood characteristics to determine probabilistic measures of residence.[7] Table 4 reports the results of the Hausman test for the employment probabilities of Newark youth, for different age groups. The tests are constructed separately for in-school and out-of-school youth and for all youth, for various age groupings. The test is specified so that the null hypothesis is exogeneity. Significant chi square test statistics indicate the rejection of exogeneity, giving evidence of endogeneity.

In no case, in the analysis of out-of-school youth, can exogeneity be rejected. Similarly, when all youth are included in the sample, exogeneity is never rejected. However, when the sample is limited to in-school youth, there are some instances when exogeneity can be rejected. Again, this suggests that endogeneity might be an important issue when considering neighborhood impacts on school outcomes.

VII. Metropolitan Differences

The results of these endogeneity tests support the existence of a causal link between spatial factors and youth employment outcomes. Furthermore, when measured at the neighborhood level, both social access (as measured by demographic characteristics) and transport access (as measured by the employment potential index) are generally statistically significant. The effect of these factors upon youth employment differs across metropolitan areas, however. To put these differences in context, Table 5 summarizes descriptive data on the four metropolitan areas. These data provide some insight into potential explanations for inter- metropolitan variation.

Of the four metropolitan areas, Newark is the largest, and the poorest. It has the largest minority and black population, the highest unemployment rate, the greatest concentration of central city employment and the highest public transit use rate. Bergen-Passaic is the next largest urban area. Its sizable minority population is much more Hispanic, and its poverty and unemployment rates are more similar to Middlesex and Monmouth than to Newark. Middlesex is a relatively well-to-do community, with the lowest unemployment and poverty rates, and a median family income for blacks that is almost forty percent higher than in Newark. Monmouth is a community which also has less income differentiation across race than the large urban areas, but with a less wealthy white population. The median income for white families in Monmouth is only slightly higher than the median income for black families in Middlesex. (See Appendix C for more geographical information.)

It is possible that these differences in the demographic profiles of these urban areas condition the empirical results. Individuals may, indeed, be affected differently by social and spatial access depending on their race or socioeconomic status.[8] Consider Middlesex, a metropolitan area in which job access is not consistently significant for youth employment. Given the higher socioeconomic profile of the community, perhaps spatial access is less of a constraint on youth employment. In fact, unlike each of the other MSAs, in Middlesex black youth reside in census tracts with slightly higher measures of job access than do white youth. Investigating such inter-group differences in larger metropolitan areas (with very large minority communities) would reveal whether the metropolitan differences reported in Table 3 arise from inter metropolitan differences in the mix of demographic groups or from intra metropolitan spatial factors.

These four metropolitan areas differ not only in their populations, but in the spatial distribution of these populations. Not surprisingly, neighborhood composition variables are highly correlated with each other in each MSA. This high correlation probably contributes to the observed inter-metropolitan differences in neighborhood effects -- with such high levels of correlation, it is difficult to isolate the effects of a specific characteristic.

The correlations might also explain the apparent insignificance of job access in Newark. (The correlations for a selection of tract level characteristics and job access are presented in Table 6.) Neighborhood characteristics are more strongly correlated with job access in metropolitan areas with poorer populations. There is no correlation between tract characteristics and access in Middlesex, low correlations in Monmouth, slightly higher in Bergen-Passaic, and the highest in Newark. Regardless of the underlying forces which have led to this greater socio-economic segregation from jobs, these forces affect the precision of the statistical model. When other neighborhood characteristics are ignored, job access has a significant effect on youth employment in Newark. However, once neighborhood characteristics are included, job access is insignificant. The former result could be dismissed as spurious correlation, the latter result as a multicollinearity problem.

VIII. Conclusion

As noted above, the high correlations among the census tract variables measuring exposure and job access make it difficult to ascribe employment differences among youth to the influences of particular variables. Despite this, we can draw some rough quantitative conclusions.

Table 7 presents estimates of the employment rate differentials in the four metropolitan areas based on the results reported in Table 3 (specifically, Model II). Panel A reports the estimated differential in employment rates between black and white youth. The estimated difference in employment rates implied by the model is 14.9 percentage points in the Bergen-Passaic MSA (i.e., the rate is estimated to be 43.4 percent for white youth and 28.5 percent for black youth). Of this difference, about 12.6 points (or almost 85 percent of the differential) is due to the large differences in the household and human capital characteristics, on average, between black and white youth. About 1.4 percentage points (or 9.4 percent) is due to differences in exposure, and the residual, 0.9 points (or 6.0 percent) arises from differences in job access.

In Newark, the black-white youth employment differential is predicted to be more than 19 percentage points, but only 57 percent of this is due to variations in household and human capital attributes. Of the remainder, 7.6 percentage points (or 39.4 percent) is due to differences in exposure.

Panel B reports the estimated differences in employment rates for white and Hispanic youth. The differences in employment rates are much smaller. However, a smaller fraction of the difference in youth employment is attributable to household and human capital differences by ethnicity. In the Bergen-Passaic MSA, less than 70 percent of the difference in estimated employment rates is attributable to household and human capital differences. One sixth of the difference is due to variations in social access or exposure, and the remaining difference -- about one percentage point in youth employment -- is attributable to differences in access to employment.

The results confirm the fact that the largest source of disparities in employment rates between white and minority youth is the discrepancy between the average human capital and household characteristics between white and minority youth. The results also suggest that a substantial fraction of the differences in employment outcomes by race is attributable to intra metropolitan spatial factors. Of these, social access or exposure seems more important than job access as measured by proximity to employment.

References

Corcoran, Mary, et al, 1992, "The Association between Men's Economic Status and their Family and Community Origins," **Journal of Human Resources** 27(4): 575-601.

Duncan, Greg J., 1994, "Families and Neighbors as Sources of Disadvantage in the Schooling Decisions of White and Black Adolescents," **American Journal of Sociology** 103: 20-53.

Evans, William et al, 1992, "Measuring Peer Group Effects: A Study of Teenage Behavior," **Journal of Political Economy** 100(5): 966-991.

Harrison, Bennett, 1972, "The Intrametropolitan Distribution of Minority Economic Welfare," **Journal of Regional Science** 12: 23-44.

Ihlanfeldt, Keith R. and David L. Sjoquist, 1990, "Job Accessibility and Racial Differences in Youth Unemployment Rates," **American Economic Review** 80: 267-276.

Ihlanfeldt, Keith R., 1993, "Intra-Urban Job Accessibility and Hispanic Youth Unemployment Rates," **Journal of Urban Economics** 33: 254-271.

Isard, Walter, 1960, **Methods of Regional Analysis**, Cambridge, MA: The MIT Press.

Jencks, Christopher and Susan Mayers, 1990, "The Social Consequences of Growing up in a Poor Neighborhood," in Laurence E. Lynn, Jr. and Michael McGeary, eds., **Inner City Poverty in the United States**, Washington, DC: National Academy Press.

Kain, John F., 1968, "Housing Segregation, Negro Employment, and Metropolitan Decentralization," **Quarterly Journal of Economics** 82: 175-197.

Kain, John F., 1992, "The Spatial Mismatch Hypothesis: Three Decades Later," **Housing Policy Debate** 3(2): 371-462.

Leonard, Jonathan S., 1987, "The Interaction of Residential Segregation and Employment Discrimination," **Journal of Urban Economics** 21: 323-346.

Massey, Douglas S. and Mitchell L. Eggers, 1989, "The Ecology of Inequality: Minorities and the Concentration of Poverty, 1970-1980," Population Research Center, NORC University of Chicago, Chicago, IL.

Miller, Vincent P. and John M. Quigley, 1990, "Segregation by Racial Demographic Group: Evidence from San Francisco," **Urban Studies** 27(1): 3-21.

Offner, P. and D.H. Saks, 1971, "A Note on John Kain's 'Housing Segregation, Negro Employment, and Metropolitan Decentralization,'" **Quarterly Journal of Economics** 85: 147-160.

O'Regan, Katherine M. and John M. Quigley, 1991, "Labor Market Access and Labor Market Outcomes for Urban Youth," **Regional Science and Urban Economics** 21: 277-293.

O'Regan, Katherine M. and John M. Quigley, 1996a, "Teenage Employment and the Spatial Isolation of Minority and Poverty Households," **Journal of Human Resources** 31(3): 692-702.

O'Regan, Katherine M. and John M. Quigley, 1996b, "Spatial Effects upon Teenage Outcomes," **New England Economic Review** May/June 1996: 41-58.

Plotnick, Robert and Saul Hoffman, 1995, "Fixed Effect Estimates of Neighborhood Effects," University of Washington, processed.

Smith, Tony E., 1984, "Testable Characterizations of Gravity Models," **Geographical Analysis** 16: 74-94.

White, Michael J., 1986, "Segregation and Diversity Measures in Population Distributions," **Population Index** 52: 198-221.

Wilson, William Julius, 1987, **The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy**, University of Chicago Press, Chicago, IL.

Appendix A: Individual Level Variables Included in Youth Employment Models

Equation (1) Table 2	Equation (3) Table 3
Sex (1=female)	Sex (1=female)
Age (years)	Age (years)
In School (1=yes)	In School (1=yes)
--- ---	Education (years)
--- ---	HS Graduate (1=yes)
Female Headed Household (1=yes)	Female Headed Household (1=yes)
Education of Head (years)	Education of Head (years)
Parent Working (1=yes)	Parent Working (1=yes)
Other Household Income (thousands)	Other Household Income (thousands)
White (1=yes)	White (1=yes)
Black (1=yes)	Black (1=yes)
Hispanic (1=yes)	Hispanic (1=yes)
--- ---	Family Size (persons)
--- ---	Children Ever Born (1=yes)

Appendix B: The Measurement of Job Access

In the analysis reported in Table 3, we employ a measure of the accessibility of each census tract to employment locations. This measure is derived from the "potential access" measures widely used by transport planners (see Smith, 1984). These measures are derived from observations on the work trip patterns of commuters and the transport linkages in an urban area.

The accessibility measures are based upon the data available through the Census Transportation Planning Package (CTPP) for large metropolitan areas. The CTPP data are obtained from the Transportation Supplement of the 1990 Census. Each metropolitan area is divided into Traffic Analysis Zones (TAZ's). Zone-to-zone peak commute flows (T_{ij}) as well as peak travel times (d_{ij}) are reported. From the elements of the matrix, the number of workers resident in each TAZ (R_i) can be estimated ($R_i = \sum_j T_{ij}$). Similarly, the number of individuals working in each zone (W_j) can be estimated ($W_j = \sum_i T_{ij}$).

The most widely used empirical model of the accessibility of particular residential locations is based upon the gravity concept:

$$\text{(B1)} \quad T_{ij} = \alpha R_i^{\beta} W_j^{\gamma} / d_{ij}^{\delta} \quad ,$$

where Greek letters denote parameters. Isard (1960) provides a number of physical and social scientific justifications for the formulation. Flows between i and j are positively related to the "masses" of residences and workplaces and inversely related to the "distance" (travel time) between i and j.

Estimates of the parameters yield a measure of "employment potential," i.e., the accessibility of each residence zone to the workplaces which are distributed throughout the region (Isard, 1960, p. 510),

$$\text{(B2)} \quad A_i = \sum_j \hat{T}_{ij} / R_i^{\hat{\beta}} \quad ,$$

where $\hat{T}$ is computed from the parameters estimated by statistical means.

We use a more sophisticated measure of access which recognizes that the transport flows to each destination are count variables: The Poisson distribution is a reasonable description for counts of events which occur randomly.

Assuming the count follows a Poisson distribution, the probability of obtaining a commuting flow T_{ij} is

$$\text{(B3)} \quad pr(T_{ij}) = e^{-\lambda ij} \lambda_{ij}^{T_{ij}} / T_{ij} \; !$$

where λ_{ij} is the Poisson parameter. Assuming further that

(B4) $\exp[\lambda_{ij}] = \alpha R_i^{\beta} W_i^{\gamma} / d_{ij}^{\delta}$,

yields an estimable form of the count model (since $E(T_{ij}) = \lambda_{ij}$). See Smith (1987) for a discussion. Estimates of the parameters similarly yield a measure of the accessibility of each residence zone to workplaces in the region

(B5) $A_i = \sum_j \hat{\lambda}_{ij} / R_i^{\hat{\beta}}$.

The coefficients of the parameters in equation (B4) are estimated using the CTPP data, separately for each metropolitan area. In each metropolitan area, the "employment potential" or job access of each census tract,[9] is computed from equation (B5).

[1] More precisely, this interaction index across demographic groups is the exposure index, while within a demographic group it is termed the isolation index. As these terms are simply complements, we use the term exposure for both forms of interaction.

[2] The sample contains individual and family information for all non Hispanic white (white), non Hispanic black (black) and Hispanic youth aged 16 to 19 living with at least one parent and in one of the 73 largest MSAs in 1990.

[3] We tested several other categories of MSA characteristics, including the average commute time and other transport-related measures of access at the MSA level. None of these variables were significant.

[4] This is computed from another source of data, the Census Transportation Planning Package (CTPP). The CTPP provides direct information about commuting patterns and proximity to jobs at the census tract level for each of these MSAs. The raw data provided by the CTPP, matrices of zone-to-zone commuting patterns and peak commute times, are sufficient to create a variety of well-defined tract level measures of employment access. We employ the Poisson measure of access described in Appendix B.

[5] However, as noted below (Table 6), the high correlation between neighborhood characteristics means that the relative importance of neighborhood characteristics cannot be determined with precision.

[6] See Corcoran et al (1992), Evan et al (1992), and Plotnick and Hoffman (1995).

[7] We use information on the occupation of the head of household as well as industry affiliation to measure the likelihood of residence in a given tract, given that tract's occupation and industry composition. Similarly, we use a measure of the availability of appropriately sized housing units, conditioning on household size, and the tenure composition in the tract conditioned on household tenure status.

[8] For example, there is some indication in sociological literature on neighborhood effects that youth with higher socioeconomic status -- more resources at home -- may be at less risk from negative neighborhood influences (see Jencks and Mayers, 1990, and Duncan, 1994).

[9] For each of these four metropolitan areas, TAZs are coterminous with census tracts.

Table 1
Regression of Unemployment Rate for Black Youth for 47 Large MSAs
All Variables in Logarithms (t ratios in parentheses)

	All Black Youth		Central City Black Youth		Suburban Black Youth	
Coefficient	Model I	Model II	Model I	Model II	Model I	Model II
A. Access						
Employment concentration (CC jobs/MSA jobs)	-0.05 (1.05)	-0.07 (1.30)	-0.09 (1.39)	-0.11 (1.65)	-0.16 (1.94)	-0.18 (2.06)
Exposure index for black poverty	0.25 (2.81)	--- ---	0.23 (2.06)	--- ---	-0.03 (0.17)	--- ---
Exposure index for poverty within race	--- ---	0.37 (2.71)	--- ---	0.38 (2.28)	--- ---	0.11 (0.50)
Average one way commute time (minutes)	0.25 (1.42)	0.26 (1.50)	0.32 (1.49)	0.35 (1.61)	0.20 (0.71)	0.23 (0.32)
B. Other						
MSA percent black	0.08 (2.61)	0.10 (4.18)	0.04 (1.19)	0.07 (2.21)	0.20 (4.20)	0.19 (4.67)
MSA percent manufacturing	0.10 (1.92)	0.10 (1.87)	0.10 (1.50)	0.09 (1.45)	-0.02 (0.19)	-0.02 (0.28)
Unemployment rate for white youth	0.95 (10.94)	0.94 (8.90)	0.97 (8.95)	0.96 (8.90)	1.13 (8.03)	1.12 (7.93)
Constant	-0.05	-0.09	-0.24	-0.25	-0.94	-0.83
R^2	0.82	0.82	0.74	0.75	0.72	0.72

Source: See O'Regan and Quigley, 1991, for definitions of variables and sources of data.

Table 2
Inter Metropolitan Differences in Youth Employment Probabilities
for 73 large MSAs
(t ratios in parentheses)

	Exposure to Whites		Exposure to Poor	
Coefficient	Model I	Model II	Model I	Model II
Unemployment Rate (percent)	-0.128 (7.79)	-0.129 (7.98)	-0.103 (5.62)	-0.092 (4.96)
Business Services Employment (percent)	0.012 (0.62)	0.014 (0.70)	-0.075 (3.69)	-0.076 (3.82)
Intercept for:				
Whites	-8.490 (46.38)	-8.523 (35.71)	-7.095 (48.99)	-7.006 (46.35)
Blacks	-8.947 (57.94)	-9.014 (55.26)	-7.655 (47.82)	-7.866 (45.45)
Hispanics	-8.543 (50.02)	-8.463 (46.60)	-7.213 (45.94)	-7.127 (42.00)
Exposure to Whites	1.105 (10.15)			
Exposure to Poor			-2.956 (8.34)	
Exposure to Whites/Poor by:				
Whites		1.140 (5.72)		-4.526 (5.28)
Blacks		1.279 (6.73)		-2.181 (4.93)
Hispanics		0.949 (5.69)		-3.783 (6.66)
R^2	.820	.821	.799	.808

Source: See O'Regan and Quigley, 1996a, for definitions of variables, sources of data, and computational details.

Table 3
Neighborhood Differences in Employment Outcomes in Four New Jersey MSAs *
(28191 Observations)
(t-ratios in parentheses)

	Model					
Coefficient	I	II	III	IV	V	VI
A. Employment						
access:						
Bergen-Passaic	0.066	0.068	0.069	0.070	0.069	0.071
	(3.45)	(3.49)	(3.52)	(3.63)	(3.51)	(3.65)
Middlesex	0.026	0.028	0.023	0.017	0.028	0.021
	(2.17)	(2.34)	(1.99)	(1.39)	(2.38)	(1.74)
Monmouth	0.006	0.007	0.006	0.007	0.008	0.008
	(1.86)	(2.25)	(1.96)	(2.07)	(2.38)	(2.35)
Newark	0.004	0.002	0.001	0.001	0.001	0.001
	(3.37)	(1.88)	(0.45)	(0.99)	(0.51)	(0.71)
percent white:						
Bergen-Passaic		0.156			0.229	0.027
		(1.17)			(1.06)	(0.19)
Middlesex		0.819			0.893	0.731
		(3.86)			(2.96)	(3.38)
Monmouth		-0.210			-0.691	-0.268
		(0.94)			(2.30)	(1.19)
Newark		0.592			0.203	0.225
		(6.43)			(1.63)	(2.26)
percent public assistance:						
Bergen-Passaic			-0.269		0.443	
			(0.42)		(0.42)	
Middlesex			-2.798		0.521	
			(2.48)		(0.32)	
Monmouth			-0.760		-2.785	
			(0.87)		(2.38)	
Newark			-0.753		-2.248	
			(7.62)		(4.58)	
percent adults not at work:						
Bergen-Passaic				-2.049		-2.140
				(3.58)		(3.60)
Middlesex				-1.536		-1.261
				(3.25)		(2.62)
Monmouth				-1.059		-1.115
				(2.99)		(3.14)
Newark				-3.579		-3.285
				(11.03)		(9.24)
Chi-squared	3848	3904	3913	4002	3931	4021
-2logL	35233	35177	35168	35079	35150	35060

*Note: Logit models also include household level variables reported in Appendix A.
Each model also includes separate intercepts for the different metropolitan areas.
See O'Regan and Quigley, 1996b, for definitions of variables and sources of data.

Table 3 (continued)
Neighborhood Differences in Employment Outcomes in Four New Jersey MSAs *
(28191 Observations)
(t-ratios in parentheses)

	Coefficient	Model I	II	III	IV	V	VI
B.	Idleness						
	access:	-0.026	-0.011	-0.004	-0.026	-0.005	-0.010
	Bergen-Passaic	(3.58)	(0.27)	(0.10)	(0.66)	(0.11)	(0.25)
		-0.003	-0.001	0.003	0.010	0.004	0.011
	Middlesex	(0.11)	(0.04)	(0.12)	(0.35)	(0.16)	(0.39)
		0.001	0.002	0.002	0.000	0.001	0.001
	Monmouth	(0.14)	(0.25)	(0.26)	(0.03)	(0.21)	(0.21)
		-0.007	-0.003	0.000	-0.002	0.000	-0.001
	Newark	(3.16)	(1.37)	(0.13)	(0.78)	(0.08)	(0.23)
	percent white:						
	Bergen-Passaic		-0.690			-0.543	-0.676
			(3.25)			(1.61)	(2.98)
	Middlesex		-0.855			-0.255	-0.651
			(2.42)			(0.41)	(1.77)
	Monmouth		-0.811			-0.198	-0.752
			(2.31)			(0.38)	(2.14)
	Newark		-0.986			-0.614	-0.808
			(6.23)			(3.13)	(4.71)
	percent public assistance:						
	Bergen-Passaic			2.179		0.882	
				(2.34)		(0.58)	
	Middlesex			4.114		4.033	
				(2.22)		(1.24)	
	Monmouth			3.192		3.297	
				(2.37)		(1.65)	
	Newark			3.077		2.007	
				(6.35)		(3.28)	
	percent adults not at work:						
	Bergen-Passaic				0.955		0.329
					(0.96)		(0.30)
	Middlesex				2.265		2.108
					(2.25)		(2.00)
	Monmouth				0.909		0.908
					(1.36)		(1.33)
	Newark				2.400		1.590
					(4.88)		(2.94)
	Chi-squared	27913	27955	27960	27944	27970	27969
	-2logL	11167	11126	11121	11137	11110	11111

*Note: Logit models include household level variables reported in Appendix A.
Each model also includes separate intercepts for the different metropolitan areas.
See O'Regan and Quigley, 1996b, for definitions of variables and sources of data.

Table 4
Tests of Exogeneity of Neighborhood Influences upon
Employment Outcomes for Newark Teenagers*
χ^2 Statistics

Age Group	In School Youth	Out of School Youth	All Youth
A. Neighborhood Influences: Percent White, Access, Percent on Public Assistance			
Ages 16 - 20	8.045	3.669	7.513
Ages 16 - 19	8.596	2.347	6.027
Ages 17 - 20	9.397	4.014	7.343
Ages 17 - 19	10.146	3.908	5.395
B. Neighborhood Influences: Percent White, Access, Percent Adults not at Work			
Ages 16 - 20	4.536	3.895	5.114
Ages 16 - 19	4.303	2.364	3.294
Ages 17 - 20	5.846	4.529	5.169
Ages 17 - 19	5.616	4.439	2.772

*The critical values of χ^2 with 3df are 7.810 and 11.300 respectively at the 0.05 and 0.01 levels of confidence.

Table 5
Descriptive Information on Four New Jersey Metropolitan Areas

Variable	Bergan-Passaic	Middlesex	Monmouth	Newark
A. General Characteristics				
Population	1,220,490	965,834	968,304	1,780,291
Number of census tracts	252	253	227	445
Median family income (dollars)				
White	$56,260	$56,639	$47,241	$57,797
Black	$35,395	$45,828	$34,388	$32,864
Hispanic	$32,575	$38,778	$38,376	$30,812
Mean travel time to work (minutes)	24.1	25.6	26.5	25.7
White	24.7	26.2	27.5	26.0
Black	23.4	26.7	22.6	27.4
Hispanic	22.4	23.3	26.1	24.1
Access (index)				
White	0.366	0.346	0.409	0.218
Black	0.337	0.360	0.331	0.175
Hispanic	0.341	0.330	0.375	0.187
B. Percentages				
Population				
White	78.5	85.6	90.2	66.0
Black	8.6	7.2	6.1	23.8
Hispanic	11.9	7.3	3.7	10.2
Unemployment rate	5.5	4.5	5.7	6.9
White	4.4	3.7	5.0	4.0
Black	11.3	8.2	11.0	12.6
Hispanic	9.3	9.8	8.8	10.3
Poverty rate	6.2	4.3	5.5	9.0
Work in MSA	68.8	67.3	72.5	73.6
Work in central city	6.6	7.1	--	17.2
White	3.4	5.3	--	8.8
Black	17.0	14.6	--	28.8
Hispanic	16.6	19.4	--	32.6
Commute by public transit	9.4	6.4	5.1	11.1
White	7.7	5.4	5.0	6.0
Black	16.1	11.9	7.4	22.5
Hispanic	12.5	7.5	8.0	12.6

Table 6
Correlations of Various Demographic Variables with Access Measure

Variable	Bergan-Passaic	Middlesex	Monmouth	Newark
Work in central city	-0.089	0.044	na	-0.307
Percent using public transit	-0.379	0.071	-0.283	-0.367
Average commute time	-0.290	-0.001	0.021	-0.205
Percent white	0.224	-0.065	0.246	0.368
Percent poor	-0.305	-0.066	-0.149	-0.514
Percent on public assistance	-0.243	-0.066	-0.129	-0.477
Percent unemployed	-0.165	-0.136	-0.161	-0.500
Percent adults not at work	-0.217	-0.240	-0.030	-0.414

Table 7
Decomposition of Employment Rate Differentials by Race

	Bergen-Passaic	Middlesex	Monmouth	Newark
A. Predicted white-black differential				
Due to individual characteristics	+12.6 pts	+12.5 pts	+12.7 pts	+11.0 pts
Due to exposure	+ 1.4	+ 4.2	- 1.8	+ 7.6
Due to job access	+ 0.9	- 0.3	+ 0.8	+ 0.7
Net differential	+14.9 pts	+16.4 pts	+11.7 pts	+19.3 pts
Due to individual characteristics	84.6 %	76.2 %	108.5 %	57.0 %
Due to exposure	9.4	25.6	- 15.4	39.4
Due to job access	6.0	- 1.8	6.8	3.6
Total	100.00 %	100.00 %	100.00 %	100.00%
B. Predicted white-Hispanic differential				
Due to individual characteristics	+ 4.6 pts	+ 5.0 pts	+ 7.0 pts	+ 4.7 pts
Due to exposure	+ 1.1	+ 5.2	- 0.7	+ 5.6
Due to job access	+ 0.9	+ 0.3	+ 0.4	+ 0.6
Net differential	+ 6.6 pts	+10.5 pts	+ 6.7 pts	+10.9 pts
Due to individual characteristics	69.7 %	47.6 %	104.5 %	43.1 %
Due to exposure	16.7	49.5	-10.4	51.4
Due to job access	13.6	2.9	6.0	5.5
Total	100.0 %	100.0 %	100.0 %	100.0 %

Figure 1

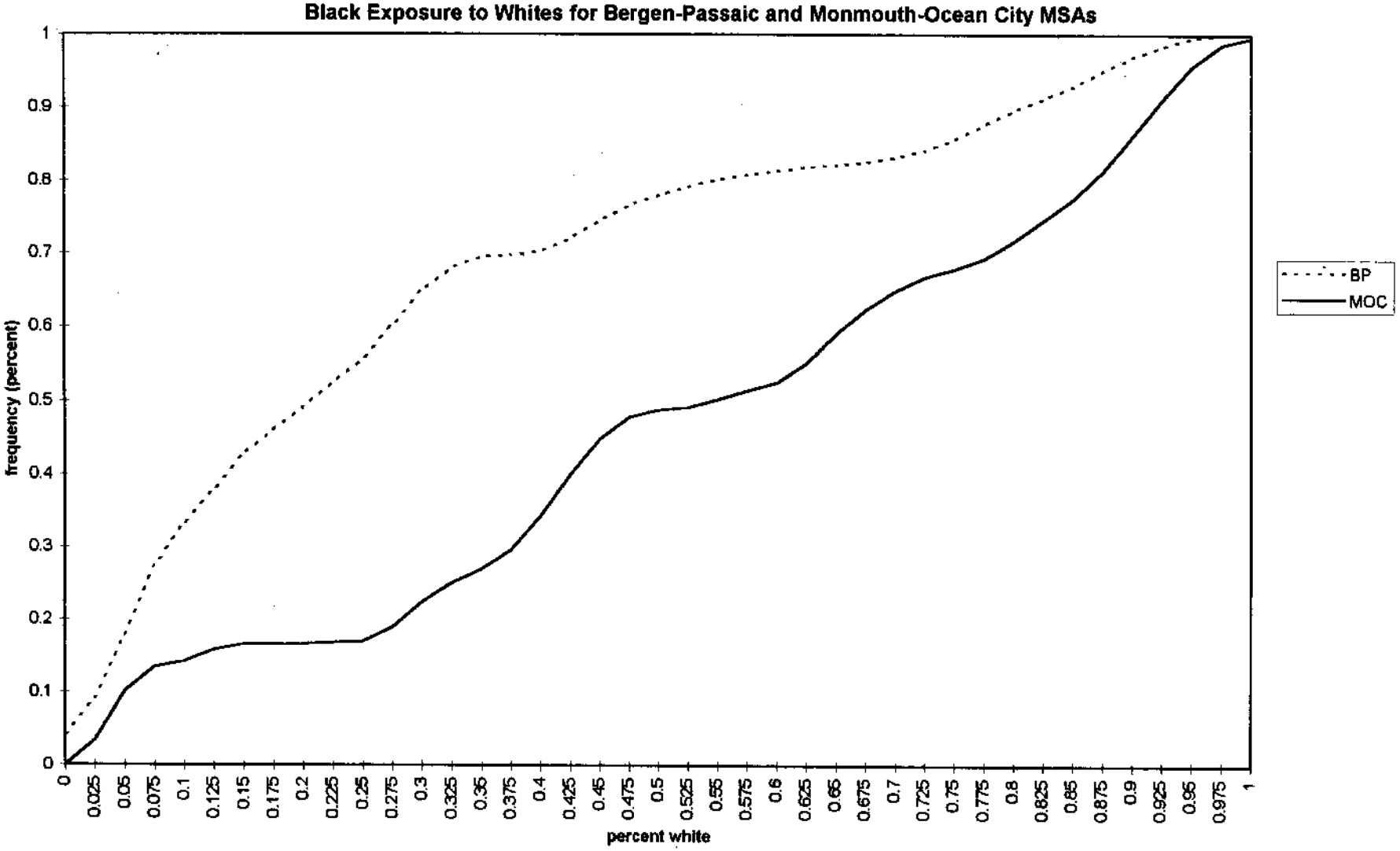
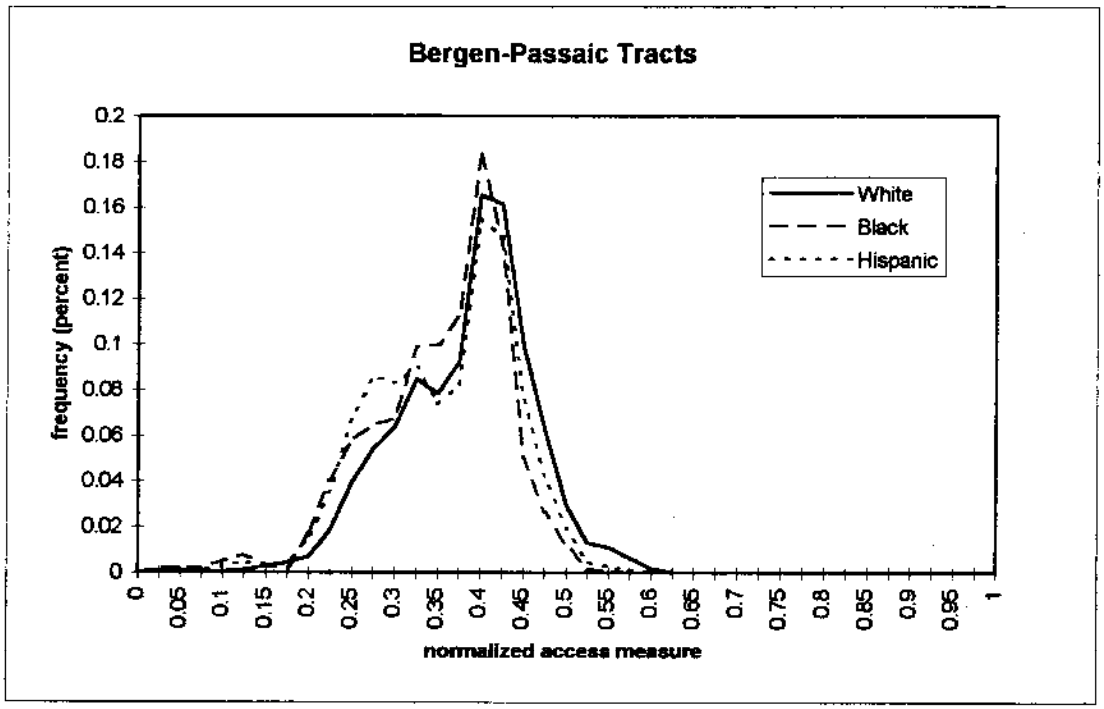
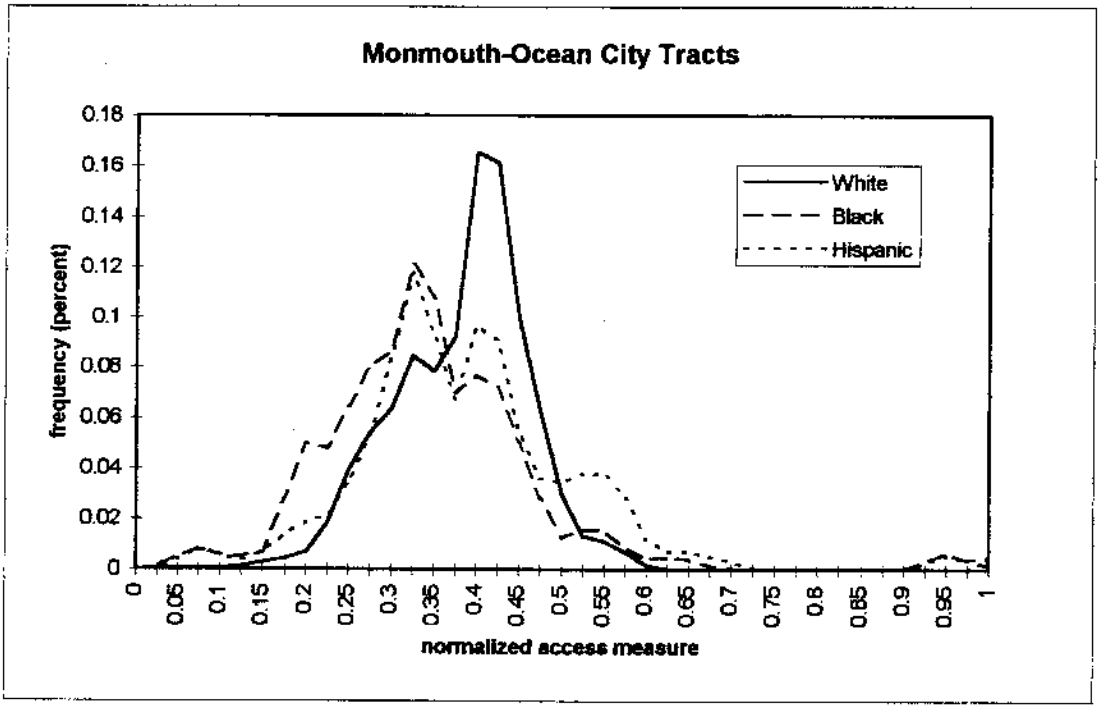
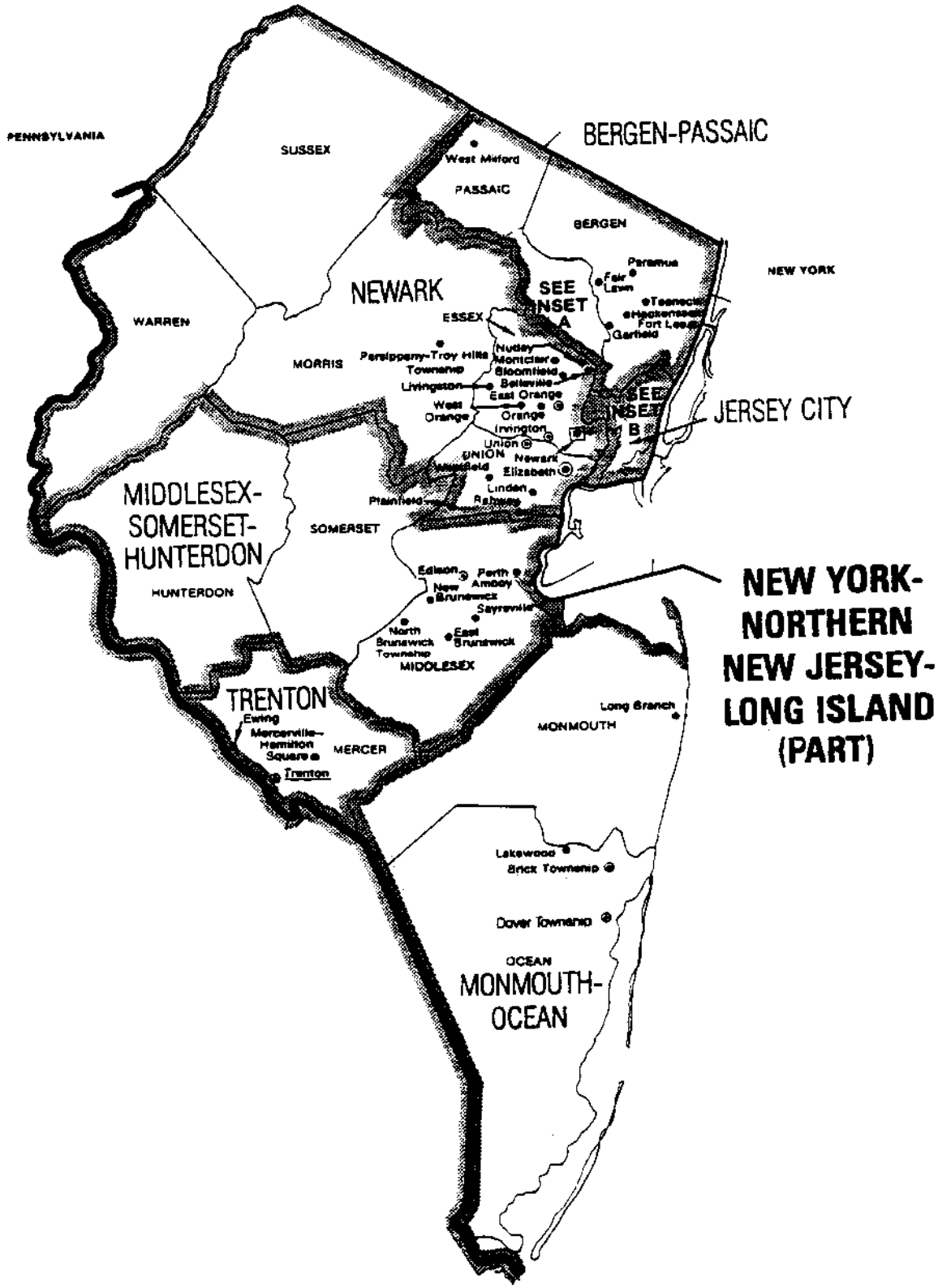

Black Exposure to Whites for Bergen-Passaic and Monmouth-Ocean City MSAs
frequency (percent)
percent white
BP
MOC
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
0.025
0.05
0.075
0.1
0.125
0.15
0.175
0.2
0.225
0.25
0.275
0.3
0.325
0.35
0.375
0.4
0.425
0.45
0.475
0.5
0.525
0.55
0.575
0.6
0.625
0.65
0.675
0.7
0.725
0.75
0.775
0.8
0.825
0.85
0.875
0.9
0.925
0.95
0.975

Figure 2
Distribution of Normalized Access Measure
for Bergen-Passaic and Monmouth-Ocean City MSA's






PENNSYLVANIA
SUSSEX
WARREN
MORRIS
ESSEX
PASSAIC
BERGEN
NEW YORK
BERGEN-PASSAIC
NEWARK
SEE INSET A
SEE INSET B
JERSEY CITY
UNION
MIDDLESEX-
SOMERSET-
HUNTERDON
SOMERSET
HUNTERDON
MIDDLESEX
TRENTON
MERCER
MONMOUTH
OCEAN
MONMOUTH-
OCEAN
NEW YORK-
NORTHERN
NEW JERSEY-
LONG ISLAND
(PART)