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By

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The Case of New Jersey Teenagers**

by

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ABSTRACT

Spatial Contributions to Employment Outcomes:
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by

John M. Quigley & Katherine M. O'Regan

Theories about the importance of space in urban labor markets have emphasized the role of employment access, on the one hand, and neighborhood composition, on the other hand, in affecting employment outcomes. This paper presents an empirical analysis which considers both of these factors, together with individual human capital characteristics and household attributes in affecting youth employment.

The analysis is based upon an unusually rich sample of micro data on youth in four New Jersey metropolitan areas. The empirical analysis is based on a sample of some 28,000 at home youth, matched to detailed census tract demographic information and specially constructed measures of employment access.

The research includes a comparison of the importance of neighborhood and access in affecting youth employment when individual and household attributes are also measured. The results demonstrate the importance of these spatial factors in affecting youth employment in urban areas.

I. Introduction

Two related bodies of research link the intra metropolitan distribution of households to labor market outcomes. These distinct perspectives extend the standard human capital model of labor markets to consider the effect of space on labor market operations, each presuming a somewhat different mechanism of causation. Research addressing the well-known "spatial mismatch hypothesis" focuses on the impact of job decentralization on the employment prospects of minority households who, through constraints on housing choices, are left behind. In this work, space affects the level and distribution of minority employment through proximity to jobs. As jobs increasingly decentralize and minorities remain concentrated in central cities, minority access to jobs declines, lowering their employment rates and earnings. While the evidence on the importance of the mismatch in jobs is not definitive, it continues to be a focus of scientific and policy interest (See Kain, 1992, and Holzer, 1991, for recent reviews).

A distinct hypothesis, associated with William Julius Wilson's (1987) work on the so-called "urban underclass," suggests that the social isolation resulting from the concentration of minorities has a negative effect on individuals more generally, and on their labor market performance specifically. While the empirical evidence on this mechanism is quite ambiguous (see Jencks and Mayers, 1990, for a review and Manski, 1993, for a critique), several recent empirical studies support some version of this hypothesis. Using different data but similar approaches, Brooks-Gunn et al (1993), Clark (1992), and Crane (1991) each found evidence of effects of neighborhood composition on youth high school dropout rates.[1] More directly related to labor market concerns, Case and Katz (1991) analyzed data on poor neighborhoods within Boston, concluding that neighborhood peers substantially influence a variety of youth behaviors, including propensity to work. There are several mechanisms through which a neighborhood might affect labor markets (for example, the absence of positive role models, the lack of informal job contacts, the presence of disruptive influences). These differ from the presumed mechanism underlying the spatial mismatch hypothesis. According to this latter research, it is the *internal* composition of a neighborhood which matters, rather than the relationship of that neighborhood to *external* employment opportunities.

A unifying theme in all this research is that urban labor market outcomes are influenced by more than the individual characteristics recognized in the standard human capital model. Even beyond characteristics of the local labor market, this work

[1] Crane's results have been questioned by the Clark's failure at replication using similar data (Clark, 1992) and by the methodological criticism of Manski (1993).

suggests that information about the local *residential* environment may improve our models of urban labor market outcomes.

This paper provides tests of the relative importance of spatial factors. We develop and apply a standardized approach to measuring job access, one that can be duplicated for a large number of metropolitan areas. Using a unique data set created and analyzed within the Bureau of the Census, we estimate a series of employment probability models based on a standard human capital model. We then expand this model to include information on proximity to jobs and various neighborhood characteristics. This permits us to examine the importance of these spatial attributes, frequently omitted from other models. It also permits us to examine the *relative* importance of these spatial variables.

Throughout our analysis, we find strong evidence of the importance of spatial factors in determining youth employment outcomes. As for which factors matter most, our results suggest that they differ both by the outcome examined and the city.

II. Methodology

a. Data

Through arrangements with the U.S. Census, we have created a data set containing all records of non Hispanic white (white), non Hispanic black (black) and Hispanic youth (aged 16 to 19) residing with at least one parent, and located in one of the 73 largest metropolitan areas. In this paper, we report on an analysis of the urban labor markets in the state of New Jersey. We have all records, rather than just the 1/10 or 1/100 publicly available samples. Thus, even by limiting the analysis to one state, the sample contains more than 28,000 youth who reside in one of New Jersey's four largest metropolitan areas (Newark, Bergan-Passaic, Middlesex, and Monmouth). The most important aspect of the data set is that each record in our 1990 extract is coded by census tract. We have matched this data set with aggregate census tract characteristics, such as the percent of the census tract which is poor, female headed, employed, black, etc. This generates a large sample of observations on youth and their labor market outcomes matched to a body of distinctly rich neighborhood context.

The second portion of the data is compiled from the transportation subsample of the 1990 Census, available at the tract level through the Census Transportation Planning Package (CTPP) for large MSAs. The CTPP provides direct information about commuting patterns and proximity to jobs at the census tract level. 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. The derivation of these measures is discussed in Appendix B. These job proximity measures are linked to the individual record through tract identifiers, providing us with both neighborhood and job access information for all youth in the sample. As described in Appendix B, we have created several measures of employment access for each census tract in the four metropolitan areas.

b. Statistical Model

The first step of the analysis is based on a logit model relating youth employment probabilities to individual and family characteristics:

$$(1) \quad \log [p_i/(1-p_i)] = \alpha X_i \quad ,$$

where X_i is a vector of those individual and family characteristics found by previous research to be relevant for youth employment outcomes.[2] We then contrast results from this model with an expanded statistical model, which includes both job proximity and neighborhood characteristics:

$$(2) \quad \log [p_i/(1-p_i)] = \alpha X_i + \beta A_i + \gamma N_i \quad ,$$

where A_i is a measure of employment access, and N_i is a vector of neighborhood (census tract) characteristics found to be important

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[2] See O'Regan and Quigley (1995) for a full description of such a model, and Freeman (1982) for a full description of relevant characteristics.

through previous empirical work.[3] (For examples of similar work which has incorporated either job proximity or neighborhood characteristics in this fashion -- but not both -- see Ihlanfeldt and Sjoquist , 1990, Case and Katz ,1991, and Duncan, 1994.)

III. Results

We estimate equations (1) and (2) for the Newark MSA, examining probabilities of both employment and "idleness" (i.e., not-in-school-and-not-employed). First we analyze all youth, then white, black, and Hispanic youth separately. We then present the results of these models for all four metropolitan areas, investigating consistency in the effects of neighborhood and accessibility upon labor market outcomes.

a. Newark

Table 1 presents estimates of the youth employment model, equation (1), for all Newark youth, and for white, black, and Hispanic youth separately. Most results confirm previous findings. Females and older youth are more likely to be working. School enrollment decreases the likelihood of working, as does the birth of a child for teen-aged girls. Youth in female-headed households are somewhat less likely to be working, while those in

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[3] For examples of such characteristics see Plotnick and Hoffman (1995) and Duncan (1994).

Table 1
Logit Models of Household-Level Determinants of Employment:
Newark Teenagers
(t-ratios in parentheses)

Coefficient	All Youth	White	Black	Hispanic
Sex (1 = Female)	0.353 (8.07)	0.351 (7.06)	0.273 (2.75)	0.399 (2.47)
Age (years)	0.305 (10.82)	0.315 (8.77)	0.279 (5.04)	0.415 (4.47)
Education (years)	0.123 (5.72)	0.182 (6.16)	0.03 (0.71)	0.075 (1.24)
HS graduate (1 = yes)	-0.107 (1.55)	-0.398 (4.49)	0.408 (3.13)	0.175 (0.57)
Female-headed household (1 = yes)	-0.134 (2.18)	-0.014 (0.17)	-0.138 (1.24)	-0.493 (2.15)
Head of household's education (years)	-0.030 (4.29)	-0.031 (3.89)	-0.008 (0.40)	-0.039 (1.91)
Parent working (1 = yes)	0.818 (8.63)	0.616 (4.34)	0.836 (5.51)	0.863 (3.04)
Youth in school (1 = yes)	-0.845 (13.18)	-0.945 (11.27)	-0.762 (6.54)	-0.505 (2.36)
Family size (persons)	-0.011 (0.72)	0.012 (0.53)	-0.003 (0.11)	-0.173 (2.97)
Children ever born (1 = yes)	-1.010 (5.59)	-0.679 (1.89)	-1.048 (4.46)	-1.076 (1.69)
Other household income (1000's of dollars)	-0.002 (5.02)	-0.002 (5.49)	0.001 (0.73)	0.003 (1.65)
White (1 = yes)	-6.548 (13.04)	-7.140 (11.37)	-	-
Black (1 = yes)	-7.420 (14.64)	-	-6.515 (6.25)	-
Hispanic (1 = yes)	-7.015 (13.90)	-	-	-8.091 (4.81)
Number of observations	10245	6900	2529	816
Chi-squared	1728	759	846	201
-2logL	12475	8807	2660	931

a family with at least one parent working are also more likely to be working. Differences in the intercepts by race reveal lower employment probabilities for minority youths, particularly for black youth.

There is some variation in results across demographic groups. Racial groups differ somewhat in the specific measure of education which is most important in affecting employment outcomes.[4] While the coefficient of the head of the household's education is always negative, it is not significant for blacks. The effect of household income (excluding the youth's earnings) on employment follows a similar pattern. Increased family resources reduces youth employment.[5]

We have also estimated this model using "idleness" (not-working-and-not-in-school) as the dependent variable. Appendix Table A1 reports the results of identical models (except the school-status variable is omitted). We expect that all variables indicating higher family socioeconomic status will decrease youth idleness. This expectation is borne out. The two sets of results are quite comparable.

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[4] In models in which years of education is the only measure of a youth's education, this variable is significantly positive for all four models. However, when high school completion is also included, this latter measure significantly (and positively) affects black youth employment rates. Neither is significant for Hispanic youth.

[5] This arises from the impact of family income in reducing the employment of in-school youth. When out-of-school youth are examined separately the effect of family income is insignificant.

In the next step of the analysis, the logit model is expanded to include neighborhood information. We examine two categories: employment access and measures of "social access." Employment access is measured by an index of employment "potential" derived from the assumption that worktrip destinations are generated by a Poisson process.[6] A lack of social access is indicated by various measures of neighborhood composition.

Preliminary analysis with a larger set of neighborhood variables[7] 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 outcomes. Table 2 presents the correlation coefficients of the relevant variables for Newark. Neighborhood demographic measures are highly correlated in Newark; with only one exception the correlation coefficients among these measures exceed 0.76. The job access

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[6] As explained in Appendix B, the relative accessibility of census tracts within each metropolitan area is quite insensitive to assumptions about the trip generation process. Results using the assumption of a Poisson process are similar to those based upon a more general assumption of a negative binomial process. In fact, for these metropolitan areas, the standard gravity model provides job access measures which are correlated with these more sophisticated measures at greater than 0.98.

[7] These included, for example, percent black, Hispanic, owner-occupied, female-headed, and tract median income.

Table 2

Correlation Matrix of Neighborhood Measures
for Newark MSA

	Percent: white	Percent: public assistance	Percent: poor	Percent: unemployed	Percent: adults not at work	job access
percent white	1.000					
percent public assistance	-0.798	1.000				
percent poor	-0.783	0.927	1.000			
percent unemployment	-0.818	0.896	0.877	1.000		
percent adults not at work	-0.572	0.776	0.764	0.766	1.000	
job access	0.331	-0.442	-0.456	-0.443	-0.331	1.000

measure is only weakly correlated with the demographic characteristics of neighborhoods.

The appropriate functional form for these variables is not known a priori. Indeed, it is possible that neighborhood effects matter after some threshold, affecting the logit of employment in a non-linear fashion. We estimated a series of models to test for non-linearities, and while there is some evidence that the relationship may be complicated, no non-linear representation seemed superior to simple continuous measures of neighborhood attributes.[8] We report results using continuous measures.

We estimated a variety of models of youth employment probabilities with these neighborhood variables. The results for the individual and family level variables were essentially unchanged -- with the exception that family background variables generally decrease slightly in magnitude and statistical significance. This suggests that, while neighborhood characteristics may spuriously capture omitted family influences (Corcoran et al, 1992), the reverse is also the case. Empirical work which does not include information about neighborhoods likely overstates the (direct) influence of family characteristics on employment outcomes.

[8] We were especially concerned with measuring threshold effects for racial composition and the fraction of the population in poverty.

Results for the neighborhood variables are presented in Tables 3. Panel A presents employment results for all youth, and Panels B through D present results separately for white, black, and Hispanic youth. In Model I of each panel and table, employment access is the sole neighborhood variable included. For all youth, and for both minority groups, improved job access has a significant and positive effect on youth employment.

The independent effect of access on employment does not persist when other neighborhood characteristics are added, singularly (Models II - VI) and in pairs (Models VII - X). In almost every case, the measure of access to jobs is insignificant when measures of neighborhood racial composition or neighborhood poverty/employment are included. In the sample of all Newark youth, each neighborhood variable, when entered individually, is significant and is of the expected sign. This is also true for the separate samples of white and black youth.[9]

The high correlation among many of the neighborhood variables means that the relative importance of neighborhood measures cannot be determined with precision. While employment access is not particularly highly correlated with the other tract variables, the correlations among the other variables are quite high. The effect of this is illustrated in the results of models

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[9] For Hispanic youth, several neighborhood variables are significant, but not all. In part, this reflects the smaller sample sizes of Hispanic youth.

Table 3
Neighborhood Determinants of Employment for Newark Youth *
(t-ratios in parentheses)

	I	II	III	IV	V	VI	VII	VIII	IX	X
A. All Teenagers (10245 observations)										
Chi-squared	1733	1758	1772	1772	1772	1835	1775	1775	1774	1839
-2logL	12469	12444	12431	12430	12431	12368	12427	12427	12428	12364
access	0.003 (2.37)	0.002 (1.60)	0.000 (0.23)	0.000 (0.36)	0.000 (0.32)	0.001 (0.71)	0.000 (0.32)	0.001 (0.43)	0.000 (0.41)	0.001 (0.52)
percent white		0.603 (5.01)					0.268 (1.84)	0.253 (1.72)	0.239 (1.59)	0.248 (1.96)
percent poor			-2.648 (6.11)				-2.112 (4.07)			
percent on public assistance				-2.536 (6.16)				-2.041 (4.09)		
percent unemployment					-4.074 (6.12)				-3.282 (3.96)	
percent adults not at work						-3.392 (9.91)				-3.178 (8.85)
B. White Teenagers (6900 observations)										
Chi-squared	759	763	766	764	767	822	766	765	767	822
-2logL	8807	8802	8799	8801	8798	8744	8799	8800	8798	8744
access	0.000 (0.24)	0.000 (0.22)	0.000 (0.22)	0.000 (0.10)	0.000 (0.34)	0.001 (0.58)	0.000 (0.17)	0.000 (0.02)	0.000 (0.27)	0.001 (0.58)
percent white		0.393 (2.14)					0.096 (0.38)	0.185 (0.77)	0.071 (0.29)	0.005 (0.03)
percent poor			-2.465 (2.74)				-2.151 (1.77)			
percent on public assistance				-2.070 (2.39)				-1.506 (1.33)		
percent unemployment					-3.419 (2.86)				-3.111 (1.94)	
percent adults not at work						-3.795 (7.87)				-3.792 (7.59)

* - Note: Logit models include household level variables reported in Table 1.

Table 3 (continued)
Neighborhood Determinants of Employment for Newark Youth *
(t-ratios in parentheses)

	I	II	III	IV	V	VI	VII	VIII	IX	X
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C. Black Teenagers (2529 observations)										
Chi-squared	855	860	866	869	867	875	867	869	868	877
-2logL	2651	2646	2640	2637	2639	2631	2639	2637	2638	2629
access	0.008 (2.98)	0.006 (2.08)	0.002 (0.54)	0.001 (0.32)	0.003 (0.90)	0.000 (0.15)	0.002 (0.47)	0.001 (0.29)	0.002 (0.84)	0.000 (0.11)
percent white		0.463 (2.26)					0.235 (1.05)	0.149 (0.65)	0.152 (0.65)	0.296 (1.41)
percent poor			-2.151 (3.27)				-1.859 (2.61)			
percent on public assistance				-2.37 (3.73)				-2.164 (3.06)		
percent unemployment					-3.482 (3.52)				-3.137 (2.80)	
percent adults not at work						-2.883 (4.43)				-2.697 (4.08)
D. Hispanic Teenagers (816 observations)										
Chi-squared	206	209	210	208	209	210	210	210	210	212
-2logL	924	922	922	923	923	921	921	921	921	920
access	0.010 (2.37)	0.007 (1.50)	0.007 (1.41)	0.008 (1.71)	0.007 (1.40)	0.008 (1.63)	0.006 (1.27)	0.007 (1.43)	0.006 (1.31)	0.006 (1.24)
percent white		0.574 (1.82)					0.363 (0.89)	0.486 (1.18)	0.474 (1.15)	0.398 (1.17)
percent poor			-2.058 (1.76)				-1.208 (0.80)			
percent on public assistance				-1.473 (1.41)				-0.444 (0.33)		
percent unemployment					-2.861 (1.45)				-0.952 (0.37)	
percent adults not at work						-2.078 (1.92)				-1.567 (1.35)

* - Note: Logit models include household level variables reported in Table 1.

VII - X, for white youth (Panel B). Each neighborhood composition measure is significant when included separately. However, when pairs of variables are included, generally neither neighborhood variable is significant. Note, however, according to a standard likelihood ratio test, the set of measures is significantly different from zero. In the aggregate and for black youth separately, it does appear that neighborhood poverty/employment characteristics have a stronger effect on employment than does the racial composition of the neighborhood.

Comparable models, using idleness as the dependent variable, appear in Appendix Table A2. Results from these models are very similar. Job access is significant when other tract information is not included; once included, measures of neighborhood demographic composition dominate. In terms of the relative importance of these variables, in regressions for all youth, both race and measures of poverty and employment are significantly different from zero. For white and for black youth, measures of poverty and employment status generally dominate, while for Hispanics, the racial composition remains significant.

Some caution is in order in evaluating these results. Several recent papers have highlighted the difficulty of controlling adequately for family characteristics and choice when identifying neighborhood and other potential influences on social outcomes (Corcoran et al, 1992, Evans et al, 1992, and Plotnick and Hoffman, 1995). Other work has emphasized the circumstances in which the logic of the identification of peer influences is problematic (Manski, 1993, 1995). The potential endogeneity of neighborhoods is also a source of concern in this empirical work. There are several ways in which endogeneity may be manifest. Our empirical analysis is more successful in dealing with some sources of this simultaneity than others.

The most obvious source of statistical problems in the interpretation of findings about youth employment is the omission of individual or family characteristics. In particular, family variables have been shown to be very important determinants of youth outcomes (Corcoran et al, 1992), yet are frequently omitted from empirical work. Since family characteristics are likely to be correlated with neighborhood characteristics, it is possible that measures of neighborhood characteristics are merely proxies for family effects. By using only at-home youth, we have access to the range of census information on the youth's family. These attributes really "matter" in the empirical results.

A second source of concern is the youth's choice of neighborhood. Here again, by limiting attention to at-home youth, we can presume that this choice is made by the parent(s), using the standard transportation-housing cost calculus. Household choice is exogeneous to the transport demands of youth. Of course, to the extent that household choices about residential location are influenced by the impact of neighborhood characteristics on youth employment, a focus on at-home youth will not eliminate this source of simultaneity.

A third source of concern is the definition and computation of the accessibility measure itself. We should emphasize that this measure 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, 1989). It is merely the "standard" accessibility measure calculated from observations on the worktrip patterns of all workers -- adults and teenagers of all races -- within the urban area.

This attention to specification does not, of course, eliminate all sources of simultaneity. To the extent that there are omitted family or individual characteristics which are more strongly correlated with neighborhood variables than with other included controls, the results may be spurious. It is also possible that the residence choices of others in a neighborhood are influenced by youth employment outcomes, affecting the characteristics of the neighborhood indirectly.

The high correlation among the various neighborhood characteristics raises a second issue in interpreting these results. Given the high correlation among neighborhood characteristics, it is difficult to separate the effects of various dimensions of related neighborhood characteristics with any precision. For models in which we include one neighborhood characteristic, this measure acts as a proxy for a collection of characteristics, and the results should be interpreted in that light.

B. New Jersey Cities

In this section, we expand the sample to include all four metropolitan areas in New Jersey. We estimate similar statistical models, but with larger samples and somewhat lower levels of intercorrelation of neighborhood demographic measures. Table 4 presents a subset of the results for all metropolitan New Jersey youth, which convey the main findings. Panel A includes results for the estimation of employment probabilities, Panel B summarizes results for the estimation of idleness probabilities.

Model I reports estimates of youth employment probabilities as a function of neighborhood access measures, individual, and household characteristics. The cardinal values of the access measure are hardly comparable across MSAs (see Appendix B), so we permit the coefficient on access to vary by MSA. Employment access has a significantly positive effect on youth employment in three of the four MSAs, and is borderline significant in the fourth MSA.

The other five models include access, but introduce other neighborhood characteristics. Models II-IV include the percent white, the percent on public assistance, and the percent of adults not-at-work, respectively, in the census tract of

Table 4
Neighborhood Determinants of Employment Outcomes for New Jersey Youth *
(28191 Observations)
(t-ratios in parentheses)

	I	II	III	IV	V	VI
A. Employment	---	---	---	---	---	---
Chi-squared	3848	3880	3897	3971	3900	3982
-2logL	35233	35201	35184	35110	35181	35099
access:						
Bergen-Passaic	0.066	0.059	0.057	0.069	0.056	0.065
	(3.46)	(3.07)	(2.93)	(3.57)	(2.89)	(3.34)
Middlesex	0.026	0.026	0.024	0.013	0.024	0.014
	(2.17)	(2.21)	(2.01)	(1.11)	(2.06)	(1.21)
Monmouth	0.006	0.006	0.006	0.007	0.006	0.007
	(1.86)	(1.72)	(1.85)	(2.09)	(1.79)	(1.98)
Newark	0.004	0.003	0.001	0.002	0.001	0.002
	(3.37)	(2.46)	(1.20)	(1.90)	(1.27)	(1.50)
percent white:		0.473			0.179	0.279
		(5.68)			(1.68)	(3.27)
percent on public assistance:			-2.192		-1.768	
			(6.90)		(4.38)	
percent adults not at work:				-2.241		-2.087
				(10.97)		(9.98)
B. Idleness						
Chi-squared	27913	27953	27958	27940	27967	27966
-2logL	11167	11128	11123	11141	11115	11114
access:						
Bergen-Passaic	-0.026	0.003	0.012	-0.017	0.018	0.006
	(3.58)	(0.09)	(0.32)	(0.45)	(0.46)	(0.16)
Middlesex	-0.003	-0.001	0.001	0.007	0.001	0.006
	(0.11)	(0.04)	(0.06)	(0.26)	(0.04)	(0.23)
Monmouth	0.001	0.002	0.001	0.000	0.002	0.001
	(0.14)	(0.33)	(0.23)	(0.03)	(0.32)	(0.23)
Newark	-0.007	-0.003	0.000	-0.003	0.000	-0.002
	(3.16)	(1.76)	(0.01)	(1.48)	(0.18)	(0.71)
percent white:		-0.895			-0.530	-0.766
		(6.27)			(3.03)	(5.18)
percent on public assistance:			2.974		2.031	
			(6.72)		(3.74)	
percent adults not at work:				1.799		1.334
				(5.14)		(3.64)

* - Note: Logit models include household level variables reported in Tables 1 and A1.
Each model also includes separate intercepts for the different metropolitan areas.

residence. Each of these neighborhood composition variables is significant and is of the expected sign. Including these characteristics has little impact on the access coefficients. In Models V and VI, which include the access measures, percent white, and one of the two poverty/employment measures, the results are comparable. Both neighborhood composition variables are significant, and the access measure is important in three cities. Newark is the exception.

In Panel B, the results for predicting teenage idleness differ slightly. The access measure is significant in the simplest model (Model I), but in more complex specifications, access appears to be less important. Individually, and in pairs, other neighborhood measures have important effects upon the probability of idleness of urban youth.

It is certainly possible that the effect of neighborhood composition differs across metropolitan areas. We have investigated models of this general specification (see Appendix Table A3). On purely statistical grounds, the complete disaggregation of neighborhood measures across MSAs does improve the employment probability model, but does not improve the idleness results. The magnitudes, however, are essentially the same.[10]

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[10] In addition, we have estimated these models separately for white, black and Hispanic youth. For white youth, results reported in Table 4 and Table A3 are confirmed. The results are more fragile when the sample is confined to minority youth. Many of the variables which are significant for all specifications

IV. Implications

The statistical results for this sample of New Jersey youth suggest that neighborhood composition and employment access affect labor market outcomes, although the quantitative estimates differ by area and by outcome. The character of urban neighborhoods and the effect of neighborhood composition on outcomes varies across metropolitan areas. This accounts for some of the observed differences in youth employment outcomes. Moreover, within metropolitan areas, there are large differences in average characteristics of neighborhoods in which youth of different race and ethnicities reside. For example, in Newark, 81.5 percent of white youth live in census tracts in which 90 percent or more of the population is white. In contrast, slightly less than 20 percent of Hispanic youth, and only 4 percent of black youth live in such tracts. Table 5 summarizes the average characteristics of neighborhoods in which youth of different races reside. These differences may lead to large differences in employment outcomes for youth.

Table 6 indicates the importance of these differences in employment access and neighborhood demographics in affecting

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with the larger samples, are insignificant for the minority samples. The pattern of results suggests that the samples of minority youth are too small to permit estimation of MSA-specific and race-specific coefficients. For that reason, we focus on the all-youth estimates.

Table 5
Average Characteristics of Neighborhoods in New Jersey MSA's

MSA	residences of	sample size	job access	Fraction: white	Fraction: public assistance	Fraction: adults not at work
Newark:						
	All Youth	10245	59.479	0.704	0.357	0.071
	White Youth	6900	63.000	0.910	0.331	0.032
	Black Youth	2529	50.649	0.194	0.416	0.164
	Hispanic Youth	816	57.049	0.536	0.395	0.116
Bergen-Passaic:						
	All Youth	6227	5.971	0.852	0.355	0.043
	White Youth	5164	6.060	0.934	0.350	0.030
	Black Youth	528	5.463	0.295	0.385	0.130
	Hispanic Youth	535	5.609	0.608	0.379	0.084
Middlesex:						
	All Youth	5713	8.136	0.899	0.309	0.033
	White Youth	5064	8.105	0.929	0.307	0.029
	Black Youth	367	8.836	0.661	0.319	0.060
	Hispanic Youth	282	7.799	0.688	0.342	0.068
Monmouth:						
	All Youth	6006	26.191	0.925	0.370	0.040
	White Youth	5446	26.494	0.948	0.368	0.036
	Black Youth	352	22.540	0.608	0.390	0.087
	Hispanic Youth	208	24.431	0.866	0.375	0.056

Table 6
Employment Outcomes for Youth with Average Capital Characteristics in Different Neighborhoods

	In average neighborhood for:			
	All Youth	White Youth	Black Youth	Hispanic Youth
A. Employment Rate				
Newark	39.39 %	42.64 %	32.15 %	35.52 %
Bergen-Passaic	55.57	56.07	52.73	53.53
Middlesex	72.57	73.04	69.02	68.37
Monmouth	51.97	51.92	52.81	51.87
B. Idleness Rate				
Newark	4.32 %	3.52 %	6.99 %	5.21 %
Bergen-Passaic	2.71	2.56	3.95	3.21
Middlesex	5.18	5.06	6.16	6.26
Monmouth	3.28	3.22	4.17	3.43

employment outcomes by race and ethnicity.[11] The first row in the table presents the employment probability estimated for the "average" youth in each of these four metropolitan areas. The second row presents the employment probability of the same "average" youth living in the neighborhood in which the average white youth resides, in each metropolitan area. The third and fourth rows present the employment probabilities estimated for the same youth living in the neighborhood inhabited by the average white, black, and Hispanic youth, respectively. Panel B presents the same simulation using idleness instead of employment. Many of these differences are quite large.

In Bergan-Passaic, residence in the neighborhood in which the average white youth lives (compared to that in which the average black lives) increases youth employment rates by 3.4 percentage points, from 52.7 to 56.1 percent. A similar comparison of employment rates for those living in the average white and average Hispanic neighborhood leads to a smaller difference. In Middlesex the differences are approximately of the same magnitude (a 4 percentage point increase for white-black comparisons, and a 4.7 percentage point increase for the white-Hispanic comparison). In Monmouth, located on the New Jersey

[11] These probabilities are computed relying upon the coefficients from Model VI in Appendix Table A3. The coefficients of the individual and household demographic variables (not presented) and the average characteristics of the sample of youth are used, together with the coefficients reported in Appendix Table A3, and the average neighborhood characteristics in each MSA.

shore, differences in average neighborhood characteristics have much smaller effects on youth employment rates, while in Newark, the effect is strikingly large. In Newark, predicted employment rates for the average white neighborhood are almost 33 percent higher than for the average black neighborhood.

Results for youth idleness are comparable. In general, the largest disparities are between probabilities for the average white and the average black neighborhoods. Across these MSAs, the effect varies, and is greatest for the largest and most urban metropolitan area in our sample, Newark.

V. Conclusion

This paper analyzes employment and "idleness" outcomes for a large sample of urban youth. The analysis is based upon observations on at-home youth and their families, the employment access of the neighborhood in which they reside, and the socio-economic character of those neighborhoods.

The analysis documents the importance of human capital and family attributes in conditioning the labor market outcomes for youth living at home. In addition to individual-level determinants, we find evidence of substantial spatial linkages to employment outcomes. Measures of access to jobs are important in affecting employment, especially for minority youth. Furthermore, whether as measures of social access, role models, or peer influence, neighborhood composition matters. Measures of the presence of employed, and non poor individuals (presumably those with knowledge of and contact with jobs) affect youth employment. Even with large samples of data, we are less successful in distinguishing among these distinct, but closely related, potential causes.

Simulations using these results demonstrate quite clearly that the constellation of factors which distinguish "good" from "bad" neighborhoods affect teenage employment in profound ways.

Table A1
Logit Models of Household-Level Determinants of Idleness:
Newark Teenagers
(t-ratios in parentheses)

Coefficient	All Youth	White	Black	Hispanic
Sex (1 = Female)	-0.322 (3.68)	-0.262 (2.04)	-0.308 (2.30)	-0.604 (2.19)
Age (years)	0.636 (13.45)	0.618 (7.95)	0.626 (9.29)	0.702 (5.07)
Education (years)	-0.315 (11.48)	-0.406 (8.70)	-0.259 (6.75)	-0.273 (3.71)
HS graduate (1 = yes)	0.362 (3.15)	0.632 (3.29)	0.225 (1.38)	3.81 (1.08)
Female-headed household (1 = yes)	0.364 (3.54)	0.382 (2.24)	0.265 (1.83)	0.611 (1.83)
Head of household's education (years)	-0.062 (4.77)	-0.065 (3.66)	-0.098 (3.79)	-0.017 (0.52)
Parent working (1 = yes)	-0.416 (3.54)	-0.484 (2.09)	-0.513 (3.36)	0.532 (1.34)
Family size (persons)	0.037 (1.48)	-0.038 (0.70)	0.039 (1.25)	0.158 (2.24)
Children ever born (1 = yes)	1.666 (9.81)	1.702 (4.12)	1.618 (7.95)	1.831 (3.20)
Other household income (1000's of dollars)	-0.004 (2.97)	-0.003 (2.05)	-0.005 (1.79)	-0.008 (1.28)
White (1 = yes)	-9.246 (10.70)	-7.607 (5.29)	-	-
Black (1 = yes)	-8.463 (9.75)	-	-8.276 (6.73)	-
Hispanic (1 = yes)	-8.943 (10.34)	-	-	-12.274 (4.81)
Number of observations	10245	6900	2529	816
Chi-squared	9749	7399	1684	694
-2logL	4454	2166	1822	438

Table A2
Neighborhood Determinants of Idleness for Newark Teenagers *
(t-ratios in parentheses)

	I	II	III	IV	V	VI	VII	VIII	IX	X
	---	---	---	---	---	---	---	---	---	---
A. All Teenagers (10245 observations)										
Chi-squared	9756	9784	9781	9788	9784	9777	9786	9796	9793	9794
-2logL	4447	4418	4421	4414	4418	4425	4417	4406	4409	4408
access	-0.006	-0.003	0.000	0.000	-0.001	-0.002	0.000	0.000	-0.001	-0.001
	(2.73)	(1.48)	(0.06)	(0.13)	(0.22)	(0.73)	(0.12)	(0.08)	(0.27)	(0.28)
percent white		-1.098					-0.792	-0.696	-0.734	-0.900
		(5.30)					(3.37)	(2.91)	(3.03)	(4.13)
percent poor			2.864				1.842			
			(5.07)				(2.88)			
percent on public assistance				3.094				2.196		
				(5.73)				(3.52)		
percent unemployment					4.843				3.165	
					(5.33)				(2.98)	
percent adults not at work						2.409				1.725
						(4.62)				(3.15)
B. White Teenagers (6900 observations)										
Chi-squared	7399	7404	7410	7408	7406	7406	7411	7408	7407	7408
-2logL	2166	2160	2155	2157	2159	2160	2155	2157	2159	2157
access	-0.002	-0.002	0.000	0.000	0.000	-0.002	0.000	0.000	0.000	-0.001
	(0.54)	(0.48)	(0.09)	(0.08)	(0.03)	(0.50)	(0.05)	(0.12)	(0.08)	(0.45)
percent white		-0.798					-0.029	-0.221	-0.320	-0.564
		(2.37)					(0.06)	(0.47)	(0.66)	(1.54)
percent poor			4.863				4.781			
			(3.55)				(2.47)			
percent on public assistance				4.144				3.557		
				(3.14)				(1.96)		
percent unemployment					5.849				4.407	
					(2.73)				(1.43)	
percent adults not at work						2.605				2.005
						(2.57)				(1.86)

* - Note: Logit models include household level variables reported in Tables 1 and A1.

Table A2 (continued)
Neighborhood Determinants of Idleness for Newark Teenagers *
(t-ratios in parentheses)

	I	II	III	IV	V	VI	VII	VIII	IX	X
	---	---	---	---	---	---	---	---	---	---
C. Black Teenagers (2529 observations)										
Chi-squared	1696	1703	1703	1708	1710	1709	1706	1710	1711	1713
-2logL	1810	1803	1803	1798	1796	1797	1800	1796	1795	1793
access	-0.120	-0.008	-0.005	-0.002	-0.004	-0.002	-0.004	-0.002	-0.003	0.000
	(3.46)	(2.33)	(1.07)	(0.54)	(0.96)	(0.52)	(0.89)	(0.43)	(0.81)	(0.08)
percent white		-0.848					-0.636	-0.508	-0.446	-0.676
		(2.55)					(1.82)	(1.44)	(1.25)	(2.02)
percent poor			2.013				1.515			
			(2.65)				(1.88)			
percent on public assistance				2.578				2.158		
				(3.46)				(2.68)		
percent unemployment					4.324				3.689	
					(3.70)				(2.89)	
percent adults not at work						2.787				2.541
						(3.56)				(3.19)
D. Hispanic Teenagers (816 observations)										
Chi-squared	695	719	705	708	699	695	719	720	719	719
-2logL	437	413	426	424	432	436	412	412	412	412
access	-0.007	0.012	0.008	0.007	0.004	-0.005	0.015	0.014	0.011	0.010
	(0.92)	(1.47)	(0.90)	(0.78)	(0.42)	(0.61)	(1.64)	(1.64)	(1.23)	(1.15)
percent white		-2.723					-2.493	-2.374	-2.898	-2.841
		(4.62)					(3.75)	(3.43)	(4.30)	(4.72)
percent poor			5.290				1.488			
			(3.18)				(0.77)			
percent on public assistance				5.244				1.705		
				(3.60)				(0.98)		
percent unemployment					6.216				-1.801	
					(2.20)				(0.53)	
percent adults not at work						0.795				-1.449
						(0.52)				(0.88)

* - Note: Logit models include household level variables reported in Tables 1 and A1.

Table A3
Neighborhood Determinants of Employment Outcomes for New Jersey Youth *
(28191 Observations)
(t-ratios in parentheses)

A. Employment	I	II	III	IV	V	VI
	---	---	---	---	---	---
Chi-squared	3848	3904	3913	4002	3931	4021
-2logL	35233	35177	35168	35079	35150	35060
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	0.276	0.023	0.0167	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)

* - Note: Logit models include household level variables reported in Tables 1 and A1.
Each model also includes separate intercepts for the different metropolitan areas.

Table A3 (continued)
Neighborhood Determinants of Employment Outcomes for New Jersey Youth *
(28191 Observations)
(t-ratios in parentheses)

B. Idleness	I	II	III	IV	V	VI
	---	---	---	---	---	---
Chi-squared	27913	27955	27960	27944	27970	27969
-2logL	11167	11126	11121	11137	11110	11111
access:						
Bergen-Passaic	-0.026	-0.011	-0.004	-0.026	-0.005	-0.010
	(3.58)	(0.27)	(0.10)	(0.66)	(0.11)	(0.25)
Middlesex	-0.003	-0.001	0.003	0.010	0.004	0.011
	(0.11)	(0.04)	(0.12)	(0.35)	(0.16)	(0.39)
Monmouth	0.001	0.002	0.002	0.000	0.001	0.001
	(0.14)	(0.25)	(0.26)	(0.03)	(0.21)	(0.21)
Newark	-0.007	-0.003	0.000	-0.002	0.000	-0.001
	(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)

* - Note: Logit models include household level variables reported in Tables 1 and A1.
Each model also includes separate intercepts for the different metropolitan areas.

Appendix B: The Computation of Spatial Access

In the text, 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 Isard [1960] for an early review or Smith [1984] for a more recent treatment). 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:

(B1) $T_{ij} = \alpha R_i^{\beta} W_j^{\gamma} / d_{ij}^{\delta}$, 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 the accessibility of each residence zone to the workplaces which are distributed throughout the region (Isard, 1960, p. 510), i.e.,

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

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

More sophisticated measures of access recognize that the transport flows to each destination are count variables. The Poisson distribution is often 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

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

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

A more general model of the flow count between i and j relaxes the Poisson assumption that the mean and variance are identical. For example, following Greenwood and Yule, Hausman, Hall, and Griliches (1984, p. 922) assume that the parameter λ_{ij} follows a gamma distribution $G(\omega_{ij})$ with parameters ω_{ij}. They show that, under these circumstances, the probability distribution of the count is negative binomial with parameters ω_{ij} and η,

(B6) $pr(T_{ij}) = \dfrac{G(\omega_{ij} + T_{ij})}{G(\omega_{ij})G(T_{ij}+1)} \left(\dfrac{\eta}{1+\eta}\right)^{\omega_{ij}} (1+\eta)^{-T_{ij}}$

Again, assuming that

(B7) $\exp[\omega_{ij}] = \alpha R_i^{\beta} W_j^{\gamma} / d_{ij}^{\delta}$

yields an estimable form of the count model and the resulting accessibility index for each residence zone.

The count models are clearly nested. If η is infinitely large, then equations (B6) and (B7) specialize to (B3) and (B4). If η is finite, then the mean and the variance of the count variables are not identical (as assumed by the Poisson representation).

The accessibility measure derived from the gravity model, equations (B1) and (B2), may be interpreted as a simple linear approximation to either of these theoretical count models. (Smith [1987] provides a thorough discussion of the link between gravity and Poisson models.)

Table B1 presents parameter estimates of the three models for four metropolitan areas in New Jersey. The models are estimated using the CTPP data from the 1990 Census. For each of these metropolitan areas, the TAZ's are coterminous with census tracts. The matrices of tract-to-tract commuting flows are sparse, with many zeros. For example, for the Newark metropolitan area there are 448 census tracts. Of the 200,704 possible commuting patterns (i.e., 448 times 448), 168,547 of them are zero. (In part, this reflects the fact that the underlying counts and transportation times are gathered from a **sample** of about fifteen percent of the population.) The estimates of the negative binomial and Poisson models are obtained by maximum likelihood methods, adjusting the likelihood function for this truncation.[12] In contrast, the gravity model is estimated in the most straightforward manner -- by applying ordinary least squares to equation (B1) in logarithmic form using the non zero observations.[13]

As the table indicates, the hypothesis of Poisson flows is rejected in favor of the negative binomial.[14] In each case, the estimate of η is rather precise, and it implies that the ratio of the variance to the mean ($[1 + \eta]/\eta$) is on the order of 2.5 or 3.

Table B2 presents the correlations among the census tract accessibility measures derived from the three models. Although the negative binomial model fits the data better than the Poisson model, the differences in the accessibility measures computed from them are very small. Similarly, the table shows that, for each of the four New Jersey metropolitan areas, the gravity model yields an almost identical measure of census tract access to employment.

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[12] The coefficients are estimated using the programs A. The refinement to recognize the truncated character of the data is more-or-less irrelevant empirically. The coefficients are quite similar when this subtlety is simply ignored.

[13] More elaborate treatments are readily available. See, for example, Weber and Sen (1985).

[14] This finding parallels that obtained by Raphael (1995) for San Francisco Bay Area teenagers.

Table B1
Parameter Estimates of Negative Binomial, Poisson, and Gravity Models of Transport Access
(Asymptotic t ratios in parentheses)

	Newark	Bergan Passaic	Middlesex	Monmouth
A. Negative Binomial				
α	1.249	0.529	0.073	0.793
β	0.342	0.474	0.545	0.421
γ	0.341	0.378	0.384	0.445
δ	0.705	0.842	0.856	0.872
η	0.555	0.587	0.527	0.608
log likelihood	-116818	-71835	-63415	-56296
B. Poisson				
α	-0.187	-1.557	-1.327	-0.991
β	0.511	0.718	0.666	0.530
γ	0.424	0.474	0.465	0.598
δ	0.806	0.967	0.894	0.918
log likelihood	-296466	-209995	-174066	-156235
C. Gravity Model				
α	0.601	-0.371	-0.337	-0.796
β	0.307	0.427	0.473	0.486
γ	0.274	0.325	0.313	0.358
δ	0.485	0.569	0.622	0.593
R^2	0.225	0.245	0.280	0.293
Number of observations	32157	18419	16760	15009

Table B2
Simple Correlation Coefficients among Census Tract Access-to-Employment Measures Derived from Negative Binomial, Poisson, and Gravity Models

	Gravity vs Poisson	Gravity vs Binomial	Binomical vs Poisson
Newark	0.980	0.994	0.988
Bergan-Passaic	0.982	0.993	0.995
Middlesex	0.973	0.989	0.976
Monmouth	0.909	0.989	0.954

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