Racial Differences in Networks: Do Neighborhood Conditions Matter?*

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Objectives. This study examines which of five neighborhood conditions help account for racial differences in social networks. *Methods.* The data set is the Urban Poverty and Family Life Survey, a survey of blacks, whites, Mexicans, and Puerto Ricans clustered in Chicago Census tracts, matched to 1990 Census data. I estimate HGLM models predicting five indicators of social isolation and five indicators of number of social ties as a function of race, controls, and the following neighborhood conditions: neighborhood poverty, proportion black, residential stability, ethnic heterogeneity, and population density. *Results.* Although initial estimates confirm the existence of racial differences in network size, most of these differences are not robust to controls for neighborhood conditions. Among the neighborhood variables, only neighborhood poverty is consistently associated with size of social networks. *Conclusions.* Findings suggest that while residential segregation has created conditions in which some races are more likely to live in high-poverty neighborhoods, it is the poverty, not the racial composition, of the neighborhoods that is significantly associated with weaker social ties.

In recent years, students of racial inequality have turned repeatedly to the study of social networks. This interest stems from the fact that people with better networks have been shown to have greater success at finding jobs (De Graaf and Flap, 1988; Granovetter, 1995), greater ability to cope with poverty (Edin and Lein, 1997; Stack, 1974), greater facility at dealing with everyday tasks (Domínguez and Watkins, 2003), greater access to economic resources (Portes, 1998), and better health conditions (Kadushin, 1982; Berkman and Syme, 1979). It is increasingly apparent that life outcomes are shaped by access to social networks and that network differences may be an important cause of racial inequality.

What is not yet clear, however, is why members of different racial groups exhibit networks of different size and composition. As I show below, blacks have been found to have fewer ties outside the family, particularly those

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offering social support or the ability to move up the social ladder. Most studies of racial differences in networks have examined the role of socioeconomic background, showing that it shapes but does not account for these differences. Comparatively few studies have examined the role of neighborhood conditions. Do these matter?

On the one hand, there are reasons to expect neighborhood conditions to be especially important to racial differences in networks: over the past two decades, several scholars have argued that neighborhood conditions shape the size and composition of social networks (Wilson, 1987, 1996; Sampson, Morenoff, and Earls, 1999), and multiple studies have documented that people of different races tend to live in markedly different neighborhoods, as a result of persistent residential segregation (Jargowsky, 1997; Massey and Denton, 1993; Farley and Frey, 1994; Charles, 2003). On the other hand, there are reasons to question this expectation. First, there is much more evidence that neighborhood conditions shape *neighbor* networks than evidence demonstrating they shape all types of networks (see Lee, Campbell, and Miller, 1991 for a review). Although it is reasonably clear that neighborhood conditions shape ties to other residents of the neighborhood, it is less clear that they shape ties to people who, regardless of where they live, provide social support or are college educated or are available in an emergency. In addition, since researchers have shown that neighbors may represent only a small proportion of the average person's total networks (Wellman, 1979), it is not clear that neighborhood conditions will have a significant impact on total network size. Second, there is neither theoretical agreement nor empirical confirmation on *which* neighborhood conditions matter. Although many researchers agree in theory that "neighborhood disadvantage" probably has a negative impact on networks, the term has been defined in so many ways in the literature on neighborhoods (Sampson, Morenoff, and Gannon-Rowley, 2002) that it is not clear, even theoretically, how disadvantage would shape networks. A necessary and missing step in this process is adjudicating empirically among neighborhood conditions.

In the following study I ask two questions: Do neighborhood conditions help account for racial differences in networks? If so, which conditions matter? I present a partial test of the neighborhood hypothesis that employs the Urban Poverty and Family Life Survey (UPFLS) and focuses exclusively on two important types of ties. Before examining how neighborhood conditions may shape these ties, I begin by reviewing the evidence on racial differences in networks.

Literature on Racial Differences in Support and Leverage Ties

This study will focus on two indicators of the quality of networks commonly associated with inequality in life chances: number of social support

ties and number of social leverage ties.[1] The distinction between support and leverage ties is based on the work of Briggs (1998), who refers to the former as ties that provide either everyday support or support with crises, and the latter as ties that help individuals move up the social ladder. In addition, the study will focus on residents of urban areas, where racial differences are most salient and where most of the research on racial differences in networks has focused.

Number of Social Support Ties

At least two different bodies of literature have examined the number of ties providing social support. One strand of the literature distinguishes strong ties from weak ties, and argues that while the latter are useful for access to new information, the former provide social support (Granovetter, 1973). Studies in this literature have often found racial differences in the number of strong ties, with strength usually measured as the level of comfort felt discussing important topics or a feeling of closeness. Using GSS data, Marsden (1987) reported that blacks had smaller discussion networks than whites. Fischer (1982), using survey data for San Francisco, found that whites had more friends and greater involvement with them than either blacks or Latinos (1982:91, 115). Using the Atlanta survey of the Multi-City Study of Urban Inequality, Tigges, Browne, and Green (1998) found that poor blacks were less likely than whites to have another discussion partner outside the household. Using data on 1,000 residents in metropolitan Detroit, Ajrouch, Antonucci, and Janevic (2001) found that blacks had fewer people than whites to whom they felt close.[2] Comparing blacks and Mexican immigrants, Klinenberg (2002), based on fieldwork, found that Latinos had larger social networks and stronger ties than blacks in comparably poor Chicago neighborhoods. Similarly, Small (2004) found dense social networks in the predominately Puerto Rican neighborhood I studied in Boston. In sum, blacks appear to have fewer close friends than either Latinos or whites. Comparisons of whites' and Latinos' network sizes are scarce.

A second strand of literature examines social support explicitly, though the literature is ambiguous in its conceptualization of social support. This ambiguity is due to two factors. First, in this literature, outcome measures for social support ties vary. For example, while some studies ask respondents

[1]For studies focused on other aspects of network composition, such as range, density, or multiplexity, see Fernandez and Harris (1992). For studies of the size and composition of kin networks of blacks and whites, see Hofferth (1984) and Johnson and Barer (1990). For studies of use of social networks, see Granovetter (1995), Stack (1974), and Cantor, Brennan, and Sainz (1994).

[2]However, some sociologists of health and aging have found that older blacks have larger networks than whites. Using representative data on noninstitutionalized persons 65 or older in New York City, Cantor, Brennan, and Sainz (1994) found that elderly blacks were more likely than elderly whites or Latinos to have friends or confidants.

to report the *number* of ties they rely on specifically for social support, others simply ask them to report whether they receive support from their existing ties (Hofferth, 1984; Hogan, Hao, and Parish, 1990). Second, while some researchers include family members in their measures of support ties, others do not (Kim and McKenry, 1998). Consequently, results on racial differences in social support have been mixed. Using the NLSY, Hogan, Hao, and Parish (1990) found that black mothers had more access than white mothers to kin for social support, due to their higher probability of living with kin. In an ethnographic study of poor blacks, Stack (1974) showed that blacks maintained extensive support networks among kin and nonkin, and that these networks resulted in reciprocal obligations that generated high social support. These findings are confirmed in other ethnographic studies of blacks in Los Angeles (Oliver, 1988) and Chicago (Pattillo-McCoy, 1999). Based on a sample of low-income mothers, Wasserman et al. (1990) also found that black respondents reported more social support than Latinas. However, Klinenberg's (2002) ethnographic study reported more support ties in a Mexican than a black poor community. Fischer (1982:125ff), using representative San Francisco data, found that blacks and Latinos (mostly Mexican immigrants in his sample) had fewer social support ties than whites. Peek and O'Neil (2001), using data on more than 4,000 elderly respondents in North Carolina, found no statistically significant difference in the size of the social support networks of blacks and whites.

Number of Social Leverage Ties

With respect to ties to persons of high socioeconomic status, such ties have been shown to help secure access to resources (Lin, 1999). In addition, they are especially important to the poor, for whom they serve as avenues for upward mobility. For example, many researchers have shown the effect of these ties on employment (Kasinitz and Rosenberg, 1996; Granovetter, 1995; De Graaf and Flap, 1988). Tests of racial differences in these types of ties are scarce. However, Tigges, Browne, and Green (1998), using the Atlanta MCSUI, found that poor blacks were less likely than whites to have a college-educated person in their network. Some researchers suggest that because of language barriers, Latino immigrants may have fewer ties to the middle class or to the highly educated than African Americans, but much more work remains to be done (Rodriguez, 1993; see also Small, 2002, 2004; Moore and Pinderhughes, 1993).

Neighborhood Conditions

Which neighborhood conditions matter? Although few works have examined the role of neighborhoods in *racial differences* in networks, several have

studied how neighborhood conditions shape network size. Based on the literature on neighborhood effects, I focus on the role of five neighborhood conditions: neighborhood poverty, proportion black, residential instability, ethnic heterogeneity, and population density. For reviews of the literature on neighborhood effects, see Small and Newman (2001) and Sampson, Morenoff, and Gannon-Rowley (2002).

Neighborhood Poverty

The most prominent theory about the impact of neighborhood conditions has been Wilson's (1987, 1996), which argues that the concentration of poverty among urban African Americans leads to their *social isolation*. Specifically, as the concentration of poverty increases, the probability of contact with nonpoor, employed, and college-educated individuals decreases, resulting in fewer social leverage ties. Others have hypothesized that neighborhood poverty affects social support ties as well, as it reduces trust (see Jencks and Mayer, 1990; Small and Newman, 2001). Consistent with this perspective, Tigges, Browne, and Green (1998) found that living in a poor neighborhood reduced network size, Fernadez and Harris (1992) found that it reduced both network size and the extent to which the network was mainstream, and Rankin and Quane (2000) found that neighborhood poverty was associated with fewer employed and college-educated ties and with more ties on public assistance. An important assumption of this work is that factors affecting social ties to neighbors will shape social ties more generally (Small, 2004). All the perspectives below rely on this assumption as well.

Proportion Black

A potential problem with Wilson's hypothesis is that neighborhoods with high concentrations of poverty are often also predominantly black. Several researchers would argue that racial segregation, not the concentration of poverty, results in smaller and weaker social networks (Massey and Denton, 1993). In fact, whether the concentration of poverty or racial segregation is the key factor shaping conditions in inner-city neighborhoods remains a critical debate in research on race and inequality (Wilson, 1996; Massey and Denton, 1993). Regarding the impact of segregation on networks, Briggs (2005) has argued that "segregation . . . reduces access by the minority poor to extensive, diverse political influence networks" (2005:244). A segregation perspective would argue that the concentration of poverty as such would not be as serious a problem if the given neighborhood were racially integrated, since integration reduces the difficulties minority groups have in accessing resources across racial lines. These resources improve neighborhood institutions and quality of life, facilitating the formation of social ties. In

addition, the perspective would posit that a high concentration of blacks in a neighborhood is a signal of the historical experience of redlining and underinvestment, leading to a weak institutional base and, thus, weak social ties.

Residential Instability

A branch of the Chicago School of sociology is the social disorganization perspective (Shaw and McKay, 1969), which argues that weakened social networks in neighborhoods are indicators of social disorganization. Social disorganization itself is caused by three factors: neighborhood poverty, residential instability, and ethnic heterogeneity. According to the perspective, neighborhoods in which a high proportion of residents are moving in and out are in transition. Under these circumstances, it is difficult for individuals to sustain social ties, leading to fewer ties of all types. In an important study, Sampson, Morenoff, and Earls (1999) found that residential instability was a better predictor of intergenerational closure (ties between parents and the parents of their children's friends) than either neighborhood poverty or racial composition.

Ethnic Heterogeneity

Ethnic heterogeneity is also predicted by social disorganization theory to negatively shape social ties. According to Shaw and McKay (1969), in neighborhoods with a high degree of homogeneity, residents have an easier time identifying with, and therefore developing social ties with, their neighbors. In a test of social disorganization theory in British localities, Sampson and Groves (1989:798) found that ethnic heterogeneity (in addition to low neighborhood SES and residential instability) led to a low proportion of residents reporting that neighbors were either friends or acquaintances.

Population Density

One way of reading the work of Wilson (1987) is as a study of the effects of depopulation in Chicago urban neighborhoods (Small and McDermott, 2006). In his description of changes taking place in the South Side of Chicago, Wilson showed that the out-migration of the middle class in this neighborhood led to the concentration of poverty. Since there was little replacement of these departing middle-class people, there was also depopulation, as evidenced by the boarded-up buildings, empty lots, and general deinstitutionalization (Wacquant and Wilson, 1989). It is possible that depopulation, not poverty as such, shapes local social ties, as low population density makes interpersonal contact less likely and as the prevalence of

empty lots makes the neighborhood feel less safe. This could be part of the reason ethnographers doing research in other poor neighborhoods with high population densities, such as New York's Harlem (Newman, 1999) and Boston's Villa Victoria (Small, 2004), report a high prevalence of local social ties.

Methods

Data

This study employs the UPFLS (Wilson et al., 1987). Conducted by the National Opinion Research Center and the University of Chicago, the UPFLS is a multistage stratified sample of 2,490 parents aged 18–47 living in 1987 in Chicago Census tracts in which at least 20 percent of persons were living below the poverty line according to the 1980 Census. The UPFLS separately sampled non-Latino blacks, non-Latino whites, Mexicans, and Puerto Ricans. It also added a sample of nonparents among blacks; for comparability across races, all nonparents ($N = 156$) are dropped in this study. The overall response rate was 78.7 percent.[3] The 2,490 respondents were in 144 tracts, and I use the tract as a proxy for the neighborhood. Census tracts are imperfect proxies because they do not always accord with socially understood conceptions of neighborhoods. However, they are the best widely available option (see Small and Newman, 2001). Weights are employed in summary statistics to indicate figures representative of black, white, Mexican, and Puerto Rican parents living in Chicago Census tracts that were at least 20 percent poor according to the 1980 Census. For further descriptions of the data set, see Stier and Tienda (2001) and Wilson (1996).

The UPFLS has been available for over a decade, but only recently have researchers examined it in depth (Barnes, 2003; Mouw, 2003; Stier and Tienda, 2001; Wilson, 1996; Reingold, 1995; Fernandez and Harris, 1992). It remains an underutilized resource for the study of social ties. It contains extensive data on social ties, and its sampling strategy makes possible racial comparisons. The UPFLS also has important limitations. The sampling frame was limited to Chicago tracts that were at least 20 percent poor in 1980. Stier and Tienda (2001:239) report that 39 percent of Chicago's Census tracts fell into this category. However, the survey was conducted in 1987, and by then many tracts had changed poverty level, resulting in a less restricted sample. In 1990, about 13.3 percent of the sample lived in tracts that were less than 20 percent poor, and the tract poverty rate ranged from 1.1 to 93.8 percent. Finally, the survey is cross-sectional, and thus better suited for identifying associations than causal relations (more on this below).

[3]By race, the rates were 82.5 percent for blacks (parents); 77.7 percent for Mexicans; 76.5 percent for Puerto Ricans; and 73.8 percent for whites.

The UPFLS data were merged to 1990 Census data on demographic characteristics at the tract level. Since the survey was conducted in 1987, the 1990 rather than the 1980 Census contains the data closest to those matching the neighborhood experience of residents. (This is especially the case in Census income-related questions, which ask about 1989 incomes, and residential stability questions, which ask about changes in residence between 1985 and 1990.) Since the sampling frame was based on 1980 Census tracts, tracts for the two decades had to be spatially matched.[4] Between 1980 and 1990, the majority of Chicago tracts in the UPFLS remained the same. However, four 1980 tracts were split into either two or three new tracts for 1990. Since the UPFLS does not make available addresses for respondents, it is not possible to know which of the two or three new tracts a particular respondent's address would fall into. In these cases, I pooled raw 1990 data from the two or three new tracts and calculated averages for the entire area denoted by the 1980 tract.

Dependent Variables

I employ 10 measures of social support and social leverage ties based on five questions in the UPFLS. One-half of the measures attempt to capture complete isolation from different types of social ties (Fernandez and Harris, 1992; Wacquant and Wilson, 1989); the other half capture the number of ties of a given type. Dependent variables with weighted summary statistics are listed in the top panel of Table 1.

Social Support Measures. The first measure is based on the assumption that strong ties provide social support. Respondents were asked: "Think about the three people to whom you feel closest personally, such as friends. This does not include your family, or people you live with, or your partner." The first dependent variable, NO CLOSE FRIENDS, is coded 1 if respondents replied they had no such friends, 0 otherwise. The second dependent variable, NUMBER OF CLOSE FRIENDS, is a continuous variable coding the number of persons named, from 0–3. The third and fourth measures attempt to capture social support directly, based on help with everyday needs. Respondents were asked: "Next I'd like to ask you about people you can

[4]The procedure to match 1980 and 1990 tracts was as follows. The Geolytics, Inc. CensusCD, 1980 Version 2.0 was used to obtain geographic boundaries for the 1980 tracts; the Geolytics, Inc. CensusCD + Maps, 1990 Version 2.1 was used to obtain geographic boundaries for the 1990 tracts. Using ESRI ArcGIS 9.1 software, the 1990 Census tract boundaries were converted to centroids. Then, the spatial join function was used to match the 1990 centroids to 1980 tracts. Although no method is perfect if geographic boundaries changed dramatically, this method yields a highly parsimonious solution with a minimum of assumptions and no loss of data.

TABLE 1

Summary Statistics for Dependent Variables and Controls, by Race

	Blacks	Whites	Mexicans	Puerto Ricans	Pooled Sample
Dependent Variables					
No close nonkin ties	16.1%	8.8%	15.9%	21.6%	16.0%
No everyday support ties	22.1%	12.4%	41.5%	28.9%	25.4%
No crisis ties	26.9%	38.0%	28.8%	40.9%	29.1%
No college-educated close ties	82.6%	63.9%	94.5%	92.2%	83.9%
No employed close ties	27.8%	18.9%	25.9%	36.1%	27.5%
Number of close nonkin ties (0–3)	1.95 (1.13)	2.26 (0.98)	1.89 (1.11)	1.76 (1.19)	1.95 (1.13)
Number of everyday support ties (0–6)	2.01 (1.69)	2.33 (1.54)	1.32 (1.49)	1.64 (1.54)	1.88 (1.66)
Number of crisis ties (0–6)	1.69 (1.56)	1.86 (2.01)	1.35 (1.32)	1.19 (1.35)	1.60 (1.55)
Number of college-educated ties (0–3)	0.23 (0.55)	0.67 (1.03)	0.08 (0.36)	0.09 (0.35)	0.23 (0.58)
Number of employed ties (0–3)	1.36 (1.08)	1.71 (1.11)	1.51 (1.15)	1.21 (1.12)	1.40 (1.10)
Individual-Level Independent Variables					
Female	67.1%	65.5%	53.2%	68.0%	64.6%
Foreign born[a]	0.2%	8.7%	85.5%	72.4%	21.2%
High school graduate	56.3%	63.3%	16.2%	29.8%	47.8%
Owns home	27.8%	34.0%	21.5%	21.5%	26.7%
Household income[b]	5.11 (3.07)	7.02 (3.38)	5.61 (2.23)	4.83 (2.48)	5.31 (2.97)
Age	31.6 (7.19)	34.4 (6.65)	32.4 (6.45)	32.2 (6.81)	31.93 (7.03)
Adult in household	42.3%	20.9%	28.4%	22.5%	36.9%
N[c]	1,027	364	489	454	2,334
Percent	44.0%	15.6%	21.0%	19.5%	100.0%

[a]Includes those born in Puerto Rico.

[b]The household income categories run from 1–12 as follows: 1 < $2,500, 2 = $2,500–5,000, 3 = $5,001–7,500, 4 = $7,501–10,000, 5 = $10,001–15,000, 6 = $15,001–20,000, 7 = $20,001–25,000, 8 = $25,001–30,000, 9 = $30,001–35,000, 10 = $35,001–40,000, 11 = $40,001–45,000, 12 > $45,000.

[c]Except for outcome variables with missing data: close friends ($N = 2,193$), support ties ($N = 2,319$), crisis ties ($N = 2,303$), college-educated ties ($N = 2,134$), employed ties ($N = 2,189$).

SOURCE: UPFLS. Standard deviations in parentheses. All figures are weighted.

depend on, such as friends, relatives, and professionals like ministers and social workers. Many people help each other with everyday favors such as getting rides, borrowing a little money, or going to the store. Please tell me the names of the people you most depend on for everyday favors.'' The variable NO EVERYDAY SUPPORT TIES was coded as 1 if respondents answered that they depended on nobody for everyday favors. The logic behind this variable is that individuals with no one, friend or family, to turn to for everyday support are likely to experience particular hardship. NUMBER OF EVERYDAY SUPPORT TIES is a count variable coding the number of persons named, with a maximum of 6. The fifth and sixth measures of support assume that even if individuals do not have much support for everyday favors, they may still have a reliable person to turn to in case of an emergency. These ''crisis ties'' are important elements of supportive networks as well. Respondents were asked: ''Now please tell me the names of the people you could turn to for help in a major crisis, such as a serious illness or death, or if you needed a place to stay.'' The fifth variable, NO CRISIS TIES, is a dichotomous variable coded 1 if respondents stated they had no such ties; the sixth, SIZE OF CRISIS NETWORK, is a continuous variable coding the number of persons named, from 0–6. As shown in Table 1, there is considerable variation among the types of social support ties. As shown in the top panel, whites are least likely to be isolated by the first two measures of social support, but second most likely to be isolated by the third. Blacks are moderately isolated by the first two measures, lying between whites and both groups of Latinos, but least likely to be isolated from crisis ties. Despite this, as shown in Rows 6 through 8, whites have the largest networks of all three support types. Puerto Ricans are much more likely than all groups to report no close friends, and Mexicans much more likely to report no everyday support ties. I note that while the first measure (close ties) excludes kin members, the others do not.

Social Leverage Measures. There are four measures of social leverage ties. Respondents were asked about the education level of their close friends. The first indicator, NO COLLEGE-GRADUATE FRIENDS, indicates isolation from close educated ties. NUMBER OF COLLEGE-GRADUATE FRIENDS is a count variable from 0–3. The third and fourth measures capture the employment status of networks. NO EMPLOYED FRIENDS and NUMBER OF FRIENDS EMPLOYED, which runs from 0 to 3, capture the number of intimate nonkin ties who are employed. As shown in Rows 4 and 5 of Table 1, whites are by far the least likely to be isolated from employed or highly educated ties. Mexicans and Puerto Ricans have the smallest number of ties of either type. It is important to note that these four measures only capture part of the social leverage networks of respondents. Since they only capture the employment and education status of close ties, they say nothing of whether respondents have weak ties or acquaintances in these higher SES categories.

Independent Variables

Individual-Level Variables. The main individual-level independent variable is race. Respondents in the UPFLS were non-Hispanic black, non-Hispanic white, Mexican, and Puerto Rican. (Not all self-reported Mexicans were immigrants; not all self-reported Puerto Ricans were born in Puerto Rico. Thus, a control for foreign-born status is included.[5]) Since the principal group of interest is African Americans, who are found to have lesser networks than each of the other groups in at least some of the literature, they will serve as reference group. There are more blacks than any single other group in the sample, so they also represent a statistically appropriate reference group.

The models control for independent variables either shown to affect social ties variables or expected to affect racial differences in social ties. These are listed in the bottom panel of Table 1. Models control for sex, age, foreign-born status, home ownership, education, and household income. Fernandez and Harris (1992) uncovered widespread sex differences, with neighborhood poverty affecting black women more than black men. Tigges, Browne, and Green (1998) found modest gender effects. The authors also found age effects, as did Ajrouch, Antonucci, and Janevic (2001), who showed it negatively affects network size (see also Cantor, Brennan, and Sainz, 1994). Foreign-born status is expected to affect establishment of ties in the United States and to account for much of the difference between Latinos and blacks (see Moore and Pinderhughes, 1993). Models also control for the presence of another adult in the household. Finally, the measures of socioeconomic status—education, income, and home ownership—are those expected to be positively associated with network size and with number of educated and employed ties, given the principle of homophily (McPherson, Smith-Lovin, and Cook, 2001). Home ownership has also been shown to be positively associated with local social ties (Campbell and Lee, 1992). Given the distributions of education across races in the UPFLS (only 6 percent of respondents had graduated from college), the control for education will be whether respondents graduated from high school, not college. The control for income was recorded by the UPFLS in 12 categories representing total household income in the previous year (see Table 1).[6]

[5]The correlation between Mexican and foreign born was 0.56; that between Puerto Rican and foreign born was 0.40.

[6]For most variables, the number of cases missing data was small or negligible. None of the dependent variables was missing data on more than 6 percent of the sample; these cases were dropped. Among the independent variables, race, sex, age, and foreign-born status were missing no observations. Graduation from high school was missing one; it was dropped. Home ownership was missing three; household income was missing for only 4.7 percent of the original sample. For these two variables, I imputed a value based on a regression of the variable missing data on all other independent variables, which is the most appropriate method given the small number of missing cases. This method provides consistent estimates and retains as much of the sample as feasible. Among the simpler alternative methods,

TABLE 2

Summary Statistics for Neighborhood-Level Predictors

Neighborhood-Level Variable	1	2	3	4	5	Mean	(*SD*)
1 Proportion poor	1.00					0.308	(0.174)
2 Proportion black	0.48	1.00				0.487	(0.438)
3 Residential stability	−0.05	0.34	1.00			0.481	(0.105)
4 Ethnic heterogeneity	−0.33	−0.72	−0.46	1.00		0.273	(0.233)
5 Population density (logged)	0.09	−0.20	−0.30	0.20	1.00	9.833	(0.596)

$N = 284$ Census tracts.

SOURCE: 1990 Census.

Neighborhood-Level Variables. Neighborhood-level variables are listed in Table 2. The measures for the first three neighborhood conditions are proportion of the residents in the neighborhood living below the poverty line; proportion of residents who are black; and proportion of residents who lived in the same residence five years earlier. I measure ethnic heterogeneity by the index $(1 - \Sigma p_i^2)$, where p_i is the proportion of residents of the neighborhood in group i. As Sampson and Groves note, the index "takes into account both the relative size and the number of groups" in the neighborhood (1989:784–85). The index ranges from 0 to 1, with 1 indicating perfect heterogeneity. Population density is measured as the number of people per square mile, with the variable logged to account for its skewed distribution. As shown in Table 2, the variables are moderately correlated. There is a high and negative correlation between heterogeneity and proportion black, indicating that as the proportion of blacks increases, heterogeneity decreases. This is consistent with literature on persistent preferences among members of all races against living near blacks (Charles, 2003). Although the size of the correlation (–0.72) is within acceptable range, analyses disentangling the effects of both variables should be sensitive to possible multicollinearity.

Models

The models predict network size as a function of race, neighborhood characteristics, and controls. Standard OLS models would be inappropriate for current purposes because they assume the outcome variable can take any value, while the presence or absence of ties must be a value of 0 or 1 and the

substituting the mean for cases with missing data would produce well-known biases, and dropping them would reduce the sample size. More complex methods such as multiple imputation might provide slightly more accurate standard errors, but at high computational costs, and they would produce negligible changes in the overall estimates (Allison, 2002).

size of network must be a positive integer. In addition, they assume a normally distributed outcome, which is not the case given the binary and count outcome data; and they assume uncorrelated errors, which is not the case given the clustered nature of the data set. I estimate hierarchical generalized linear models (HGLM), based on the work of Raudenbush and Bryk (2002).

Generalized linear models specify a sampling model, a structural model, and a link function. For the binary outcomes, I specify a Bernoulli distribution with probability of 1 equal to π_{ij}, such that $E(Y_{ij}|\ \pi_{ij}) = \pi_{ij}$. For count outcomes, I specify a Poisson distribution with the expected value reflecting "rate" λ_{ij}, such that $E(Y_{ij}|\ \lambda_{ij}) = \lambda_{ij}$. The structural model takes into account that the data exhibit a two-level, hierarchical structure of individuals within Census tracts, and that variables at both levels are hypothesized to shape either the probability of having no tie or the expected number of ties. The model at the individual level takes the form:

$$\eta_{ij} = \beta_{0j} + \beta_{1j}(White)_j + \beta_{2j}(Mexican)_j + \beta_{3j}(PuertoRican)_j + \sum \beta_{kj}(Controls)_j, \quad (1)$$

where the predicted ties for individual i in neighborhood j are a function of three race indicator variables (with black as the baseline) and individual-level controls. I specify a random intercept model. At the neighborhood level, the model takes the form:

$$\begin{aligned}\beta_{0j} =& \gamma_{00} + \gamma_{01}(Poverty\_rate)_j + \gamma_{02}(Proportion\_black)_j + \\ & \gamma_{03}(Residential\_stability)_j + \gamma_{04}(Ethnic\_heterogeneity)_j + \\ & \gamma_{05}(Population\_density)_j + \mu_{0j},\end{aligned} \quad (2)$$

where the predicted ties for a resident in the average neighborhood are said to be a function of five neighborhood-level predictors. I test whether coefficients for the race indicator variables (β_1, β_2, and β_3) remain statistically significant after controlling for the neighborhood predictors, and whether the coefficients for the neighborhood predictors (γ_{01} to γ_{05}) are statistically significant.

The link function connects the linear predictor to the outcome variables. In the equation, the linear predictor η_{ij} can take any value, positive or negative. However, for models predicting whether the respondent has no ties, the outcome variable only takes the forms 0 or 1. For the binary outcomes, I specify the logit link, whereby $\eta_{ij} = \ln(\pi_{ij}/(1-\pi_{ij}))$. The log-odds that the respondent has no ties is assumed to be a linear function of the predictors. For the count outcomes, I specify the log-link, whereby $\eta_{ij} = \ln(\lambda_{ij})$. The log of the expected number of ties is a linear function of the predictors. The anti-log of the coefficient is interpreted as a multiplier of the number of ties associated with a one-unit increase in the predictor

(Long, 1997; Raudenbush and Bryk, 2002). All standard errors account for the clustered nature of the data set.

Estimating the impact of neighborhood conditions on individual-level outcomes is a notoriously complex problem with no straightforward solution (Goering and Feins, 2003; Jencks and Mayer, 1990). Models based on observational data, such as the UPFLS, are unable to account for unobserved heterogeneity, an important problem because individuals may end up in neighborhoods as a result of factors related to the number of social ties they eventually have. Experimental models, such as those of the recent Moving to Opportunity (MTO) experiment (Goering and Feins, 2003), solve this problem elegantly through random assignment of individuals to different types of neighborhoods. This solution, however, produces its own problems. Since experiments such as MTO are based only on people looking for subsidized housing, they rely on an inherently self-selected sample that is not representative of the urban population. In addition, it is practically difficult to disentangle experimentally the effect of *different* neighborhood conditions, since participants would have to be randomly assigned to many specific types of neighborhoods (high and low poverty, high and low proportion black, high and low instability, etc.) through a very costly multiple-treatment design. In the present case, disentangling the role of different neighborhood conditions is paramount. Thus, this study exploits the strengths of the UPFLS design while remaining cautious about causal claims.

Findings

Table 3 exhibits the coefficients for the effect of race indicator variables from two sets of models. The first set of models takes into account the hierarchical nature of the data but controls only for individual-level variables; the second includes neighborhood predictors. All models include three indicator race variables, with black as baseline. For each outcome, the effect of each race variable is presented separately to facilitate comparison between the two models.

As seen in the first column of Table 3, controlling for socioeconomic and other demographic variables does not eliminate many of the black-white differences in social support or social leverage ties. Controlling for individual-level differences, whites are better connected than blacks by most measures, though they remain significantly more likely to be isolated from crisis ties. However, as shown in the second column, most of these differences disappear after controlling for the five neighborhood-level predictors. Neighborhood conditions account for black-white differences in probability of having no close friends, everyday support ties, or crisis ties, and for differences in the number of close friends, of everyday supportive ties, and of college-educated ties. Black-white differences in probability of having no college-educated ties remain.

TABLE 3

Effect of Race Variables on Social Ties, Before and After Controlling for Neighborhood Conditions (Black Baseline)

	Independent Variable					
Dependent Variable	White		Mexican		Puerto Rican	
No close nonkin ties (1/0)[a]	−0.531*	−0.225	0.119	0.383	0.538	0.795
	(0.267)	(0.402)	(0.289)	(0.436)	(0.276)	(0.417)
No everyday support ties (1/0)[a]	−0.832**	−0.355	0.375	0.822**	0.053	0.452
	(0.292)	(0.455)	(0.246)	(0.370)	(0.243)	(0.370)
No crisis ties (1/0)[a]	0.453*	0.185	0.160	-0.076	0.794**	0.535
	(0.217)	(0.385)	(0.244)	(0.366)	(0.253)	(0.402)
No college-educated ties (1/0)[a]	−0.508*	−0.762	0.545	0.159	0.355	0.088
	(0.224)	(0.393)	(0.340)	(0.411)	(0.291)	(0.366)
No employed ties (1/0)[a]	−0.129	0.009	0.090	0.248	0.523**	0.633*
	(0.186)	(0.285)	(0.226)	(0.329)	(0.183)	(0.293)
Number of close nonkin ties[b]	0.113**	0.068	−0.060	−0.114	−0.161**	−0.198*
	(0.037)	(0.081)	(0.057)	(0.100)	(0.050)	(0.081)
Number of everyday support ties[b]	0.198**	0.098	−0.074	−0.181	0.022	−0.064
	(0.066)	(0.097)	(0.093)	(0.110)	(0.079)	(0.095)
Number of crisis ties[b]	0.126	0.326	−0.062	0.126	−0.236*	−0.054
	(0.103)	(0.181)	(0.101)	(0.168)	(0.127)	(0.210)
Number of college-educated ties[b]	0.421**	0.401	−0.480	−0.369	−0.508	−0.488
	(0.154)	(0.322)	(0.297)	(0.367)	(0.265)	(0.337)
Number of employed ties[b]	0.065	−0.060	0.023	−0.106	−0.179**	−0.280*
	(0.046)	(0.112)	(0.072)	(0.127)	(0.065)	(0.113)
Individual-level controls?	Yes	Yes	Yes	Yes	Yes	Yes
Neighborhood-level controls?	No	Yes	No	Yes	No	Yes

[a]HGLM model with logit link. Figures represent logit coefficient.

[b]HGLM model with log link. Figures represent Poisson coefficient.

**$p < 0.01$; *$p < 0.05$.

NOTE: Unit-specific estimates, HGL models. All estimates weighted. All continuous predictors centered on the grand mean. All models include three indicator variables for race, with black as baseline, as well as for sex, foreign-born status, high school graduation, income, age, home ownership, and presence of another adult in household. See text and Table 4 for information on models with neighborhood conditions.

When comparing blacks and Mexicans, there are no statistically significant differences in ties. This remains true after controlling for neighborhood conditions except that Mexicans become more likely to report no everyday support ties. This finding is consistent with the very high probability among Mexicans of reporting no support ties exhibited in the raw (weighted) figures on Table 1, but the issue remains to be explored. When comparing Puerto Ricans and blacks, the fifth column confirms that the Puerto Ricans have especially weak support and leverage networks. Yet after controlling for the observed neighborhood conditions, three of six differences become insignificant. Differences in probability of having no employed friends, number of close friends, and number of employed friends remain.

Table 4 exhibits the coefficients associated with each neighborhood condition. They represent the same model as that in the neighborhood columns of Table 3. As was suggested by the correlation matrix in Table 2, multicollinearity in the estimates became an issue. A common solution to this problem in the neighborhood literature is to create indexes of neighborhood disadvantage that combine variables such as poverty, proportion black, and residential instability. However, our objective is to disentangle the independent effect of each of these variables. In three of the 10 models, this was not possible with respect to residential instability, so the variable was dropped from the predictors. In two of these three models, and in a third, the high correlation between proportion black and ethnic heterogeneity (-0.72) was an issue. To ascertain the independent effect of both variables, I first regressed heterogeneity on proportion black using the neighborhood-level data. The residuals from this regression are the variation in heterogeneity that does not depend on proportion black. I entered these residuals into the model *in lieu* of ethnic heterogeneity, which yielded estimates of the effects of proportion black and ethnic heterogeneity that were uncontaminated by multicollinearity.[7] The three coefficients where this was done are identified in italics.

As shown in Table 4, proportion poor is, by far, the most consistent predictor of both probability of having no ties and total number of ties, with a positive relationship to the former and a negative relationship to the latter. Examining, first, the models predicting probability of having no ties of a given type (first five rows): a 10 percentage point increase in the poverty rate, holding all other factors constant, increases the log-odds of having no close

[7]This method did not change the coefficients or standard errors of any of the neighborhood predictors, except, as expected, the coefficients for the effect of proportion black. In the original models for number of college-educated ties and probability of having no college-educated ties, the coefficients for proportion black were larger and statistically significant. In the original model for number of crisis ties, the coefficient was similar, indicating that the unexpected effect of proportion black on number of crisis ties is not due to the high covariance with ethnic heterogeneity. I thank Fabia Gumbau for conversations leading to this solution.

TABLE 4

Effect of Neighborhood Conditions on Social Ties

	Independent Variable				
Dependent Variable	Proportion Poor	Proportion Black	Residential Stability	Ethnic Heterogeneity	Population Density (ln)
No close nonkin ties (1/0)[a]	1.256*	−0.074	—	−0.632	−0.098
	(0.542)	(0.457)		(0.639)	(0.181)
No everyday support ties (1/0)[a]	0.669	0.426	0.850	−0.066	−0.580
	(0.486)	(0.426)	(0.856)	(0.428)	(0.155)
No crisis ties (1/0)[a]	1.929**	−0.606	1.579	0.816	−0.152
	(0.547)	(0.426)	(1.081)	(0.662)	(0.165)
No college-educated ties (1/0)[a]	1.112	−0.674	—	*−1.378**	−0.075
	(0.616)	(0.425)		*(0.574)*	(0.175)
No employed ties (1/0)[a]	1.760**	−0.142	0.920	0.234	−0.157
	(0.461)	(0.322)	(0.826)	(0.434)	(0.118)
Number of close nonkin ties[b]	-0.317**	−0.028	0.003	−0.061	0.037
	(0.121)	(0.105)	(0.167)	(0.105)	(0.042)
Number of everyday support ties[b]	−0.347*	−0.073	0.363	0.072	0.053
	(0.178)	(0.116)	(0.305)	(0.140)	(0.036)
Number of crisis ties[b]	−0.729*	0.488*	−0.295	*−0.195*	0.118
	(0.290)	(0.199)	(0.513)	*(0.280)*	(0.069)
Number of college-educated ties[b]	−0.855	0.210	—	*1.448***	−0.078
	(0.515)	(0.358)		*(0.458)*	(0.142)
Number of employed ties[b]	−0.540**	−0.079	−0.014	−0.022	0.061
	(0.161)	(0.139)	(0.220)	(0.141)	(0.046)

[a]HGLM model with logit link. Figures represent logit coefficient.

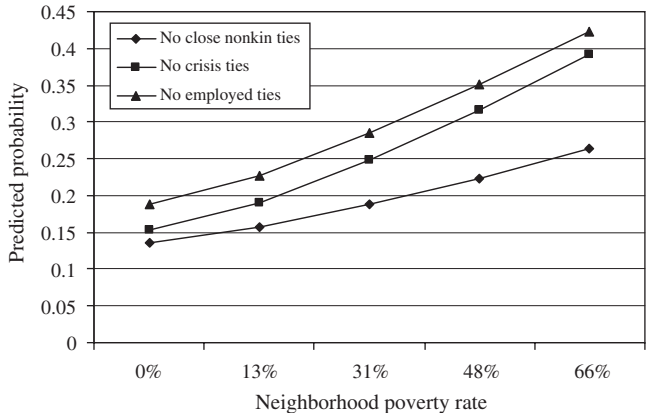
[b]HGLM model with log link. Figures represent Poisson coefficient.

**$p < 0.01$; *$p < 0.05$.

NOTE: Unit-specific estimates, HGL models. All estimates weighted. All continuous predictors centered on the grand mean. All models include controls for race, sex, foreign-born status, high school graduation, income, age, home ownership, and presence of another adult in household. In models for no college ties, number of college ties, and number of crisis ties, the residuals of a neighborhood-level regression of heterogeneity on proportion black are entered *in lieu* of heterogeneity. See text.

FIGURE 1

Predicted Probability of Having No Ties, by Neighborhood Poverty Rate

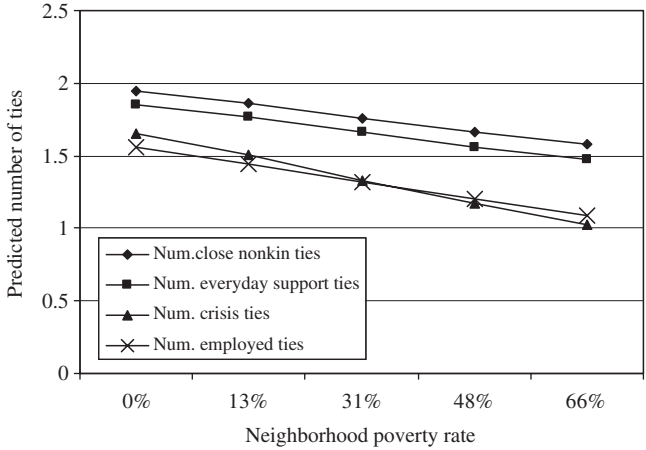


friends by 0.126 (0.10 × 1.256), of having no crisis ties by 0.193, and of having no employed ties by 0.176. To represent these figures more intuitively, I calculate predicted probabilities in Figure 1. These are the predicted probabilities of having no ties for an individual with a value of 0 on all dichotomous values—that is, for a black male who does not own a home, is not a high school graduate, and lives in a household without a second adult—and the statistical average on continuous variables. The figure presents predicted probabilities for an individual with these characteristics who lives in a neighborhood at the mean poverty rate (31 percent), and in neighborhoods one and two standard deviations above and below the mean (the Figure 2 *SD*s below the mean is set at 0). As shown in Figure 1, high and very high poverty neighborhoods increase social isolation dramatically, as predicted by Wilson. A black male with average characteristics and living in a 13 percent poor neighborhood (one *SD* below the mean), has a 16 percent probability of having no close ties, a 19 percent probability of having no crisis ties, and a 23 percent probability of having no employed ties. If he lives in a neighborhood 48 percent poor (one *SD* above the mean), his probabilities of not having ties of each type are 22 percent, 32 percent, and 35 percent, respectively. In a 66 percent poor neighborhood, predicted probability of isolation rises dramatically, to between 26 percent and 42 percent depending on the measure.

For models predicting number of ties, Table 4 shows that an increase in the neighborhood poverty rate decreases the log-number of close ties, everyday support ties, crisis ties, and employed ties. Figure 2 converts the log-number of ties into predicted number of ties for an individual with statistically average characteristics and values of 0 in all dichotomous predictors. As shown, there are substantial declines in the expected number of

FIGURE 2

Predicted Number of Ties, by Neighborhood Poverty Rate



ties as poverty increases. For a black male with the aforementioned traits living in a 13 percent poor neighborhood, the predicted number of ties is 1.86 for close ties, 1.76 for everyday support ties, 1.5 for crisis ties, and 1.45 for employed ties. In a 66 percent poor neighborhood, the figures drop dramatically to 1.58, 1.47, 1.03, and 1.09, respectively, ranging between about one-third and one-half of a social tie lost.

Most of the other neighborhood predictors make little difference. Net of proportion poor and other neighborhood conditions, proportion black has a positive effect on number of crisis ties, which may be tied to the fact that, as shown in Table 1, while blacks have fewer such ties than whites, they have more ties than Mexicans, and substantially more than Puerto Ricans. In addition, ethnic heterogeneity has effects only on variables indicating college-educated network. This may result from the fact that ethnic heterogeneity is often a sign of gentrification, a process by which highly educated, higher income residents move into formerly homogenous neighborhoods.

Discussion

Two general conclusions derive from these findings: that most differences in support and leverage ties between blacks and whites, and many differences between blacks and Puerto Ricans, can be statistically accounted for by differences in the neighborhoods in which they live; and that the most important of these differences is the neighborhood poverty rate. I note that the data are representative of parents in one city, which should inform

comparisons with other studies. As in all studies based on observational data, any interpretation must take into account unobserved heterogeneity.

Unobserved heterogeneity does not appear to be a problem for the conclusion that many racial differences in networks can be accounted for by neighborhood differences. I separately ran within-neighborhood fixed-effect models and obtained similar reductions in the race effects (available on request). This suggests that the five observed neighborhood variables capture what is important at the neighborhood level to racial differences in the network measures.[8] The findings suggest that neighborhood conditions are associated with overall networks, not merely neighbor networks, to a greater extent than much of the research acknowledges. Thus, accounts of racial differences in networks that ignore neighborhood conditions are missing an important part of the picture. Despite advances in transportation and communication and the increased ability to communicate across space, neighborhoods continue to matter to social networks. It remains to be seen whether the popularity of cell phones, which rose dramatically after 1990, undermines the significance of neighborhoods to social connections.

For the conclusion that neighborhood poverty reduces network size and increases isolation, unobserved heterogeneity would be a problem if one believed a missing variable is biasing the coefficient for neighborhood poverty. This question cannot be answered statistically with the current data. Nonetheless, the consistency of the neighborhood poverty effect across different types of outcomes makes it difficult to rule out a neighborhood effect, since the unobserved variable would have to account not only for selection into poor neighborhoods but also for multiple types of network outcomes.

At a minimum, it is certainly the case that individuals with identical observed characteristics face alarmingly higher rates of social isolation if they live in high poverty neighborhoods than if they live in low poverty neighborhoods. Their networks are also much smaller, in many ways confirming the predicament hypothesized by Wilson and by earlier scholars such as Shaw and McKay. The alternative neighborhood conditions—proportion black, residential stability, ethnic heterogeneity, and population density—bore no statistical relation to social ties. The fact that other studies have found statistically significant associations between both residential stability and heterogeneity and local neighbor networks suggests that while some neighborhood factors affect only ties to neighbors, only neighborhood poverty affects ties to alters regardless of where they live.

Even though the findings are most consistent with the work of Wilson, they also support, in a different way, the arguments of many observers that residential segregation is one of the most important conditions shaping the networks of the poor. Conceptually, the idea of segregation has been used in two different senses: to refer to neighborhoods and to refer to cities.

[8]This model accounts for unobserved heterogeneity at the neighborhood level. Unobserved heterogeneity at the individual level remains unaccounted for.

Commentators refer to "segregated neighborhoods" as those with high proportions of black or other racial minorities. As we have seen in Table 4, the proportion of blacks in the neighborhood has no impact on support or leverage ties after other factors are accounted for. But a "segregated city," a concept more consistent with standard segregation indexes, is one in which residents of different races tend to live in different neighborhoods. The most common segregation measure, the index of dissimilarity, indicates the proportion of residents in a city of a particular race who would have to move to a different neighborhood for the proportions of the race in every neighborhood to be identical to that in the city (Massey and Denton, 1993). From one perspective, segregated cities are a problem because separation of races into different neighborhoods reduces their contact; from another, they are a problem not because of separation as such but because the neighborhoods in which the different racial groups live exhibit different conditions. The findings in Table 4 and Figures 1 and 2 suggest that latter. They suggest that *the racial segregation of Chicago has created conditions in which some races are more likely to live in high-poverty neighborhoods, but it is the poverty of the neighborhoods (not their racial composition) that is significantly associated with weaker social ties*. More systematically: residential segregation → differential exposure to neighborhood poverty → differential access to support and leverage ties. In this way, the perspectives of Wilson and of Massey and Denton are complementary (cf. Quillian, 1999). One points to the city-wide structural conditions that allocate racial groups to different neighborhood conditions; the other to the actual neighborhood condition that shapes social ties.

This study has brought the relationship between neighborhoods and networks to bear on our understanding of racial inequality. In this respect, it contributes to an ongoing problem in the literature on neighborhood effects—*how* they matter (Small and Newman, 2001; Sampson, Morenoff, and Gannon-Rowley, 2002). The findings of this study suggest that scholars looking at the impact of neighborhood poverty on racial differences in life chances should seriously consider the role of support and leverage ties as mediating mechanisms. In this endeavor, the use of multiple approaches, both experimental and observational, will continue to be important.

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