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How Long Do African Americans Stay in High-Poverty Neighborhoods? An Analysis of Spells

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Abstract

Discussions of high-poverty neighborhoods often assume that their residents are a distinct population trapped in poor neighborhoods for long durations. This paper examines this claim by calculating the first estimates of duration of residence in high-poverty neighborhoods for the African-American population. Using data from the Panel Study of Income Dynamics matched to census tract data and a model of movement among neighborhood types adopted from Bane and Ellwood (1983, 1986) and McGinnis (1968), I derive measures of the duration of stays in high-poverty neighborhoods. A large share of the black population will experience a short spell of residence in an extremely poor neighborhood at some time over a 10-year period. Many of the residents of nonpoor and poor neighborhoods at a point in time, however, will be there for long spells. Among poor African Americans, reentry to high-poverty neighborhoods following an exit is common. Patterns of stays in high-poverty neighborhoods are more complex and heterogeneous than usually supposed.

How Long Do African Americans Stay in High-Poverty Neighborhoods?
An Analysis of Spells

Writers on high-poverty neighborhoods, notably W. J. Wilson (1987, 1991, 1996), have long referred to the residents of such neighborhoods as a population separate and distinct from mainstream society—the "underclass" or "ghetto poor." In Wilson's account, the spatial separation of the residents of high-poverty neighborhoods is a factor that reinforces class barriers, leading to a population with low levels of social contact with middle-class persons and institutions.

Implicit in the social isolation argument and in most descriptions of high-poverty neighborhoods is the assumption that their residents rarely move into more prosperous neighborhoods. In most accounts, residents of high-poverty neighborhoods are assumed to be trapped there; exits are correspondingly described as "escapes" (e.g., South and Crowder 1997). Policy discussions reflect this in the recent emphasis on housing mobility programs for low-income families (e.g., Polikoff 1995). Yet almost no research has examined this "entrapment" hypothesis.[1] In fact, studies of the determinants of residential mobility provide reasons to doubt it. Because low-income people tend to be renters, they tend to move frequently (Speare, Goldstein, and Frey 1975). If some of these moves are to middle-income or affluent neighborhoods, then many of those living in high-poverty neighborhoods may be temporary sojourners rather than long-term residents.

The primary goal of this paper is to examine the duration of African-American residence in high-poverty neighborhoods. Using data from the Panel Study of Income Dynamics, I develop a model of neighborhood movement and then apply it to estimate time spent in high-poverty neighborhoods, conditional on poverty status. Although everyday language lends itself to the description of the residents of such neighborhoods as a "trapped" population, in reality there is much population turnover in poor neighborhoods and great heterogeneity in how long people stay.

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[1]The term "entrapment hypothesis" is from Gramlich, Laren, and Sealand (1992).

BACKGROUND AND MOTIVATION

Two issues motivate the analysis of durations in high-poverty neighborhoods. First, duration of stay in a high-poverty neighborhood is a basic social fact that is important to understanding the social costs imposed by poor neighborhoods on their residents. No past research has addressed duration of stay in high-poverty neighborhoods. Second, the issue of durations provides insight into the extent to which the residents of poor neighborhoods can be considered a "trapped" population, unable to escape poor neighborhoods.

Past research on high-poverty neighborhoods has defined them as those in which more than a fixed percentage of the population of the neighborhood has an income below the federal poverty line. Common choices are 20 percent poor (South and Crowder 1997), 30 percent poor (Wilson 1987), and 40 percent poor (Jargowsky and Bane 1991; Jargowsky 1997a). In field work, Jargowsky and Bane (1991) found that of these three thresholds, neighborhoods that were more than 40 percent poor corresponded most closely to what are commonly called slums or ghettos. Correspondingly, I consider high-poverty neighborhoods to be those in which at least 40 percent are poor.

Duration and Neighborhood Effects

Probably the most important consequence of high-poverty neighborhoods is their negative influence on the quality of life. Poor neighborhoods tend to have high rates of neighborhood crime, dilapidated housing stock, and inadequate public services (Jargowsky and Bane 1991; Krivo and Peterson 1996; Morenoff and Sampson 1997). Ethnographic accounts suggest that these problems strongly influence community life and are a constant stress on the inhabitants of poor neighborhoods (Anderson 1990; Kotlowitz 1991). A second, more studied consequence of high-poverty neighborhoods is their negative influence on the life chances of children who grow up in them (Brooks-Gunn, Duncan, and Aber 1997).

Knowing how long residents spend in high-poverty neighborhoods is a prerequisite to understanding the social costs associated with these neighborhoods. Little systematic research has investigated the issue of how neighborhood effects may vary by duration in a high-poverty neighborhood. Qualitative studies, however, suggest that the psychological stresses of poor neighborhoods accumulate over time (Kotlowitz 1991; Furstenberg 1993). Children who spend many years in high-poverty neighborhoods are probably more affected by them than children who spend only a couple of years there.[2] For short-term residents of high-poverty neighborhoods, there may be no lasting effects.

Measuring Entrapment

At the most basic level, to be trapped in a neighborhood is to reside there involuntarily for a long period of time. Because entrapment is usually an implicit rather than an explicit assumption, though, there is no more exact standard for what might constitute entrapment in poor neighborhoods. More precise definitions can include several possible patterns of duration, such as:

1. *Long spells*: Most of the residents of poor neighborhoods will tend to reside there for long spells; exits from poor neighborhoods will be very unusual.

2. *Long total exposure*: The residents of poor neighborhoods will be exposed to poor neighborhoods for a long time, even if they tend to exit poor neighborhoods at moderate or high rates. This is possible if many of the residents of poor neighborhoods often move out of poor neighborhoods for more affluent neighborhoods but also tend to move back frequently—that is, if repeat spells in high-poverty neighborhoods are common.

3. *Relatively long spells or relatively long total exposure*: Residents of poor neighborhoods will tend to have either longer single spells or longer total exposure than residents of some comparison neighborhood type.

This investigation considers the entrapment hypothesis in only the first two senses, not in sense #3 above or in other possible senses of "entrapment." The first two definitions measure entrapment in an absolute

[2]An, Haveman, and Wolfe (1992) conclude that measures of family characteristics taken from a single year of a child's life are poor proxies for multiyear information recorded over the life of a child. Their investigation does not, however, include neighborhood variables.

sense, which is one sense clearly implied in current discussions of the residents of high-poverty neighborhoods as an isolated and distinct population.

The third sense of entrapment, relative to other neighborhood types, is appealing in that it provides a clear standard to judge what is considered “long” by comparison to other neighborhood types. But entrapment in this sense faces serious problems of interpretation and measurement. Comparing the stays of residents of high-poverty neighborhoods to stays of residents of other neighborhood types raises the problem that residents may tend to stay in some neighborhood types by choice, rather than because they are unable to move out (as “trapped” implies). If the residents of Beverly Hills rarely move away from their neighborhood, this is probably because they prefer their neighborhood to others, not because it is difficult for them to move elsewhere. The residents of high-poverty neighborhoods, on the other hand, have good reasons to want to move to more affluent neighborhoods. Qualitative studies correspondingly find that many residents of poor neighborhoods want to escape their impoverished environments (Kotlowitz 1991; Furstenberg 1993). It is difficult to choose a comparison neighborhood type that residents have as strong a reason to avoid as the poorest neighborhoods, which is necessary to make a meaningful comparison in the third sense.

Prior Research

To my knowledge, no prior research systematically considers how long residents stay in high-poverty neighborhoods. Several recent studies, however, consider the probability of moving across neighborhoods with specific poverty thresholds (Gramlich, Laren, and Sealand 1992; Massey, Gross, and Shibuya 1994; South and Crowder 1997).[3] Probability of movement and spell length are closely related. But the probabilities estimated in these studies are not appropriate for deriving a distribution of spell

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[3]South and Crowder (1997) examine patterns of movement conditioned on many independent variables, although not duration. Conditioning on independent variables is likely to reduce duration-dependence, and might eliminate it completely (McFarland 1970). However, there is no way to tell the extent of residual time dependence from their results.

lengths because no study models the transition probabilities as a function of duration in the neighborhood. Research on residential mobility finds that persons who moved recently are much more likely to move than people who have not moved recently (Land 1969). Estimates based on probabilities that do not incorporate duration-dependence will systematically underestimate the share of persons who experience both short and long spells in a high-poverty neighborhood. As a result, it is impossible to estimate spell lengths in poor neighborhoods without new estimates of the transition probabilities.

METHODS

The residents of poor neighborhoods at a point in time are in the midst of heterogeneous temporal patterns—some experience long single spells in poor neighborhoods, others are in the midst of one of multiple spells, and yet others are in the midst of a short spell that does not recur. Correspondingly, rather than single numbers I derive distributions of single spells and distributions of exposure to poor neighborhoods. The corresponding results are more complex to interpret than single-number summaries, but they do not oversimplify the problem as single-number summaries do.

A Model to Form Spell Estimates

The simplest method to compute spells is direct tabulation of years spent in high-poverty neighborhoods, based on a fixed observation window. Because many long spells will be in progress at the beginning and end of the observation window, however, this method will lead to substantial underestimates of the number of long spells unless the observation window is much longer than almost all spells (Bane and Ellwood 1986). Without a very long time span and a great amount of data, the censoring problem inherent in not observing the beginning and end of long spells will inevitably lead to trouble. No data set including sufficient information is available to directly tabulate spell durations for high-poverty neighborhoods.

The most common solution to this problem, and the one that I follow here, is to use a model of how people move among neighborhoods to estimate spell lengths. Bane and Ellwood (1983, 1986) first used this approach to calculate spells in poverty. They show that duration-dependent exit probabilities can be used to estimate a distribution of spell lengths based on a model of how persons move. A key advantage of this approach is that it does not require a correct model of each individual's probability of mobility among neighborhood types to generate accurate spell estimates for the population of interest. All that is necessary are estimates of entry and exit probabilities conditional on duration (Bane and Ellwood 1986).[4]

Bane and Ellwood's (1983, 1986) approach has one key limitation: it focuses exclusively on single spells. Bane and Ellwood's analysis can only be used, then, to examine entrapment in the sense of long spells (sense #1), rather than long total exposure (sense #2). Accounting for repeat spells requires a slightly more elaborate model than Bane and Ellwood used. Several approaches are available from the literature on spells in poverty or on welfare (Coleman 1989; Gottschalk and Moffitt 1994; Stevens 1995). My solution is formally identical to that employed by Coleman (1989). Instead of using Coleman's algebra for considering multiple spells, however, I use an equivalent algebra from McGinnis's (1968) work on Markovian models of social mobility.[5] This model incorporates the probabilities of moving in *and* moving out, rather than just exit probabilities as Bane and Ellwood's spell calculations do.

This approach can be thought of as a simulation based on a hypothetical population. First, using data I estimate duration-dependent probabilities of exiting and entering a high-poverty neighborhood; these are the estimates that govern the simulation. Then, I begin with a hypothetical population that has the same distribution among neighborhood types (the same percentage in a high-poverty neighborhood)

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[4]The formulas and essential logic of the spell calculations of Bane and Ellwood are given in the Appendix.

[5]Coleman (1989) derives explicit measures of spells based on a population which is formally equivalent to that of McGinnis (1968), except that Coleman's estimates extend the process to continuous time. McGinnis's (1968) matrix algebra is more compact for discrete-time applications. McGinnis, however, never applied the model to estimate spell times.

as the observed (actual) population.[6] I allow this hypothetical population to move according to the specifications of the model. Duration calculations then follow by tabulation from these patterns of movement among neighborhood types.

This approach is similar to spell estimates based on model life tables (Keyfitz 1977), but in my models, the probability of moving is a function of duration, rather than age as is typical in life tables. Unlike age, duration resets to zero after a move, whereas after a death an observation exits the population permanently. Wolf (1988), however, has developed life table techniques that incorporate duration. Simple forms of his models are equivalent to those used here.

McGinnis (1968) developed a model of social processes in which the probabilities of changing from one state to another are a monotonically declining function of duration in the neighborhood type.[7] In McGinnis's model a move into or out of a high-poverty neighborhood resets the duration clock to one, so the persons most likely to move are those who have just switched into a new neighborhood type. This is also an implicit assumption of Bane and Ellwood's calculation of spell times. There are a number of other forms that such declining probabilities could take, but I follow McGinnis's and Bane and Ellwood's assumption that the duration clock resets following a move.[8] For a general overview of Markovian and pseudo-Markovian models and recent work using them, see Amemiya (1985, chapter 11).

A bit of formalism is necessary to describe the specifics of the model. My exposition closely follows McGinnis (1968). Let p(d) be the probability that a respondent who has been in a poor neighborhood for d prior time periods will exit; r(d) is the probability that a respondent who has been out

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[6]I also assume that the marginal distribution among duration categories at the start distribution is the same as for the stable population distribution corresponding to the transition rates.

[7]McGinnis refers to the decline of exit probabilities common to many social processes as the "axiom of cumulative inertia." Logan (1981) refers to these effects more simply as "persistence effects."

[8]Boudon (1973) discusses several other possible models of duration-dependent exit probabilities. Instead of fully resetting the clock of duration after each move, alternative models Boudon discusses decrease it by one for each move, or do not increment the duration clock during for the period when the respondent moves. To some extent I am able to evaluate the adequacy of this duration-resetting model by considering model fit (below).

of the poor neighborhood type for d time periods will enter. We can write these transition probabilities into a duration-specific transition matrix P(d):

$$P(d) = \begin{bmatrix} 1 - r(d) & r(d) \\ p(d) & 1 - p(d) \end{bmatrix} \quad \textbf{(1)}$$

In this matrix the probability of staying in the current neighborhood type (poor/nonpoor) is given by the diagonal element of the matrix and the probability of changing neighborhood type is given by the off-diagonal element. The d distinct P(d) matrices define the process that governs mobility in this simulation. Define the duration-specific stayer matrix as:

$$S(d) = \begin{bmatrix} 1 - r(d) & 0 \\ 0 & 1 - p(d) \end{bmatrix} \quad \textbf{(2)}$$

Likewise define the mover matrix M(d) = P(d) − S(d). Finally, let A(t) denote the 2 x D matrix that contains the distribution of the population among each of the two states in each of the D duration categories at time period t. Let $A_d(t)$ denote the dth row of the matrix, which contains the distribution of the population in the dth duration category. Denoting the transpose of the mover matrix M(d) by M(d)′, the distribution of the population under this model at time t will be:

$$A_d(t) = \begin{cases} \sum_{d=1}^{D} M(d)' A_d(t-1) \;\; if \;\; d=1 \\ S(d) A_{d-1}(t-1) \;\; if \;\; d>1 \end{cases} \quad \textbf{(3)}$$

B(t) is a 1 x 2 vector that contains the marginal probability of being in each state at time t. Therefore:

$$B(t) = \sum_{d=1}^{D} A_d(t) \quad \textbf{(4)}$$

One useful property of the population governed by this mobility process is that:

$$\lim_{t \to \infty} B(t) = B* \qquad \textbf{(5)}$$

where B* is the 2 x 1 equilibrium vector of the population distribution. In other words, if the duration-dependent transition probabilities are applied to a population over a long period of time, the population will eventually achieve a stable equilibrium distribution among states, as an ordinary Markov model would. This equilibrium distribution is known in demography as the stable population.[9] The population of this duration-dependent model will reach a steady state because this non-Markovian process can be redefined so that it is conditionally Markovian (Wolf 1988).

McGinnis's model and other models that are close to it (Ginsberg 1971; Tuma 1976; Logan 1981) have not seen many applications in sociology since they were developed. One likely reason is the lack of longitudinal data needed to estimate duration-specific transition probabilities. But a bigger impediment was that these models were never given any clear use in empirical research by sociologists. Bane and Ellwood (1983, 1986) gave models of this form an important substantive application by using them to model spell times on welfare and in poverty.

The McGinnis model also addresses a problem with applying Bane and Ellwood's spell techniques to high-poverty neighborhoods. Bane and Ellwood's poverty spells assume that the system is at equilibrium—the rates are such that the proportion of persons who are poor is stable over time. Bane and Ellwood argue that lack of an overall trend in poverty rates suggests that this is a reasonable assumption when the object of the investigation is spells in poverty. In the case of high-poverty neighborhoods, however, research strongly suggests that the proportion of the population living in poor

[9]See a demographic methods textbook, such as Hinde (1998), for a discussion of the stable population applied to birth and death rates. See Keyfitz (1977) for a discussion of computing the stable population distribution from a matrix of transition rates, and Rogers (1968) for the use of matrix methods in the analysis of migration.

neighborhoods increased in the 1980s (Gramlich, Laren, and Sealand 1992; Kasarda 1993; Jargowsky 1997a; Quillian 1999), implying that the system is not in a stable state. A model that incorporates entry and exit rates allows the calculation of statistics measuring exposure to high-poverty neighborhoods when the system is at an arbitrary, out-of-equilibrium starting point. It is still necessary, however, to assume that the transition rates, conditional on duration, are stable over time.

This approach to estimating spells requires three steps. First, I estimate the probabilities of exit and entry to a neighborhood type, conditional on duration, based on data on actual mobility. Second, I calculate spell distributions in poor neighborhoods using the Bane and Ellwood spell calculations (the formulas are reproduced in the Appendix). Finally, I use a computer simulation based on a hypothetical population whose mobility is governed by the models in equations 1–5 to consider repeated spells and an out-of-equilibrium starting point.

DATA

The basic data used to estimate transition probabilities are from the Panel Study of Income Dynamics (PSID), a large, longitudinal study that has followed 5,000 families and their descendants with yearly reinterviews since 1968 (see Hill 1992 for a summary). I use PSID data for all years from 1979 to 1990 matched to census data on tracts in which the PSID respondents lived.[10] The sample excludes individuals who were not observed for at least 5 years; all other PSID respondents with valid geocodes are included.

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[10]I do not use data before 1979 because the PSID geocode addresses are not available for 1975, 1977, and 1978. Tracts are small areas of a few city blocks that usually contain on average about 4,000 residents. For a detailed description of how census tract boundaries are drawn and discussion of the validity of using tracts for neighborhoods, see White (1987), Chapter 1 and Appendices A and B. Appendix 3 includes more detail on the size of the samples used in the analysis.

Sample and Analysis Choices: The Studied Subgroups

Potentially, duration estimates in high-poverty neighborhoods can be calculated for the total population or for any subset of the total population, within the constraints of sufficient sample sizes of these subgroups. I choose to focus here separately on persistently poor and nonpoor African Americans.

This study examines only the experiences of African Americans rather than other racial groups for practical reasons. Due to the poverty-concentrating effect of residential racial segregation on minority populations, non-Hispanic whites make up only a very small share of the residents of extremely poor neighborhoods (Massey 1990). In 1990 about 14.3 percent of African Americans and 9.4 percent of Hispanics lived in high-poverty neighborhoods; only 1 percent of non-Hispanic whites did so (Jargowsky 1997a, p. 69). The PSID contains too few whites in high-poverty neighborhoods to support a separate analysis. Pooling African Americans and whites together in an analysis would combine two extremely heterogeneous groups—the transition probabilities through high-poverty neighborhoods are very different for African Americans than for whites. Because the burden of high-poverty neighborhoods falls so disproportionately on nonwhites, and because the PSID has very few nonwhites other than African Americans, I focus exclusively on African Americans.

I calculate spell distributions separately for poor and nonpoor persons, where poverty is defined by long-term poverty status. This division of the sample into two groups is guided by theoretical concerns. Discussions of high-poverty neighborhoods are often especially concerned with their poor residents. Wilson (1991, 1996), for instance, focuses on the problems of the "ghetto poor." Further, if there is any subgroup that is likely to be "trapped" in poor environments, it is the persistently poor. Thus, examining the experiences of this subgroup allows an examination of the group for which there is the greatest concern about possible long-term exposure to high-poverty neighborhoods.

"Poor" in the PSID is defined as living in a family with a long-term average income-to-needs ratio less than 1.25 times the federal needs standard. Specifically, I use the mean family income-to-needs ratio for all years from 1979 to 1990 for which the individual is observed. (The sample includes only individuals who were observed for at least 5 years.) Unless otherwise noted, the persons I refer to as "poor," then, are poor based on their long-term average income-to-needs ratio. If moves into or out of high-poverty neighborhoods are often accompanied by major changes in economic status, however, this approach would miss an important aspect of relocations among neighborhoods. Thus, I also conduct a separate analysis using a single-year measure of income to needs to analyze the relationship between income changes and entrance to or exit from high-poverty neighborhoods.

It would also be possible to subdivide the population further and in different ways, and to separately examine spell distributions for these subgroups. Practically, this might be difficult because the subgroup sizes could be too small to generate reliable transition probability estimates. More important, most other subgroup breakdowns lack the clear justification from past literature to lead me to calculate separate estimates by poverty status.

Neighborhood Poverty Rates

The individual-level PSID data are matched to data on census tracts from the U.S. Bureau of the Census. I use linear interpolation between adjacent census years (1970 and 1980 or 1980 and 1990) to predict tract poverty rates for the years 1979 and 1981–89.[11] This allows for the fact that respondents can exit or enter a high-poverty neighborhood in two ways: they can move to another census tract, or the census tract can change in type around them.

Two other alternatives that could be taken to deal with change in census tract poverty rates are to only use census data for tracts from either 1970, 1980, or 1990, or to use some more complicated nonlinear function to predict change in census tract poverty rates. Each of these options has disadvantages that lead me to prefer linear interpolation to fill in poverty rates. Matching the nearest

[11]Census tracts whose boundaries changed between census years were coded to be missing for purposes of this analysis.

census year without interpolation does not allow for the fact that census tract poverty rates change over time. One way people enter and exit poor neighborhoods, neighborhood change, would be eliminated by definition, leading to an underestimate of the extent of mobility into and out of high-poverty neighborhoods.[12] Using a more complicated quadratic or other nonlinear specification to estimate change in neighborhood poverty rates would also be possible, but existing research provides no basis upon which to choose the equation to use for such an interpolation. Although imperfect, a linear trend is simpler and probably at least as accurate as arbitrarily imposing some more complicated function to estimate tract poverty rates.

I consider respondents to be residents of high-poverty neighborhoods when they live in a metropolitan census tract in which at least 40 percent of persons live in families with income below the poverty line.[13] Under this definition, respondents who are not residents of metropolitan areas *are* included in this analysis. Effectively there are two possible states: residents of high-poverty metropolitan tracts and residents of other neighborhoods. Nonmetropolitan residents are included in the latter category. This choice requires some defense, because at first glance it might seem that nonmetropolitan residents should be excluded. If this were a purely cross-sectional study, this might be the correct course of action, but in an analysis of moves, such an exclusion would lead to the omission of persons who move into or out of a high-poverty urban neighborhood by moving to or from a nonmetropolitan area. This would lead to underestimates of the probability of exiting a high-poverty neighborhood, because

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[12] In addition, using data for specific years without interpolating leads to the problem that there is a sudden, sometimes large, change in poverty rates in the transition year between the base years that are used for assignment. If 1985 tract poverty rate is assigned using 1980 data, and 1986 is assigned using 1990 data, this will create a sudden jump in average poverty tract percentages in the data from 1985 to 1986.

[13] Justification of the 40 percent poor criterion is discussed above.

moves to nonmetropolitan areas are excluded. To be representative of all moves that influence the population of a neighborhood type, all moves to and from that type must be included.[14]

A different alternative for dealing with nonmetropolitan respondents would be to categorize respondents living in high-poverty rural areas as residents of high-poverty neighborhoods. There are, however, theoretical and practical difficulties with this approach. The lower population density in nonmetropolitan areas almost surely gives this poverty a different character from that of high-poverty neighborhoods in metropolitan areas. Practically, before 1990 the Census Bureau did not tract nonmetropolitan areas. None of the units available for nonmetropolitan units before 1990 are comparable to tracts, and it is arguable that none of these units do a good job of capturing the idea of "neighborhood."

My sample is analyzed in person-year format. If a family of three persons moves, this counts as three separate moves.[15] This does not bias transition probability estimates, but it is a source of clustering in the data. The data are also clustered because they include observations on individuals at multiple points in time and because the sample was selected by a clustered sampling design. Formulas assuming independence of observations will seriously underestimate the true sampling variation. Standard errors are calculated using the Taylor series formulas with strata/PSU identifiers to adjust for these sources of clustering (StataCorp 1999).

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[14]The exclusion of moves to and from nonmetropolitan areas is a source of bias in several published studies of mobility using the PSID data, although not necessarily a severe one.

[15]One other option would have been to do the analysis entirely using PSID families rather than individuals. There are two reasons why this would be inferior. First, it is difficult to decide how to handle family split-ups that lead to moves among neighborhood types. Second, and more fundamentally, we are interested in generalizing to the population exposed to high-poverty neighborhoods among persons, not families. Using families gives equal weight in the analysis to single- and multiple-person families. The human costs of poor neighborhoods are best assessed on a per person basis, not a per family basis.

Maximum Durations and Left-Censored Spells

A final problem is that many of the individuals in the data never move into or out of a high-poverty neighborhood during the 11-year span of data available (1979–1990). Since no transition is observed, the duration of residence for these cases is unknown. It is tempting simply to discard cases that never switch neighborhood types, but to do so would induce a form of selection bias (Stevens 1995). Individuals who began spells after 1979 are likely to have higher transition probabilities than the rest of the population because they have experienced at least one transition since 1979.

An easy solution to this problem is available if the probabilities of entering or exiting stabilize after a given number of years (Stevens 1995). Assuming that the neighborhood probabilities stabilize after roughly 5 years, I include all respondents who have resided in a neighborhood type for at least 5 years in a "5+" category.[16] In addition to solving this selection problem, this approach also substantially increases the number of cases in the highest-duration category (5+) and so leads to more precise estimates. Inspection of the transition probabilities beyond 5 years suggests that they stabilize at this point, although sample sizes are too small to draw any strong conclusions (not shown).

Other Sources of Population Change in Neighborhoods

The entrances and exits used in the model to estimate spell times include only those due to migration or neighborhood change. Other processes such as birth and death also influence the total population of poor and nonpoor neighborhoods, but these sources of population change are not modeled; essentially, my estimates abstract from these other processes.[17] At points below, I discuss the likely

[16]Respondents who are not observed for at least 5 years are excluded. Unlike the exclusion of persons who have never moved, there is no reason to assume that excluding these cases will bias transition probability estimates conditional on duration.

[17]The models limit the maximum length of stay in a neighborhood type to 50 years. This eliminates the small share of a population who, in the simulation, would be living in a neighborhood type for extremely long periods. If death were modeled, this subpopulation of extremely long stayers would attrite somewhat in that way.

influence of this exclusion in the results section. This is a topic that could be considered further in future research.

RESULTS

I consider two preliminary questions and then proceed to the analysis of durations.

Do Exits from High-Poverty Neighborhoods Constitute Meaningful Changes?

Any definition of a high-poverty neighborhood that relies on a fixed cutoff point involves an element of arbitrariness. If many moves "out" of high-poverty neighborhoods are small changes in neighborhood poverty levels, such as a move from a neighborhood that is 41 percent poor to a neighborhood that is 39 percent poor, then it may be misleading to make much of most exits from high-poverty neighborhoods.

Table 1 investigates the extent to which this is a problem. The cell entries in Table 1a give the average changes in poverty status that accompany exits from high-poverty neighborhoods. Among persons who moved out of poor neighborhoods, the average decline in the poverty rate of the neighborhood to which they moved was 18 percent for poor respondents and about 27 percent for nonpoor respondents. Entries into high-poverty neighborhoods, shown in Table 1b, are accompanied by increases in neighborhood poverty rates of about equal magnitude—about 19 percent for poor respondents and about 26 percent for nonpoor respondents. When PSID respondents move out of extremely poor neighborhoods they usually move to substantially less-poor neighborhoods.

Among respondents who did not move, but whose neighborhoods changed around them, the increase or decrease was much smaller, about 2 percent. In part, this small change is an artifact of the interpolation of neighborhood changes based on data 10 years apart, effectively smoothing the pace of

TABLE 1a

**Average Decline in Neighborhood Poverty Percentage,
African Americans Exiting a Poor Neighborhood**

Exits	Poor	Nonpoor
Movement	18.0	26.6
	(1.84)	(1.86)
Neighborhood change	2.1	2.1
	(2.46)	(0.26)
All	15.3	18.2
	(3.37)	(2.43)

TABLE 1b
**Average Increase in Neighborhood Poverty Percentage,
African Americans Entering a Poor Neighborhood**

Entries	Poor	Nonpoor
Movement	18.6	26.2
	(1.16)	(1.14)
Neighborhood change	2.6	1.7
	(0.62)	(0.25)
All	13.6	12.8
	(0.87)	(3.37)

Source: Panel Study of Income Dynamics, 1979–90.

Note: Poverty status is determined by long-term average income-to-needs ratio (see text). Standard errors are in parentheses.

neighborhood change. Still, this accords with general intuition that changes in neighborhood environments are likely to be more gradual than changes resulting from relocation to a new environment.

The third rows in Tables 1a and 1b show changes in the neighborhood poverty percentages for moves of all sorts. Because movement is a more frequent source of entrances to and exits from high-poverty neighborhoods than is neighborhood change, the average overall change in poverty percentages tends to be large. Most entrances to and exits from high-poverty neighborhoods represent significant shifts in the poverty rate of the surrounding neighborhood.

Changes in Neighborhood and Economic Status

By using a long-term average to characterize poverty status, I avoid complications to the model that would result by allowing poverty status to change over time. Yet if many moves out of high-poverty neighborhoods are accompanied by substantial changes in poverty status—that is, if they are also moves up in terms of social class—then this approach may miss an important aspect of such transitions. Row 1 of Table 2 shows average changes in the family income-to-needs ratio that accompany transitions into and out of high-poverty neighborhoods.

There is only a relatively weak tendency for transitions into or out of high-poverty neighborhoods to be accompanied by changes in economic status. The average change in the income-to-needs ratio in the survey years surrounding the move is −.032, a statistically insignificant decline. Moves into high-poverty neighborhoods are accompanied by statistically significant declines in the family income-to-needs ratio, but the change is substantively small. Using a longer window after moves to gauge the change in income associated with moving, shown in Row 2, leads to similar results. This is consistent with South and Crowder's (1997) multinomial logit results predicting exit from poor neighborhoods; they

TABLE 2

Change in Economic Well-Being of African Americans Accompanying Changes in Neighborhood Status

	Exit High-Poverty Neighborhood	Enter High-Poverty Neighborhood
Mean change in income-to-needs ratio, year after move minus year before	-0.03	-0.25
	(0.039)	(0.034)
Mean change in income-to-needs ratio, 2 years after move minus year before	0.09	-0.28
	(0.034)	(0.050)

Source: Panel Study of Income Dynamics, 1979–90.

Note: Poverty status determined by single-year income-to-needs ratio. Standard errors are in parentheses.

found no statistically significant association between moving out and change in income.[18] Most entries and exits from poor neighborhoods do not appear to be accompanied by substantial increases or decreases in family economic status.

Entries, Exits, and Neighborhood Types

The first step in deriving a distribution of spell times is empirically to estimate the exit and entrance probabilities, conditional on duration of residence (the p(d) and r(d) of equation 1). To do so, I use discrete-time event history models of exits from and entries to high-poverty neighborhoods with data in person-year format (Allison 1984). Inspection of the transition probabilities shows that the relationship between the logit of the transition probabilities and duration to be tolerably close to linear.[19] Accordingly, I model the logit of the probability of moving out as a linear function of duration in a high-poverty neighborhood.[20] If the probability of entering or exiting a high-poverty neighborhood increased in the later years, this could distort the duration estimates, because there is a positive correlation between duration and survey year in the sample. To deal with this, year dummy variables are included to control for period effects.[21]

The model estimates are shown in Table 3. The results confirm that the probability of moving into or out of a high-poverty neighborhood declines with duration of residence. This model is used to estimate the duration-specific rates of mobility that are the basis of the duration estimates. The models

[18]Because South and Crowder control for many variables, including some that may mediate between the effect of income and mobility among neighborhood types (such as renter/owner status), their results cannot be used to analyze descriptively whether changes in economic status tend to be accompanied by changes in residence.

[19]Squared terms for duration to allow for nonlinearity in the functional form were not statistically significant. A graph showing the logit of the exit and entry probabilities against year are shown in Appendix Figure 1.

[20]I have also calculated estimates using two other approaches. First, I have tried using dummies for duration (effectively a step function) rather than a linear duration term. Second, I have tried simply using raw probabilities, shown in Appendix Table 1. These changes do not alter the substantive conclusions of the paper.

[21]Interactions of poverty status and duration were not statistically significant.

TABLE 3

Models of Probability of Entering or Exiting a High-Poverty Neighborhood by Moving, Conditional on Duration

Exits from Poor Neighborhoods		Entrances into Poor Neighborhoods	
Variable	Coef.	Variable	Coef.
Duration in poor neighborhood in years	-0.65* (0.112)	Duration out of poor neighborhood in years	-0.58* (0.112)
Respondent is poor (1=yes)	0.61 (0.352)	Respondent is poor (1=yes)	1.25* (0.607)
Year 1981 (1=yes)	0.35 (0.431)	Year 1981 (1=yes)	-0.22 (1.198)
Year 1982 (1=yes)	1.64* (0.405)	Year 1982 (1=yes)	0.54 (1.087)
Year 1983 (1=yes)	2.28* (0.725)	Year 1983 (1=yes)	-0.04 (0.499)
Year 1984 (1=yes)	1.75* (0.533)	Year 1984 (1=yes)	-0.50 (0.759)
Year 1985 (1=yes)	1.23* (0.557)	Year 1985 (1=yes)	0.54 (1.027)
Year 1986 (1=yes)	2.13* (0.707)	Year 1986 (1=yes)	-0.28 (0.998)
Year 1987 (1=yes)	1.51* (0.602)	Year 1987 (1=yes)	-0.16 (0.669)
Year 1988 (1=yes)	1.83* (0.564)	Year 1988 (1=yes)	0.51 (1.069)
Year 1989 (1=yes)	1.89* (0.538)	Year 1989 (1=yes)	0.48 (1.194)
Intercept	-2.14* (0.581)	Intercept	-2.26* (1.085)

Notes: Reference year is 1980. Standard errors are in parentheses. Person-years in which neighborhoods changed around respondents are excluded. Poverty status is determined by long-term average income-to-needs ratio (see text). * = coefficient / standard error > 2.

could include additional controls, but these controls would not serve any useful purpose unless we were to use the models to derive estimates of spell length for the groups defined by the controls. To generate accurate spell estimates, it is necessary only that we have accurate average probabilities of movement conditional on duration of residence, not that we include all variables that influence the probability of making a transition.

The second way that people can switch neighborhood type is by having their neighborhood change around them. Unlike switching among neighborhood type due to movement, prior research provides no reason to believe that these changes are a function of duration of residence. Tests with the PSID data correspondingly showed little relationship between how long people stay and whether a neighborhood changes around them.[22] Accordingly, I separately estimate the probability of neighborhood change without conditioning on duration.[23]

The estimated probabilities, from both the model and the simple means from the neighborhood change estimates, are shown in Tables 4a and 4b. Tables 4a and 4b give the estimated probabilities of moving, conditional on length of stay. The left column shows the predicted probabilities from models that estimate the logit of the probability of moving in or moving out as a linear function of duration. The predictions are generated using the average year effect from the logistic regression (Table 3) in the predictions, rather than choosing any particular base year for the estimates.[24]

In the second column, Tables 4a and 4b show the overall probability of moving into or out of a neighborhood type. The overall probability, conditional on duration, is shown in the third column. The overall probability is the sum of the probability of entering or exiting by moving (column 1) and the

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[22]These tests are shown in Appendix Table 2.

[23]The major empirical advantage of estimating these two processes separately is that it allows me to use all the data to estimate the probability of movement out of a poor neighborhood due to neighborhood change. This improves the precision of the neighborhood-change probability estimates because cases with unknown duration of stay can be included.

[24]This is the average of the intercept term and the other year effects in Table 3.

TABLE 4a

Probabilities for African Americans from Exit of the Extremely Poor Neighborhood Type, Conditional on Length of Stay

	Poor			Nonpoor		
Duration	Predicted Probability, Linear Logit with Year Controls (1)	Probability of Neighborhood Change (2)	Overall Probability of Exit, p(d) (3)	Predicted Probability, Linear Logit with Year Controls (1)	Probability of Neighborhood Change (2)	Overall Probability of Exit, p(d) (3)
1	0.340	0.026 (0.0156)	0.367	0.219	0.031 (0.0130)	0.250
2	0.213	0.026 (0.0156)	0.239	0.128	0.031 (0.0130)	0.159
3	0.124	0.026 (0.0156)	0.150	0.072	0.031 (0.0130)	0.102
4	0.069	0.026 (0.0156)	0.096	0.039	0.031 (0.0130)	0.070
5+	0.037	0.026 (0.0156)	0.064	0.021	0.031 (0.0130)	0.051

Source: Panel Study of Income Dynamics, 1979–90.

Notes: Extremely poor neighborhoods are those in which at least 40 percent of the population is poor. Standard errors of nonmodel-based estimates are in parentheses.

TABLE 4b

Probabilities for African Americans of Moving into the Extremely Poor Neighborhood Type, Conditional on Length of Stay

	Poor			Nonpoor		
Duration	Predicted Probability, Logit with Year Linear Controls (1)	Probability of Neighborhood Change (2)	Overall Probability of Entrance, r(d) (3)	Predicted Probability, Linear Logit with Year Controls (1)	Probability of Neighborhood Change (2)	Overall Probability of Entrance, r(d) (3)
1	0.183	0.011 (0.0042)	0.194	0.060	0.007 (0.0023)	0.068
2	0.112	0.011 (0.0042)	0.123	0.035	0.007 (0.0023)	0.042
3	0.066	0.011 (0.0042)	0.077	0.020	0.007 (0.0023)	0.027
4	0.038	0.011 (0.0042)	0.049	0.011	0.007 (0.0023)	0.019
5+	0.022	0.011 (0.0042)	0.033	0.006	0.007 (0.0023)	0.014

Source: Panel Study of Income Dynamics, 1979–90.

Notes: Extremely poor neighborhoods are those in which at least 40 percent of the population is poor. Standard errors of nonmodel-based estimates are in parentheses.

probability of entering or exiting by neighborhood change (column 2). This is the estimate of p(d) and r(d) used in equation 1 to generate spell estimates.

We can use these estimates and the McGinnis algebra to examine the equilibrium distribution (or the stable population) implied by these rates, and compare this to the observed marginal distribution of respondents in neighborhood types to see if the system is at its equilibrium distribution. That is, we can see if the rates imply that the proportion of the African-American population living in a high-poverty neighborhood is stable over time. In Table 5 the proportion of both poor and nonpoor African Americans living in extremely poor neighborhoods (those in which 40 percent or more of the population is poor) is substantially below that of the stable distribution implied by the rates; the population of poor African Americans is especially far from its stable distribution. The rates indicate that the proportion of African Americans in extremely poor neighborhoods is going up over time. This is consistent with analyses based on decennial census results, which show an increase in the proportion of the population living in high-poverty neighborhoods during the 1980s (Jargowsky 1997a).

Spells in Extremely Poor Neighborhoods

Are the African-American residents of extremely poor neighborhoods largely long-term residents, who might be thought of as an isolated and distinct group? Table 6 is a first attempt to answer this question using single-spell estimates. The spell estimates are based on the probabilities in Table 6 and on formulas for computing spell distributions (Ellwood and Bane 1986; the formulas are reproduced in Appendix 1). Table 6a shows spell estimates for poor blacks, and Table 6b for nonpoor blacks.

As Table 6 shows, the answer to the question “How long are spells in high-poverty neighborhoods?” depends on how we define the population of people exposed. Durations of stay are usually short among new entrants to high-poverty neighborhoods. More than half of poor African Americans who have just entered very poor neighborhoods will not stay long—65.3 percent are expected to stay for 5 years or less, while another 9.7 percent are expected to stay for 6 to 10 years. For nonpoor

TABLE 5
Populations at Starting and Equilibrium

	Starting Distribution	Equilibrium Distribution
Poor African Americans		
40% or more poor	14.6%	25.1%
Less than 40% poor	85.4%	74.9%
Nonpoor African Americans		
40% or more poor	11.3%	16.7%
Less than 40% poor	88.7%	83.3%

Source: Panel Study of Income Dynamics, 1979–90.

Notes: Starting distribution based on direct tabulation of PSID person-years, 1979–90. Equilibrium distribution based on model using estimated transition probabilities. Poverty status is determined by long-term average income-to-needs ratio (see text).

TABLE 6

Estimated Spell Distribution for African Americans in Extremely Poor Neighborhoods

Spell Length	Persons Beginning a Spell Completed Spell Distribution	Persons in Neighborhood at a Given Time Completed Spell Distribution
A. Poor African Americans		
1	36.7%	4.6%
2	15.1%	3.8%
3	7.3%	2.7%
4	3.9%	1.9%
5	2.4%	1.5%
Subtotal, 1–5	65.3%	14.5%
6–10	9.7%	9.5%
11–15	7.0%	11.2%
16–20	5.0%	11.2%
21–30	6.2%	19.3%
31+	6.6%	34.3%
Total	100.0%	100.0%
B. Nonpoor African Americans		
1	25.0%	2.0%
2	11.9%	1.9%
3	6.5%	1.6%
4	3.9%	1.3%
5	2.7%	1.1%
Subtotal, 1–5	50.0%	7.9%
6–10	11.6%	7.5%
11–15	8.9%	9.4%
16–20	6.8%	10.0%
21–30	9.3%	19.0%
31+	13.3%	46.3%
Total	100.0%	100.0%

Source: Panel Study of Income Dynamics, 1979–90.

Note: Estimates are computed assuming a maximum spell length in a high-poverty neighborhood of 50 years. (Exit probability at year 50 is equal to 1.) Spell distributions at a given time assume system is at equilibrium. Extremely poor neighborhoods are those in which at least 40 percent of the population is poor. Poverty status is determined by long-term average income-to-needs ratio (see text).

African Americans, stays are on average somewhat longer—50 percent are expected to stay for 5 years or less, and another 12 percent are expected to stay 6 to 10 years. The other 25 percent of poor and 38 percent of nonpoor African Americans who enter a very poor neighborhood are expected to remain there for at least 10 years.

The duration of stays in poor neighborhoods looks much longer if we consider completed spells of persons who reside in poor neighborhoods at a given time. The distribution of completed spell times for individuals living in an extremely poor neighborhood is shown in the second column of Table 6a. About 15 percent of poor and 8 percent of nonpoor black residents in a poor neighborhood at a given time are short-term residents (less than 5 years). About 9.5 percent of poor blacks and 7.5 percent of nonpoor blacks experience slightly longer spells of 6 to 10 years. More than half of poor residents and more than 60 percent of nonpoor residents at a given time are likely to be residents in very poor neighborhoods for a long time, more than 20 years.[25] Thus, most residents of poor neighborhoods at a given point in time are in the midst of a long spell.

Two general results are worth highlighting in Table 6. First, contrary to intuition, spells in extremely poor neighborhoods tend to be longer for nonpoor blacks than for poor blacks. Poor blacks are more likely to be renters than are nonpoor blacks, and renters are more likely to move (Speare, Goldstein, and Frey 1975; South and Crowder 1997). Second, persons in the midst of long stays make up a large share of the population of poor neighborhoods, even though they make up a minority of persons who will experience some time in a poor neighborhood over a 10-year period. This follows mathematically from a system in which exit probabilities decline with duration, because long stayers tend to accumulate in poor neighborhoods (Bane and Ellwood 1986).

[25]The proportion with long stays is inflated somewhat by the fact that death is not modeled. Long-stayers are probably more likely to die than short-stayers; if death were included as a method of exiting a high-poverty neighborhood, the share of long-stayers would probably be somewhat smaller.

Despite the presence of a group of long-term residents, the results point out the fallacy of thinking that all entrants to extremely poor neighborhoods are "trapped" there, in the sense that persons who enter a high-poverty neighborhood almost never move out (entrapment in sense #1, applied to all persons who enter). Many persons who move into a high-poverty neighborhood are likely to move out quite rapidly. Among the persons resident at a point in time, however, many will tend to reside there for long spells.

Repeating Spells

Do people who move out of poor neighborhoods tend to stay out? Or are they likely to move back? Some persons who switch neighborhood types frequently may experience many years in high-poverty neighborhoods even though they have high exit rates from such neighborhoods.

We can consider the extent to which a focus on single spells is misleading by comparing the number of years, out of a fixed number, that we expect to be spent in a high-poverty neighborhood under models constructed with and without repeat spells (Stevens 1995). This comparison is shown in the first two columns of Table 7. Column 1 shows the number of years (out of 10) in a poor neighborhood for persons who just began a spell in a high-poverty neighborhood, assuming zero probability of reentry after an exit; column 2 allows individuals to repeat spells. This is based on the McGinnis model applied to a population that has just entered a poor neighborhood at the first time period.[26] Allowing repeated spells, poor African Americans spent on average about a year longer and nonpoor African Americans about one-third of a year longer in poor neighborhoods than they did based on the single-spell estimates. For poor African Americans in particular, reentry to a poor neighborhood is a common event.

The distribution of spells out of a poor neighborhood for a population that has just exited also clarifies the nature of repeat spells. The proportion of persons who will move back into a high-poverty

[26]That is, a population with 100 percent of its members living in a high-poverty neighborhood for duration 1 at the simulation starting point.

TABLE 7
Estimates of Time Spent by African Americans in Extremely Poor Neighborhoods, Allowing for Recurring Spells

	Years in a 10-Year Period in a Neighborhood, for Persons Beginning a Spell		Reentry Proportions	
Spell Length	Single-Spell Estimate (1)	Repeat-Spell Estimate (2)	Duration out (3)	Proportion Who Will Reenter before Next PSID Year (4)
A. Poor African Americans				
1	36.7%	20.6%	1	19.4%
2	15.1%	13.0%	2	9.9%
3	7.3%	8.6%	3	5.5%
4	3.9%	6.0%	4	3.2%
5	2.4%	4.5%	5	2.0%
6	2.2%	4.3%	Subtotal, 1–5	40.0%
7	2.1%	4.6%		
8	1.9%	5.3%	6	2.0%
9	1.8%	6.6%	7	1.9%
10	26.6%	26.6%	8	1.8%
			9	1.8%
Mean	4.42 years	5.44 years	10	1.7%
			Total, 1–10	49.3%
B. Nonpoor African Americans				
1	25.0%	20.2%	1	6.8%
2	11.9%	11.0%	2	3.9%
3	6.5%	6.6%	3	2.4%
4	3.9%	4.4%	4	1.6%
5	2.7%	3.2%	5	1.2%
6	2.6%	3.1%	Subtotal, 1–5	15.9%
7	2.4%	3.2%		
8	2.3%	3.6%	6	1.2%
9	2.2%	4.2%	7	1.1%
10	40.5%	40.5%	8	1.1%
			9	1.1%
Mean	5.73 years	6.08 years	10	1.1%
			Total, 1–10	21.5%

Source: Panel Study of Income Dynamics, 1979–90.

Notes: Extremely poor neighborhoods are those in which at least 40 percent of the population is poor. Poverty status is determined by long-term average income-to-needs ratio (see text). Single-spell estimates (column 1) are a retabulation of results shown in Table 6, included for comparison.

neighborhood within 10 years is shown in column 4 of Table 7. The results are much different for poor African Americans than for nonpoor African Americans. I estimate that 40 percent of the poor blacks who move out of a high-poverty neighborhood in a single year will return to a high-poverty neighborhood within 5 years, and nearly 50 percent will return within 10 years. For nonpoor African Americans, in contrast, exits from a high-poverty neighborhood are much more likely to be long-term—only about 20 percent will return within 10 years.

Finally, Table 8 shows the distribution of number of years spent in extremely poor neighborhoods over a 10-year span for the entire populations of poor and nonpoor African Americans. (Table 7 shows estimates only for the population of persons who have just entered, i.e., persons beginning a spell.) Columns 1 and 2 of Table 8 show the distribution using the model at equilibrium and the model at the empirical starting distribution. Because the system is out of equilibrium (Table 5), the spell times of the equilibrium model look fairly different from the model at the empirical starting distribution. On the basis of this table, the model at the empirical start suggests that 7.3 percent of poor and 6.7 percent of nonpoor African Americans will spend all 10 years in a poor neighborhood. Likewise, 28.5 percent of poor and 15.1 percent of nonpoor African Americans will experience between 1 and 9 years in poor neighborhoods over a 10-year period. Finally, the model indicates that 64 percent of poor and 78 percent of nonpoor African Americans will be able to avoid exposure to high-poverty census tracts altogether. The greater entry probabilities for poor African Americans lead to much higher rates of exposure than they do for nonpoor African Americans, who have low rates of both entry to and exit from high-poverty neighborhoods. Over a 10-year period, about 37 percent of poor African Americans will spend at least 1 year in a high-poverty neighborhood, while only about 22 percent of nonpoor African Americans will experience at least 1 year there.

The contrast between the model at equilibrium (column 1) and the model at the empirical starting distribution (column 2) suggests that the length of spells in high-poverty neighborhoods grew longer from

TABLE 8

Years Spent by African Americans in Extremely Poor Neighborhoods over a 10-Year Span, Model Estimates and Direct Tabulations

Year	Model at Equilibrium (1)	Model at Empirical Starting Distribution (2)	Observed (3)
A. Poor African Americans			
0	56.3%	64.2%	63.9%
1	7.6%	7.8%	4.5%
2	4.9%	4.8%	6.2%
3	3.6%	3.3%	5.8%
4	2.8%	2.6%	6.3%
5	2.5%	2.2%	1.3%
6	2.3%	2.0%	2.8%
7	2.3%	1.9%	0.8%
8	2.4%	1.9%	2.5%
9	2.7%	2.0%	0.5%
10	12.6%	7.3%	5.4%
Mean	2.51 years	1.81 years	1.67 years
B. Nonpoor African Americans			
0	73.4%	78.2%	78.5%
1	4.0%	3.9%	4.0%
2	2.5%	2.4%	2.2%
3	1.9%	1.7%	2.6%
4	1.6%	1.4%	1.9%
5	1.4%	1.2%	0.9%
6	1.3%	1.2%	0.8%
7	1.3%	1.1%	0.7%
8	1.3%	1.1%	0.4%
9	1.3%	1.1%	0.4%
10	9.9%	6.7%	7.7%
Mean	1.67 years	1.26 years	1.21 years

Source: Panel Study of Income Dynamics, 1979–90.

Notes: Extremely poor neighborhoods are those in which at least 40 percent of the population is poor. Poverty status is determined by long-term average income-to-needs ratio (see text).

1979 to 1990. In the stable distribution, the proportion of the population that experiences 10 years of a 10-year observation window in a high-poverty neighborhood is much larger than at the empirically observed distribution, especially among poor African Americans.

The results suggest that entrapment in sense #2 (long total exposure) applies more to poor than to nonpoor blacks. This is because poor blacks are much more likely than nonpoor blacks to reenter a high-poverty neighborhood after they move out—nearly 40 percent of blacks who move out at a point in time are expected to reenter a high-poverty neighborhood within 5 years, contrasted to only about 16 percent of nonpoor blacks. For poor African Americans, the most difficult part of "escape" from high poverty neighborhoods is not moving out at a point in time, but staying out for long durations.

Years in High-Poverty Neighborhoods and Model Fit

As is not the case with spell estimates, it is possible to directly tabulate the proportion of years out of 10 spent in a high-poverty neighborhood from the PSID data. This enables us to compare the model estimates of years in high-poverty neighborhoods to those actually observed in the PSID sample, allowing for a check on the adequacy of some of the assumptions behind the model.

The model used to generate spell estimates involves several assumptions, including (1) that the transition rates are roughly constant across survey years, (2) that the transition probabilities stabilize after a duration of 5 or more years in a neighborhood type, and (3) that the probability of changing neighborhood types, conditional on duration, resets following a move into or out of a high-poverty neighborhood. All of these assumptions are questionable.[27]

Column 3 of Table 8 shows the years spent in a high-poverty neighborhood directly tabulated from the PSID sample. Compared with the model at the empirical starting distribution (column 2), the results are fairly close. The model fit is slightly better for nonpoor than for poor African Americans. But

[27]It may be that persons who exit following a long spell in a high-poverty neighborhood are more likely to return than persons who exit following a short spell. This would violate the third assumption listed here.

overall this formulation does a fairly good job of reproducing the actual lengths of time spent in high-poverty neighborhoods that are observed in the PSID sample. The model assumptions are not so far wrong that they lead to obviously flawed duration estimates, at least over a 10-year period.

CONCLUSIONS

Despite considerable recent research on high-poverty neighborhoods, the temporal aspect of residence in high-poverty neighborhoods has largely been ignored. This research calculates the first estimates of duration of stay in high-poverty neighborhoods. My estimates suggest that, based on a 10-year observation window, about 7 percent of poor and 6 percent of nonpoor African Americans will be subject to 10 or more consecutive years in a high-poverty neighborhood and the stresses that accompany continuous exposure to such neighborhoods. A large share of the African-American residents of poor neighborhoods at a point in time are long-term residents.

Yet this is a minority of African Americans who will have some contact with a high-poverty neighborhood over 10 years. Another 10 percent of poor and 6 percent of nonpoor African Americans will experience 5 to 9 years in high-poverty neighborhoods over a 10-year span. A larger share of the black population, about 19 percent of the poor and 9.4 percent of the nonpoor African-American population, will experience 1 to 4 years in a high-poverty neighborhood over a 10-year period.

Nonpoor African Americans tend to experience longer single spells in high-poverty neighborhoods than do poor African Americans, who are more likely to be renters and therefore exit high-poverty neighborhoods more often. Despite their higher rates of exit, poor African Americans experience greater exposure overall to high-poverty neighborhoods than do nonpoor African Americans because they enter high-poverty neighborhoods at high rates. Entries are especially likely to follow exits; nearly half of poor African Americans who exit at a point in time will reenter within 10 years. Entries occur both through movement and through neighborhoods becoming poorer around their stable residents.

Finally, the model suggests that the length of durations in high poverty neighborhoods increased from 1979 to 1990. At the stable distribution implied by the 1979–1990 rates, the share of poor blacks experiencing 10 consecutive years out of a 10-year observation window in a high-poverty neighborhood increased by about 73 percent from the estimates at the empirical starting distribution. The share of nonpoor blacks experiencing all 10 years in a high-poverty neighborhood increased more modestly, by about 48 percent.

To return to the two motivating issues at the beginning of the paper, the results suggest that there is a substantial enough group of African Americans who experience long-term exposure to high-poverty neighborhoods to raise substantial concern for this group. Yet a much larger share of the African-American population will experience brief exposure to high-poverty neighborhoods than will experience long-term exposure. If neighborhoods have strongly negative effects on youth who are exposed for a short period of time, then the consequences of such exposure will influence the lives of a much larger share of the population than those exposed for long durations. This heterogeneity of temporal experiences suggests that research on neighborhood effects should more clearly investigate how the duration of residence influences possible neighborhood effects. If short-term exposure is harmful, then a very large share of the black population will suffer negative consequences. If only longer-term contact has lasting effects, on the other hand, then we need to be concerned about neighborhood effects on a small, though nonnegligible, number of persons. Research on neighborhood effects has for the most part not separated these two heterogeneous groups.

The second goal of this paper is to consider the “entrapment” hypothesis. It is important to distinguish both the temporal population of interest and the meaning of entrapment in answering this question. The results differ sharply depending on whether we look at the population of people who will ever be in a high-poverty neighborhood at any point over 10 years, or whether we look only at persons residing in a high-poverty neighborhood at a point in time. The results also differ, especially for poor

African Americans, depending on whether we are considering length of single spells or total exposure, allowing spells to recur.

On the basis of this analysis, it is clearly incorrect to think of most persons who enter a high-poverty neighborhood as becoming “trapped” there, in the sense that they are almost never able to move out of high-poverty neighborhoods (in my discussion above, this is entrapment in sense #1). Many persons who move into a high-poverty neighborhood move out very quickly. Many residents of high-poverty neighborhoods at a point in time, however, will have resided in high-poverty neighborhoods for long spells, and can be described as trapped.

Many poor African Americans living in high-poverty neighborhoods are trapped there in the sense of experiencing recurring spells (entrapment in sense #2). Nearly half of persistently poor African Americans who move out at a point in time will return to a high-poverty neighborhood within 10 years; that is true for only about 20 percent of nonpoor African Americans. For persistently poor African-Americans, the difficulty in avoiding high-poverty neighborhoods is not so much in moving out of high-poverty neighborhoods at a point in time as it is in staying out of such neighborhoods for extended periods.

The lack of a single, definitive, yes-or-no answer to the entrapment hypothesis may be disappointing to some readers. Yet any serious consideration of the problem shows that it is sufficiently complex to make a yes-or-no answer unlikely. The metaphor of entrapment, though deeply embedded in accounts of high-poverty neighborhoods, is too simplistic to account for the complex pattern of residence suggested by this model.[28] Descriptions of slums or ghettos containing a trapped population make the

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[28]Duncan (1969) pointed out that discussions of poverty often assume it is a permanent trait, when in fact it is a temporal condition. Like poverty, residence in a high-poverty neighborhood is a status that can and often does change over time.

world tidier than it really is, obscuring the diversity of experience of the residents of high-poverty neighborhoods.[29]

The results have several implications for studies of mobility into or out of high-poverty neighborhoods. The population that moves into or out of a particular neighborhood type at any time includes many persons who will move back in within 5 years. Thus, studies that focus only on the population of persons who move out at a particular time, or that focus only on exit rates, need to be very careful about the conclusions they draw. Studies focusing only on the population that "escapes" poor neighborhoods at a point in time miss the fact that a substantial share of this population will rapidly move back in. There is no guarantee that the same variables that predict moving out will also predict staying out. As a result, studies should either distinguish short-term from long-term exits or examine both the determinants and the probability of reentry into high-poverty neighborhoods.

For the purposes of public policy, the results indicate that persistently poor families in particular may need relatively long-term, ongoing assistance to help them avoid high-poverty neighborhoods. Policy efforts that provide temporary assistance for families moving out of high-poverty neighborhoods may be largely ineffective, because poor families are so likely to return to high-poverty neighborhoods following an exit. Assistance in exiting a high-poverty neighborhood which does not specifically target the neediest could well lead to a net loss of nonpoor persons from poor neighborhoods, because an equal number of exits by poor and nonpoor persons will result in many more permanent exits by nonpoor than poor persons.

Jargowsky (1997b) notes that a problem with housing mobility programs for families in low-income neighborhoods is that many of the families that leave through such programs may be moderately well off, leaving the neighborhoods left behind with even poorer populations. Such creaming off of the

[29]Jargowsky (1996) makes the more general argument that descriptions of high-poverty neighborhoods often overlook their diversity. Jencks (1996) has pointed out that the same oversimplification has dominated discussions of the "underclass" based on nonspatial definitions.

relatively affluent population of poor neighborhoods can result from a class-selective process of reentry among the recently departed just as it can from initial selection into a housing mobility program. To avoid worsening the neighborhoods of those left behind, mobility programs must target the neediest and actively counteract the tendency of poor people to return to poor places.

APPENDIX

The Spell Calculations of Bane and Ellwood

Bane and Ellwood (1983, 1986) use duration-dependent exit probabilities to estimate the distribution of spells on welfare and below the poverty line. They develop three distributions that are particularly informative about the typical duration spent in a state: the distribution of completed spells for persons who have just entered that state; the distribution of completed spells for everyone in a state at a given time; and the distribution of uncompleted spells (the distribution of spells up to that point in time) for everyone in a state at a given time. Bane and Ellwood's major innovation was in separately examining spell distribution for persons poor at a given time and those who are just beginning a spell.

First, consider the population of persons who are beginning a spell. As Bane and Ellwood outline, let p(d) be the probability that a person who has lived in a poor neighborhood for d years will exit next year. Let F(d) describe the fraction of the number of people who have just moved into a poor neighborhood and who will live there for exactly d years. F(d) computed over a range of d, then, gives us the distribution of completed spells for people who have just entered a poor neighborhood. F(d) is easy to calculate from the transition probabilities:

$$\begin{aligned} F(1) &= p(1) \\ F(d) &= p(d)\left[1 - \sum_{j=1}^{d-1} F(j)\right] \end{aligned} \tag{A1}$$

The first term in equation A1 is the exit probability, the second is the fraction surviving to year t−1. Users of event history models often refer to this as the survivor function.

A second useful distribution is the distribution of completed spells for persons living in a poor neighborhood at a given point in time. To derive this distribution, Bane and Ellwood rely on the assumption that the system is at equilibrium—that we are in a no-growth, steady state.

The distribution of completed spells follows from the fact that people with long spells tend to accumulate in the stable population. If the probabilities of beginning a spell of duration 1 and duration 10 are equal, then at equilibrium there would be ten times as many people undergoing spells of length 10 as people undergoing spells of length 1. Let G(d) be the fraction of all persons in a poor neighborhood at a point in time who will be in a poor neighborhood for exactly d years. Then

$$G(d) = \frac{dF(d)}{\sum_{j=1}^{D} jF(j)} \tag{A2}$$

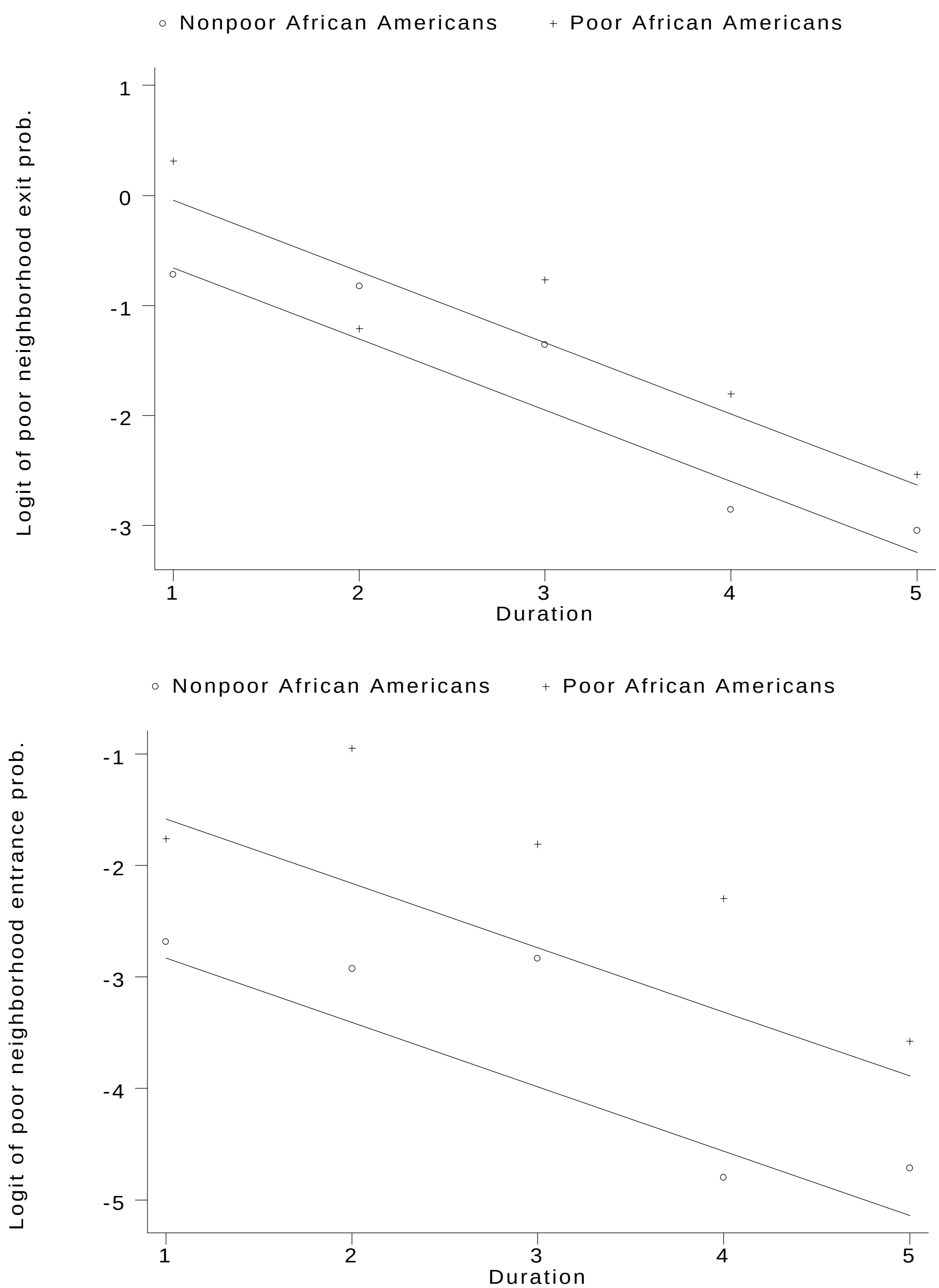
Finally the distribution of uncompleted spells for persons poor at a given time, H(d), is derived by calculating the fraction of the number of persons who began spells d years earlier who would still be living in poor neighborhoods (assuming a steady state), then renormalizing:

$$H(d) = \frac{1 - \sum_{j=1}^{t-1} F(j)}{\sum_{s=1}^{D} [1 - \sum_{k=1}^{s-1} F(k)]} \tag{A3}$$

The distribution H(d) is the length of time people have spent in poor neighborhoods up to the current time.

APPENDIX FIGURE 1

Actual and Predicted Logits of Exit and Entrance Probabilities, Conditional on Duration, for African Americans in the PSID.



Notes: "Fitted" values corresponds to the model shown in Table 3. Actual and fitted logits are net of year effects.

APPENDIX TABLE 1

Unsmoothed Probabilities for African Americans of Moving out of the Extremely Poor Neighborhood Type, Conditional on Length of Stay

Exit probabilities			Entrance Probabilities		
Duration in	Poor	Nonpoor	Duration out	Poor	Nonpoor
1	0.437	0.182	1	0.121	0.056
	(0.1203)	(0.0476)		(0.0337)	(0.0229)
2	0.144	0.165	2	0.226	0.039
	(0.0254)	(0.0581)		(0.0976)	(0.0187)
3	0.218	0.122	3	0.113	0.043
	(0.0569)	(0.0671)		(0.0733)	(0.0370)
4	0.087	0.045	4	0.079	0.006
	(0.0587)	(0.0247)		(0.0510)	(0.0032)
5+	0.047	0.029	5+	0.021	0.007
	(0.0155)	(0.0085)		(0.0038)	(0.0046)

Source: Panel Study of Income Dynamics, 1979–90.

Notes: Extremely poor neighborhoods are those in which at least 40 percent of the population is poor. Standard errors are in parentheses.

APPENDIX TABLE 2

Tests of Duration Dependence in Probability of Switching Neighborhood Types

Exits from Poor Neighborhoods Variable	Coef.	Entrances into Poor Neighborhoods Variable	Coef.
Duration in poor neighborhood in years	0.32 (0.194)	Duration out of poor neighborhood in years	-0.09 (0.284)
Respondent is poor (1=yes)	0.53 (0.372)	Respondent is poor (1=yes)	0.78* (0.259)
Year 1981 (1=yes)	1.06 (0.626)	Year 1982 (1=yes)	13.36* (2.230)
Year 1983 (1=yes)	-1.21 (0.919)	Year 1983 (1=yes)	14.28 +
Year 1984 (1=yes)	1.16 (0.987)	Year 1984 (1=yes)	14.33* (0.818)
Year 1985 (1=yes)	-2.69* (0.984)	Year 1985 (1=yes)	14.02* (0.931)
Year 1986 (1=yes)	-1.66 (1.305)	Year 1986 (1=yes)	14.17* (1.188)
Year 1987 (1=yes)	-0.66 (1.242)	Year 1987 (1=yes)	14.67* (1.405)
Year 1988 (1=yes)	-2.21 (1.362)	Year 1988 (1=yes)	14.00* (0.983)
Intercept	-4.63* (0.718)	Year 1989 (1=yes)	14.06* (0.981)
		Intercept	-18.82* -2.47

Notes: Reference year is 1980. Standard errors are in parentheses. Person-years in which respondent moved are excluded. Years 1982 and 1989 are excluded from the exit model because there were no exits due to neighborhood change in those years. Year 1981 is excluded because there were no entrances due to neighborhood change in that year. Poverty status is determined by long-term average income-to-needs ratio (see text).
* = coefficient / standard error > 2
+ = too few entrances in this year for standard error to be computed.

APPENDIX TABLE 3

Unweighted Person-Year Ns for Basic Samples

A. Unweighted counts of person-years, persons in a high-poverty neighborhood, by duration (used in Table 3)

Duration	Nonpoor	Duration	Poor
1	336	1	370
2	221	2	235
3	152	3	153
4	109	4	96
5	1046	5	1196

B. Unweighted counts of person-years, persons in a high-poverty neighborhood, by duration (used in Table 3)

Duration	Nonpoor	Duration	Poor
1	372	1	346
2	314	2	262
3	266	3	220
4	219	4	160
5	16707	5	6282

C. Unweighted counts of person-years, persons in a high-poverty neighborhood. Includes those for whom duration is unknown (used for neighborhood change column of Table 4)

	Poor	Nonpoor
Entrance	11802	28103
Exit	3392	3060

Source: Panel Study of Income Dynamics, 1979–90.

Note: Poverty status is determined by long-term average income-to-needs ratio (see text).

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