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A Driving Factor in Mobility? Transportation's Role in Connecting Subsidized Housing and Employment Outcomes in the Moving to Opportunity (MTO) Program

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A Driving Factor in Mobility?

Transportation's Role in Connecting Subsidized Housing and Employment Outcomes in the Moving to Opportunity (MTO) Program

Evelyn Blumenberg and Gregory Pierce

Problem, research strategy, and findings: We evaluate the role of transportation in improving the employment outcomes of participants in the Moving to Opportunity (MTO) for Fair Housing Voucher Program, a 10-year demonstration project designed to enable low-income families to improve their outcomes by moving out of high-poverty neighborhoods. We use longitudinal data from the MTO program to assess the role of transportation—automobiles and improved access to public transit—in moving to, and maintaining, employment. We use multinomial logistic regression to predict changes in employment status as a function of change in automobile availability and transit accessibility, controlling for other potential determinants of employment. We find that keeping or gaining access to an automobile is positively related to the likelihood of employment. Improved access to public transit is positively associated with maintaining employment, but not with job gains. Although we cannot say for certain whether car ownership preceded or followed employment, it is clear that having a car provides multiple benefits that facilitate getting and keeping a job.

Takeaway for practice: Policies to increase automobile access among low-income households—even in dense urban areas—will most clearly enhance job gain and job retention. While auto programs are unpopular with many planners, they would improve the lives of low-income families who currently have the least access to cars. In addition, supporting moves to transit-rich neighborhoods may help households maintain consistent employment.

The U.S. Department of Housing and Urban Development's (HUD) Moving to Opportunity (MTO) for Fair Housing experiment was a housing voucher demonstration program intended to assist low-income households in moving out of low-income neighborhoods in the hopes that residing in higher-income neighborhoods would lead to improved social and economic outcomes. Authorized by Congress in 1992, the MTO voucher program was implemented in five major metropolitan areas: Baltimore, Boston, Chicago, Los Angeles, and New York.

The MTO program itself did not focus on transportation as a pathway to improved household outcomes. Evaluations of MTO find that the program did not significantly improve employment outcomes (Orr et al., 2003; Sanbonmatsu et al., 2011). These disappointing findings may be due in part to the fact that some program participants moved to neighborhoods that were not well served by public transit (Briggs, 2005; Turney et al., 2006; Turney, Kissane, & Edin, 2012). However, when planners and scholars discuss the link between transport, housing, and employment more broadly, their attention has remained largely on the role of public transit rather than automobiles.[1] This transit focus persists despite a growing body of research showing the positive effect of automobiles on the employment outcomes of low-income adults (Baum, 2009; Cervero, Sandoval, & Landis, 2002; Gurley & Bruce, 2005; Lucas & Nicholson, 2003; Ong, 2002; Raphael & Rice, 2002; Raphael & Stoll, 2001; Sandoval, Cervero, & Landis, 2010).

In this study, we draw on data from the MTO housing voucher program to more explicitly analyze the relationship between transportation and employment outcomes among subsidized housing recipients. As part of the

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experimental research design, 4,608 families were randomly assigned to one of three groups. The MTO low-poverty voucher group received a voucher to move to neighborhoods with poverty rates lower than 10% in 1990. The traditional voucher group received geographically unrestricted housing vouchers (Section 8). Finally, the control group remained eligible for public housing and other social programs but did not receive housing vouchers at the outset of the experiment. HUD collected baseline, interim, and final survey data on program participants and maintained a spell file with participant addresses. These data included whether participants had access to automobiles and their employment status as well as their residential location.

Using these data, we examine the relationship between automobiles and public transit availability on employment transitions between baseline and interim surveys, controlling for other potential determinants of employment. In addition, we test whether households in the experimental group were more likely to benefit from automobile ownership compared with other households, because to use their vouchers they were required to secure housing in lower-poverty neighborhoods where access to transit is often limited.

As did previous evaluations of MTO, we find that program status and successful housing voucher use are not statistically related to the likelihood of employment. However, we find a positive relationship between automobile ownership and employment outcomes among low-income households in the experiment. This relationship is not uniquely important to adults in the experimental group. We also find that all participants—including public housing households who tend to live in transit-rich, central-city neighborhoods—benefit from having a car. With respect to public transit, moving to neighborhoods with better transit is positively related to the likelihood of being employed in both time periods; however, it is not associated with employment gains. Our findings indicate therefore that job search and transitions to employment may be most effectively facilitated by access to a car.

Transportation and Employment Outcomes

While no guarantee of movement into the middle class, employment is the largest determinant of income among low-income households. Adults in low-income households are less likely to be employed and to live with other wage earners, and on average work fewer hours compared with those in higher-income households (Sawhill & Karpilow, 2013). Efforts to improve the employment conditions of low-income families often center on bolstering the labor market, increasing the wage rate, improving educational attainment, and strengthening families (Sawhill & Karpilow, 2013). The MTO experiment and other HUD voucher programs were designed to test the impact of housing assistance and long-term access to lower-poverty neighborhoods on recipients' housing, employment, and educational achievements (HUD, 2014). These programs largely do not focus on differences in transportation options in the neighborhoods from which people are moving and the neighborhoods to which they move. Accordingly, many program participants encountered difficulty in reaching jobs by public transit (Briggs, 2005; Turney et al., 2006; Turney et al., 2012).

Research suggests, however, that automobiles can also play an important role in facilitating employment. U.S. metropolitan areas have dispersed over time, elevating the importance of automobiles in accessing regional opportunities. As Figure 1 shows, less than two-fifths of the metropolitan population lives in the central city, technically the principal cities of metropolitan areas (U.S. Census Bureau, 2012). Low-income families—those with incomes below the federally designated poverty line—also have suburbanized (Kneebone & Garr, 2010; U.S. Census Bureau, 2012). Nevertheless, a slight majority of the poor (52%) remain in central-city neighborhoods, largely to take advantage of the availability of affordable housing and—for those without automobiles—access to relatively high levels of public transit service (Glaeser, Kahn, & Rappaport, 2008; U.S. Census Bureau, 2012).

At the same time, employment has dispersed. Only 23% of employees in the 100 largest metropolitan areas now work within 3 miles of the central business district. In contrast, 43% commute to locations more than 10 miles away from the city center (Kneebone, 2013). While the dispersal of employment slowed during the recent recession in most metropolitan areas, it did not reverse. Contemporary proponents of Kain's 1968 spatial mismatch hypothesis contend that low-income residents have stayed behind in urban areas and are thus now disconnected from suburban employment opportunities. The weight of the evidence suggests that the spatial mismatch contributes to high levels of joblessness, particularly among African American men (Gobillon, Selod, & Zenou, 2007; Ihlanfeldt & Sjoquist, 1998).

A number of scholars, however, find that rather than facing the classic spatial mismatch, low-income, inner-city residents suffer from a modal mismatch, a drastic divergence in the relative advantage between those who have access to automobiles and those who do not (Blumenberg

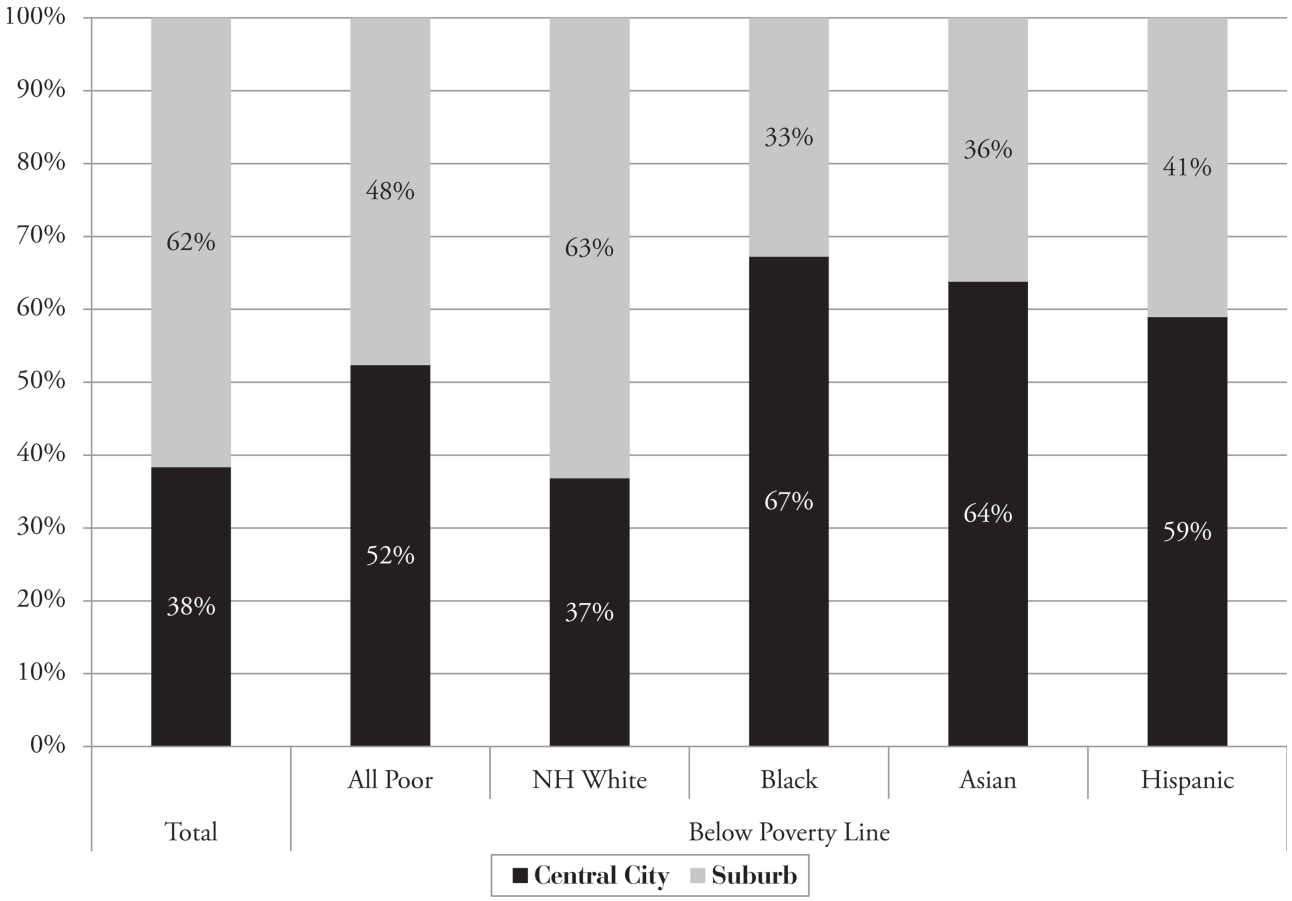

Figure 1. U.S. metropolitan population by residential location.
Source: U.S. Census Bureau (2012).

& Ong, 2001; Grengs, 2010; Kawabata, 2003; Ong & Miller, 2005; Shen 1998; Taylor & Ong, 1995; Wyly 1998). Twenty-five years after his pioneering work, Kain (1992) himself noted, "None of the spatial mismatch studies, including my original 1968 study, does a good job of dealing with mode choice" (p. 392). Since that time, scholars have worked to rectify this omission.

In almost all metropolitan areas, individuals lacking reliable access to automobiles reach far fewer opportunities within a reasonable travel time compared with those who travel by car (Benenson, Martens, Rofé, & Kwartler, 2010; Blumenberg & Ong, 2001; Grengs, 2010; Kawabata, 2009; Kawabata & Shen, 2006, 2007; Ong & Miller, 2005; Shen, 1998, 2001). In cities considered to have ample transit service such as Boston and San Francisco, average transit travel times remain much longer than automobile travel times (Kawabata & Shen, 2007; Shen, 2001). Long transit travel times result from walking to and from transit stops, waits at stops and for transfers, slower travel speeds, and frequent vehicle stops along the way.

Given the access advantage of automobiles, it is no surprise that a growing number of studies show that they dramatically improve economic outcomes for low-income and minority adults. Automobiles make it easier to search for and regularly commute to jobs and, in so doing, increase employment rates. Conversely, employment can provide households with the necessary resources to purchase automobiles; income is one of the strongest correlates of automobile ownership (Blumenberg & Pierce, 2012). Yet, the importance of automobiles to employment persists even in studies that control for the simultaneity of the car ownership and employment decision (Baum, 2009; Cervero et al., 2002; Gurley & Bruce, 2005; Lucas & Nicholson, 2003; Ong, 2002; Raphael & Rice, 2002; Sandoval et al., 2010).

Transportation is one of the largest expense categories for American families: In most cases, it is second only to housing (Lipman, 2006). Yet, over time, automobile ownership has become nearly ubiquitous, even among the poor. Data from the 2010 American Community Survey of the U.S. Census show that nearly 80% of adults with household incomes below the poverty line lived in a household with a vehicle, an increase from just over 50% in 1960 (Ruggles et al., 2010). Yet, some low-income individuals face barriers

to automobile access. As of 2010, more than 6 million poor adults lived in households without automobiles. Many of these adults still travel by car, either via carpooling with others or borrowing vehicles. For example, in 2010, 30% of low-income adults in households without automobiles traveled to work by private vehicle. A slightly higher percentage (35%) commuted by public transit, suggesting that proximity to transit services was essential to their mobility. Writing a quarter-century apart, LeRoy and Sonstelie (1983) and Glaeser et al. (2008) assert that the presence of public transit largely explains the concentration of low-income households in the central city. In fact, Glaeser et al. (2008) find that "public transportation is two to three times more important than the income elasticity of demand for land in explaining the central location of the poor" (p. 2).

Despite evidence for the importance of public transit to low-income families, previous studies have, at best, found small but positive effects of transit access on economic outcomes. Some studies show that public transit access increases the employment rates for residents—particularly those without cars—who live close to transit (Kawabata, 2003; Ong & Houston, 2002; Sanchez, 1999; Yi, 2006). In contrast, in their study of welfare recipients in six major U.S. metropolitan areas, Sanchez, Shen, and Peng (2004) conclude that access to fixed-route transit and employment concentrations showed virtually no association with the employment outcomes of welfare recipients. The few studies that directly compare the relative benefits of cars and public transit find that automobiles better facilitate job acquisition and job retention than public transit (Cervero et al., 2002; Gurley & Bruce, 2005; Sandoval et al., 2011).

Among those receiving some kind of housing subsidy, cars may be more important for voucher recipients who tend to live in more spatially dispersed neighborhoods than for public housing residents. MTO participants who moved to lower-poverty neighborhoods often found themselves far from bus stops and in neighborhoods where buses ran infrequently; as a result, many residents had difficulty reaching jobs by public transit (Briggs, 2005; Turney et al., 2006; Turney et al., 2012). For example, Turney et al. (2012) show that moving to low-poverty neighborhoods increased participants' stress in part due to their greater distance from public transportation. In contrast, in their study of welfare recipients in Cleveland, Bania, Coulton, and Leete (2003) find that compared with those living in more traditional project-based public housing, welfare leavers who receive housing vouchers are more likely to be employed closer to their homes, have shorter estimated commutes, and are better connected to their first jobs by direct bus routes.

Data and Research Design

In this analysis, we take advantage of longitudinal data from the MTO program to examine the relationship between changes in automobile ownership and transit access and changes in full-time employment. Specifically, we evaluate changes from the baseline (October 1994–May 1996) to the interim survey (4–7 years after the baseline survey) using multinomial logistic regression to analyze the relationship between a discrete, categorical response variable measuring full-time employment across the two surveys and a set of explanatory variables. In our model, the dependent variable for full-time employment indicates that between baseline and interim surveys, the individual fell into one of four categories: 1) was unemployed at baseline and interim: the base outcome (56% of the sample); 2) shifted from unemployed at baseline to employed at interim (29% of the sample); 3) shifted from employed at baseline to unemployed at interim (5% of the sample); or 4) was employed at baseline and interim (10% of the sample). We present results for all adults who reported their full-time employment status at the interim survey.[2] The model form, which is shown in full in the Technical Appendix, takes account of individual characteristics: household characteristics, baseline neighborhood characteristics, and a set of dummy variables for the five metropolitan areas with Los Angeles as the base metropolitan area. We use sample weights to account for differences between baseline and interim surveys in our descriptive analysis and regression models.

The data set includes extensive information about individuals and households in the sample, both before the start of the program (baseline) and at the time of the interim survey (interim). We use these data to control for the effect of demographic and socioeconomic characteristics, housing attributes, and neighborhood quality on employment outcomes. Table 1 lists the variables included in our analysis. Data for the dependent variable and most of the independent variables are derived directly from the baseline and interim surveys. We supplement this information with data on the neighborhoods where program participants live.

We focus on the following two variables of interest: changes in automobile ownership and residential relocation to neighborhoods with improved public transit. Consistent with the broader literature, we expect both of these variables to be positively associated with employment, with stronger effects for automobile ownership. In both surveys, households were asked whether they had a car. With respect to public transit, participants were asked at baseline

Table 1. Descriptive statistics: baseline independent variables.

Variables	Definition	Baseline survey average
Individual characteristics		
Age	Age (continuous variable in years)	33 years (*SD* = 9)
Male-headed household	1 = Self-identified household head is a male 0 = Self-identified household head is female	2% (*N* = 53)
High school graduate	1 = Graduated from high school 0 = Did not graduate	39% (*N* = 1,242)
Race/ethnicity		
Non-Hispanic White	White, non-Hispanic	3% (*N* = 95)
Black	Black	64% (*N* = 2,049)
Hispanic	Hispanic	29% (*N* = 928)
Asian	Not available	–
Other race	Other race; not a concatenation of other identified groups	4% (*N* = 127)
Household characteristics		
Household size	Continuous variable (number of persons)	3.9 (*SD* = 1.6)
Welfare receipt	1 = Receiving Temporary Assistance for Needy Families (TANF) 0 = Not receiving TANF	74% (*N* = 2,363)
Supplemental disability insurance (SSI)	1 = Receiving Supplemental Security Income (SSI) 0 = Not receiving SSI	17% (*N* = 546)
Moved between baseline and interim	1 = Adult moved between surveys 0 = Did not move	70% (*N* = 2,224)
Program status		
Control group	Not given a housing voucher at baseline	30% (*N* = 966)
Section 8	Given Section 8 voucher at baseline with no geographic restrictions	29% (*N* = 927)
Experimental group	Given Section 8 voucher at baseline that can only be used in <10% poverty rate neighborhoods	41% (*N* = 1,306)
Lease-up	Successfully leased up using Section 8 voucher	24% (*N* = 757)
Transportation		
Moved to better transit[a]	Between baseline and interim survey, moved to a tract with more jobs accessible by public transit within 30 minutes	20% (*N* = 653)
Self-reported bus within 15 minutes	Could walk to a bus station within 15 minutes	77% (*N* = 2,463)
1+ automobile in household	Measured at household level. Baseline: "Do you have a car that runs?"	18% (*N* = 576)
Gained car	No car at baseline, car at interim	28% (*N* = 900)
Lost Car	Car at baseline, no car at interim	4% (*N* = 135)
Kept car	Car at baseline, car at interim	13% (*N* = 401)
Never had car	No car at baseline, no car at interim	56% (*N* = 1,763)
Neighborhood characteristics		
Ratio of tract jobs access relative to MSA[b]	The number of jobs accessible within 30-minute drive time	1.4 (*SD* = 0.4)
Tract poverty rate[c]	The proportion of households below the poverty line living in the tract	49% (*SD* = 14.8)
Metropolitan areas		
	Baltimore	15% (*N* = 473)
	Boston	23% (*N* = 727)
	Chicago	20% (*N* = 622)
	Los Angeles	16% (*N* = 532)
	New York City	26% (*N* = 845)
N		3,199

Notes:

a. Data source: Tomer, Kneebone, Puentes, & Berube (2011).

b. Data source: Google Map data (2013); U. S. Census Bureau (2000).

c. Data source: Neighborhood Change Database (2002).

whether they lived within 15 minutes from a bus stop. In addition to self-reported transit proximity, we include a transit supply measure from the Brookings Metropolitan Policy Program, the number of jobs available in a 30-minute transit trip.[3] Specifically, we test whether there is a positive relationship between employment rates and moving to neighborhoods with improved transit access, as measured by the Brookings data.

In repeated evaluations of the MTO program, the effect of housing mobility on employment outcomes has been disappointing (Carlson, Haveman, Kaplan, & Wolfe, 2012; Jacob & Ludwig, 2012; Ludwig et al., 2008; Mills et al., 2006). MTO households had difficulty "leasing up," or successfully using their housing voucher to secure a lease. The lease-up rate among Section 8 recipients was only 38% and was even lower for families in the experimental group at 32%. Moreover, most, if not nearly all, MTO households eventually moved back into higher-poverty neighborhoods and thus spent the vast majority of time during the course of the experiment in neighborhoods with poverty rates higher than 10% (Feins & Schroder, 2005; Turner, Comey, Kuehn, & Nichols, 2011). MTO households also spent little time in neighborhoods with more holistic definitions of opportunity that account for education, racial diversity, job access, and transit access (Pendall et al., 2014; Turner et al., 2011). The broader "opportunity" research also shows that families in the experimental group faced hard trade-offs in accessing different dimensions of opportunity. Therefore, despite the intent of the program, MTO households reduced their overall exposure to poverty surprisingly little. We include measures of program group status, lease-up, and the combined effect of experimental group and lease-up in our model. Given the findings of previous studies, however, we do not expect program participation and lease-up to be significantly related to employment outcomes.

Additional explanatory variables in the model include relevant sociodemographic and economic characteristics of the individual (age, sex, race and ethnicity, education) and household (size, earnings, living in public housing, receipt of Supplemental Security Income [SSI], and welfare status) as well as neighborhood characteristics (employment accessibility and poverty rate) and a set of dummy variables for each of the metropolitan areas. The inclusion of these variables is supported by the broader literature on the determinants of employment among low-wage workers and welfare recipients.

Women are less likely to be employed than men (54% versus 67%; Ruggles et al., 2010), since they tend to bear much of the burden of raising children. However, the sex difference in employment status narrows among low-income adults (aged 16 or older with incomes below the poverty line); 28% of women are employed compared with 32% of men (Ruggles et al., 2010). Further, sex differences in employment among MTO participants may be difficult to discern since the sample is overwhelmingly female at 98%.

In the presence of discrimination, racial or ethnic minorities negatively affect the likelihood of employment (Allard & Danziger, 2002; Neckerman & Kirschenman, 1991). However, MTO participants are largely non-White (97%). Therefore, the analysis may reveal differences in labor market outcomes between low-income African Americans (65% of the sample) and Hispanics (28% of the sample). Moreover, there is also substantial variation in the racial and ethnic composition of participants across the five metropolitan areas. While the samples in Chicago and Baltimore are 98% Black, the samples in New York, Los Angeles, and Boston are more diverse and include substantial Hispanic populations (40% or more).

Larger household size, or having more children, also directly impinges upon the employment opportunities of adults, particularly single women (Anderson & Levine, 1999; Leibowitz, Klerman, & Waite, 1992; Meyers, Heintze, & Wolf, 2002). Education also plays a clear role in employment, providing the human capital necessary to secure a job (Holzer, 1996; Schoeni & Blank, 2000). Numerous studies show the positive economic benefits of graduating from high school (Rumberger, 2011), an accomplishment achieved by 40% of the MTO sample. Almost 70% of participants moved between baseline and interim surveys, perhaps relocating to live closer to employment opportunities (Bania et al., 2003). If so, we would expect movers to have higher employment rates than nonmovers. The Social Security Administration's SSI program offers benefits to disabled adults and children who have limited income and resources and to low-income people aged 65 and older. Seventeen percent of the sample received SSI. We would expect disabled adults, adults taking care of disabled children, and low-income seniors to have lower employment rates.

The effect of other social programs—public housing, welfare, and housing vouchers—is less clear. Benefits—monetary or in kind—increase disposable income and therefore may reduce work incentives. Low-income households who acquire housing subsidies will have greater income available to cover other expenses and therefore a reduced desire to work. In the MTO program, at baseline all participants lived in public housing and were thus receiving housing subsidies. As a result, lower employment rates among families in the control group would have less

to do with incentive effects than with the negative externalities of concentrated poverty in inner-city neighborhoods where most public housing is located. Indeed, one of the motivations of housing voucher programs is the hypothesis that low-income households, separated from neighborhoods of concentrated poverty, would experience improved employment outcomes (Popkin, Levy, & Buron, 2009). Olsen, Tyler, King, and Carrillo (2005) find that "the work disincentive effects of housing assistance are somewhat smaller for tenant-based housing vouchers than for either type of project-based assistance" (p. 182). We expect living in public housing to have a mild, negative effect on employment and participation in the treatment group to have a positive effect on employment.

The relationship between welfare receipt and employment rates is somewhat ambiguous, although the weight of the evidence suggests that—at least in its current form—welfare should be associated with increased employment rates. In general, individuals who receive welfare have less motivation to gain employment than those poor adults who do not receive assistance (Ashenfelter, 1983; Moffitt, 1992). By imposing work requirements and time limits on welfare receipt, the Personal Responsibility and Work Opportunity Act restructured the welfare program to address this incentive problem. Recent studies suggest that the current federal welfare program—Temporary Assistance to Needy Families—has contributed to increased employment rates, although employment gains have not been consistent across population groups (Grogger & Karoly, 2005; Moffitt, 2008).

Finally, our models include variables that characterize the residential location of households such as employment accessibility and the neighborhood poverty rate. A number of scholars have developed employment access measures using data from the Census Transportation Planning Package that include worker flows between home and work within particular commute-time bands (see, for example, Bania et al., 2003). As a measure of employment access, these measures fall short since they rest on existing travel patterns (the demand for travel) and therefore do not incorporate the capacity to travel between all potential origins and destinations. Other studies rely on travel-time data generated from travel demand models that vary across region (see, for example, Shen, 1998). For this study, we developed an alternative measure of employment accessibility derived from Google Maps–estimated drive times and employment data from the Census Transportation Planning Package. We use these data to create metrics showing both the number of jobs available by automobile within 30 minutes and the proportion of jobs (and, more specifically, low-wage jobs) relative to the metropolitan area average for each census tract in which survey participants live. We expect a positive relationship between the relative number of jobs and the odds of employment at baseline and follow-up (Allard & Danziger, 2002; Immergluck, 1998).

Hypotheses regarding the relationship between neighborhood poverty levels and employment outcomes draw more generally on the neighborhood effects associated with concentrated poverty: Living in dense, highly poor areas has a negative effect on economic outcomes, including employment (Galster, 2012; Massey, 1993; Wilson, 1987). As noted here, one of the explicit hypotheses of housing voucher programs is that low-income households, separated from neighborhoods of concentrated poverty, will experience improved employment outcomes (HUD, 2014; Popkin et al., 2009). Given the existing literature, however, we expect that after controlling for individual and household characteristics, neighborhood effects on individuals' employment will be minimal. For instance, Ludwig et al. (2008) find large neighborhood effects of MTO group status on other quality-of-life outcomes, but not on employment.

A few gaps in data constrain our analysis. As we discuss here, automobiles can facilitate employment. Conversely, employment can provide the resources necessary for families to purchase automobiles. To address this simultaneity issue, a number of studies use instrumental variables to predict auto ownership (Baum, 2009; Ong, 2002; Raphael & Rice, 2002). Longitudinal data such as those available for MTO participants are useful in teasing out these causal relationships (Cervero et al., 2002; Gurley & Bruce, 2005; Sandoval et al., 2011); however, they are not perfect. The MTO survey data provide automobile ownership status for two time periods. If a participant had a car in both surveys and transitioned to employment, we assume that the car preceded the job. However, households' automobile ownership status may vary between surveys, making it impossible to know for certain which came first: the car or the job.

In addition, our analysis would be strengthened by a more precise measure of automobile access. In the MTO surveys, automobile access is recorded as a binary "have versus have not" variable measured at the household level at baseline and interim. A more precise measure would be the number of vehicles in the household, which would allow us to assess both the presence of an automobile as well as changes in the ratio between drivers and automobiles. Finally, we note several sample size caveats. The total number of adults for which full employment and socioeconomic data are reported at baseline and the interim survey is 3,199, about three-quarters of the baseline sample.[4] Full socioeconomic data are only provided for one adult per household, so we can only model the relationships for the head of household. We note

however, that employment and transportation access characteristics among households that dropped out of the sample and those that remained in the sample are nearly identical; thus, there is little concern that the households included in our analysis varied significantly in their transportation and employment profiles from those excluded. Small sample sizes also prevented us from developing metropolitan-specific models. Instead, we include metropolitan-area dummy variables to control for variation across the five metropolitan areas in our analysis.

Employment Rates, Automobile Access, and Improved Public Transit

We explore the data by outlining general trends in our outcome of interest (full-time employment) and our transportation variables of interest (automobile and public transit access). Figure 2 shows that the proportion of employed adults more than doubled from baseline to interim surveys. Only 15% of the sample was employed at baseline compared with 39% at interim. While more than half of the sample remained unemployed between baseline and interim, nearly one-third gained a job.

Figure 3 shows the change in automobile ownership between baseline and interim for the entire sample. At baseline only 18% of the sample had access to an automobile. While more than one-fourth gained an automobile between the two time periods, more than half the sample remained without an automobile at both time points. Rates of automobile ownership were substantially lower among this population group than among all low-income individuals. Data from the 2000 Public Use Microdata Sample of the U.S. Census show that approximately 75% of adults living below the poverty line had access to a household vehicle; only 57% of poor adults who receive public assistance lived in households with automobiles (Ruggles et al., 2010). Moreover, the MTO sample was more disadvantaged in terms of income, education, and access to cars than both the general voucher population and the total population of individuals living below the poverty line (Pendall et al., 2014; Ruggles et al., 2010).

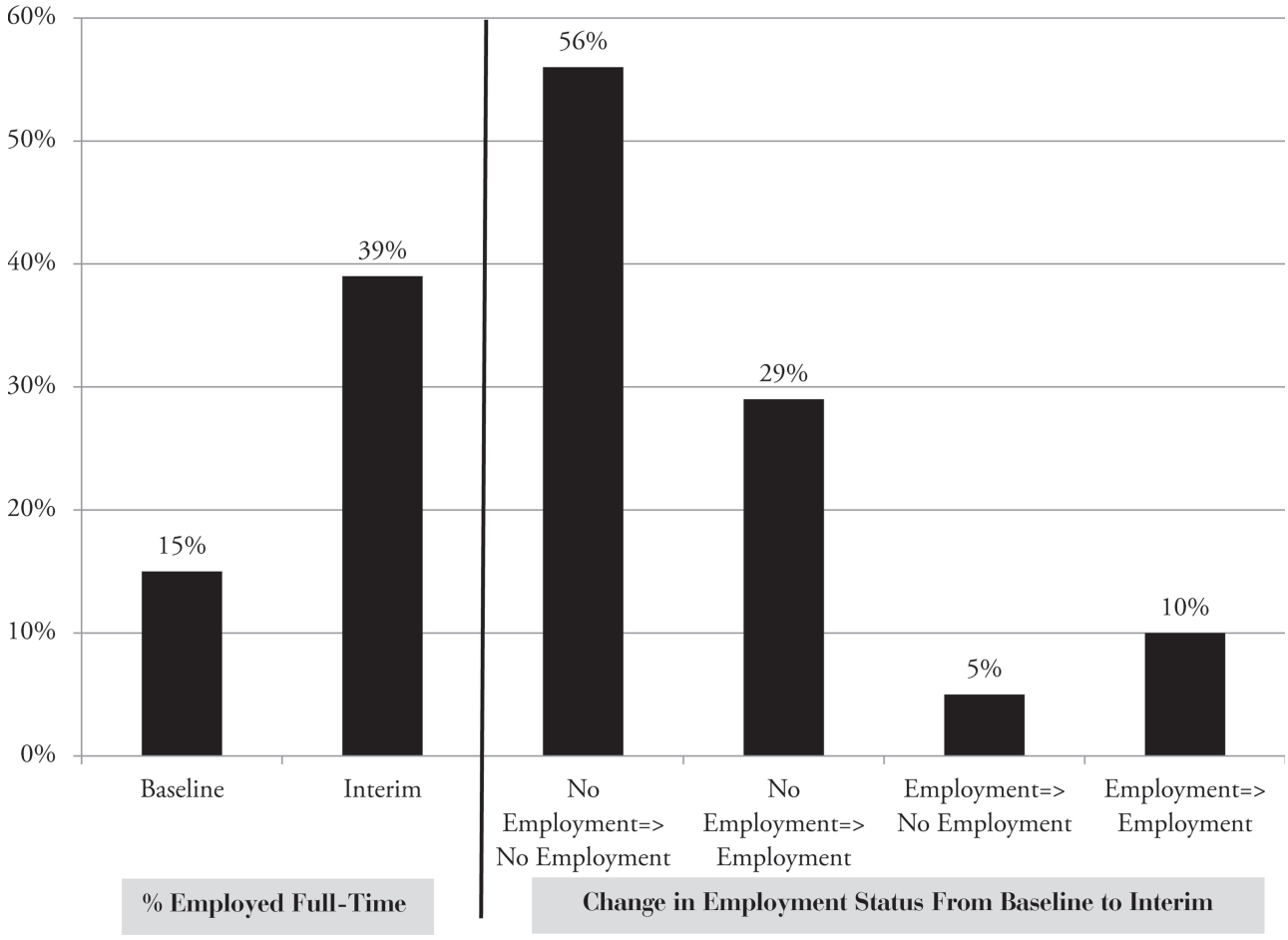

Figure 2. Employment and change in full-time employment status (baseline to interim).

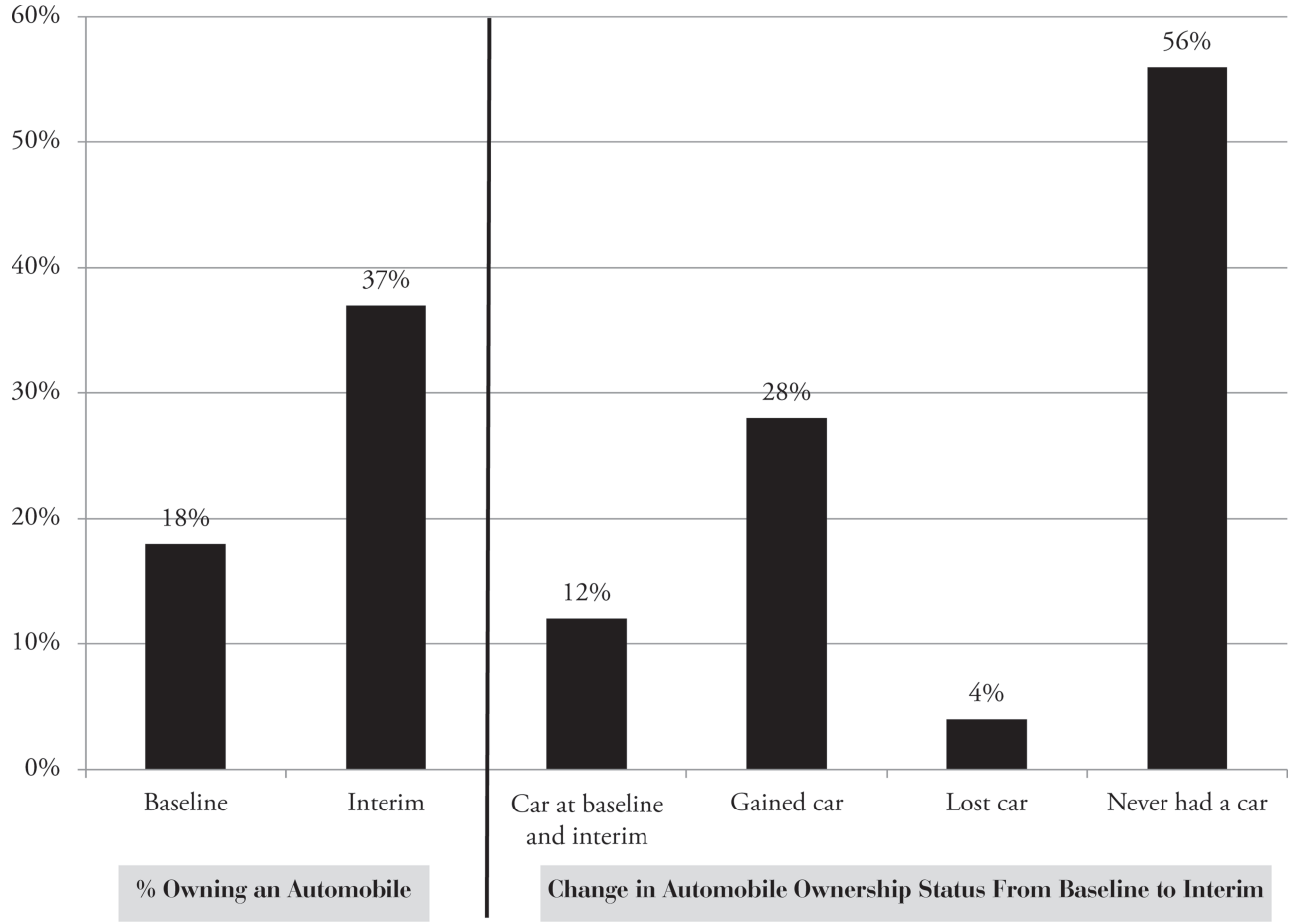

Figure 3. Automobile ownership and change in automobile status (baseline to interim).

Finally, just over 20% of the sample moved to neighborhoods with better access to public transit, as measured using the Brookings Institution's data (Tomer, Kneebone, Puentes, & Berube, 2011). We expected that adults without automobiles would be more likely to move to neighborhoods with good transit than adults with automobiles, but this hypothesis was not borne out. Participants in both groups—with and without cars—were equally likely to move to transit-richer neighborhoods.

Does Access to Transportation Improve Employment Outcomes?

We further examine the relationship between transportation and employment outcomes using multinomial logistic regression to hold constant other determinants of employment. The full results of these models are shown in Table A-2 in the Technical Appendix. We report relative risk ratios, significance levels, and robust standard errors for each independent variable. The relative risk ratio is the probability of choosing one outcome category over the probability of choosing the base category for a unit change in the predictor variable. A variance inflation factor test indicates that there is not a high degree of multicollinearity between the independent variables in our regression model; in other words, our explanatory variables do not appear to be redundant.

Gaining a car between baseline and interim and maintaining access to a car at both time points are positively and strongly correlated with finding employment and being employed at baseline and interim. The presence of a car raises the probability of finding a job by a factor of two and of being employed at both time points by a factor of four. We tested whether the effect of automobile ownership varies by program status. As we note here, we expected access to automobiles to be particularly important for participants in the experimental group. However, the joint effect of car access and status in the experimental group—as measured using interaction terms—was not significant, and therefore was omitted from our final results.

While improved transit access is not a significant factor in finding employment, it appears to be the most important factor associated with being employed at both time

points. Having moved to a neighborhood with better transit between baseline and interim and living within 15 minutes of a bus stop both greatly raise the probability of having consistent employment.[5] Consistent with previous evaluations of the MTO program and our analysis of employment outcomes for Welfare to Work Voucher participants (Blumenberg & Pierce, 2014), experimental group status is not significantly correlated with job gains or job retention.

In terms of individual characteristics, there is a consistent relationship between age and employment. Being older is generally associated with an increased probability of gaining and keeping employment, but near the high end of the age range, this effect sharply reverses. As expected, having graduated from high school is strongly and positively correlated with positive employment status. Male headship of household does not have a statistically significant relationship to employment outcomes, although as mentioned here, this finding may be due to the small number of men in the sample. With respect to race and ethnicity, Hispanics are less likely than non-Hispanic Whites to gain employment, while Blacks are more likely than non-Hispanic Whites to be employed at both time points.

At the household level, as expected, the receipt of SSI is negatively associated with any type of employment. Welfare receipt is strongly and negatively associated with losing a job and being employed at both time points. This relationship may reflect that very few individuals on welfare were employed at baseline, or the fact that enrollment in the MTO program occurred before welfare reform was fully implemented. Household size and household mobility—whether a household moved between the two surveys—have no relationship with employment outcomes.

Neighborhood characteristics also appear to be weakly correlated with employment outcomes, after we control for individual and household attributes. The presence of a high number of jobs near the census tract and the poverty rate of the tract are not associated with employment. Metropolitan-level effects are stronger than neighborhood associations. Compared with participants in Los Angeles, participants in Baltimore, Chicago, and New York were more likely to both obtain a job and retain a job over the survey period, although the significance of the relationship in Chicago was weaker.

Compared with similar auto–employment models and our own analysis of the Welfare to Work voucher dataset (Blumenberg & Pierce, 2014), our model explains a moderate amount of the variation in employment outcomes. Low levels of explanatory power for individual outcomes, particularly among vulnerable population groups, are common. Employment status—particularly among disadvantaged population groups—is difficult to predict. The factors that influence job gains may be different from those that influence job loss or employment stability. Table A-2 in the Technical Appendix presents diagnostics for our model, including the percentage of correct predictions across employment outcomes (Cervero et al., 2002) as well as several other indicators of model fit used in comparable studies, such as the pseudo log-likelihood and the chi-square test for goodness of fit (Baum, 2009; Sandoval et al., 2011). The goodness of fit is robust for our model. Nearly half of our model predictions are correct. We predict consistent unemployment and job gain best, and loss of a job very poorly. Factors not included in the MTO data such as firm and employer characteristics and other unobserved characteristics (e.g., motivation) also likely influence job loss and maintenance. Complementary qualitative research might enable us to better understand the factors that allow people to remain employed.

Conclusion

Evidence from the MTO experiment suggests that transportation assets play a major role in improving and maintaining positive employment outcomes for subsidized housing recipients, whereas housing assistance itself had little effect. The model results also show a strong relationship between relocating to transit-richer neighborhoods and employment at both time periods. This relationship suggests that individuals with jobs may strategically relocate to neighborhoods where they can more easily use public transit for the commute. Policies to enable household moves to transit-rich neighborhoods may help participants retain employment. Among unemployed participants, moves to transit-richer neighborhoods do not appear to increase the likelihood of employment. This finding may be due to transit's inherent difficulty in connecting families to opportunities in an increasingly dispersed labor market. It may also be the case that transit only facilitates employment in neighborhoods where there is extensive transit service; in other words, when services levels cross a particular threshold. Although MTO metropolitan areas are large with relatively high levels of transit service, not all neighborhoods are equally well served. Future research should examine the presence of transit threshold effects.

Having a car (at baseline and interim), however, contributes to a shift from unemployment to employment. In these cases, the automobile likely precedes employment and therefore contributes to obtaining a job. However, there are some caveats to this finding. As we discuss here, given survey

data at only two time points, we cannot rule out the possibility that for some participants the job preceded the car purchase. Nor can we rule out the possibility that automobile access is associated with other factors that make employment more likely. For example, those participants who are highly motivated to find employment might also be more inclined to purchase vehicles. Automobile ownership at both baseline and interim is also positively associated with being employed at both time periods. In this case, causality is difficult to ascertain. Employment may have preceded automobile ownership and therefore facilitated the purchase of a vehicle. However, automobiles may make it easier for workers to maintain long-term employment by reducing travel times, allowing participants the flexibility needed to make work- and household-serving trips and increasing the likelihood of timely arrivals. Alternatively, employment and automobile access might both be correlated with additional, unobserved factors such as individual motivation or ability, or employer bias toward applicants with cars.

Our findings confirm those of previous studies that show a positive impact of cars on employment outcomes among low-income households. This suggests that policies to increase automobile access among low-income households will most clearly enhance job gain and retention, even in large metropolitan areas such as MTO study areas and in dense urban neighborhoods where public housing is located. Thus far, policy efforts to coordinate housing and transportation have largely centered on public transit, as demonstrated in the funding history of programs such as the Partnership for Sustainable Communities. These efforts ought to be supplemented with policies to facilitate automobile ownership. There is evidence that reducing the vehicle asset limitation associated with some public benefit programs, and providing low-income auto loan and subsidy programs, can increase automobile ownership and employment among the poor (Hurst & Ziliak, 2006; Lucas & Nicholson, 2003; Sullivan, 2006).[6] Policies such as individual development accounts (matched saving accounts) also may help families save for and purchase vehicles (Stegman & Faris, 2005). Policies to increase automobile access—rather than ownership—could provide many of the benefits of automobiles without the high costs of ownership. These policies might include efforts to promote car sharing, ride sharing, and automobile leasing. However, thus far, there is little evidence of the effectiveness of these programs in meeting the transportation needs of the poor.

Many, if not most, policymakers loathe policies and programs that promote automobile use, thus contributing to traffic congestion, air pollution, sprawl, and high transportation costs. There are many good reasons for these concerns and for associated efforts to address them. Yet, the responsibility for mitigating the negative externalities of automobiles should not be shifted to low-income families, the population group who currently uses cars the least and, as the evidence shows, needs them the most. Therefore, for low-income households the pursuit of "economic sustainability"—in this case measured by employment rates—may conflict with other dimensions of sustainability and thus will necessitate some difficult policy trade-offs.

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Notes

1. For example, in recent years, HUD and the U.S. Department of Transportation (DOT) have collaborated—in an unprecedented fashion—to better integrate transportation, housing, and employment, with the end goal of creating more "economically sustainable and livable communities" (HUD and DOT 2010). The listing of FY2011 Sustainable Communities Grantees (http://portal.hud.gov/hudportal/documents/huddoc?id=FY2011RegGrantees_noDist.pdf) includes numerous references to transportation, particularly efforts to improve the linkage between affordable housing and public transit. Not a single grantee lists efforts to increase low-income households' access to automobiles.

2. We tested the sensitivity of the model by including part-time jobs in a more broad definition of employment as the dependent variable; the model results are consistent with the figures reported for full-time employment.

3. For a more extensive description of these data, see Tomer, Kneebone, Puentes, and Berube's (2011) Appendix 1, Technical Methodology. We also experimented with other sources of transit data, including a transit availability index from the Federal Highway Administration, but found the Brookings data to be superior.

4. Data on employment and car ownership are also available in the final survey, but missing data and nonresponses from this survey round would have cut the usable sample to a maximum of 2,400 participants. This level of attrition was deemed problematic and thus the final survey data were not used in this analysis.

5. A handful of studies show that access to public transit is positively associated with employment among households without cars (Kawabata, 2003; Ong & Houston, 2002; Sanchez, 1999; Yi, 2006). Therefore, in a separate model, we examined the relationship between public transit and employment for participants without automobiles. The sample size is reduced by less than one-fifth, since so few households had cars at baseline. Similar to the full model, transit—as measured by both self-reported bus access and households moving to neighborhoods with better service between baseline and interim—has a large positive impact on keeping employment. Improved public transit also has a negative but nonsignificant effect on gaining employment.

6. The studies on the relationship between vehicle asset limitations and ownership are mixed. For example, Nam (2008) finds no relationship between more generous vehicle asset limits and vehicle ownership.

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Technical Appendix

Model Form, Results, and Diagnostics

Model Form. The multinomial regression model takes the following form:

$$\frac{p_{io} = \exp\,(I_{io}, H_{io}, N_{io}, M_{io})}{\sum_j \exp\,(I_{io}, H_{io}, N_{io}, M_{io})} \qquad \text{for } j = 1,2,3,4,$$

where p_{io} = probability person i belongs to discrete-change category o; I_{io} = a vector of individual (personal) characteristics such as sex, race and ethnicity, education level of person I; H_{io} = a vector of household characteristics such as

Table A-1. Model results: Employment model [base = not employed → not employed].

	Not employed → employed		Employed → not employed		Employed → employed	
Independent variables	**RRR**	**SE**	**RRR**	**SE**	**RRR**	**SE**
Individual characteristics						
Age	1.16***	0.05	1.08	0.07	1.31***	0.11
Age^2	0.07***	0.04	0.29	0.22	0.02***	0.02
Male	1.85	0.77	1.70	0.89	1.84	0.81
High school graduate	1.32***	0.13	1.23	0.25	1.51**	0.26
Race/ethnicity [excluded: non-Hispanic White]						
Black	0.63	0.21	0.91	0.45	2.83*	1.72
Hispanic	0.43**	0.14	0.72	0.36	2.01	1.21
Other	0.77	0.31	0.46	0.33	0.92	0.65
Household characteristics						
Household size	0.95	0.03	1.02	0.07	0.95	0.06
Aid to families with dependent children	1.02	0.14	0.15***	0.03	0.06***	0.01
Supplemental Security Income (SSI)	0.56***	0.08	0.39***	0.13	0.2***	0.07
Moved between baseline and interim	0.85	0.10	0.98	0.23	0.93	0.18
Program status [excluded: control group]						
Section 8	1.05	0.14	1.10	0.31	0.92	0.20
Experimental	1.10	0.13	1.14	0.29	0.99	0.19
Lease-up	1.05	0.13	1.13	0.30	0.85	0.19
Improved public transit between baseline and interim	0.84	0.29	3.67	2.96	16.98**	19.85
Live <15 minute walk to transit (self-reported)	0.98	0.32	2.95	2.31	16.62**	19.26
Automobile access [excluded: no car]						
Gained car between baseline and interim	2.7***	0.31	1.27	0.31	4.11***	0.8
Lost car between baseline and interim	0.91	0.30	1.21	0.69	2.26**	0.8
Had car at baseline and interim	2.04***	0.37	1.65	0.55	4.18***	1.04
Neighborhood characteristics						
Job access (relative to MSA)	0.73	0.26	1.02	0.73	1.04	0.58
Poverty rate	0.99	0	1	0.01	1.01	0.01
Metropolitan area [excluded: Los Angeles]						
Baltimore	2.05***	0.38	0.91	0.41	2.81***	0.94
Boston	1.34	0.45	1.28	0.81	1.59	0.87
Chicago	1.48*	0.30	1.37	0.60	1.96*	0.69
New York City	2.25***	0.39	0.92	0.33	2.68***	0.80
N = 3,199 pseudo R^2 = .17						

*p < .10; **p < .05 level; ***p < .01.

household size, earnings, public assistance receipt (welfare, social security), program status (control or experimental), moved, moved to neighborhood with better public transit, change in automobile access of person *i*; N_{io} = a vector of neighborhood characteristics such as employment accessibility and poverty rate of person *I*; and M_{io} = a set of dummy variables for the four metropolitan areas with Los Angeles as the excluded metropolitan area.

Model Diagnostics. We simulate correct predictions for each of the models multiple times, introducing randomness to select outcomes of different probability "sizes." We first turn the probabilities associated with each outcome into cutoffs for bins. A case is defined as correctly predicted if there is a match between the employment category observed and the employment bin predicted by the model. We run this simulation 10 times, and the results reflect the average of these ten simulations. This approach is contrasted by a more generous approach, which appears to be used in some of the comparable literature, which simply matches the observed employment category with the highest predicted membership in the model (in this case, with four categories the proportion must be greater than or equal to 0.25).

Table A-2. Model diagnostics.

Pseudo log-likelihood	–3074.723
Chi-square goodness of fit	.000
Percent correctly predicted	
No employment → no employment	65%
No employment → employment	31%
Employment → no employment	8%
Employment → employment	29%
Overall prediction	49%