●東洋大学社会福祉学会　第 12 回大会／ 2016年7月

【基調講演】

A study of former welfare recipients' employment in Ohio, USA : Focusing on the effects of job access and neighborhood condition

Seok-Joo Kim, Ph.D., MSSA, MSW

Assistant Professor
Department of Social Welfare, College of Social Sciences,
Daegu University, Gyeongsan, South Korea

Abstract

This study aimed to test the effects of job access and neighborhood disadvantage on the earnings of female former welfare recipients. It mainly addressed vital policy concerns on employment issues of Temporary Assistance for Needy Family (TANF) recipients who exited cash assistance. This study was grounded on two theoretical perspectives: (1) the Spatial Mismatch Hypothesis (SMH) that explained job access as a barrier to employment and (2) Wilson's observation (1996) that neighborhood disadvantage negatively affected employment. As a non-experimental design, this longitudinal study merged two local administrative datasets with 2000 Census data. This study selected female former welfare recipients (N=13,788) in Cuyahoga County, Ohio, USA. The dependent variable was measured by average quarterly earnings. In addition to demographic and human capital variables, the independent variables that were measured: (1) individual job access (distances), (2) neighborhood public transportation access, and (3) neighborhood disadvantage. As a main analysis, Hierarchical Linear Model (HLM) was conducted to test the nested effects of job access and neighborhood disadvantage on the earnings. Furthermore, this study used spatial analysis (i.e., mapping and spatial auto-correlation) to support the main analysis. The main results showed that (1) neighborhood disadvantage adversely affected the earnings, (2) shorter job distances and higher public transportation access increased the earnings. In conclusion, this study recommended community development and residential programs should ameliorate the job access barriers and neighborhood disadvantage of welfare recipients. The implementation of cash assistance programs should consider the effects of job access and neighborhood disadvantage.

1. Introduction

The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA) eliminated the Aid to Families with Dependent Children (AFDC) program and embarked on Temporary Assistance for Needy Family (TANF) program (P.L. 104-193). Compared to AFDC, TANF places a stronger work requirement on its recipients. TANF limits the length of receiving cash assistance and regulates that its recipients cannot receive cash assistance for more than five years. Therefore, self-sufficiency and employment of welfare recipients who exited cash assistance are vital policy concerns raised by the 1996 welfare reform. Thus, the first concern of this study was to focus on the importance of employment among female former welfare recipients who exit cash assistance.

Under this policy context, this study aimed to examine the effects of job access and neighborhood disadvantage on the earnings of former TANF recipients who were employed after exiting cash assistance. This study mainly addressed three policy concerns surrounding the 1996 welfare reform: (1) the employment of female former welfare recipients who were mandated to participate in work-related activities and exit cash assistance within a time limit, (2) job access, as many available workplaces have been suburbanized in the past few decades and there are limited

options for transportation, and (3) neighborhood disadvantage, as many TANF recipients lived in economically disadvantaged neighborhoods that may have lowered their employment chances.

Despite their potential importance, many studies have paid little attention to the influence of job access and neighborhood disadvantage on female former welfare recipients' employment. Few studies have analyzed the effects of job access or neighborhood disadvantage on the employment of welfare recipients, yielding inconsistent results due to different theoretical perspectives, research methods, and analytical tools. Therefore, this study was focused on female former welfare recipients who resided in neighborhoods within Cuyahoga County[1], Ohio, USA.

2. Background

2.1. Job access as a barrier of employment

A potentially significant barrier to employment was the problem of geographic job access for female former welfare recipients. Because of increasing suburbanization of low-skilled job opportunities, the concentration of welfare recipients in inner cities, and welfare recipients' dependency on public transportation, job access was one of the important factors that affected the employment of female former welfare recipients (Allard, 2002; Allard & Danziger, 2003; Bania, Coulton, & Leete, 1999, 2003; Bloom, Riccio, & Verma, 2005; Blumenberg & Manville, 2004; Blumenberg & Ong, 1998; Blumenberg & Shiki, 2003; Gurley & Bruce, 2005; Gurmu & Smith, 2006; Ihlanfeldt & Sjoquist, 1998; Ong, 1996; Pan, Jensen, Fuller, & Mohanty, 2006). The phenomenon of job suburbanization has attenuated an employment likelihood of low-skilled workers who were unable to move from the inner cities to the suburbs (Blumenberg & Marville, 2004; Coulotn, 2003; Holzer & Ihlanfeldt, 1996; Ihlanfeldt, 1994; Ihlanfeldt & Sjoquist, 1998; Kain, 1968, 1974). A high portion of female former welfare recipients can be regarded as low-skilled workers in a labor market;

fifty-two percent of closed TANF recipients did not have a high-school diploma in the 2009 fiscal year (U.S. Department of Health and Human Services [HHS], 2012). Also, female former welfare recipients have less work-experience; only two of ten active TANF recipients worked in the fiscal year 2009 (HHS, 2012).

With regards to job suburbanization, TANF recipients often confronted a job access barrier to their workplaces because many of them reside in poor inner-cities and rely on public transportation (Bloom et al., 2005; Blumenberg & Manville, 2004; Blumenberg & Ong, 1998; Blumenberg & Shiki, 2003; Ong, 1996; Ong & Blumenberg, 1998; Sanchez, Qing, & Peng, 2004). In 2001, 748,000 mothers, ages 15 to 44, received TANF cash assistance (U.S. Census Bureau, 2012). Eighty one percent of them resided in metropolitan areas; fifty percent of metropolitan TANF recipients lived in inner-cities (U.S. Census Bureau, 2012). Given these characteristics, former welfare recipients are exposed to job access barriers to employment. However, few empirical studies have been conducted on testing the relationship between job access and the employment of welfare recipients.

2.2. Effect of neighborhood disadvantage on employment

An additional factor considered in this study was the effect of neighborhood disadvantage on the employment of female former welfare recipients. There is some evidence that the socio-economic characteristics of neighborhoods are associated with the self-sufficiency and employment of welfare recipients (Austin & Lemon, 2005; Allard & Danziger, 2003; Coulton, 2005; Gurmu, Ihlanfeldt, & Smith, 2008; Mendenhall, DeLuca, & Duncan, 2006). During the transformation of public assistance policy from AFDC to TANF, neighborhood effects based on an ecological perspective emerged as an important factor of welfare recipients' employment (e.g., Allard & Danziger, 2003; Allen & Kirby, 2000; Austin & Lemon, 2005; Chow, Johnson, & Austin, 2005;

1　Cuyahoga County includes many poor neighborhoods, particularly within the City of Cleveland and the City of East Cleveland, which are persistently and extremely poor urban cities in the U.S.

Casiano & Massey, 2008; Coulton, 2003; Deverteuil, 2005; Gurmu et al., 2008; Ihlanfeldt & Sjoquist, 1998; O'Connor, 2000; Vartanian, 1999). Concentrated disadvantage in inner city neighborhoods has been recognized as a serious concern since the 1970s (Briggs, 2005; Massey & Denton, 1993; Massey, Gross, & Shibuya, 1994; Wilson, 1987, 1996). Basic statistics illustrate the skewed distribution of income and poverty between inner cities and suburbs; the median household income of the suburbs ($56,140) was greater than that of inner cities ($44,409) in 2010 (DeNavas-Walt, Proctor, & Smith, 2011). It was also estimated that 46 million people, which was 15.1 percent of the U.S. population, lived below the federal poverty threshold in 2010 (DeNavas-Walt et al., 2010). Among them, 38 million lived in metropolitan areas, including 19 million in inner cities and 8 million in the suburbs (DeNavas-Walt et al., 2010).

Like median household income, there was a difference in the poverty rate between inner cities and suburbs; the poverty rates of inner cities and the suburbs were 19.7 percent and 11.8 percent, respectively (DeNavas-Walt et al., 2010). An additional problem is that the concentrated poverty in inner-city neighborhoods is associated with other indicators of some distress. The influence of concentrated poverty in inner-cities has been expanded to measure a broad concept of the level of neighborhood disadvantage (Deverteuil, 2005; Sampson, Morenoff, & Earls, 1997). Because many TANF recipients reside in urban areas, their economic activities (i.e., employment) are expected to be understood by the level of neighborhood disadvantage where they reside.

Moreover, neighborhood disadvantage adversely affects various outcomes of low-income families including TANF recipients. For example, low-income families in concentrated areas of poverty are more likely to be exposed to negative individual, familial, and social outcomes such as unemployment, crime, mortality, teenage childbearing, low birth weight, physical and mental health issues, child development issues, and adolescent behavioral problems (e.g., Austin & Lemon, 2005; Chow et al., 2005; Fauth, Leventhal, & Brooks-Gunn, 2005; Goering & Feins, 2003; Katz, Kling, & Liebman, 2001; Kling, Liebman, & Katz, 2007; Ludwig, Duncan, & Pinkston, 2005; Sampson & Sharkey, 2008). Related to this study, welfare recipients who exit cash assistance and reside in poor inner-city neighborhoods encounter economic challenges, such as unemployment and low earnings.

## 2.3. Conceptual framework and research questions

This study was conceptualized as multi-leveled because it focused on how individual employment was affected at the individual- and neighborhood-level. The types of variables were divided into three components: (1) a dependent variable, (2) independent variables, and (3) covariates. The dependent variable was the earnings of female former welfare recipients at the individual-level (Level-1). It was measured with an eight-quarter window. This study assumed that the independent variables simultaneously affected the dependent variable at the individual (Level 1) and neighborhood-level (Level 2) (See Figure 1).

In accordance with the research purposes and analytical models, this study established a research question that contained five hypotheses[2] as follows:

Research question: How do job access and neighborhood disadvantage influence female former welfare

2 H1. There will be a significant variance in average quarterly earnings of female former welfare recipients by census tracts.

H2. The differences in the covariates (i.e., demographic, human capital, and involuntary exit of cash assistance) will affect average quarterly earnings of female former welfare recipients.

H3. A longer individual job access (distance) will decrease average quarterly earnings of female former welfare recipients.

H4. A higher level of neighborhood public transportation access will increase average quarterly earnings of female former welfare recipients.

H5. A higher level of neighborhood disadvantage will decrease average quarterly earnings of female former welfare recipients.

Figure 1. Conceptual framework
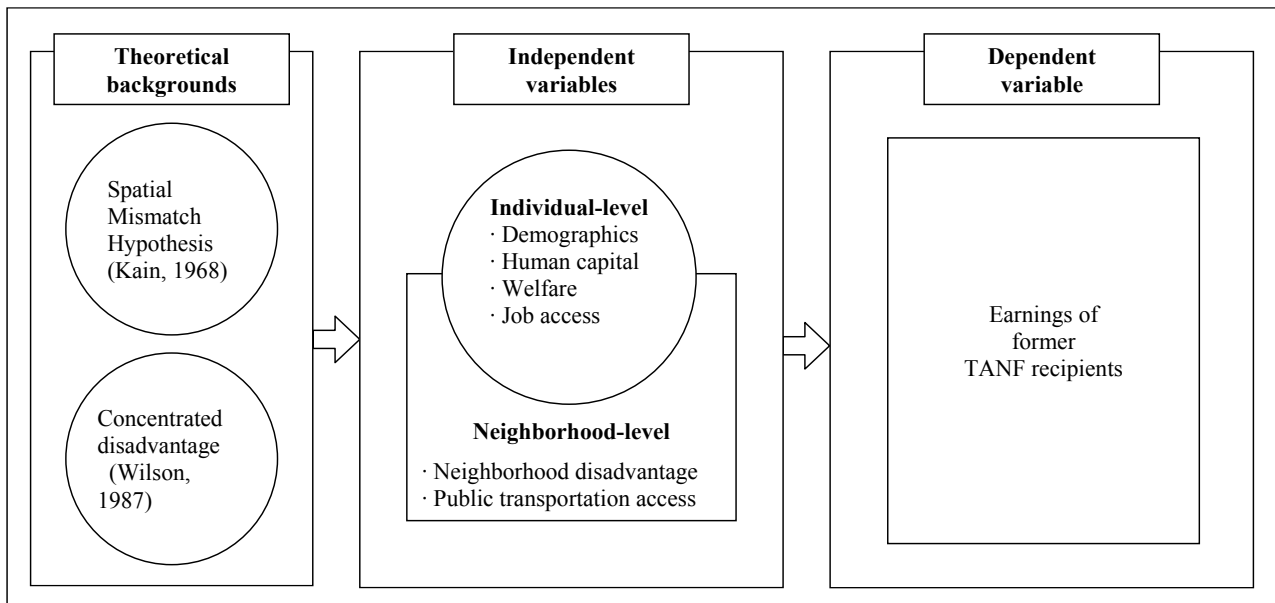
recipients' average quarterly earnings within eight quarters after exiting cash assistance and being employed?

3. Method

3.1. Data

This study combined two sets of administrative data with Census 2000 data (See Figure 2). Two sets of administrative data were provided by Cuyahoga County Employment & Family Services (EFS), Ohio. These administrative data sets were longitudinal data which consisted of (1) TANF data and (2) the Quarterly Wage Recode (QWR). Since these data sets were merged by matching the TNAF recipients' social security number,

Figure 2. Data manipulation
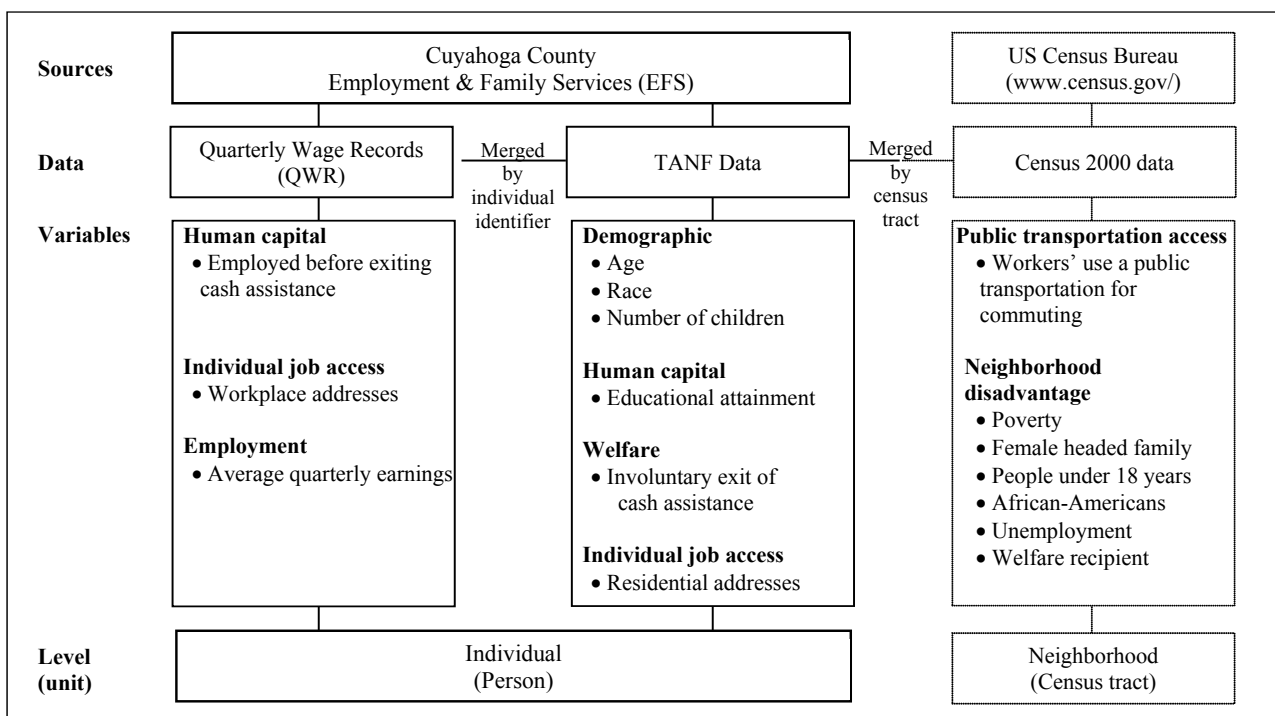
the personal information was strictly protected under the review and regulations of the Institutional Review Board (IRB). In addition to these administrative data, Census 2000 data was collected at the Census Bureau's website (U.S. Census Bureau, 2012). Those two administrative data sets and Census 2000 data were merged by a census tract in which the welfare recipients resided at the point of exiting cash assistance.

3.2. Sampling

This study selected its sample by establishing eight criteria. First, this focused on female welfare recipients because they were a majority of the cash assistance program and their employment context was different from males (Hanson, Kominiak, & Carlin, 1995) (Criterion 1). Further, the selected sample was those without disability (Criterion 2). Considering data availability and policy context, the sample should exit TANF cash assistance between 2000 and 2003. Therefore, most of the first TANF generation began to exit cash assistance during this time period (Criterion 3). In this study, the event of being employed was prerequisite to measuring earnings and individual job access (Criterion 4). The sample should be an adult (over 18 years old) at the point of exiting cash assistance (Criterion 5). The sample also had at least one child whose age should be below 18 at the point of exiting cash assistance (Criterion 6). In addition, this study excluded the sample that resided outside of Cuyahoga County within two year after exiting cash assistance (Criterion 7). Finally, the sample should work in two in Metropolitan Statistical Areas (MSA), Cleveland-Elyria-Mentor MSA and Akron MSA, within eight quarters after exiting cash assistance (See Figure 3). As a key independent variable, individual job access was calculated by a distance between residential addresses and workplace addresses.

Figure 3. Job locations in Metropolitan Statistical Areas
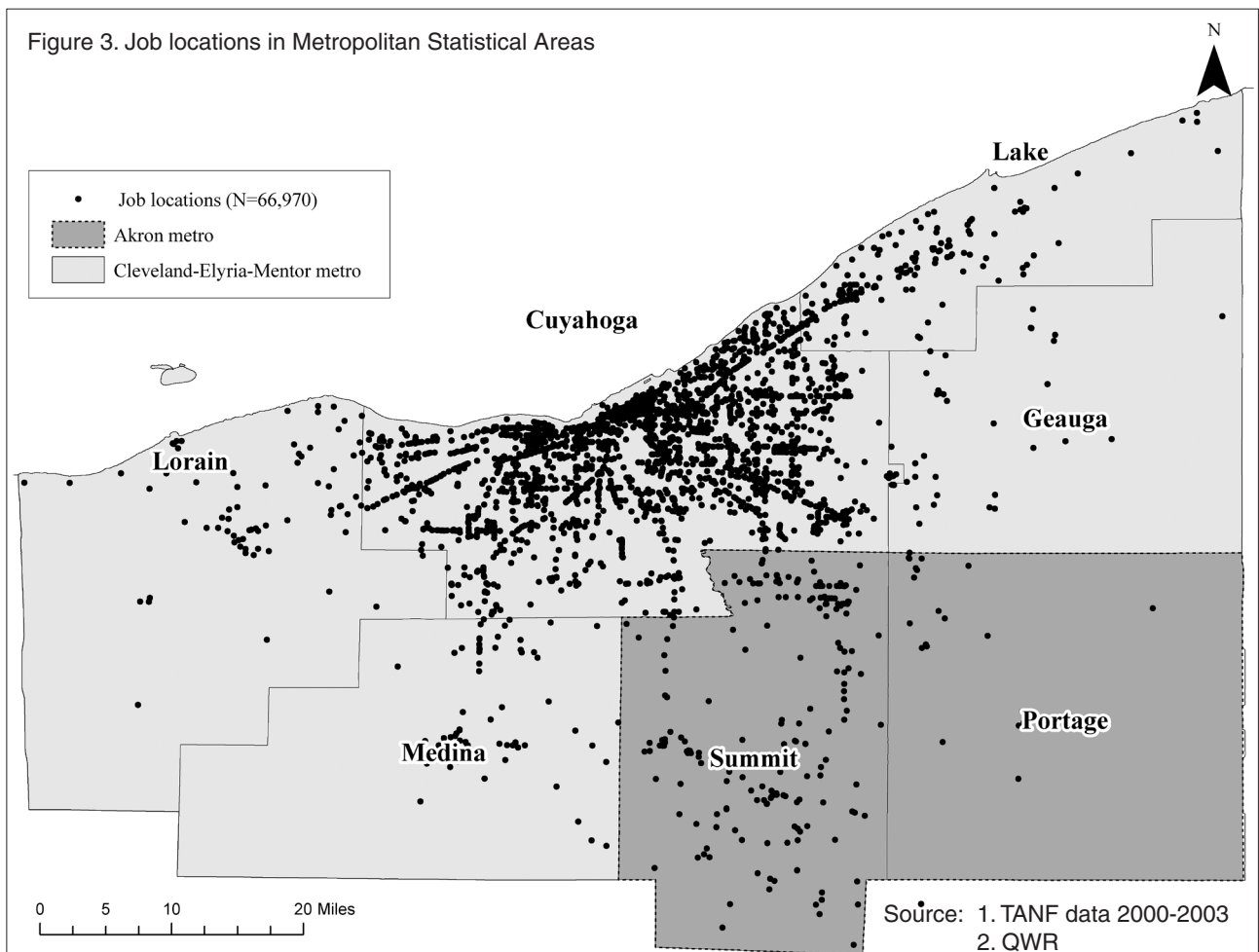
If a sample worked outside of these two MSAs, it was unreasonable to measure the distance between a residential place and the workplaces of the sample. Following this criterion, this study selected 66,790 job locations in these two MSAs (Criterion 8). Following these criteria, this study collected 13,788 female former welfare recipients.

3.3. Measures

The dependent variable, the average quarterly earnings, was measured by using an eight-quarter window. The average quarterly earnings were the mean taxable earning of the employed quarters within eight quarters after exiting cash assistance regardless of job retention. Specifically, the earnings of eight quarters were summed and divided by the number of the employed quarters.

The individual-level variables were comprised of several covariates and individual job access. The main analysis controls three sets of covariates were controlled at an individual level. TANF data contained four demographic variables: age, race, and number of children at a point of exiting cash assistance. The age (year) of the sample was calculated at the time of exiting cash assistance. Considering the racial proportions of the sample, race was divided into three categories: Whites, African-Americans, and others. The sample's number of children in the house was measured at the point of exiting cash assistance. In addition to the demographic variables, two human capital variables were included in the main analysis. If the level of educational attainment at the point of exiting cash assistance was higher than high school graduation, it was coded into one; otherwise, it was coded into zero. The sample's work-experience

was measured within one quarter before exiting cash assistance. If the sample was employed one quarter before exiting cash assistance, it was coded into one; otherwise, it was coded into zero. The reasons of leaving cash assistance were coded into a dichotomous variable; if the sample involuntary exited cash assistance is coded into one; otherwise, it was coded into zero.

In this study, individual job access was defined as the average distance (in miles) between a residential address at the point of exiting cash assistance and workplaces after exiting cash assistance of the female former welfare recipients. The residential address and workplace address were obtained from TANF data and QWR, respectively. The Euclidean distance, the airway distance between two points, was used to calculate the distance between a residential place and workplaces of the sample[3].

TANF data contained addresses of the female former welfare recipients resided in at the point of exiting cash assistance. By using *ArcGIS* 10.0, the addresses were geo-coded in order to identify Census 2000 tract number (geographic boundaries) of the sample. Also, this study was able to collect neighborhood information of female former welfare recipients as it merged TANF data and Census 2000 data. The neighborhood characteristics of female former welfare recipients were collected from decennial Census 2000 data (U.S. Census Bureau, 2012). According to Census 2000 data, Cuyahoga County consisted of 502 census tracts. From this study, the sample resided in 445 Census tracts at the point of exiting cash assistance.

The variables to measure the level of neighborhood concentrated disadvantage were collected based on the theoretical background (Wilson, 1996) and the empirical study (Sampson et al., 1997). The level of concentrated

---

3　The sample's (i) residential location was r_i; this study obtained only one residential location of the sample. Depending on the number of employments (j) in each quarter (q), the sample (i) was employed at workplaces (w_{ij}). For i's average job distance of each quarter (D_{iq}), the sum of distances within each quarter (q) was divided by the number of employment (j).

$$D_{iq} = \frac{\sqrt{\sum_{j=1}^{j}(r_i - w_{ij})^2}}{j}$$

disadvantage was gauged by the factor scores of the six items[4] in each census tract. Each of these six variables was calculated by a proportion of the census tract where female former welfare recipients resided at the point of exiting cash assistance (See Table 1).

As a proxy of neighborhood job access, this study included the neighborhood-level of public transportation from 2000 Census data (U.S. Census Bureau, 2012). Specifically, it included the percentage of workers' use of public transportation in the census tract where female former welfare recipients resided at the time of exiting cash assistance. This study assumed that this indicator was a proxy for access to public transit.

3.4. Analysis

This study was designed to conduct two steps of statistical analysis: (1) explanatory and (2) main analysis. The explanatory approach was comprised of descriptive analysis and spatial analysis[5]. After completing the explanatory analysis, this study utilized Hierarchical Linear Model (HLM) in order to test the research question (Raudenbush & Bryk, 2002; Raudenbush, Bryk, Cheong, Congdon, & Toit, 2011). In order to systematically test the research hypotheses, this study used the multi-level analysis, HLM. Specifically, this study incorporated two models: (1) null model and (2) random-intercept *ANCOVA* model (Raudenbush & Bryk, 2002).

The null model was established as follows[6]:

Individual-level	$Y_{ij} = \beta_{0j} + r_{ij},$	[1]
Neighborhood-level	$\beta_{0j} = \gamma_{00} + b_{0j},$	[2]
Spatial weight	$b_{0j} = pMb_{0j} + u_{0j}$	[3]

The final model, random-intercept *ANCOVA*, model was built as follows:

Individual-level	$Y_{ij} = \beta_{0j} + \beta_{qj} \cdot X_{qij} + r_{ij},$	[4]
Neighborhood-level	$\beta_{0j} = \gamma_{00} + \gamma_{0s} \cdot W_{sj} + b_{0j},$	[5]
Spatial weight	$b_{0j} = pMb_{0j} + u_{0j}$	[6]

This study used three software packages for data manipulation, spatial analysis, and statistical analysis: Statistical Analysis System (SAS) 9.0, *ArcGIS* 10.0, and HLM 7.0. SAS 9.0 was used for data management, descriptive analysis, and PCA. Spatial analysis was conducted by *ArcGIS* 10.0. The major analyses of this study, HLM, were conducted by HLM 7.0 (Raudenbush et al., 2011).

---

4   The six variables to measure the level of neighborhood disadvantage in 1999 were (1) poverty rate (a proportion of individuals below the federal poverty threshold), (2) a proportion of households that received public assistance, (3) a proportion of female-headed families with children, (4) unemployment rate, (5) a proportion of individuals less than 18 years old, and (6) a proportion of African-Americans (U.S. Census Bureau, 2012; See Table 1). Similar to the previous study, this study conducted a Principal Component Analysis (PCA) with oblique rotation in order to check the factor structure of these six variables (Sampson, et al., 1997). As an aggregated number of these six items, the regression factor score from PCA was inputted in the main analysis.

5   According to *Moran's I*, the spatial autocorrelation between residential places and the earning of the sample was detected (Dormann et al., 2007). Therefore, this study used a spatial analysis tool to calculate and to produce spatial weight scores within Census 2000 tracts of Cuyahoga County, Ohio. Then, the spatial weights were inputted and adjusted in the main analyses.

6   Y_{ij}: Average quarterly wage, Y(US\$), of former welfare recipient (i) in a census tract (j) (i=1,…,13788, j=1,…,445),
    β_{0j}: Between-level intercept,
    X_{qij}: Individual-level covariates (q=1,..,8), β_{qj}: *Coefficient of X_{qij}*,
    r_{ij}: Individual-level error, $N(0, \sigma^2)$,
    γ_{00}: Within-level intercept,
    W_{sj}: Neighborhood-level covariates (s=1,2), γ_{0s}: Coefficient of Wsj,
    p: Spatial correlation parameter, Mb_0: Spatial weight, b_{0j}: j's census tract,
    u_{0j}: Neighborhood-level error, $N(0, \tau^2)$

4. Results

4.1. Descriptive analysis

The dependent variable, average quarterly earnings, was examined. The mean of average quarterly earnings were $2,656.87 (SD=1772.09) with an eight-quarter window. In other words, the sample earned $739.22 per month on average. Average quarterly earnings were also

Table 1. Descriptive analysis

Variables	Mean / %	SD	Min.	Max.	Data [a]
Individual-level [b]					
Average quarterly earnings (US$) [c]	2656.87	1772.09	101	28784	A
Age (Year)	28.90	7.39	18	60	B
Race					B
African-Americans (Yes=1)	75.5%				
Whites (Yes=1)	17.2%				
Reference: others	8.3%				
Number of children	2.15	1.24	1	11	B
High school diploma (Yes=1)	56.6%				B
Employed before exiting cash assistance (Yes=1)	60.5%				A
Involuntary exit of cash assistance (Yes=1)	18.2%				B
Mean distance between residential place and workplaces (Miles)	7.36	5.83	0.02	62.47	A,B
Neighborhood-level [d]					
Neighborhood disadvantage (Score) [e]	0	1	-1	-3	C
(1) Individuals poverty rate [f]	17.9%	16.19	0	100	C
(2) Household on public assistance [f]	7.5%	8.37	0	59	C
(3) Female-headed families [f]	32.5%	18.62	5	91	C
(4) Unemployed [f]	5.0%	4.03	0	27	C
(5) Less than aged 18 [f]	25.7%	7.58	1	56	C
(6) African-Americans [f]	37.8%	38.96	0	100	C
Workers' use of public transportation for commuting	9.7%	9.47	0	58	C

Note. a) Data: A=QWR, B=TANF, C=U.S. Census 2000
b) N=13,788
c) Spatial Auto-correlation (Census tract): Moran's I=.001, z=141.70, p<.001
d) Area=501 Census tracts, Cuyahoga County, Ohio, USA
e) Composite factor score from (1) to (6)
f) Factor loading (PCA, Oblique rotation): (1)=.92, (2)=.90, (3)=.96, (4)=85, (5)=.72, (6)=.78

spatially auto-correlated with the sample's residential location (*Moran's I*=.001, z=141.70, *p*<.001).

The individual-level variables consisted of demographics, human capital variables, involuntary exit of cash assistance, and job access variable. The sample's average age was 28.9 (SD=7.39). The ethnic majority was African-Americans (76.5 percent). On average, the sample had 2.15 children (SD=1.24) at the point of exiting cash assistance. The results showed that 56.5 percent had a high school diploma at the point of exiting cash assistance. 60.5 percent were employed one quarter before exiting cash assistance.

Individual job access was the average distance between a residential place and all workplaces during the time the sample was continuously employed since the first quarter of exiting cash assistance. Job access was used for the statistical model with job retention. The average score of job access was 7.34 miles (SD=5.99).

Based on a previous study, neighborhood disadvantage was operationalized through six neighborhood variables (Sampson, et al., 1997). The average neighborhood poverty rate was 17.9 percent (SD=16.19). The average proportion of households on public assistance in neighborhoods was 7.5 percent (SD=8.37). On average, the neighborhoods had 32.5 percent of female-headed families (SD=18.67). The average neighborhood unemployment rate was 5.0 percent (SD=4.03). The average proportion of young people (less than 18 years old) in neighborhoods was 25.7 percent (SD=7.58). The average proportion of African-Americans in the neighborhoods was 37.8 percent (SD=38.9). By aggregating these six items, the factor scores of neighborhood disadvantage were produced (Sampson et al., 1997). Therefore, the average factor scores of neighborhood disadvantage was 0.0 (SD=1.00).

As a proxy for neighborhood job access through public transportation, this study included the percent of workers' use of public transportation from 2000 Census data. The average proportion of workers using public transportation to commute in neighborhoods was 9.7 percent (SD=9.47).

4.2. Multi-level analysis

As the null model, the analysis began with fitting a one-way random-effects *ANOVA* model in order to determine the total amount of variability in average quarterly earnings within and between-neighborhoods (H1; See Table 2). The mean of the average quarterly earnings was estimated as \$2,735.2. The pooled within-neighborhood variance was 303335.868; the between-neighborhood variance of this model was 134512.758. In sum, there was a significant variance of average quarterly earnings among neighborhoods (χ^2=1022.295, *p*<.001). Using these variance components, the proportion of variance between neighborhoods was estimated as 30.7 percent (Intra-class Correlation Coefficient [ICC]=.307). Around 31 percent of the variance in average quarterly earnings was due to the difference across the sample's neighborhoods.

The final model for average quarterly earnings, random-intercept *ANCOVA* model, included all individual- and neighborhood-level variables. Compared to the null model, the final was improved and obtained more explanatory power. The ICC of this model was .006, which is much smaller than that of the null model. The variance of the null model explained by this model was 87.6 percent. After including the individual- and neighborhood-level variables, there was a significant variance of average quarterly earnings among neighborhoods (Between-neighborhood variance=16686.603, χ^2=631.374, *p*<.001).

The final model identified the significant effect of the covariates on the earnings of former female welfare recipients (H2). As the sample's age increased by one year, average quarterly earnings increased by \$20.7 (β=20.730, *t*=10.146, *p*<.001). Whites earned \$260.4 less than the reference group (β=-260.356, *t*=-3.395, *p*<.001). As the sample had one more child, its average quarterly earnings increased by \$48.6 (β=48.594, *t*=3.890, *p*<.001). Human capital variables significantly predicted average quarterly earnings. The sample with a high school diploma earned \$684.1 more than its counterparts (β=684.117, *t*=22.581, *p*<.001). The sample that had been employed one quarter before exiting cash assistance

earned $338 more than those who had not (β=338.333, t=11.106, p<.001). Average quarterly earnings of the sample that involuntarily exited cash assistance were $708 lower than those who did not (β=-708.026, t=-19.906, p<.001).

This model showed that individual job access affected average quarterly earnings of the sample after controlling for neighborhood-level variables (H3). As the mean distance between a residential place and

workplaces increased by one mile, average quarterly earnings of the sample decreased by $9 ($\beta$=-9.136, t=-3.668, p<.001).

The neighborhood-level variables also significantly influenced on average quarterly earnings after controlling for the individual-level variables. As the score of neighborhood disadvantage increased by one point, average quarterly earnings of the sample decreased by $229 ($\beta$=229.634, t=-7.994, p<.001). This result showed that

Table 2. Multi-level analysis

Model	Null		Final	
Fixed effect	β	t	β	t
Intercept	2735.211	101.733***	2369.741	38.177***
Individual-level				
Age (Year)			20.730	10.146***
Race: Reference (Others)				
African-Americans (Yes=1)			51.460	.773
Whites (Yes=1)			-260.356	-3.395***
Number of children			48.594	3.890***
High school diploma (Yes=1)			684.117	22.581***
Employed before exiting cash assistance (Yes=1)			338.333	11.106***
Involuntary exit of cash assistance (Yes=1)			-708.026	-19.906***
Mean distance between residential place and workplaces (Miles)			-9.136	-3.668***
Neighborhood-level				
Neighborhood disadvantage (Score)			-229.634	-7.994***
Workers' use of public transportation for commuting (%)			6.661	2.542*
Model χ2	1022.295***		631.374***	
Between-neighborhood variance	134512.758		16686.507	
Within-neighborhood variance	303335.868		2784241.484	
Intra-class Correlation Coefficient (ICC)	.307		.006	
Variance explained by (%)	n/a		87.60	

Note: Dependent variable: Average quarterly earnings (US$) within 8 quarters after exiting cash assistance; N of individuals=13,877, N of neighborhoods=445; *p<.05, **p<.01, ***p<.001

female former welfare recipients in more disadvantaged neighborhoods earn less than those their counterparts (H4; See Figure 4). What is more, neighborhood public transportation access also influenced average quarterly earnings of the sample. As the neighborhood percentage of workers' using public transportation increased by one, average quarterly earnings of the sample in the neighborhood increases by $6.7 ($\beta$=6.661, t=2.542, p<.05). Therefore, this result showed the association between the condition of neighborhood public transportation access and average quarterly earnings of the sample (H5; See Figure 5).

In sum, the results demonstrated that the variation of the female former welfare recipients' earnings by neighborhoods (H1). This study identified that demographic (i.e., age, Whites, and number of children), human capital (i.e., high school diploma and work-experience), and involuntary exit of cash assistance influenced the earnings of the female former welfare recipients (H2). In particular, the longer job distance between a residential place and workplaces decreased the earnings
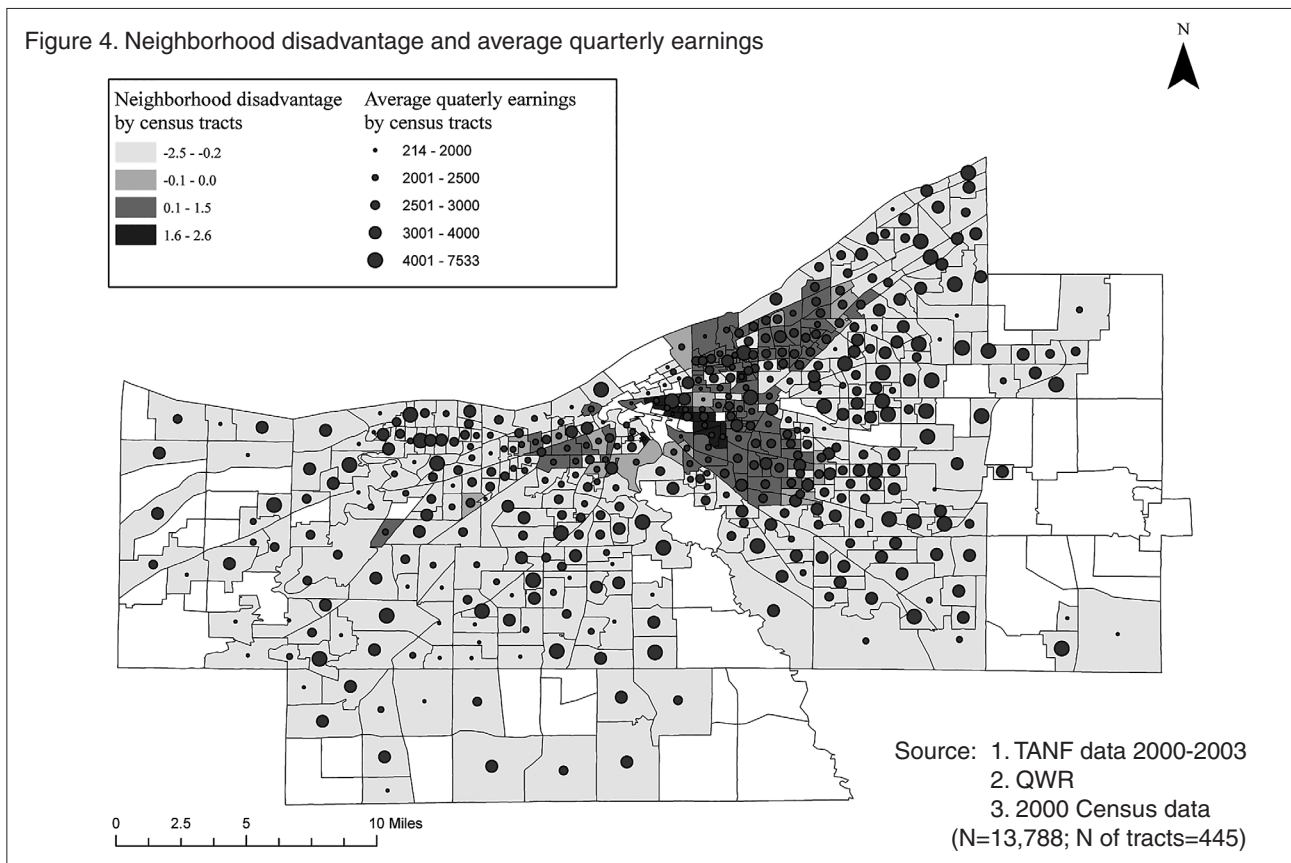
of the female former welfare recipients (H3). Female former welfare recipients in disadvantaged neighborhoods had fewer earnings (H4). Finally, female former welfare recipients residing in a neighborhood with a higher public transportation access had more earnings than those who reside in a neighborhood with lower public transportation access (H5).
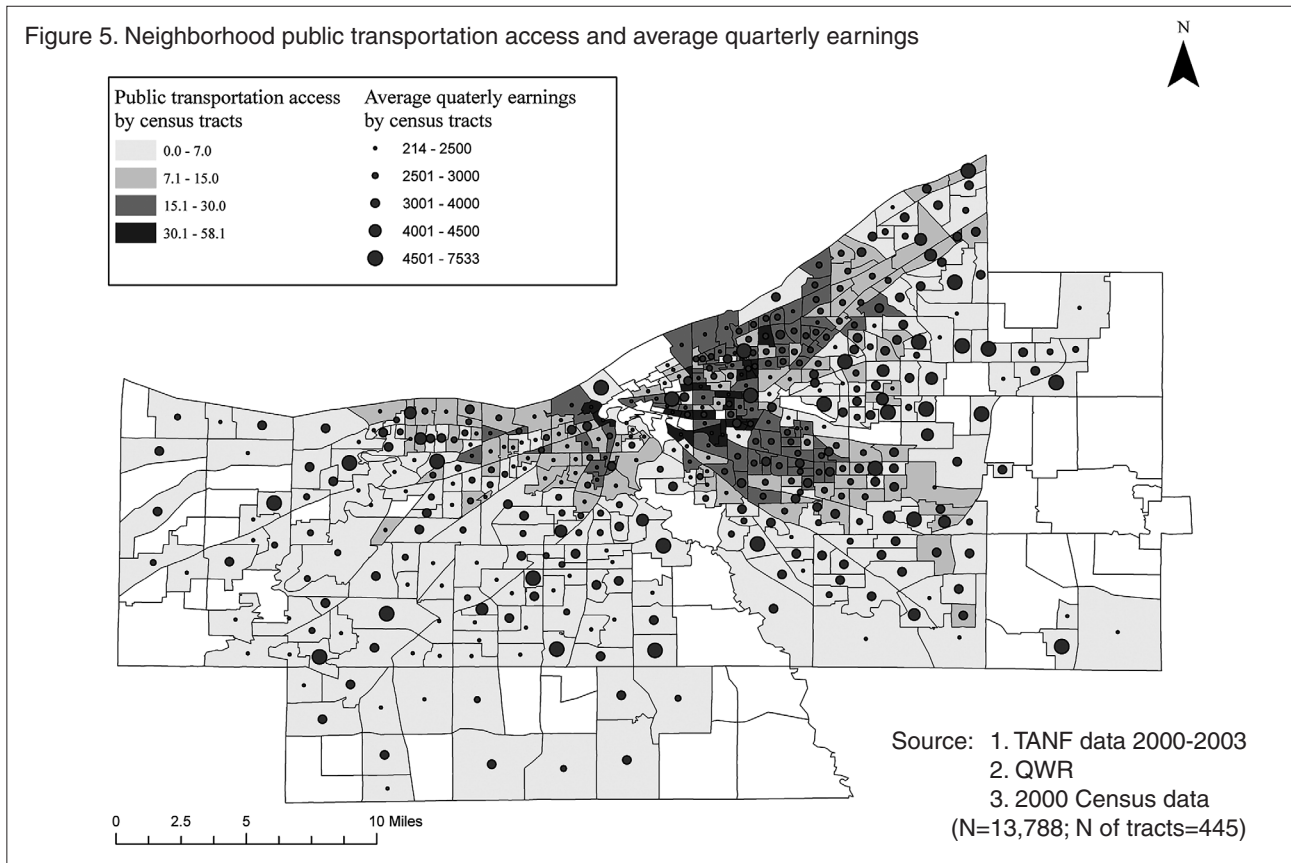
5. Conclusion

5.1. Discussion and implications

The results of this study can be interpreted in relation to previous studies, social work practice (especially, social programs and community development), and policy under three domains: (1) neighborhood disadvantage, (2) individual job access and neighborhood public transportation access, and (3) cash assistance program and policy

First, this study focused on the association between neighborhood disadvantage and the employment of female former welfare recipients. The multi-level analyses

Figure 4. Neighborhood disadvantage and average quarterly earnings

Neighborhood disadvantage by census tracts
- -2.5 - -0.2
- -0.1 - 0.0
- 0.1 - 1.5
- 1.6 - 2.6

Average quaterly earnings by census tracts
- 214 - 2000
- 2001 - 2500
- 2501 - 3000
- 3001 - 4000
- 4001 - 7533

Source: 1. TANF data 2000-2003
2. QWR
3. 2000 Census data
(N=13,788; N of tracts=445)

0   2.5   5   10 Miles

Figure 5. Neighborhood public transportation access and average quarterly earnings

N

Public transportation access by census tracts	Average quaterly earnings by census tracts
0.0 - 7.0	214 - 2500
7.1 - 15.0	2501 - 3000
15.1 - 30.0	3001 - 4000
30.1 - 58.1	4001 - 4500
	4501 - 7533

Source: 1. TANF data 2000-2003
2. QWR
3. 2000 Census data
(N=13,788; N of tracts=445)

0   2.5   5   10 Miles

found a nested neighborhood effect of job access and neighborhood disadvantage on the employment of female former welfare recipients. The results indicate that effects of neighborhood disadvantage have direct implications for social policy, mobility or housing programs, and community development. With a broad perspective, this study suggests that the extension of welfare benefits including public assistance programs could ameliorate the adverse effects of neighborhood disadvantage by reducing the depth of poverty in these neighborhoods. Specifically, two types of social programs could mitigate the negative effects of neighborhood disadvantage on residents' economic status including employment: (1) residential mobility (or housing) programs to help residents in disadvantaged neighborhoods move to better places and (2) community development to make disadvantaged neighborhoods better. Consequently, it is necessary to accommodate supportive services that encourage welfare recipients to move to better places.

Along with residential mobility programs, community development is another approach to overcome the negative effects of neighborhood disadvantage. Community development builds up resources that can reverse the deteriorated neighborhoods while enhancing the human capital of welfare recipients in these disadvantaged neighborhoods (Austin & Lemon, 2005; Bloom et al., 2005; Bruster, 2009; Coulton, 2003). Community development agencies can implement various activities in order to revitalize inner cities via federal, state, and local supports (Coulton, 2005). Moreover, various approaches in community development can make supportive resources more available to welfare recipients and the poor in disadvantaged neighborhoods (Austin & Lemon, 2005). Specifically, employment-related services included various types of programs such as job search assistance, education programs, vocational trainings, and supportive services (e.g., child care and transportation assistance) (Bloom et al., 2005).

Community development strategies can build up the social resources to facilitate employment of welfare recipients in disadvantaged neighborhoods (Austin &

Lemon, 2005; Bloom et al., 2005; Coulton, 2005). If the female former welfare recipients begin or continue to work, their improved economic status also contributes to enhancing their neighborhood conditions. Because welfare recipients were affected by their neighborhood's conditions, community development programs should be broadened to address human capital and employment needs (Coulton, 2005).

Second, this study was the first trial to calculate actual job distances between a residential place and workplaces and to estimate the association between the job distances and the earnings of female former welfare recipients. It is important to interpret the effect of job access in the context of what is known about women's employment, which along with job access can be discussed in relation to the skill mismatch hypothesis as well as the SMH. Furthermore, the result of job access effect in this study should be interpreted in the context of women's employment. Studies have shown that access to appropriate jobs have an influence on the level of female employment (Hanson et al., 1995). Localized job-network and juggling domestic tasks (e.g., childcare) make it difficult for females to find a job located far from home (Blumemberg & Manville, 2004; Hanson et al., 1995). Because welfare recipients mainly depend on public transportation, far fewer jobs are manageable for them as opposed to individuals who can travel by automobiles (Blumenberg & Manville, 2004; Blumenberg & Ong, 1998; Hanson et al., 1995). As a trade-off with job distances, this context of women's employment points to the important role that job distances my play on the equality of work for low-income females including welfare recipients. Considering that most welfare recipients are employed with low-wage and a part-time job, their job access is probably affecting their work-hours and, therefore, their earnings (Hanson et al., 1995; Mendenhall et al., 2006). Given these findings, this result largely supports the SMH which found a significant relationship between a job location and employment, although previous studies based on the SMH showed an inconsistent effect of job access on employment (Kain, 1968).

Finally, two main components of TANF program affecting welfare recipients are a time-limit on cash assistance and work-requirements. Similar to previous studies on welfare recipients, this study also identified human capital variables as a barrier to employment of welfare recipients (e.g., Allad & Danziger, 2003; Austin & Lemon, 2005; Blank & Blum, 1997; Gurley & Bruce, 2005; Ong, 1996). The results showed that female former welfare recipients with a high school diploma were more likely to achieve employment success than their counterparts. This study reconfirmed that the current cash assistance program should empower human capitals of current and former welfare recipients, especially prior to exiting cash assistance (Austin & Lemon, 2005; Blank & Blum, 1997). Therefore, as TANF is a major cash assistance program, it must be more cohesively connected to educational programs for its recipients (Austin & Lemon, 2005). This study also found that the employment success of female former welfare recipients was worse for those who involuntarily exited cash assistance than others. This suggests that the TANF program should modify the policy of a time-limit on cash assistance to all recipients. Several individual-level variables, which were determined before exiting cash assistance, may be associated with welfare recipients' readiness to work. Furthermore, these results suggested that more flexible and generous regulation on cash assistance could make the female welfare recipients more successful in the labor market. As one of the solutions, TANF program can extend or adjust its period of cash assistance benefits so that TANF recipients can be more ready to work.

5.2. Limitations

Overall, the limitations of this study may raise the threats to internal, statistical conclusion, and external validities. First of all, the biggest issue for any neighborhood study is selection bias, which is one of the threats to internal validity (Ludwig et al., 2008; Sampson, Morenoffe, & Ganno-Rowley, 2002). This study could not accurately differentiate the effects of neighborhood characteristics and neighborhood

selection on the employment of female former welfare recipients (Gurmu et al., 2008).

In addition to the selection bias issue, this study did not track the housing mobility or migration of the sample. The residential place of the sample was measurable only at the point of exiting cash assistance. Due to the data availability, this study assumed that there was no mobility or migration of the sample within eight quarters after exiting cash assistance.

Furthermore, these administrative data sets in this study had a limited number of variables and measurement issues regarding the dependent variable, independent variables, and covariates. The limited number of variables may yield threats to statistical conclusion validity; the measurements issues may construct threats to external validity (Shadish, Cook, & Campbell, 2002). The dependent variable of this study which was collected from the QWR of an administrative agency was the taxable earnings.

Finally, this study used administrative data. Because this administrative data only included the specific population of female former welfare recipients who resided and were employed in a particular local area, its results could not necessarily be generalized to TANF recipients in the U.S.

References

Allard, S. W. & Danziger, S. (2003). Proximity and opportunity: How residence and race affect welfare recipients. *Housing Policy Debate, 13*(4), 675-700.

Allard, S. W. (2002). The urban geography of welfare reform: Spatial patterns of caseload dynamics in Detroit. *Social Science Quarterly, 83*(4), 1044-1062.

Allen, K. & Kirby, M. (2000). Unfinished business: *Why cities matter to welfare reform.* Washington, D.C.: Brookings Institution, Center on Urban and Metropolitan Policy.

Austin, M. J. & Lemon, K. (2005). Promising programs to serve low-income families in poverty neigh-

borhoods. *Journal of Health & Social Policy, 21*(1), 65-94.

Bania, N., Coulton, C. J., & Leete, L. (1999). *Welfare reform and access to job opportunities in the Cleveland metropolitan area.* Cleveland, OH: Center on Urban Poverty and Community Development, Case Western Reserve University.

Bania, N., Coulton, C. J., & Leete, L. (2003). Public assistance, public transportation, and the welfare-to-work transition. *Journal of Policy Development and Research, 6*(2), 7-44.

Blank, S. W. & Blum, B. B. (1997). A brief history of work expectations for welfare mothers. *The Future of Children Welfare to Work, 7*(1), 28-38.

Bloom, H. S., Riccio, J. A., & Verma, N. (2005). Promoting work in public housing: *The effectiveness of Job-Plus.* New York, NY: Manpower Demonstration Research Corporation.

Blumenberg, E. & Manville, M. (2004). Beyond the spatial mismatch: Welfare recipients and transportation policy. *Journal of Planning Literature, 19*(2), 182-205.

Blumenberg, E. & Ong, P. (1998). Job access, commute, and travel burden among welfare recipients. *Urban Studies, 35*(1), 77-93.

Blumenberg, E. & Shiki, K. (2003). How welfare recipients travel on public transit, and their accessibility to employment outside large urban centers. *Transportation Quarterly, 57*(2), 25-37.

Briggs, X. S. (2005). The geography of opportunity: *Race and housing choice in metropolitan America.* Washington, D.C.: Brookings Institution Press.

Bruster, B. E. (2009). Transition from welfare to work: Self-esteem and self-efficacy influence on the employment outcome of African American Women. *Journal of Human Behavior in the Social Environment, 19*, 376-393.

Casciano, R. & Massey, D. S. (2008). Neighborhoods, employment, and welfare use: Assessing the influence of neighborhood socioeconomic composition. *Social Science Research, 37*(2), 544-558.

Chow, J. C., Johnson, M. A., & Austin, M. J. (2005). The status of low-income neighborhoods in the post-welfare reform environment: Mapping the

relationship between poverty and place. *Journal of Health & Social Policy, 21*(1), 1-32.

Coulton, C. J. (2003). Metropolitan inequities and the ecology of work: Implications for welfare reform. *Social Service Review, 77*(2), 159-190.

Coulton, C. J. (2005). The place of community in social work practice research: Conceptual and method-ological developments. *Social Work Research, 29*(2), 73-86.

DeNavas-Walt, C., Proctor, B. D., & Smith, J. C. (2008). *Income, poverty, and health insurance coverage in the United States: 2007.* Washington D.C.: U.S. Government Print Office.

Deverteuil, G. (2005). Welfare neighborhoods: Anatomy of a concept. *Journal of Poverty, 9*(2), 23-42.

Dormann, C. F., McPherson, J. M., Araújo, M. B., Bivand, R., Bolliger, J., Carl, G., Davies, R. G., Hirzel, A., Jetz, W., Kissling, W. D., Kühn, Ohlemüller, R., Peres-Neto, P. R., Reineking, B., Schröder, B., Schurr, F. M., & Wilson, R. (2007). Methods to account for spatial autocorrelation in the analysis of species distributional data: a review. *Ecography, 30*, 609-628.

Fauth, R. C., Leventhal, T., & Brooks-Gunn, J. (2005). Early impacts of moving from poor to middle-class neighborhoods on low-income youth. *Applied Developmental Psychology, 26*(4), 415-439

Goering, J. & Feins, J. D. (2003). A choosing a better life? *Evaluating the moving to opportunity social experiment.* Washington, D.C.: The Urban Institute Press.

Gurley, T. & Bruce, D. (2005). The effect of car access on employment outcomes for welfare recipients. *Journal of Urban Economics, 58*(2), 250-272.

Gurmu, S. & Smith, W. J. (2006). Recidivism among welfare recipients: The role of neighborhood and access to employment. *Atlantic Economic Journal, 34*(4), 405-419.

Gurmu, S., Ihlanfeldt, K. R., & Smith, W. J. (2008). Does residential location matter to the employment of TANF recipients? Evidence from a dynamic discrete choice model with unobserved effects. *Journal of Urban Economics, 63*(1), 325-351.

Hanson, S., Kominiak, T. & Carlin, S. (1995). Accessing the impact of location women's labor market outcomes: A methodological exploration. *Geographic Analysis, 29*(4), 281-297.

Holzer, H. J. & Ihlanfeldt, K. R. (1996). Spatial factors and the employment of blacks at the firm level. *New England Economic Review, May/June special issue,* 65-82.

Ihlanfeldt, K. R. & Sjoquist, D. L. (1998). The spatial mismatch hypothesis: A review of recent studies and their implication to welfare reform. *Housing Policy Debate, 9*(4), 849-892.

Ihlanfeldt, K. R. (1994). The spatial mismatch between jobs and residential locations within urban area. *Cityscape, 1*(1), 219-244.

Kain, J. F. (1968). Housing segregation, Negro employment, and metropolitan decentralization. *Quarterly Journal of Economics, 82*(2), 175-197.

Kain, J. F. (1974). Reply to Stanley Masters' comment on "Housing segregation, Negro employment, and metropolitan decentralization" *Quarterly Journal of Economics, 88*(3), 513-519.

Katz, L. F., Kling, J. R., & Liebman, J. B. (2001). Moving to opportunity in Boston: Early results of a randomized mobility experiment. *Quarterly Journal of Economics, 116*(2), 607-654.

Kling, J. R., Liebman, J. B., & Katz, L. F. (2007). Experimental analysis of neighborhood effects. *Econo-metrica, 75*(1), 83-119.

Ludwig, J., Duncan, G. J., & Pinkston, J. C. (2005). Housing mobility programs and economic self-suffi-ciency: Evidence from a randomized experiment. *Journal of Public Economics, 89*(1), 131-156.

Ludwig, J., Liebman, J. B., Kling, J. R., Duncan, G. J., Katz, L. F., Kessler, R. C., & Sanbonmatsu, L. (2008). What can we learn about neighborhood effects from the Moving to Opportunity experiment? *American Journal of Sociology, 114*(1), 144-188.

Massey, D. S., Gross, A. B., & Shibuya, K. (1994). Migration, segregation, and the geographic concen-tration of poverty. *American Sociological Review, 59*(3), 425-445.

Mendenhall, R., DeLuca, S., & Duncan, G. (2006). Neighborhood resources, racial segregation, and economic mobility: Results from the Gautreaux program. *Social Science Research, 35*(4), 892-923.

O'Connor, A. (2000). Poverty research and policy for the post-welfare era. *Annual Review of Sociology, 26*(1), 547-562.

Ong, P. & Blumenberg, E. (1998). Job access, commute, and travel burden among welfare recipients. *Urban Studies, 35*(1), 77-93.

Ong, P. (1996). Work and car ownership among welfare recipients. *Social Work Research, 20*(4), 255-262.

Pan, S., Jensen, H. H., Fuller, W. A., & Mohanty, S. (2006). The effects of local labour market conditions on welfare programme participation. *Applied Economics, 38*(6), 649-659.

Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA; P.L. 104-193)

Raudenbush, S. W. & Bryk, A. S. (2002). Hierarchical linear models: *Applications and data analysis methods*. Thousand Oaks, CA: Sage.

Raudenbush, S. W., Bryk, A. S., Cheong, Y. F., Congdon, R. T., & Toit, M. d. (2011). *Hierarchical linear and nonlinear modeling*. Lincolnwood, IL: Scientific Software International, Inc.

Sampson, R. J. & Raudenbush, S. W., & Earls, F. (1997). Neighborhood and violent crime: A multilevel study of collective efficacy. *Science, 277*(5328), 918-924

Sampson, R. J., Morenoff, J. D., & Gannon-Rowley, T. (2002). Assessing "Neighborhood effects": Social process and new directions in research. *Annual Review of Sociology, 28*, 443-478

Sampson, R. J. & Sharkey, P. (2008). Neighborhood selection and the social reproduction of concentrated racial inequality. *Demography, 45*(1), 1-29.

Sanchez, T. W., Qing, S., & Peng, Z. (2004). Transit mobility, job access and low-income labour participation in US metropolitan areas. *Urban Studies, 41*(7), 1313-1331.

Shadish, E. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experiment designs for generalized casual inference*. Boston, MA: Houghton Mifflin.

U.S. Census Bureau (2012). Census 2000 data. Retrieved from http://www.census.gov/

U.S. Department of Health and Human Services (HHS) (2012). *TANF data*. Retrieved from http://www.acf.hhs.gov.

Vartanian, T. P. (1999). Locational effects on AFDC exits: Examining local labor market. *Journal of Socio-Economics, 28*, 607-631.

Wilson, W. J. (1987). The truly disadvantaged: *The inner city, the underclass, and public policy*. Chicago, IL: University of Chicago Press.

Wilson, W. J. (1996). When work disappears: *The world of the new urban poor*. New York, NY: Alfred A. Knof, Inc.