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ABSTRACT. This study examines the residential spatial patterns of Housing Choice Voucher holders in Western New York in 2004 and 2008 (n = 4,600 and n = 4,759, respectively). It seeks to answer two questions: Has the concentration of voucher holders in impoverished and same race neighborhoods diminished overtime; and are voucher holders, particularly African Americans, relocating in patterns that would lead to reghettoization or the reconcentration of race and poverty? This type of residential pattern puts voucher holders at risk for resettling in neighborhoods that limit economic and social mobility. Data from the public housing agency contracted to distribute Housing Choice Vouchers were examined. Exploratory spatial analysis techniques were used to identify spatial outliers and to form a hypothesis on spatial patterns of relocation. Spatial clustering analyses were conducted to test the hypothesis on the reghettoization of African American voucher holders in recently relocated neighborhoods. Analyses indicate that African American voucher holders are moving out of impoverished, hypersegregated areas into historically White neighborhoods. A limited number of voucher holders are moving in clustered patterns, which lead to reghettoization. Future research is needed that highlights the role that housing assistance providers play in the residential location choices of low-income clients.

KEYWORDS. Segregation, subsidized housing, concentrated poverty, Housing Choice Vouchers, residential spatial patterns, spatial clustering

In 1989, eight African Americans brought forward a class-action lawsuit, Comer v. Kemp, charging the city of Buffalo, its suburbs, and the Department of Housing and Urban Development (HUD) of racially biased discriminatory practices in the administration of the federally funded Section 8 and certificate programs. ¹ They charged the Buffalo and suburban public housing agencies (PHAs) with requiring the plaintiffs to use their certificates and vouchers in the city and preventing them, by use of location preferences, from moving to the suburbs. In essence, the PHAs’ practices trapped voucher holders in Buffalo’s impoverished urban neighborhoods.
In 1991, the HUD intervened with legislation that compelled PHAs across the country to permit certificate and voucher holders to move anywhere in their jurisdiction, surrounding county, or adjacent jurisdiction (Briggs, 2003; Goering & Siewert, 1995; Polikoff, 1995; Popkin, Galster, et al., 2000; Popkin et al., 2003). Then, in 1997, HUD settled the Buffalo case (by this time, Comer v. Cisneros) in favor of the plaintiffs. There were three provisions in the settlement. First, a single countywide preference was initiated to ensure that any person residing in Erie County could obtain a subsidy from either the city or suburban PHA and use it anywhere else in the county. Second, 800 new Section 8 subsidies were awarded to the PHAs and the Buffalo Municipal Housing Authority to remedy past ills. Finally, $3.5 million from HUD were allocated to create a community housing center (CHC; New York State Advisory Committee to the U.S. Committee on Civil Rights, 1999; Popkin, Galster, et al., 2000; Popkin et al., 2003).

The primary mission of the CHC was to increase residential choices and expand opportunities for mobility throughout the region for low-income certificate and voucher holders. This would be accomplished through mobility counseling, which would educate recipients about the benefits of living in less-impoverished neighborhoods. In addition, logistical counseling would inform recipients about the location of available housing, how to get to those units (e.g., bus lines), and the characteristics of particular neighborhoods (e.g., quality of the schools). The CHC would also provide readiness counseling so that recipients were prepared for: approaching and interviewing landlords, landlords’ expectations of potential tenants, and completing application forms. Lastly, the CHC would provide follow-up counseling to see how tenants who moved to new neighborhoods were faring (Popkin, Galster, et al., 2000). Besides counseling services, the CHC also provided transportation to available rentals, childcare stipends, and assistance with security deposits.

Thus, the settlement with HUD included provisions that attempted to open up the residential opportunity structure for low-income, minority renters in the Buffalo-Niagara region. Whether direct judicial intervention can improve the lot of poor voucher holders has yet to be examined. However, Goering and Siewert (1995) suggest that local jurisdictions can use tenant-based subsidy programs to address issues of poverty and segregation. This is particularly effective in conjunction with counseling and placement services. So, with the PHA constraints removed and intensive mobility counseling put in place, individual preferences and market forces should prevail. Subsequently, the residential spatial patterns should reflect a decrease in concentrated poverty and racial segregation, especially for African American voucher holders (Deluca & Rosenbaum, 2003).

The following study examines the residential status of Housing Choice Voucher (HCV) (formerly Section 8) holders in the Buffalo-Niagara region in 2004 and 2008 to ascertain whether the concentration of voucher holders in impoverished and segregated urban neighborhoods changed over time. Based on the goals of the federal program and the local context, it is hypothesized that the concentration of voucher holders, especially African Americans, has decreased during the 4-year time period. Additionally, it is also hypothesized, based on the literature that those African Americans who do relocate may do so in clustered patterns, which lead to reghettoization or the reconcentration of race and poverty. These types of mobility patterns would render the HCV Program less effective in achieving the goals of desegregation and deconcentration of poverty.

Recent literature highlights the tendency of voucher holders to concentrate in areas with high rates of poverty (Basolo & Nguyen, 2006; Galster, Tatian, Santiago, Pettit, & Smith, 2003; Hartung & Henig, 1997; McClure, 2008; Newman & Schnare, 1997; Pendall, 2000; Wang & Varady, 2005). In light of these findings, this study examines the relative neighborhood conditions of African Americans, who do penetrate suburban rental markets (Varady & Walker, 2003) and less-impoverished urban neighborhoods (McClure), relative to other neighborhoods in the city of Buffalo. The results will highlight whether or not the neighborhoods that African American voucher holders are moving into improve their neighborhood quality. These
findings are important because most similar studies have been based on cities with tight housing markets, which limit the opportunities for low-income renters to be mobile outside of the poorest areas where voucher housing tends to cluster (Basolo & Nguyen, 2006; Finkel & Buron, 2001; Hartung & Henig; McClure; Newman & Schnare; Pendall). This is not the case in Buffalo or its metropolitan area, where there is an abundance of available rental housing that meets HUD’s fair market standards for affordable housing (Wardrip, 2008). If African Americans are not significantly able to penetrate neighborhoods outside of the poorest areas, there may be other dynamics that are constraining their opportunities for mobility.

Additionally, voucher holders, especially poor, minority voucher holders, who do move tend to recluster in neighborhoods where the proportion of poor and minority residents is still very high (Briggs, Comey, & Weismann, 2010; Hartung & Henig, 1997; McClure, 2008; Wang & Varady, 2005). McClure explains that this is mainly the case because these voucher holders make short-distance moves. Hence, the second part of our analysis is based on the hypothesis that minority voucher holders—in this case African American voucher holders—who do move outside of the traditionally poor, African American East-side neighborhoods of Buffalo relocate in patterns that would lead to reghettoization in areas vulnerable to decline. Among other things, these patterns might precipitate declining property values and increasing poverty levels (Galster et al., 2003; Galster, Tatian, & Smith, 1999; Husock, 2000; Varady & Walker, 2003; Williamson, Smith, & Strambi-Kramer, 2009). Here, this study will gain valuable ground on other studies that assess spatial clustering patterns (Oakley & Burchfield, 2009; Wang & Varady) because it looks at change during two time periods and tests the hypothesis on cluster analysis, which allows for the identification of statistically significant clusters.

**Residential Location and Neighborhood Quality**

Giving very low-income residents the opportunity to move into rental housing outside of impoverished and segregated neighborhoods is a longstanding goal of HUD’s HCV Program (HUD Office of Policy Development and Research, 2001). These goals are based on a substantial literature that reveals there is a host of spatially defined disadvantages that individuals and families face when clustered in poor, racially isolated urban neighborhoods (Brooks-Gunn, Duncan, Klebanov, & Sealand, 2003; Coulton & Pandey, 1992; Massey & Denton, 1993; Sampson, Morenoff, & Gannon-Rowley, 2002; Wilson, 1987). These interconnected disadvantages include inferior schools, higher school-dropout rates, substandard housing, and higher rates of welfare dependency, substance abuse, unemployment, teenage pregnancy, and crime. Neighborhood characteristics have also been found to impact various psychological outcomes (Rosenbaum, Reynolds, & DeLuca, 2002; South & Crowder, 1997). Residents in these neighborhoods have lower life satisfaction, lower levels of self-efficacy, and increased fear of criminal victimization (Rosenbaum et al., 2002). Children, consequently, have reduced cognitive development, which is found to be related to their higher incidence of lead poisoning, malnutrition, and/or increased exposure to trauma resulting from witnessing violence in their neighborhoods (Perry, 2001).

It is this spatial concentration of social problems and pathologies, often referred to as “poverty traps,” that housing policymakers want poor minority residents to have the opportunity from which to escape (Bowles, Durlauf, & Hoff, 2006; HUD, 2003). It is thought that moving out of distressed segregated neighborhoods into more stable ones improves the life chances for poor people. These neighborhoods give residents improved school districts, more job opportunities, lower crime rates, and higher-quality dwellings (Rosenbaum, 1995; Rosenbaum et al., 2002; Sampson & Morenoff, 2006).

While the research on residential segregation thoroughly states its detriments, the findings of improved outcomes for voucher holders who actually did move into less-segregated and less-impoverished neighborhoods as part of dispersal programs such as Gautreaux and Moving to Opportunity (MTO) are mixed, with some researchers even using terms like “disappointing”
to describe the consistently poor record of benefits, particularly in economic improvements (Galster & Zobel, 1998; Goering, 2000; Goetz & Chapple, 2010; Keels, Duncan, Deluca, Mendenhall, & Rosenbaum, 2005; Ludwig et al., 2008; Rosenbaum, 1995; Rosenbaum, DeLuca, & Zuberi, 2009; Rosenbaum et al., 2002).

The Gautreaux program was a court-ordered desegregation remedy that was a response to a class action lawsuit filed on behalf of Chicago public housing residents against the Chicago Housing Authority and HUD, charging that these agencies had employed racially discriminatory policies in the administration of the Chicago low-rent housing program. As a result of the consent decree, the Gautreaux program moved more than 7,000 low-income African American families who were living in Chicago public housing or on the waiting list for public housing to racially integrated neighborhoods. Families enrolled in the program had to be willing to move to census tracts with 30% or fewer African American residents, which resulted in half the participants moving within the city of Chicago; the other half moved to the suburbs (Bembry & Norris, 2005; Keels et al., 2005; Rubinowitz & Rosenbaum, 2000).

Researchers followed these families for two decades and found that moves out of the central city had positive employment, earning, and education effects (Rosenbaum & Popkin, 1991; Rubinowitz & Rosenbaum, 2000). The effects were most profound for children and adolescents. For instance, Popkin, Buron, et al. (2000) found that moving to the suburbs had significantly positive effects on the educational attainment of the children and that they were not only less likely to drop out of school, but they were also more likely to take college-track courses compared with those who moved within the city. After graduating from high school, children of suburban movers were also likely to attend a 4-year college or become employed full-time at jobs with fringe benefits. Heads of household were also impacted by desegregated moves. Popkin, Rosenbaum, and Meaden (1993) found that suburban movers, in particular African American women, were significantly more likely to have a job postmove compared with city movers, even among those who had never had a job before moving. Although this was not necessarily a positive impact, it was the absence of a negative one.

MTO is the other federal dispersal program that has netted some positive outcomes for program participants who moved to less-impoverished neighborhoods. Between 1994 and 1997, HUD initiated the MTO for Fair Housing Demonstration Program to examine the effects of housing mobility on various factors such as neighborhood quality, educational attainment, and economic self-sufficiency (Goering & Feins, 2003; Goering, Feins, & Richardson, 2002). The MTO demonstration gave families living in distressed public housing in Baltimore, Boston, Chicago, Los Angeles, and New York the opportunity to relocate to private market housing in low-poverty suburban and city neighborhoods. MTO applicants were randomly assigned to one of three groups: an experimental group, with members receiving a housing voucher to be used in a census tract with a poverty rate of less than 10%; a Section 8 group with members receiving a voucher to move anywhere; or a control group (Goering et al.; Turney, Clampet-Lundquist, Edin, Kling, & Duncan, 2006).

The findings, based on interviews an average of 18 months after families moved, reveal improvements in neighborhood and housing conditions for all participating families. Families in the experimental group experienced even greater gains in terms of housing and especially neighborhood conditions. Labor force participation and employment increased for residents in both groups. However, consistent across findings is that there have been no detectable impacts on economic self-sufficiency (Goering et al., 2002; Goetz & Chapple, 2010; Ludwig et al., 2008; Rosenbaum & Harris, 2001).

Regardless of which mobility program, poor families who relocated out of high-poverty neighborhoods experienced improved neighborhood socioeconomic conditions and reported higher levels of social cohesion and less danger and violence compared with families who remained in high-poverty neighborhoods (Katz, Kling, & Liebman, 2001; Leventhal & Brooks-Gunn, 2003; Rubinowitz & Rosenbaum, 2000). In summary, although the lack of positive
economic outcomes was unanticipated, the host of positive psychological and other behavioral outcomes is promising.

**Reghettoization—Adverse Neighborhood Outcomes**

Whereas there is evidence that relocating in neighborhoods with fewer minorities and less poverty concentration is beneficial to families, some researchers have found that poor movers especially African Americans tend to recluster in new neighborhoods that are vulnerable to decline (Hartung & Henig, 1997; Khadduri, 2001; McClure, 2008; Popkin & Cunningham, 2000; Varady & Walker, 2003; Wang & Varady, 2005). When this is the case, it has been argued that physical deterioration, crime, and other social problems might become significant (Galster et al., 1999, 2003; Husock, 2000; Kingsley, Johnson, & Pettit, 2003; Williamson et al., 2009). Goetz (2002) and others found that HCV holders, in particular, tend to make short-distance moves often to vulnerable neighborhoods experiencing racial turnover (Khadduri; McClure; Popkin & Cunningham). Turner, Popkin, and Cunningham (2000) discussed the apprehension that civic leaders and residents feel when faced with the clustering of voucher holders, which they believe leads to the destabilization of neighborhoods and may precipitate a cycle of disinvestment and decline.

While it is the goal of the HCV Program to give poor families the opportunity to be mobile within and between jurisdictions, there is a persistent concern on the part of local officials, landlords, and residents that the relocation of voucher holders might negatively impact their neighborhoods (Fischer, 1999; Galster et al., 1999, 2003; Husock, 2000; Kingsley et al., 2003; Smith, 2002; Turner et al., 2000). This is especially the case if it is perceived that voucher holders are located in concentrated rather than dispersed patterns that threaten to change the composition of the neighborhood, and subsequently, impact the health of the neighborhood.

However, the argument for destabilization of neighborhoods resulting from the reclustering of HCV voucher holders has not necessarily held true in national studies. Devine, Gray, Rubin, and Taghavi’s (2003) national data from HUD’s Multifamily Tenant Characteristics System indicate that in most neighborhoods, vouchers are only used in a small proportion of the total occupied housing stock. In approximately 90% of all neighborhoods with voucher holders living in rental units, HCV recipients make up less than 5% of the housing stock. In assessing whether Housing Opportunities for People Everywhere (HOPE) VI's Section 8 relocatees were clustering in spatial patterns that might facilitate further deterioration of vulnerable neighborhoods, Kingsley et al. (2003) found that they had not reclustered except in a few cases. Although there are cases where significant reclustering of Section 8 households has occurred (Fischer, 1999; Galster et al., 1999; Smith, 2002), Turner et al. (2000) caution that there is no consistent evidence that indicates that the Section 8 program is undermining the health of urban neighborhoods.

The following analyses will determine if the concentration of voucher holders, especially African Americans, has decreased during a 4-year time period and will additionally assess whether those African Americans who do relocate do so in clustered patterns that lead to reghettoization or the reconcentration of race and poverty.

**METHODS**

**Data**

To address these foci, we relied on data from the PHA contracted to administer the HCV Program for the city of Buffalo. The voucher holders in 2004 and 2008 represent the total number of voucher holders in the PHA database for both years. These vouchers account for approximately 50% of the total vouchers distributed in both years, because there is another PHA that is contracted with Erie County. Together, these two PHAs distribute 98% of the total vouchers in the area. The Buffalo Municipal Housing Authority controls the remaining vouchers (approximately 200), which are mainly attached to the project-based housing units they manage in the city of Buffalo.

There were a total of 4,642 voucher holders during 2004 and 4,805 in 2008. In 2004, there were 3,394 (73%) African American voucher holders, and 4,642 during 2008 and 4,805 in 2008, respectively.
holders and 1,206 (26%) White voucher holders. In 2008, there were 3,463 (72%) African American voucher holders and 1,296 (27%) White voucher holders. The final data set is limited to African American and White voucher recipients because they constitute 99% of the HCV population in both years. The other 1% (or 42 in 2004 and 46 in 2008) is composed of Asians, Native Americans, and Native Hawaiians. These recipients are excluded in the current analysis due to their small numbers. Thus, the final data sets utilized for this study include 4,600 HCV holders in 2004 and 4,759 in 2008.

The data set includes individual-level attributes of voucher holders, such as address, race, age, and gender, as of July 2004 and July 2008. All cases were deidentified prior to analysis so that there was minimal risk for attaching a name to an address. Individual voucher-holder data were aggregated to the areal level, such as census tracts, to investigate the spatial patterns that are associated with the economic and demographic characteristics of the areas where voucher holders reside. The percentage point change of African American voucher holders during 4 years (2004–2008) at the census-tract level is used as a dependent variable (response variable) in the current study. As an indicator of the socioeconomic status of each census tract, the poverty rate and the proportion of African American households from the 2000 U.S. Census data are used. The inclusion of census-tract data is valuable for linking additional census information to this already-rich data set. This enabled a more comprehensive analysis of neighborhood-specific sociodemographic characteristics.

The HCV data set is particularly well suited to the study of residential location patterns across different types of neighborhoods because each recipient’s address was also geocoded and matched to the corresponding census tracts. This procedure allowed the tracking of voucher holders through the process of mapping between poor and nonpoor neighborhoods and segregated and less-segregated neighborhoods, utilizing spatial identifiers. Subsequently, the residential location of voucher holders is analyzed visually through a series of dot maps. In addition, more sophisticated mapping was done through the use of spatial visualization methods to effectively identify spatial patterns of African American voucher holders and to detect changes in their spatial concentration (spatial cluster) over time. Lastly, spatial statistic procedures were conducted to determine whether or not the clustering patterns identified were significant. It is important to note that prior to any data analysis, the university’s institutional review board approved all research procedures for this study.

Our study area includes the city of Buffalo and its suburb, Cheektowaga, located in Western New York. Buffalo is the seat of Erie County and the principal city of the Buffalo-Niagara Metropolitan area, which is connected by major state highways as shown in Figure 1. Its central business district is close to the waterfront, the Eastern end of Lake Erie, where two major interstate thruways are intersected. The dot map of voucher holders in Erie County in the inset map of Figure 1 clearly shows that voucher holders are spatially concentrated in Buffalo. The boundary of the study area, the city of Buffalo and Cheektowaga, is outlined with a thick line.

Analyses

We used exploratory spatial data analysis (ESDA) techniques to identify areas with substantial African American voucher-holder changes between 2004 and 2008 and to form a hypothesis on the spatial pattern of relocation. Spatial clustering analysis was conducted to test a hypothesis on the reghettoization of African American voucher holders in recently relocated neighborhoods. Sensitivity analysis was performed to validate a cutoff (threshold) value used in substantial percentage-point change analysis.

Mapping of Spatially Aggregated HCV Holder Data

While individual data on HCV holders may allow for inferring their behaviors, spatially aggregated data (a total number of voucher holders residing at each census tract) enable us to explore their geographic variability at a regional scale associated with socioeconomic and demographic variables. To better understand the
spatial patterns of HCV holders’ residential status and their potential relocations overtime, an ESDA is a valuable starting point for systematic inquiry (Haining, 2003). Maps are an essential element in visualization of spatial data for ESDA, and particularly, the choropleth map is a commonly used form for displaying spatially aggregated data. In the choropleth map, each area is shaded according to a discrete scale based on the value of the attribute within that area.

Mapping raw data, however, may pose a challenge for analysis due to the differences in the total number of voucher holders at two time periods. We, therefore, convert count data to the percentage of African American voucher holders for each census tract (to the total number of voucher holders of Erie County) in 2004 and 2008 and map the percentage-point changes at each census tract (see Figure 2).

The East side of Buffalo experienced the loss of African American voucher holders (shaded by the dark color), while the census tracts located along the edge of Buffalo and the tracts in Cheektowaga adjacent to Buffalo, gained more African American voucher holders (shaded by the diagonal line symbol). As you can see, there is a clear transition of African American voucher holders from the city of Buffalo to the neighboring suburb of Cheektowaga, indicating a potential change in the racial composition of particular neighborhoods. In addition to the movement east outside of Buffalo into Cheektowaga, there is also an intracity move of African American voucher holders to the West side of Buffalo, a historically White area in Buffalo. Note that in Figure 2, census tracts shaded light gray include tracts with either a slight increase or decrease (classified as “no changes”) in African American voucher holders, and census tracts shaded
FIGURE 2. Choropleth Map of Percentage-Point Changes of African American Voucher Holders Between 2004 and 2008 Overlaid With a Proportional Symbol Map of the Actual Number of African American Voucher Holders in 2008 (Color figure available online).
white indicate census tracts with no voucher holders. This was intentionally done to highlight the tracts with the most dramatic changes.

The choropleth map of substantial changes is an effective means to understand the overall trend of African American voucher holders’ spatial distribution, to formulate hypotheses on their relocation patterns, and to identify areas with unusually high and/or low concentrations of African American voucher holders. This map of percentage point changes alone, however, can be misleading because it may obfuscate the actual number of voucher holders. For example, census tracts located on the West side of Buffalo and Cheektowaga show substantial increases in percent-point change, while the actual number of voucher holders residing there in 2008 is relatively small (11–29). To avoid such over-interpretation based only on percentage-point changes, we overlaid the proportional symbol map of the actual number of African American voucher holders in 2008, where the size of the circle is proportional to the number of African American voucher holders.

The proportional symbol map of Figure 2 reveals the spatial pattern of census tracts with a high concentration of African American voucher holders; most census tracts with a high concentration are located inside the city of Buffalo in 2008, while a small number of neighborhoods with high concentrations appear along the border between Buffalo and Cheektowaga and the West side of Buffalo. As mentioned earlier, the classification of voucher-holder percentage-point changes into three categories shown in Figure 2 is subject to the cutoff value used. Based on sensitivity analysis (see Table 1), however, we found 25% enables us to identify consistent spatial patterns of voucher-holder changes.

Following the visual inspection of African American voucher holders’ relocation, we also examined summary statistics of the demographic and economic characteristics of the tracts from which voucher holders are leaving and the neighborhoods in which they are newly settled. These tracts are areas that experienced a decrease and an increase in African American voucher holders during the 4-year period. This is indicated by “substantial decrease” and “substantial increase,” respectively, in Figure 2. We consider the proportion of African American households and the poverty index as indicators of demographic and economic conditions of the areas that African Americans are substantially moving out of and substantially moving into.

The data show that HCV holders are moving from neighborhoods with a high proportion of African Americans (70%) to areas where African Americans are the minority on the West side of Buffalo (11%) and in the town of Cheektowaga (2%; see Table 2). It is also worth noting that a substantial number of African American voucher holders moved into the Easternmost neighborhoods of the East side of Buffalo along the border of Cheektowaga. Although there are a high proportion of African American households in those neighborhoods (54%), it is almost 20% fewer than in the historically African American neighborhoods African Americans are leaving on the East side of Buffalo.

Additionally, African Americans are moving into neighborhoods where poverty rates are lower (24% on the West side of Buffalo, 20% in the border neighborhoods of the East side of Buffalo, and 11% in Cheektowaga), relative to the average poverty rate of the Buffalo neighborhoods they are leaving (35%). With the exception of Cheektowaga (11%), however, the

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### Table 1. Sensitivity Analysis on the Cutoff of the Percentage-Point Change

<table>
<thead>
<tr>
<th># of Census Tracts</th>
<th>Neighborhoods African Americans Are Leaving</th>
<th>West Side of Buffalo</th>
<th>East Side of Buffalo</th>
<th>Cheektowaga</th>
</tr>
</thead>
<tbody>
<tr>
<td>30%</td>
<td>12</td>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>25%</td>
<td>15</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>20%</td>
<td>17</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>15%</td>
<td>18</td>
<td>10</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>10%</td>
<td>24</td>
<td>14</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

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*Trapped in Poor Places?*

<table>
<thead>
<tr>
<th>Sociodemographic Variables</th>
<th>Neighborhoods African Americans Are Leaving</th>
<th>West Side of Buffalo</th>
<th>East Side of Buffalo</th>
<th>Cheektowaga</th>
</tr>
</thead>
<tbody>
<tr>
<td>% African American Households</td>
<td>70%</td>
<td>11%</td>
<td>54%</td>
<td>2%</td>
</tr>
<tr>
<td>Poverty Rate</td>
<td>35%</td>
<td>24%</td>
<td>20%</td>
<td>11%</td>
</tr>
<tr>
<td>Average Median Household Income</td>
<td>$20,299</td>
<td>$23,472</td>
<td>$27,439</td>
<td>$29,349</td>
</tr>
<tr>
<td>High School Graduates</td>
<td>68%</td>
<td>80%</td>
<td>76%</td>
<td>72%</td>
</tr>
<tr>
<td>Unemployed</td>
<td>8%</td>
<td>5%</td>
<td>6%</td>
<td>3%</td>
</tr>
<tr>
<td>Average Median Housing Value</td>
<td>$42,167</td>
<td>$72,000</td>
<td>$52,500</td>
<td>$77,500</td>
</tr>
<tr>
<td>Owner-Occupied</td>
<td>41%</td>
<td>34%</td>
<td>56%</td>
<td>52%</td>
</tr>
<tr>
<td>Vacancies</td>
<td>23%</td>
<td>12%</td>
<td>14%</td>
<td>7%</td>
</tr>
<tr>
<td>Pay 35% or more of income on rent</td>
<td>51%</td>
<td>35%</td>
<td>47%</td>
<td>39%</td>
</tr>
</tbody>
</table>

neighborhoods that African Americans are moving into still have a higher rate of poverty than Erie County (12%).

The African American household and poverty maps shown in Figures 3a and 3b support our hypothesis that African American voucher holders are moving into less-segregated and less-poor neighborhoods even when they are making short-distance moves on the East side of Buffalo.9

Cluster Analysis for Detecting Reghettization

Local Indicators of Spatial Association (LISA; Anselin, 1995) statistics assess the null hypothesis of spatial randomness by comparing the attribute value in each specific location with values in neighboring locations. We used local Moran’s I in the current study among other LISA statistics because it allows for the decomposition of the pattern of spatial association into four categories10 (Wong, 2008). Two of these categories imply positive spatial association—that is, when an above-average value in a location is surrounded by neighbors whose values are above average (high–high), or when a below-average value is surrounded by neighbors with below-average values (low–low). By contrast, negative spatial association is implied when a high value is surrounded by low neighbors, or vice versa.

The local form of Moran’s I is a product of the z-score at a location and the average z-score in the surrounding areas. Let $I_i$ denote the local Moran’s I index at the $i$-th location, $i = 1, ..., n$, and $z_i$ be the attribute value of the variable observed at the location. The measure of spatial autocorrelation at the location is calculated as $I_i = z_i \sum_{i \neq j} w_{ij} z_j$ where $w_{ij}$ denotes the $i$-th entity of the row-standardized weight matrix. The entity of weight matrix is specified such that they are $1/n_i$ if locations are adjacent and 0 otherwise, where $n_i$ is the number of neighbors at the location. A typical use of LISA statistics, which detect spatial patterns, requires hypothesis testing; namely, whether or not the value of local Moran’s I index at a particular location is significantly different from the value that occurs by chance.

We used LISA statistics as a means of detecting a potential re-concentration of HCV holders. Moran’s I index is calculated using the percentage-point change of African American voucher holders during 4 years for each census tract. LISA statistics enable us to identify census tracts with a significant increase in the proportion of African American voucher holders surrounded by neighboring census tracts that experience a similar trend. This spatial pattern analysis is used to test our hypothesis on a re-concentration of African American voucher holders in new neighborhoods. One of the categories in Moran’s I index, high–high cluster, identifies the census tracts that are experiencing re-concentration or reghettization (Cohn & Jackman, 2011). A focal census tract is not identified as a high–high cluster unless both the specified census tract and its surrounding census tracts...
have a higher concentration of African American voucher holders in 2008 compared with 2004.

The LISA clustering map in Figure 4 indicates that regghettoization is occurring in the neighborhoods of Cheektowaga and the West side of Buffalo. Again, neither area is historically African American, but both areas are better off socioeconomically (see Table 2). Meanwhile, the census tracts from which African American voucher holders are moving out form another spatial cluster that is denoted as a low–low cluster. From the LISA statistics, we hypothesize that African American voucher holders residing in census tracts located on the East side of Buffalo, which is considered a historic African American community, began to relocate. Considering that the information to track the moves of individual voucher holders is unavailable, an analysis based on spatially aggregated data is the only way to understand such relocation patterns. The LISA clustering map in Figure 4 may not agree with the map of the percentage-point change in Figure 2, because the cutoff value used for high/low is not necessarily corresponding to the threshold used to define substantial increase/decrease.

Additionally, other forms of spatial clustering such as low–high or high–low types allow us to understand HCV holders’ residential dynamic. For example, the two census tracts on the West side of Buffalo with the low–high cluster are likely to accommodate more African American voucher holders in the near future because the neighboring census tracts already have high proportions of African American voucher holders.

Making inferences based on LISA statistics requires hypothesis testing (Anselin, 2003). The LISA statistics do not form a normal distribution; therefore, the significance test is often
conducted by simulating random arrangements. The different-sized circles overlaid on the clustering map in Figure 4 indicate the significance level based on a $p$-value (after carrying out 9,999 permutations) associated with the corresponding spatial clusters. Every local cluster reported in Figure 4 is statistically significant with a varying level of significance, $p < .001$, .01, .05, and .10. The local clusters (low–low) at the center of Buffalo and the high–high clusters on the West side of Buffalo are statistically significant at the $p < .001$ and $p < .05$ levels, while the high–high clusters in the Easternmost neighborhoods of Buffalo and the clusters in Cheektowaga are statistically significant but relatively less with $p$-values of .05 and .10.

In summary, the clustering patterns of HCV holders in census tracts on the East side (where African American voucher holders left) and the West side (where African American voucher holders moved to) are significant even after multiple testing. In addition, the spatial concentration of African American voucher holders outside of Buffalo, in the suburb of Cheektowaga, is also significant. The significance map (in the form of a proportional symbol map) in Figure 4 confirms that our findings of reghettoization due to the relocation of African American voucher holders is not by chance, but is based on statistically significant evidence.

**DISCUSSION**

This research substantiates that African Americans were utilizing their HCVs to move into less-impoverished and more racially diverse neighborhoods during the 4-year span from 2004 to 2008 in the Buffalo metropolitan region. Specifically, African Americans moved in considerable numbers to three specific areas: to the adjacent inner-ring suburb of Cheektowaga, to
the West side of Buffalo, which is the most ethnically and racially diverse area in Buffalo, and to the Easternmost neighborhoods in Buffalo, which border Cheektowaga.

A number of African American voucher holders moved outside of Buffalo and specifically outside of segregated, predominantly African American areas into the adjacent suburb of Cheektowaga, which has, according to the 2000 U.S. Census, an African American population of approximately 2,963 or 3.7% of the total population of 79,988. The specific neighborhoods to which African Americans are moving have a lower proportion of African American households (2%) than in Cheektowaga as a whole, which is a proportion significantly lower than the average proportion of African American households in the neighborhoods that they are leaving (70%; see Table 2).

African Americans are also moving into less-poverty areas with this move to Cheektowaga. The neighborhoods from which they are moving have on average a 35% poverty rate. They are moving into neighborhoods with an 11% poverty rate, which is higher than Cheektowaga’s average rate of 6.5%, but much lower than the neighborhoods they are leaving. In fact, the average poverty rate in the neighborhoods to which voucher holders are relocating is not considered to be impacted based on HUD’s definition. These are the types of neighborhoods that HUD identifies as potentially beneficial for voucher recipients. Observing other socioeconomic indicators for Cheektowaga confirms that a move there gives African Americans a substantial improvement in their quality of life (see Table 2).

As can be seen from Table 2, Cheektowaga outperforms Buffalo on economic, housing, and social indicators commonly used to measure neighborhood quality of life. These measures include income, educational attainment, unemployment rates, median housing value, tenure, and vacancy rates. The median household
income in Buffalo is $20,299, and in Cheektowaga, it is $29,349. Another measure that is used to emphasize the financial health status of a population is the percentage of income residents pay in rent. In the neighborhoods African Americans are leaving, more than half the population (51%) pays 35% or more of their income on rent. In the Cheektowaga neighborhoods, only 39% of the residents pay this percentage.

Lastly, the difference in the crime index, which measures eight crimes that the Federal Bureau of Investigation combines to produce its annual crime index, is considerable. These offenses include willful homicide, forcible rape, robbery, burglary, aggravated assault, larceny of more than $50, motor vehicle theft, and arson. This is important because research has shown that safer neighborhoods and the perception of being safe are important psychological benefits of using vouchers to move from high-risk neighborhoods to suburbs that are better off socioeconomically and have lower crime rates (Goetz, 2002; Goetz & Chapple 2010; Popkin & Cove, 2007). In 2008, the average U.S. crime index was 297; in Cheektowaga, it was 232. In Buffalo, the crime index was 701 (http://www.city-data.com/crime/crime-Buffalo-New-York.html).

According to the literature, HCV holders who make the move from poor inner cities like Buffalo to more relatively stable suburbs such as Cheektowaga will live in better-quality neighborhoods and experience more opportunities to improve their financial, human, and social capital potentially translating into upward social mobility (Keels et al., 2005; Wilson, 1987, 1996). One of the most important factors in the potential upward trajectory of the residents is the schools. Here, the Cheektowaga School District is an improvement on the Buffalo Public School District. According to New York State Education Department test score data, Cheektowaga is ranked 65th among Erie County’s 97 school districts, while Buffalo is ranked last (New York State Education Department Information and Reporting Services, 2010).

In addition to moving into Cheektowaga, African Americans are moving to the West side of Buffalo. African American voucher holders who move to these areas of Buffalo are also successfully moving to areas with less poverty and racial concentration. Although the difference in poverty rate is not as great and the school district is no different, African Americans who make the move to the West side see improvement in other indicators of neighborhood quality. The average poverty rate is lower at 24% as compared with 35% in the tracts they are leaving on the East side, but that is still considered an impacted poverty rate where economic and social disadvantages accrue. Although 24% is still considered an impacted area by HUD’s standards, the degree of neighborhood disorganization and isolation is much greater with the higher poverty rate. Anywhere with a poverty rate greater than 30% is considered an extreme-poverty neighborhood where significant socioeconomic distress occurs, which limits the life chances of the residents.

The West-side neighborhoods, however, are much more ethnically diverse, with African Americans comprising only 11% of the population compared with their former East-side neighborhoods, which were on average 70% African American. These African Americans have moved out of segregated, racially isolated neighborhoods, which have been found on many levels to be detrimental to the well-being of residents. This is especially the case for children and adolescents who are vulnerable to neighborhood influences such as peer-group pressures, school quality, and the level of violent crime (Goering et al., 2002; Leventhal & Brooks-Gunn, 2003).

African Americans who escape these neighborhoods have more opportunities for upward social mobility because desegregated neighborhoods are generally socioeconomically more advantageous (Wilson, 1987, 1996). The West side of Buffalo is no different. Compared with the neighborhoods that African Americans left, which had an average income of $20,299, the West side’s average income is $23,472. The education level may have contributed to that number. The proportion of those who graduated from high school is 80% in the West-side neighborhoods where African American voucher holders are located and only 68% in the East-side neighborhoods they left. Neighborhood housing quality also improves on the West side of
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Buffalo. The median housing value is $72,000 on the West side and $42,167 on the East side. In addition, the vacancy rate on the East side is almost double the rate on the West side: 23% and 12%, respectively. Thus, you can see that African Americans made significant socioeconomic and housing gains by moving out of the poorer East-side neighborhoods.

Lastly, African Americans are making short-distance moves to the Easternmost sections of Buffalo, which border Cheektowaga. These neighborhoods are not a part of the historically or traditionally African American neighborhoods. They have only recently transitioned to African American neighborhoods during the past two decades (see footnote 8). This is apparent based on the socioeconomic indicators. The proportion of African Americans in these neighborhoods is slightly more than half, at 54%, and the poverty rate is lower than the Eastside neighborhoods that African Americans are leaving, at 20%. In addition, there are more owner-occupied housing units in these neighborhoods (56%) compared with all the other neighborhoods including Cheektowaga (52%). So African Americans, even moving the shortest distance within the East side of Buffalo, improve their status. This is reflective of the extremely poor conditions of the neighborhoods in the City of Buffalo, which is not surprising because in 2008, Buffalo was the second-poorest city in the nation (U.S. Department of the Census, 2008).

Our findings support and refute previous studies on residential mobility and relocation with subsidized vouchers. Prior research based on the regular mainstream Section 8/HCV Program shows that African American voucher holders have successfully moved to neighborhoods with lower rates of poverty (Goering, 2000; Goering & Siewert, 1995; Kingsley et al., 2003; Trudeau, 2006), but they do not move to less-segregated neighborhoods (Fischer, 1999; Hartung & Henig, 1997; Kingsley et al., 2003; Trudeau, 2006; Varady & Walker, 2000), even if they are outside the city. We have shown that African Americans have significantly moved from very poor African American neighborhoods to less-poor, predominantly White neighborhoods in Erie County from 2004 to 2008. What makes these findings more substantial is that African Americans not only moved within the city to higher-quality neighborhoods, but they moved outside the city to a neighboring suburb.

Patterns of Relocation

After establishing the mobility patterns of African American voucher holders, it was necessary to determine if these patterns facilitated a reclustering effect or what scholars have termed a reghettoization of African American voucher holders in their new neighborhoods. The data reveal that the voucher holders are spatially clustering in Cheektowaga, the Easternmost neighborhoods in Buffalo that border Cheektowaga, and in two census tracts on the West side of Buffalo (see Figure 4). In addition, the maps show that on the West side, there are additional areas that are in the process of transitioning because the census tracts around them have significant numbers of clustered African American voucher holders. This reghettoization process may be a cause for concern for both the local PHAs and local residents because of the potential impacts on the surrounding neighborhoods (Turner et al., 2000). Although there are limited data on the negative, real impacts on the receiving neighborhoods where HCV recipients choose to relocate (Galster et al., 1999, 2003), there are perceived impacts that contribute to various behaviors of the receiving neighbors such as the intense opposition because of fear of increased crime or fear that concentrations of HCV holders may lead to increasing neighborhood poverty and the destabilization of local housing markets (HUD, 2003; HUD Office of Policy Development and Research, 2001; Turner et al., 2000). Local PHA caseworkers and mobility counselors are cognizant of these perceptions and inform voucher holders if there are immediate problems in particular neighborhoods.

There are various explanations for these reclustering patterns. One reason may simply be household preference based on market availability. However, this should not be as prominent in Buffalo because intensive mobility counseling expands the knowledge of voucher holders about the available rental opportunities outside of poor
and segregated areas. In addition, as mentioned earlier, unlike other metropolitan areas with tight housing markets, there is a sizeable number of available and affordable rentals throughout Erie County.

Another explanation may be that participants may be attracted to neighborhoods where HCVs utilize a significant portion of the occupied housing stock because they have an easier time finding rental housing in those neighborhoods (HUD, 2003). This may be the case in the poorest neighborhoods in Buffalo, where landlords see vouchers holders as more desirable and responsible than poor renters without vouchers. In Cheektowaga, there are a number of apartment complexes, which, because of the decline in demand, have now begun to accept vouchers as alternatives to empty apartments. Once this happens, and information about the available housing is made known, voucher recipients may view this as an opportunity to move outside of Buffalo to a place where vouchers are accepted and where they could maintain an adequate level of comfort.

Finally, local and regional contexts apply. For instance, Williamson et al. (2009) found that the availability of low-income housing tax-credit units were an important source of housing opportunity for voucher holders in Florida. But they also found evidence that the location of tax-credit housing in economically distressed neighborhoods reinforced existing poverty concentrations. In Erie County, because of the past history of the Comer case and the creation of the housing mobility center, PHA caseworkers and mobility counselors have mechanisms in place to encourage voucher holders to use their vouchers to move outside of impoverished, racially segregated neighborhoods. These clustering patterns may be the result of the mobility counselors finding housing pockets of available rental housing and targeting those landlords for HCV leases. Although the purpose is not to recreate ghettoized spatial patterns, those outcomes may result because other market forces are working in conjunction with this assistance.

**CONCLUSION**

This analysis has shown that despite decades of rental housing discrimination in Western New York, which led to racial and class segregation, African Americans are moving outside of historically poor, African American neighborhoods in significant numbers. This indicates that they are no longer trapped in Buffalo’s most segregated neighborhoods and have increased opportunities for upward social and economic mobility. However, their mobility patterns suggest that in a few places, they are locating in clustered patterns, which facilitate reghettoization. PHA administrators, housing caseworkers, and mobility counselors should take note of these trends and increase efforts to further disperse HCV holders throughout the metropolis. In this vein, future research should focus on the importance of the housing counseling that low-income voucher holders receive and determine the effect, if any, their assistance has on the quality of the neighborhood that recipients choose. Although these results are based on a case study of Buffalo and its metropolitan area, awareness of these potential outcomes can assist PHAs in other cities when designing their mobility counseling programs.

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**NOTES**

1. The federal Section 8 voucher and certificate programs increase affordable housing choices for very low-income households by paying landlords the difference between what the household can afford and the rent for a privately owned rental unit. Local public housing agencies administer the program. These programs preceded the HCV Program, which combines the certificate and voucher programs in one.

2. Section 8 is still commonly used to refer to the HCV Program. The HCV Program is the current federal program for assisting very low-income families, the elderly, and the disabled to afford decent, safe, and sanitary housing in the private market.

3. Reghettoization is a term used by social scientists to describe patterns of racial change whereby African Americans settle in concentrated patterns in areas that were previously White. These settlement patterns replicate the urban ghettoization process, which
concentrates African Americans in segregated residential areas that are oftentimes avoided by other groups (Alba & Logan, 1993; Logan & Schneider, 1984; Muller, 1981; Rose, 1976; Stahura, 1983). This is not an ideal process because for the most part, segregated neighborhoods are poorer, have weaker social institutions, higher school-dropout rates, and higher crime rates (Farley & Allen, 1987; Masse, Condran, & Denton, 1987).

4. HOPE VI is a major HUD program that transforms the worst public housing projects into mixed-income developments.

5. We investigated a potential use of the 2005–2009 U.S. Census estimates for the analysis, but the sampling errors of some census tracts are too large (coefficient of variance > 25%), making them unreliable for analysis.

6. Although census tracts are an administrative delineation, as is common in housing research, they are used here to geographically approximate neighborhoods.

7. The total population of Erie County is 950,269. If you subtract the population of Buffalo, which is 292,648, Erie’s population is 657,621. The total number of rental households in Erie County is 132,106. Of that total, the proportion that is HCV holders from Buffalo’s PHA is 4%. All voucher households account for approximately 10% of renter households in Erie County.

8. Census data show that the proportion of African American households is almost identical to the proportion of African Americans in the study region.

9. The Buffalo census tracts bordering the town of Cheektowaga are located on the East side; however, they did not until very recently consist of a majority of African Americans and are not considered to be a part of the historically African American section in Buffalo. As recently as 1990, the average African American population of those neighborhoods was 23%; in 2000, it was 60%.

10. Hereafter, LISA statistics refers to the local Moran’s I statistic.

11. Busing is citywide for the Buffalo Public Schools, so moving for better schools is more of an issue for voucher holders leaving the city than for those staying in Buffalo.

REFERENCES


