THE GROWTH AND DECLINE OF THE AFRICAN-AMERICAN POPULATION IN CHICAGO AND ITS SUBURBS: A CLUSTER ANALYSIS

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This study used census data to identify the spatial pattern of African American movement in the Chicago metropolitan area since 1990. Using data from the U.S. Census and GIS tools, it shows that, between 1990 and 2010, 48% of the city's community areas and 21% of suburban municipalities were part of clusters experiencing rising African American population. Changes in the share of African American populations over time is also clustered, with the largest increases occurring in the west and southwestern parts of the city and adjacent suburbs.

INTRODUCTION

African Americans have been leaving Chicago in large numbers over the past twenty years. The Windy City lost 181,000 such residents between 2000 and 2010, and in the subsequent eight years lost around another 46,000 (Eltagouri, 2017, Gee, 2018). Many suburban communities, in turn, have seen their African American populations grow, while other communities have seen it expand hardly at all.

African Americans, are likely leaving the city for many reasons, including better jobs and safer neighborhoods. According to White (2003), among the factors responsible for this shift are dissatisfaction with economic opportunities and their place of residence.   Among the parts of the city seeing the significant outmigration of African Americans are lower-income neighborhoods on the South and West sides that have unemployment rates well above the regional average.

This study explores patterns of African American population movement within the Chicago metropolitan area. To foster a better understanding of the implications of these movements for local governments and the region as a whole, it tracks shifts from 1990. It identifies how migration has occurred in statistically significant clusters rather than in a random pattern.

BACKGROUND

The segregated settlement patterns within metropolitan Chicago are to a large extent legacies of the Great Migration, which brought approximately six million African-Americans from the rural South to urbanized areas in the Northeast, Midwest, and West between about 1916 and 1970. In Chicago, the Great Migration spurred the arrival of approximately one million African Americans, which today comprise about a third of the city's population (Layson & Warren, 2017). This arriving population settled largely in South Side neighborhoods stretching from 22nd Street down to 55th Street, which initially was labeled the"Black Belt of Chicago". These areas today include the Bronzeville and Kenwood neighborhoods (Layson & Warren,2017).

The settlement patterns that occcured were partially the result of restrictive measures put on the sale or lease of properties (Layson & Warren, 2017). The discriminatory restrictions were in some ways outgrowths of the Jim Crow laws enacted in the late 19th and early 20th Century. These notorious laws, including restrictive covenants put on the sale of homes preventing their sale to blacks, reinforced the practice of providing separate public facilities and accommodations for black and white residents. The law was challenged in 1940s but remained in effect until 1965. By then, segregation had already taken root, making the country's third-largest city deeply divided on racial lines, which is still is today.

Such racial segregation has major sociological implications for Chicago and other cities. According to Boustan, (2013), African Americans living in a segregated areas have lower family incomes, scarce local opportunities and inferior educational attainment. The communities are also subjected to more various forms of discrimination than those living in integrated neighborhoods. Additionally, the harmful social interactions within segregated African American neighborhoods, especially due to the concentrated

poverty and other socio-economic disadvantages it creates, limited local business development and hence employment opportunities.

A wide body of academic research explores the movement of African Americans in major U.S. metropolitan regions. According to Hobbs and Stoops (2002), minorities have long been becoming part of the demographic landscape of U.S. suburbs. Similarly, Eltagouri (2017) shows that Chicago experienced the largest loss of this population of any city in United States. Research also shows that increasing property values, gentrification, a desire for more stable incomes and search for safer neighborhoods are among the reasons blacks have left the city (McMillen, 2003; Eltagouri, 2017). More recently, the Metropolitan Planning Council has been disseminating research outlining the social costs of segregation in our region.

At the same time, the migration of minority groups in and out of the Chicago has helped make metropolitan Chicago, as a whole, one of the most diverse regions of the country (Mendell, 2001). According to Mendell (2001), through the 20th Century, Chicago stitched together its unique culturally segregated neighborhoods of hard-working Irish Catholics and devoted Italian grandmothers and freedom-seeking African-Americans. The metropolitan region has a broader demographic diversity and multicultural fabric than before due to growing numbers of Spanish speakers, more college-educated black suburbanites and heaving immigration from places around the world.

METHODOLOGY

The analysis below uses census data aggregated at a prominent census geography of census tract. The boundary shapefiles corresponding to this census geography were acquired from Census Tiger/Line files. A GIS attribute table formatting operation was conducted for spatial joining census demographic data with its corresponding census geography.

Although the data analysis was conducted at the scale of census tract, the results are presented and interpreted at the scale of *community areas* within Chicago and *suburban municipalities within Cook County.* (The analysis does not include other "Collar Counties" that are part of the metropolitan Chicago

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region). This allows for a clear interpretation of their planning and policy implications. Municipalities are local functional units of the government while Community Areas are zones created by University of Chicago's Social Science research committee for the city's statistical and planning purposes. Hence, shapefiles for 117 suburban municipalities and the Chicago's 77 community areas were obtained from the city government's data portal.

The results are presented on a choropleth map, which uses a graduated shading to represent quantitative information by grouping the population into classes. In this analysis, values of percent African American population was grouped into five classes namely: *very low* (i.e., 5% and below), *low* (i.e., 5% - 10%), *moderately low* (i.e., 10% – 20%), and *moderately high* (20% - 40%) and *dominant* (i.e., 40% - 100%). It should also be noted that the statewide average for 2010 (14.5%), is in *the moderately low* category, while the countywide average (22.8%) is *moderately high*.

Spatial pattern analysis of the values was analyzed using pattern analysis toolsets built into ArcGIS. *Global spatial autocorrelation* was used to quantify spatial patterns of the values of percent to the population in the study area as a whole. This allowed for an exploration of the correlation between values of the percent African America population of each census tract and the distance separating the tracts, which is estimated by Moran's I index (Anselin, Luc, 1995). On the other hand, *local autocorrelation* is an indicator of spatial clustering of similar values of percent African American population, considering neighborhood census tracts. The analysis, also known as Getis-Ord Gi* Statistic, is a given set of weighted features that identifies statistically significant hot spots and cold spots such that hot spot meaning statistically significant clustering of high values of percent African American population, while cold spot indicates spatial clustering of values of low percent population.

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Validation of the distribution and movement of African Americans are verified by the values of Moran's I Index and corresponding p-value. Generally, a value of +1 Moran's Index value indicates a strong geographical controls of percent African American distribution, while the index value near -1.0 indicates their random distribution (i.e., no geographical control).

RESULTS OF POPULATION ANALYSIS

The 2010 census data shows distinct patterns in the African-American presence in Chicago and suburban municipalities in Cook County (Figure 1 and Table 1). Overall, 32 of the 77 community areas (i.e., 42%) and 20 of 117 suburban municipalities (i.e., 24%) have the *dominant* presence of African American population (i.e., greater than 40%). Similarly, 41% of the city's community areas and 55% of the suburbs have very low presence. In more than half of all suburbs, few than one in twenty residents are African American.

A statistically significant (α = 0.05) geographical *clustering* of census tracts with higher values of percent African Americans was detected in 38 community areas and 25 suburban municipalities. The largest cluster extends from the South Side of the city to the south suburbs. A smaller cluster is on the West Side of Chicago.

The *south cluster* includes the community areas of Beverly, Chatham, Englewood, Hegewisch, Morgan Park, Pullman, Riverdale, South Chicago, South Deering, and Washington Heights. It also includes 13 suburbs: Blue Island, Burnham, Calumet City, Calumet Park, Chicago Heights, Dixmoor, Dolton, East Hazel Crest, Evergreen Park, Flossmoor, Harvey, Hazel Crest, and Homewood.

The *west cluster*, smaller and more circular in shape, includes the Austin, East Garfield Park, Humboldt Park, North Lawndale, and West Garfield Park community areas. No suburban communities are part of this cluster.
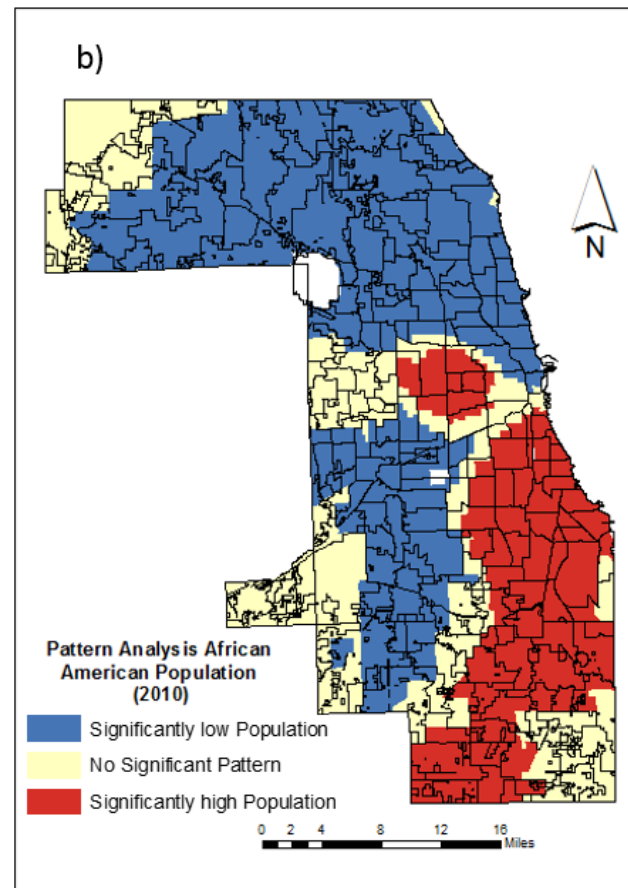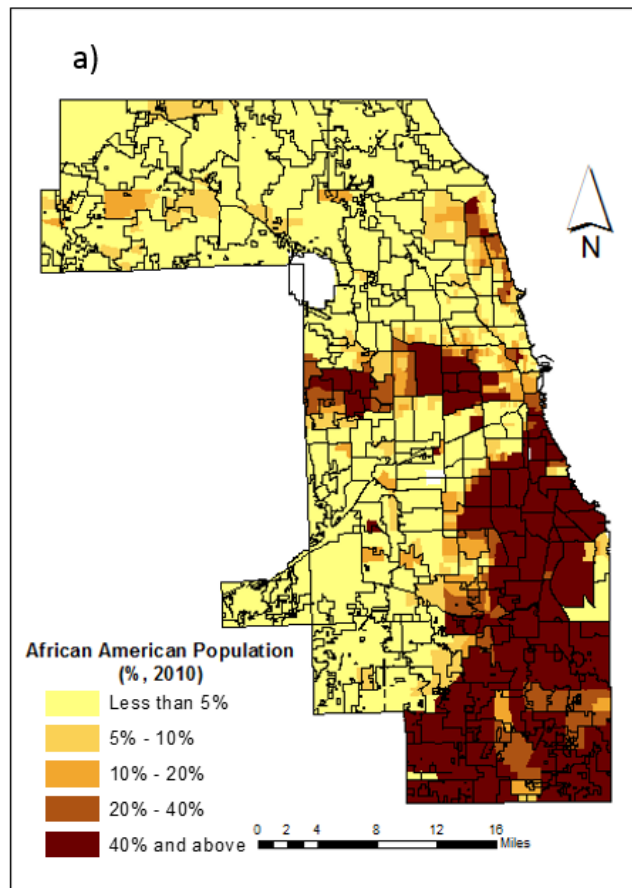
FIGURE 1: AFRICAN AMERICANS AS A PERCENTAGE OF POPULATION

BY CENSUS TRACTS IN 2010

Share of African American Population by Census Tract   *Clustering of African American population using*

Spatial Autocorrelation

Similar clustering was found in areas with very *low percentages* (i.e., less than 5%) of African American population. These clusters encompass 32 of 77 (i.e., 42%) community areas and 66 out of 117 (i.e., 55%) suburban municipalities. As is evident on the map, the largest cluster, which encompasses approximately one fourth of the county's entire geographic areas, extends from the North and Northwest sides of the city to the north and northwest suburbs. This cluster encompasses 31 of the 77 community areas (i.e., 39%) and 61 of 117 suburban municipalities (i.e., 52%). It extends to the northern edge of the county and almost reaches the county's far western boundary. No significant clustering of low or high percent African American population is detected on southwest, north and northwest Chicago community areas and surrounding suburban municipalities.

TABLE 1:
**PERCENT CHANGE IN SHARE OF POPULATION THAT IS AFRICAN AMERICAN
COMMUNITY AREAS OF CHICAGO AND COOK COUNTY SUBURBS**
1990 - 2010

Percent change in population share	African American Population (2010)			
	Areas		Suburban municipalities	
	No.	%	No.	%
5% and below	32	41	66	55
5% - 10%	7	9	6	5
10% – 20%	4	5	11	9
20% - 40%	4	5	8	7
40% - 100%	32	40	28	24
	77	100	117	100

[Insert source or caption, if desired]

TABLE 2

CLUSTER ANALYSIS OF CHICAGO COMMUNITY AREAS AND SUBURBAN
MUNICIPALITIES IN 2010

Patterns of Clusters	Number of Areas	Number of Suburban municipalities	Percent	
			Number of Areas	Number of Suburban municipalities
Clustering of Significantly Lower population (α = 0.05)	31	61	39%	52%
No Significant Clustering (α = 0.05)	10	32	13%	28%
Clustering of Significantly Higher population (α = 0.05)	36	24	48%	21%
Total	77	117		

[Source]

Only four of the 77 community areas (i.e., 5%) and 11 out of 117 suburban municipalities (i.e., 9%) have a percentage of the African American population in the *moderate* category, which puts them near the state's average (i.e., 14.5%). These community areas are: Logan Square, the Loop, Near West Side, Rogers Park, Uptown, and West Town. Several suburban municipalities, including Hoffman Estates in the northeast part of the county; Chicago Ridge, Evergreen Park, and Palos Hills in the southwest part of the county; and Homewood in the south, also fall in this category.

POPULATION CHANGES BETWEEN 1990 AND 2010

Between 1990 and 2010, significant changes in the racial composition took place in the county. These changes, however, were not spread equally across the study area. In fact, the majority of the community areas and suburban municipalities experienced neither a significant gain nor loss in African American population. No significant change was detected in 52 of the 72 community areas (i.e., 72%) of Chicago and in 89 of 117 (i.e., 76%) of the suburban municipalities.

Nevertheless, several distinct patterns emerge. Most community areas that had *insignificant* changes are those community areas and suburban municipalities that had either very low (i.e., less than 5%) and very high (i.e., above 40%) percentages of African American populations in 1990. Most of the significant change occurred in areas that had percentages closer to the middle of the distribution.

FIGURE 2

AFRICAN AMERICAN POPULATION CHANGES AND MOVEMENT IN CHICAGO AND SURROUNDING SUBURBAN
MUNICIPALITIES (1990 AND 2010)

a) Percent change   *b) Percent change pattern analysis.*
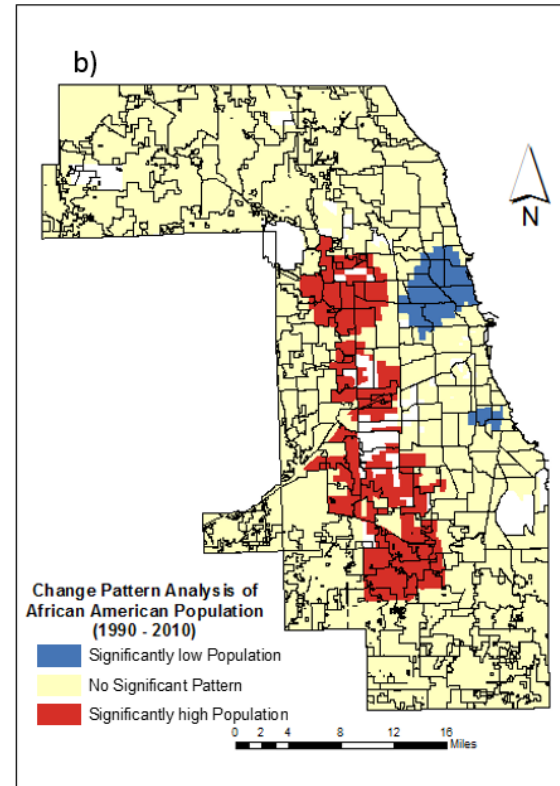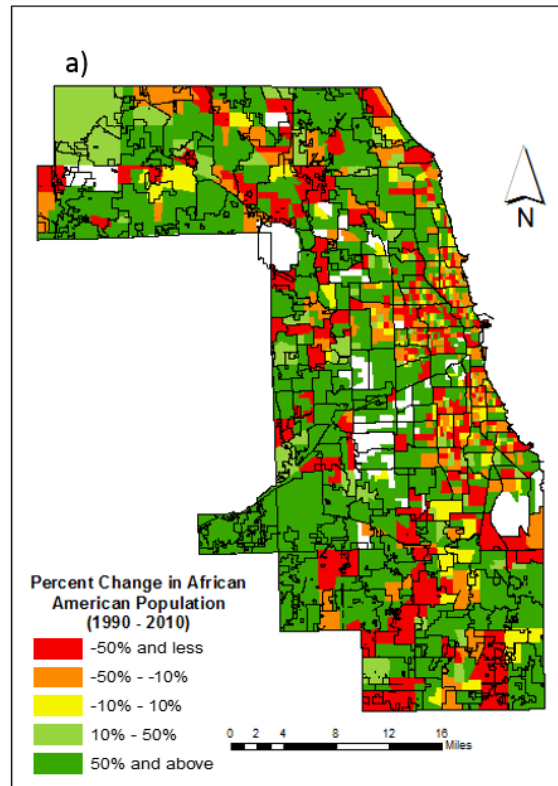
Among suburban municipalities, the changes followed a more complex pattern. Both suburbs with very low (i.e., less than 5%) and low (i.e., 5% - 10%) percentages saw the percentage of African Americans decline significantly, averaging 19% and 17%, respectively. Conversely, those with high (i.e., 20 – 40%) and very high (i.e., 40% and above) percentages saw these percentages *increase* by 75% and 71%; respectively. As these latter statistics suggest, movements of African American population to the suburban areas was dominated by a move to suburbs that already had a high share of African American population. Areas that had a large share of black population tended to see greater percentage gains than those that did not.

Moreover, a far greater share of the suburbs experienced increases in African American population than that occurring in community areas of the city. Among 117 suburbs, 88 (75%) experienced 10% or higher rate of increase in percent African American population.

TABLE 4

CLUSTER ANALYSIS OF SIGNIFICANT GAINS AND LOSSES IN AFRICAN AMERICAN POPULATION AMONG COMMUNITY AREAS IN CHICAGO AND ITS SUBURBAN MUNICIPALITIES BETWEEN 1990 AND 2010

Patterns of Gains/Losses Clusters	Number of Community Areas	Number of Suburban municipalities	Percent	
			Number of Community Areas	Number of Suburban municipalities
Clustering of Significantly Lower population (α = 0.05)	13	0	18%	0
No Significant Clustering (α = 0.05)	52	89	72%	76%
Clustering of Significantly Higher population (α = 0.05)	7	28	10%	24%
Total	72	117	100	100

There was also significant clustering with respect to the population changes. Only 7 out of 72 community areas of the city (10%) were part of the four *clusters* identified with significantly gains in the African American population ($\alpha = 0.05$). Conversely, 28 of 117 suburban municipalities (24% of the total) were part of these growth clusters—a rate 2.5 times higher than community areas in the city. These clusters can be found in areas northwest, west, south central, and southwest parts of the study area.

The *southwest cluster* includes three Southwest Side community areas (Ashburn, Beverly, and Mount Greenwood) and eight suburbs (i.e., Bridgeview, Burbank, Forest Park, Hickory Hills, Lyons, North Riverside, Riverside, and Stickney.

The *northwest cluster* includes two Northwest Side community areas (Belmont-Cragin and Montclare) and two suburbs, Harwood Heights and River Grove. The *central-south* cluster includes four suburbs of (i.e., Alsip, Crestwood, Midlothian, Oak Forest, and Posen) but not city neighborhoods. The *west cluster* includes the Garfield Ridge communities and the suburbs of Elmwood Park, Franklin Park, Melrose Park, and Oak Park.

The majority of the losses (-10% and more) in African American population was observed in 41 of 72 community areas (51%), although only 13 of them (i.e., 18%) had significantly losses ($\alpha = 0.05$). These areas included: Avondale, East Garfield Park, Humboldt Park, Hyde Park, Lake View, Lincoln Park, Lincoln Square, Logan Square, North Center, Uptown, Washington Park, West Town, and Woodlawn. As show on Figure 2, two significant clusters emerged, the first on the near North and Northwest Side of the city, and another on the South Side around Hyde Park. Although such reduction in African American population was detected only in 25 of the 117 of suburban municipalities (i.e., 20%), none of the suburban municipalities had significantly losses. Generally, the observed urban-to-suburban movement of African American population corroborates with previous reports by Hobbs and Stoops (2002) and Eltagouri (2017).

CONCLUSION

The analysis shows significant spatial patterns in African American population distribution and movement. Forty-eight percent of the community areas in Chicago experienced and are part of clusters with high percentage of African American populations. The vast majority of these community areas (87%) are on the South Side, while the remaining 13% are found in the city's West Side. The juxtaposition of these clusters shows clear racially segregated settlement patterns. On the contrary, only 21% of the suburban municipalities (i.e., all most all in the south) have a dominant African American presence. A significant clustering of communities with lower shares of African American populations was detected in 39% of the community areas and 51% of the suburban municipalities. These suburban municipalities are found in the northern, northwestern, and western parts of the metropolitan areas.

The results also show that much of the change has occurred since 1990. The magnitude of change is higher in the suburban municipalities than in the city. In fact, there was a net loss of share in 51% of the community areas of Chicago, while 75% of the suburban municipalities showed net gain in share. Most of these changes occurred in the areas and municipalities with low (i.e., 5 - 10%) and very low (<5%) percentages of the African American population during the 1990 census, revealing a trend of African American migration to predominantly white neighborhoods, which can be interpreted as sign of improvement in racial integration.

This paper does *not* address the "push or pull" factors that generated the observed shifts in population. Better jobs, lower cost of housing, education, and crime are among many likely factors explaining the shift. Arguably, along with the out-migration of African-Americans in some areas, there has also been a concurrent growth of white working class millennials, particularly in such sought-after neighborhoods as the South and West Loops, Near North Side (Old Cabrini Green Projects) Logan Square, Bucktown, West Town, and Ukrainian Village. A related question is what neighborhoods have had net depopulation, due to the number of

African-Americans leaving being greater than or equal to the number of other populations moving in? Additional analysis will be need to answer that question.

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