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Social and spatial characteristics of systemic inequality in three US cities

Washington DC, Baltimore and Philadelphia

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ABSTRACT

Systemic inequality correlates with spatial disparities in the US: underprivileged communities were designated in specific areas and were not allowed to reside in other areas because of systematic government policy. While this fact has a great impact on segregation historically, current income inequality and increase in land value due to urban renewal projects and gentrification caused these spatial disparities that enable segregation to intensify. In this paper, we aim to uncover how urban spaces suffering from systemic inequality socially and spatially perform in the cases of three cities in the US: Washington DC, Baltimore, and Philadelphia. We propose a twofold methodology exploring the persistence of racial inequities – first, using HOLC maps and current census maps, and by comparing inter-group interaction index and secondly investigating the impacts of street networks on configurational inequalities using space syntax measures normalised angular integration (NAIN) and normalised angular choice (NACH). The findings of our study show that Washington DC and Philadelphia still carry segregated patterns originating from historical systemic inequality. African Americans in Washington DC and Baltimore have significantly low exposure to other races and generally live in configurationally segregated spaces while non-Latino Whites tend to self-segregate in spaces well-connected to the rest of the city in terms of through-movement. The Latino community prefers living around other similar people in city enclaves or ethnoburbs. Our findings can be used in relating ethnic and racial groups' segregation tendencies to configurational characteristics of urban space in the context of systemic inequality in the US.

KEYWORDS

Systemic inequality, exposure analysis, street network analysis, racial inequality, spatial segregation

1 INTRODUCTION

"History, despite its wrenching pain, cannot be unlived, and if faced with courage, need not be lived again." Maya Angelou

In many cities in the United States, spatial disparities originate from differences in racial and ethnic backgrounds. Historically, metropolitan areas were designed to hold segregated neighbourhoods that separated people of colour, especially blacks. A closer look at how the US Federal government designed programs to exclude people of colour from certain parts of American cities, and how these attempts were also supported by local governments and individuals help us understand why racial and ethnic communities still experience consequences of segregation, economic and social disparities today.

Our study aims to explore three cities of the United States – Washington DC, Baltimore, and Philadelphia in terms of how different ethnic and racial communities are included and excluded in specific areas within cities. We aim to look at spatialities that they form as a group and their interactions with other groups. We intend to investigate patterns of group interaction compared with how groups locate with each other or separated from each other. We first attempt to explain briefly how historical systemic racism implemented in the law of the United States, resulted in metropolitan areas to be residentially segregated. Then, we will introduce our methods – and related datasets of the three case studies. We adopt a twofold methodology where we first explore "how historic patterns of racial inequality still persist", -- by comparing historical HOLC maps and current racial and ethnic composition choropleth maps of the US Census Bureau, and by statistically analysis interaction index in between groups (exposure metrics). We secondly investigate "how those patterns can be explained with street network analysis". We use space syntax measures normalised angular integration (NAIN) and normalised angular choice (NACH) to uncover configurational inequalities in these cities.

For this inquiry, our hypotheses are:

- The historically underrepresented groups – especially African Americans, still experience less interaction with other racial and ethnic groups, because of systemic segregation patterns from the past that somehow persist in cities today.
- Whites self-segregate in upper class neighbourhoods within cities with high levels of mobility, or in some suburbs with the same qualities.
- Ethnic communities – especially Latinos, live in ethnic enclaves within cities where interaction levels between groups are high and highly locally integrated, but these neighbourhoods might be challenged with gentrification issues.

2 THEORY AND HISTORY OF RACIAL AND ETHNIC RESIDENTIAL SEGREGATION IN THE UNITED STATES

Rothstein (2017) explains in his book "The Color of Law" that the segregation in the United States has long been defined as "de facto" segregation, resulting from individual practices such as prejudice from white families who moved away when blacks settled into their neighbourhood, and subsequent community deterioration and white flight occurrences. The explanations made to support that racial segregation consequences were unintentional and deriving from individual practices. However, Rothstein states that segregation is the product of a publicly stated systematic government policy in every metropolitan area in the United States, and its consequences still endure today. Public policies were implemented to separate White communities from Black communities. As we cannot cover all these policies, we intend to discuss a few important ones:

- First, racial restrictive covenants appeared in the late 1800s and spread rapidly in the early 1900s. They were agreements between buyers and sellers of property not to sell, rent, or lease real estate to minorities, usually blacks but also any non-Caucasians (Jones-Correa, 2000). The government efforts primarily designed to provide housing to white middle-class, lower middle-class families.
- Home Owners' Loan Corporation (HOLC) which supported homeowners to pay their mortgages contributed to segregation by assessing property values to lower their risk as lender. HOLC created maps with colour code, with green signifying the safest and red the most hazardous areas. A neighbourhood was reported as red, even if it is middle-class single family home neighbourhood, if it was inhabited by some African Americans (Rothstein, 2017).
- Due to redlining, blockbusting became a way for African Americans to obtain mortgage for higher than regular price and hard conditions such as the inability of leaving the mortgage. Borderline neighbourhoods became strategic places for speculators to buy and sell properties to Blacks, then purchasing more houses from panicked Whites who thought the neighbourhood is deteriorating. This scenario resulted in overcrowding neighbourhoods and schools, neglected maintenance of houses owned and rented by Blacks (Rothstein, 2017).
- The Fair Housing Act outlawed legal housing discrimination in 1968. However, conditions in metropolitan centres, where the majority of African Americans were still located, had deteriorated dramatically by the end of the 1970s (Charles, 2003). According to Wilson (1987), growing poverty was restricted to a small number of closely packed and spatially isolated places due to segregation. African American were pushed in urban housing projects.

We are going to explore two models that help us understand current segregation tendencies in the United States. First, place stratification theory defines how dominant groups control space to

preserve their physical and socio - economic isolation from communities they perceive as unwanted (Charles 2003; Logan and Molotch 1987). This viewpoint emphasizes the challenges that minorities experience in terms of residential mobility (Pais et al, 2012). Living in racially segregated neighbourhoods means the lack of mobility and proximity which also resulted in being excluded from attractive locations, good career possibilities, quality of education, safety, and social networks (Jargowsky, 1996; Wilson, 1987; Charles, 2003). In some cities like Washington DC, there is still a visible "colour line" between black and white neighbourhoods. In the last 5 decades, Black isolation in metropolitan settings has decreased because of increased exposure to other non-Whites (Rugh and Massey, 2013; Lichter et al, 2015) however, Blacks' exposure to Whites in their neighbourhood did not vary significantly. Black-White segregation remains greater than Latino-White and Asian-White segregation (Logan and Stults, 2011; Tienda and Fuentes, 2014; Lichter et al, 2015). This issue translates as the place stratification model, and is a White strategy towards Blacks, but not as much towards Asians and Latinos.

Second, according to the spatial assimilation model, immigrants migrate from ethnic communities as their socioeconomic advantages translate into greater comfortable accommodation and better living conditions. Individual immigrant traits are often linked to a contextual result in models of this phenomenon (Ellis et al, 2013). In fact, macro-segregation is the least evident among Asians, meaning that others have less resistance to Asians forming communities around them (affluent ethnoburbs, middle class) (Lichter et al., 2015). So, in general, Asians are the most spatially assimilated group among underrepresented groups.

Factors like gentrification that affects how neighbourhoods are socially constructed in the 21st century. Some cities, such as Washington, DC, have witnessed an inner-city revival, which was followed by a massive gentrification – the influx of wealthier younger whites in inner-city areas and the out-migration of ethnic minorities to poorer, more ethnically diverse neighbourhoods (Lichter et al., 2015).

Segregation is not just a result of local real estate markets or neighbourhood characteristics. Neighbourhoods are characterized by their places, such as cities or suburbs, that effectively embrace or exclude people of colour (Lichter et al, 2015). We support the view that racial and ethnic stratification derives from a big picture issue – such as systemic inequality towards Blacks and the formation of extremely poor and extremely wealthy neighbourhoods are the result of the policies in their cities or suburban communities. To this end, we intend to understand how these patterns of systemic inequity persist or change analysing macro and micro-segregation patterns in these three cities.

3 METHODS AND DATASETS

3.1 Historical and current segregation patterns and exposure analysis

In the first part of our exploration, we aim to find out how systemic inequality translates to space in terms of social segregation looking into historical segregation patterns and current social segregation patterns. We start with examining HOLC maps and other redlining sources to locate historically segregated areas (Figure 1). We compare HOLC maps with the current choropleth maps measuring the individuals' characteristics by race and ethnicity datasets in every zip code (2019) using the data platform of the Census Bureau (Table 1).

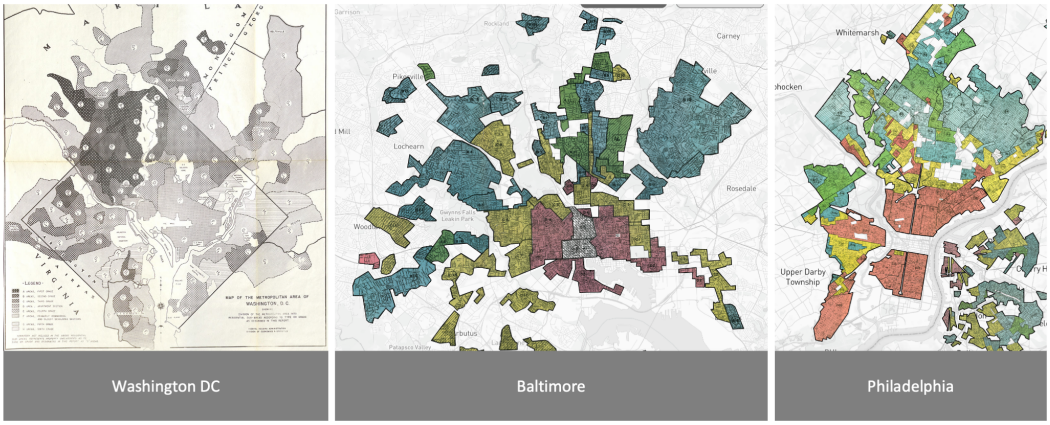
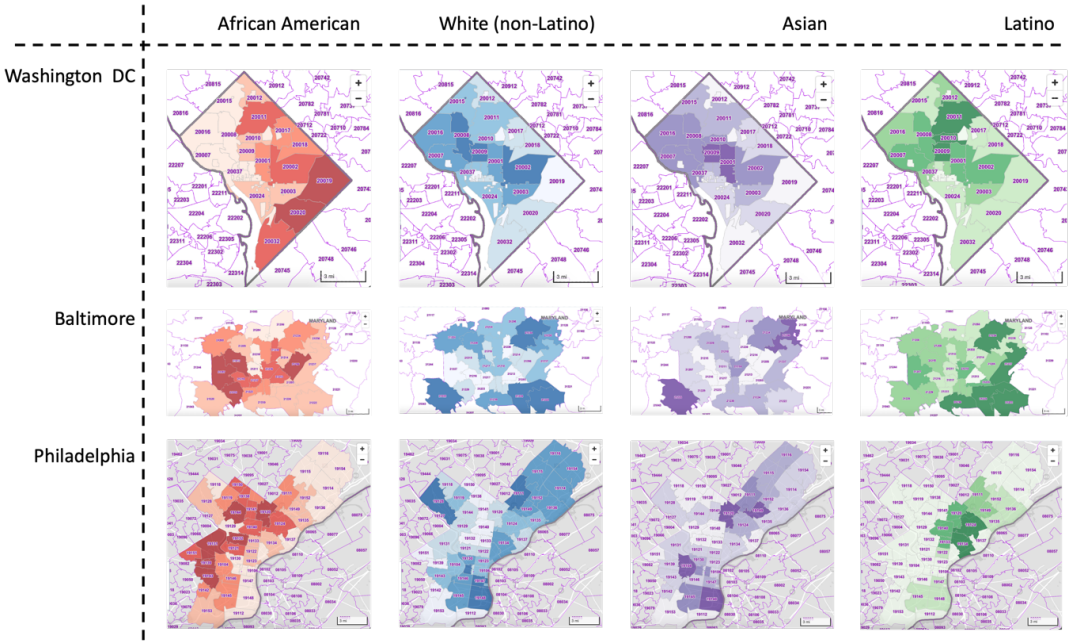


Figure 1: 1934 FHA neighbourhood grading map of Washington DC, and HOLC maps of Baltimore and Philadelphia

Table 1: Race and ethnicity by ZIP code, based on Census Data of the three cities



Next, we measure current social characteristics of space by assessing the degree of isolation and interaction between different races and ethnicities based on measures of segregation using US Census data. We use measures of exposure – isolation index and interaction index—to see how

more socially-mixed neighbourhoods perform in terms of social exposure in-between different communities. Exposure measures the degree of possible contact, or probability of interaction, between marginal and mainstream group members (Massey and Denton, 1988). The level to which two groups share similar living areas, and consequently the degree to which the typical underrepresented group member "experiences" segregation, determines exposure (Housing Patterns, 2021). Segregation measures are mostly studied using evenness measures, including dissimilarity index, Gini Coefficient or Theil entropy index among others. However, we prefer using exposure measures in this study to find out about the level of contact in-between different groups, weighted by the size of the specific group. Evenness measurements are unaffected by the relative sizes of the two groups being compared, whereas exposure measures are (Housing Patterns, 2021).

$$B_{bw} = \sum \left({}^{n_{ib}}/_{N_b} \right) \left({}^{n_{iw}}/_{n_i} \right)$$

Where:

n_{ib} = number of Blacks in the tract
n_{iw} = number of Whites in the tract
N_b = number of Blacks in the city
n_i = total population of the tract

Equation 1: Interaction Index Equation (Forest, 2005).

Table 2: Exposure statistics of different racial and ethnic groups based on Census Data of the four cities

Exposure _Interaction	**African American <-> White**	**Asian <-> White**	**Asian <-> African American**	**Latino<-> African American Non-Latino**	**Latino<-> White Non-Latino**	**Latino<-> Asian Non-Latino**
Washington DC	0.23 0.26	0.59 0.56	0.26 0.21	0.37 0.09	0.39 0.12	0.04 0.12
Baltimore	0.27 0.32	0.52 0.05	0.33 0.03	0.37 0.04	0.46 0.06	0.04 0.06
Philadelphia	0.53 0.62	0.78 0.16	0.68 0.12	0.73 0.26	0.64 0.27	0.14 0.28

Interaction and isolation are two key and interrelated metrics of exposure. The two indices measure the likelihood that a minority person will cohabit a particular location with either a majority or another minority person. The interaction index evaluates the exposure of racial minorities to members of the majority group. The isolation index measures "the extent to which minority members are exposed only to one another," (Massey and Denton, p. 288; Housing Patterns, 2021). Here, we calculate the exposure metrics by comparing the values of interaction, of each community in every zip code to each other using the equation below. The interaction index acts as indicator of the likelihood of a member of one group meeting or interacting with a member of another group (Forest, 2005) (Equation 1). B_{bw} calculates the probability of a Black

person meeting a White person. The likelihood of a "typical" Black person encountering a White person is not the same as the probability of a "typical" White person meeting a Black one in most interaction indices (Forest, 2005). The value of this index tends to reach the maximum when the two groups have arithmetically equal and are evenly distributed throughout tracts (Forest, 2005). So, when there are low values, this means that tracts are not equally distributed, and there is a great difference in the number of people from each group. We then compare historical patterns with current patterns and identify different neighbourhoods with their respective typologies – historically segregated neighbourhoods, ethnic enclaves, or gentrifying neighbourhoods— affected by social segregation.

3.2 Configurational characteristics of urban inequality: Space syntax analysis

In the second part of the study, we investigate spatial attributes of the previously identified socially segregated neighbourhoods using space syntax methods to conduct a street network analysis. Space syntax is a collection of tools for relating spatial analysis results to diverse socioeconomic variables (Yamu et al, 2021). Previous studies using space syntax methodology to assess American cities put forward that urban configuration and patterns of movement and co-presence can be correlated by examining movement flows and densities of pedestrians in Atlanta (Peponis et al., 1997, Ozbil&Peponis, 2007). Also, a neighbourhood scale study compares various localities of 24 metropolitan cities across the US using the standard deviation of the mean scale, to describe the variation between and within these localities (Haynie, 2015). According to the study of amalgamated and fragmented blocks in Savannah and Atlanta, as cities evolve building block deformation affects the intelligibility of the street network (Vialard, 2012). In a historical (diachronic) study of Detroit, the configurational street network is challenged in terms of social and economic change since 1796 (Psarra & Kickert, 2012). In the book “The Syntax of City Space: American Urban Grids”, Major explores urban morphology – the grid system and different suburban layouts in the United States using space syntax methods (Major & Conroy Dalton, 2018). Within this framework, our study proposes to use space syntax to study American cities in terms of the correlation of urban configuration with social inequality patterns.

Space syntax methods are useful to identify socioeconomic disparities linked to inequalities related to urban form and configuration. The city itself carries its own inequalities as a configurational system. Hillier (2001) explains this phenomenon stating that the urban grid might be reinterpreted as a system of configurational inequalities - that is, disparities in integration values in the lines that make up the axial map - that creates a system of attractional inequities. We use space syntax methods to identify spatial inequities in cities. We investigate correlations between the street network integration/segregation patterns and racial and ethnic enclaves and related potential socioeconomic disparities. Some areas in the street networks perform accessible and well connected and integrated to local and global centres, whereas some others perform poorly and stay disconnected and segregated in the system.

The street network analysis comparatively measures closeness centrality and betweenness centrality characteristics. Higher closeness centrality (integration) levels ensure better accessibility to the socio-economic centres, whereas lower closeness centrality levels bring remoteness, therefore spatial segregation. To determine closeness centrality (integration) levels, we use the NAIN (Normalised angular integration) analysis (Hillier et al, 2012) with multiple metric radii to assess global and local integration computed on DepthMap to analyse the "to-movement" potentials in the urban system (Yamu et al, 2021). To-movement describes the movement to a space as a target from all others (Hillier et al, 1987).

Angular choice measure depicts how well one street segment is connected to the others in terms of the least number of angular deviations (Yamu et al, 2021). Higher betweenness centrality (choice) levels signify better connections from an area to other parts of the city to go through the city, however lower betweenness centrality levels promote spatial isolation in terms of spatial mobility. "The angular choice analysis shows the through-movement potentials in an urban system" (Yamu et al, 2021). We use the NACH (Normalised angular choice) analysis (Hillier et al, 2012) with multiple metric radii to assess global and local choice. We lastly elaborate on the correlation of different types of social segregation patterns with their respective spatial attributes and conclude that systemic inequality may result in various forms of spatial disparities.

4 RESULTS

4.1 Washington DC

Washington DC comprises a large metropolitan area including District of Columbia and some counties from the state of Maryland and Virginia. In this study, we are concentrating on the District of Columbia only. The District of Columbia contains the most densely urbanised area of Washington Metro (DMV) area. The District of Columbia is known as one of the most unequal places in the United States in terms of income inequality. The Gini Index of the Population Reference Bureau states that the District of Columbia is the highest percentage of income inequality in the United States with 52.8%.

Washington DC has an earlier map from 1934 produced by the FHA used for grading neighbourhoods, instead of the HOLC map. Looking at the grading map (Figure 1- Washington DC), we can find out that the Northwest part of the city is defined as first grade and second grade, the Northeast as third grade, Central Northeast as fourth grade and Southwest and Southeast as fifth and sixth grade, that constitute the restricted area for African Americans at that time. Compared with the current racial and ethnic distribution of District of Columbia dwellers, we notice a resemblance in the segregated patterns that the city offers. Especially, the Northwest is still generally occupied by the wealthy non-Latino Whites and Asians. The Southwest still carries the same patterns of segregation, densely occupied by African Americans. The area that was characterized by third and fourth grades is densely inhabited by Latino and Asian

communities. Those communities also seem quite compact, compared to the other racial and communities. In short, the city has a ‘colour line’ that divides the East and the West and may be characterized as highly segregated.

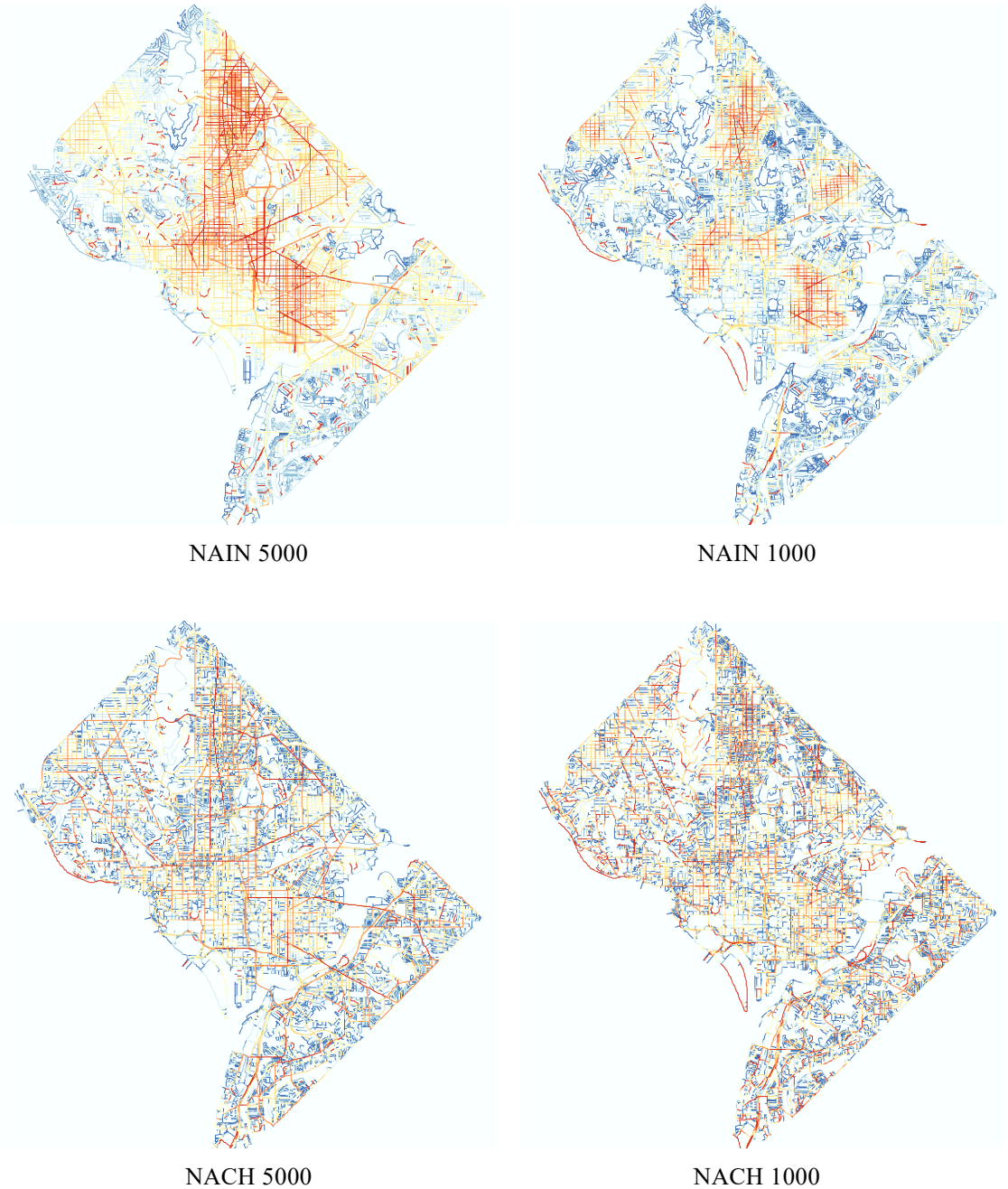


Figure 2: Washington DC (District of Columbia) Space Syntax Analyses

Analysing the exposure metrics, the interaction index between the African American and Whites is quite low. African Americans and Whites overlap less and interact less that some other groups do. The same pattern is valid for African American and Asians interaction. That is deriving from the “colour line” and the high levels of segregation within the two racial groups. The most

interacting pair are Asians and Whites. They are mostly concentrated around the centre and the west neighbourhoods. Latinos have equal exposure to Whites and African Americans however each of these groups have much less exposure to Latinos. This happens because of the very concentrated Latino enclave in the zip codes 20009, 20010 and 20011.

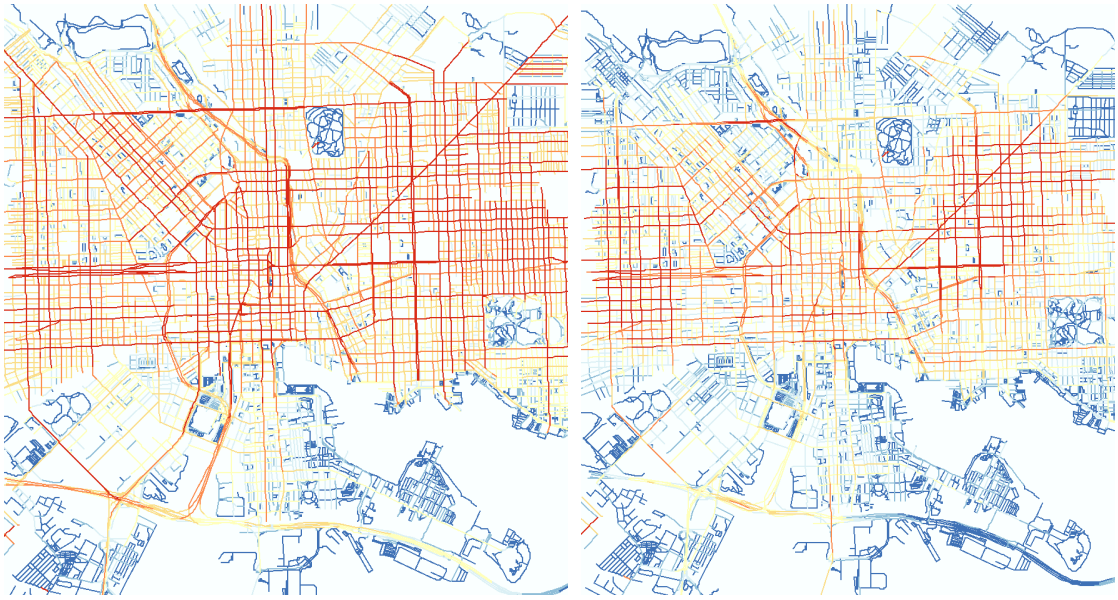
Space syntax analyses show that Washington DC is highly globally integrated in the centre north-south axis (Figure 2). Interaction between groups especially African American, Latino and White concentrate in these inner-city areas. Local (NAIN1000) integration (closeness centrality) values are the highest in the north area where the Latino enclave is and in the city centre where groups interact the most with each other. Those areas constitute also the most gentrified places. The globally segregated areas are the west side of the NW— predominantly white neighbourhoods, and the entire SE – predominantly black neighbourhoods. This relates to our prediction that whites self-segregate in NW. Also, we note that Black community continues to exist in SE, that is poorly integrated to the centre, following the same historical pattern in the FHA map. The global (NACH5000) choice (Betweenness centrality) analysis shows that except the very ends of the Northwest and Southeast, the city is globally well connected. This translates as lower accessibility to the city centre and remoteness, therefore segregation in the sense of mobility. Local choice values (NACH1000) show that, the most accessible neighbourhood concentrate along the centre north to south axis. Those neighbourhoods are more accessible locally, meaning that they are more walkable with an increased mobility for the dwellers. The most gentrified areas match quite well with the segments that have a high amount of betweenness centrality on a local level.

4.2 Baltimore

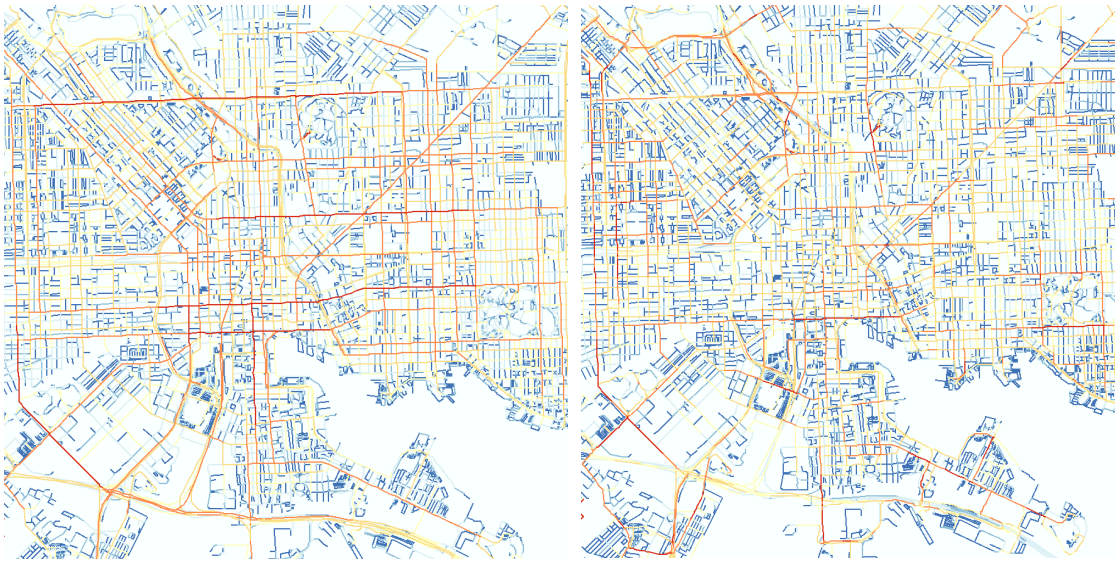
Baltimore is a major city of the State of Maryland with an inner harbour. The city has a central grid system and suburban areas around the grid are linking to the inner city through less prominent diagonal axes. Baltimore is a city with an African American majority. The African American community is concentrated in the West and East of Baltimore city. Compared with the HOLC map, the concentration of the African Americans did not change so much in the West but decreased in the East. White community of Baltimore typically lives in suburbs and the outer city areas. They are mostly concentrated just around the city edges in the Southeast, the Southwest, and the Northeast, with a prominent number of Whites in the Northwest as well. Asian and Latino communities in Baltimore lives mostly in ethnoburbs, Asians in the Southwest and Northeast, characterized by green areas in the HOLC map, whereas Latino communities concentrate in the Southeast, shown as yellow area in the HOLC map.

African Americans and Whites interact less than Asians towards Whites or Latinos towards Whites. They have quite similar interaction values which means that they have quite a balance in the areas that they live together, but these areas are not too many mostly restricted in the city centre. Whites and African Americans usually live in separated areas, African American in the

city centre and Whites in the suburbs. HOLC map shows similar patterns to what happens today. Asians are more exposed to Whites than African Americans, but least exposed to Latinos. Latinos are again more exposed to Whites than African Americans, with slightly lesser values. The main reason behind this fact is that Latino and Asian communities are quite segregated in themselves, as they mostly live in ethnoburbs. That is also why the least chance of interaction is between Asians and Latinos, as they live in separate geographies.



NAIN 2000 NAIN 500



NACH 2000 NACH 500

Figure 3: Baltimore Space Syntax Analyses

Looking at the NAIN 500 results (Figure 3), the city seems the most locally—and very centrally— integrated where the African Americans are situated. Globally, (NAIN2000) the city centre expands its integration to the diagonal grid outer rim, where most of the suburbs are

located. We may conclude that the suburbs connection (transition) areas to the city centre are integrated, but the suburbs themselves are not integrated to the system. This phenomenon makes sense aligning with our hypothesis that predicts that White suburbs want to self-segregate. Global choice (NACH2000) values show that all the suburbs and ethnoburbs are well connected to the city centre and easily accessible. On the local level, choice values are lower around the area where African Americans live. Those segments do not seem locally connected to each other, compared with the inner-city segments just around the harbour. This may create accessibility problems within the inner city. Also, the places that have higher local choice values seem to be gentrified neighbourhoods: Station North and Middle East.

4.3 Philadelphia

Philadelphia is a major city in the state of Pennsylvania, characterised by the grid-iron layout as the planning principle (Conzen, 2001), that were implemented by the English planner William Penn. In Philadelphia, African Americans concentrate in the Southwest today, which used to be a mixed grading area in the HOLC map. As we look at the HOLC maps, we can conclude that this area changed and started accommodating more African Americans than before. The HOLC maps shows a large red area in the South and Southeast neighbourhoods. These neighbourhoods used to be inhabited by African Americans. Now, contrarily, they accommodate more Whites than African Americans in this same area. Whites also concentrate in the North, where they used to live in the past as well, as shown on the HOLC maps. Asian communities are dispersed around the city, there are many areas that they are numerous. Most of these areas coincide with White majority areas. Latinos, on the other hand, are compactly concentrated in the central east area of the city, where HOLC maps marked yellow as a transition area between the red area in the South and the green area in the North.

African Americans and Whites interaction is greater than the other two cities: Washington DC and Baltimore, almost doubling the chances to meet with each other compared to the other cities' values. White exposure to African Americans is more than African American exposure to Whites like the other two cities. Asian exposure to Whites is greater that other cities with 0.78. Asians have also a high interaction value towards African Americans. Latinos interact the best with African Americans but also have a great interaction value towards Whites. Latino-Asian pair do not interact as much as the other pairs, but the chance of interaction is very high compared to the other two cities as the interaction values are greater.

NAIN5000 shows that Philadelphia's grid iron implementation through north-south axis is well integrated (Figure 4). The South part of the grid-iron where Whites are majority now –unlike the past where African American were a majority in the same space, is one of the best globally integrated areas. The same area has been heavily gentrified during the last 20 years (Mitchel, 2018). NAIN1000 shows some areas in the south and the centre are locally integrated. Those neighbourhoods match where the inner-city centres are and gentrifying areas. The areas where

African Americans are a majority are segregated from the system. Ethnic enclaves –Asians and Latinos, have locally integrated neighbourhoods, but do not necessarily connect well to the city centre on the global level. NACH5000 indicates that the city is well-connected and there are almost no inaccessible spaces globally. Local choice values show that the inner-city has a lot of potential to encourage through-movement, grid system integrates with other linking axes, increasing the potential of walkability and therefore interaction. These areas are inhabited by a variety of groups, so intergroup contact is expected.

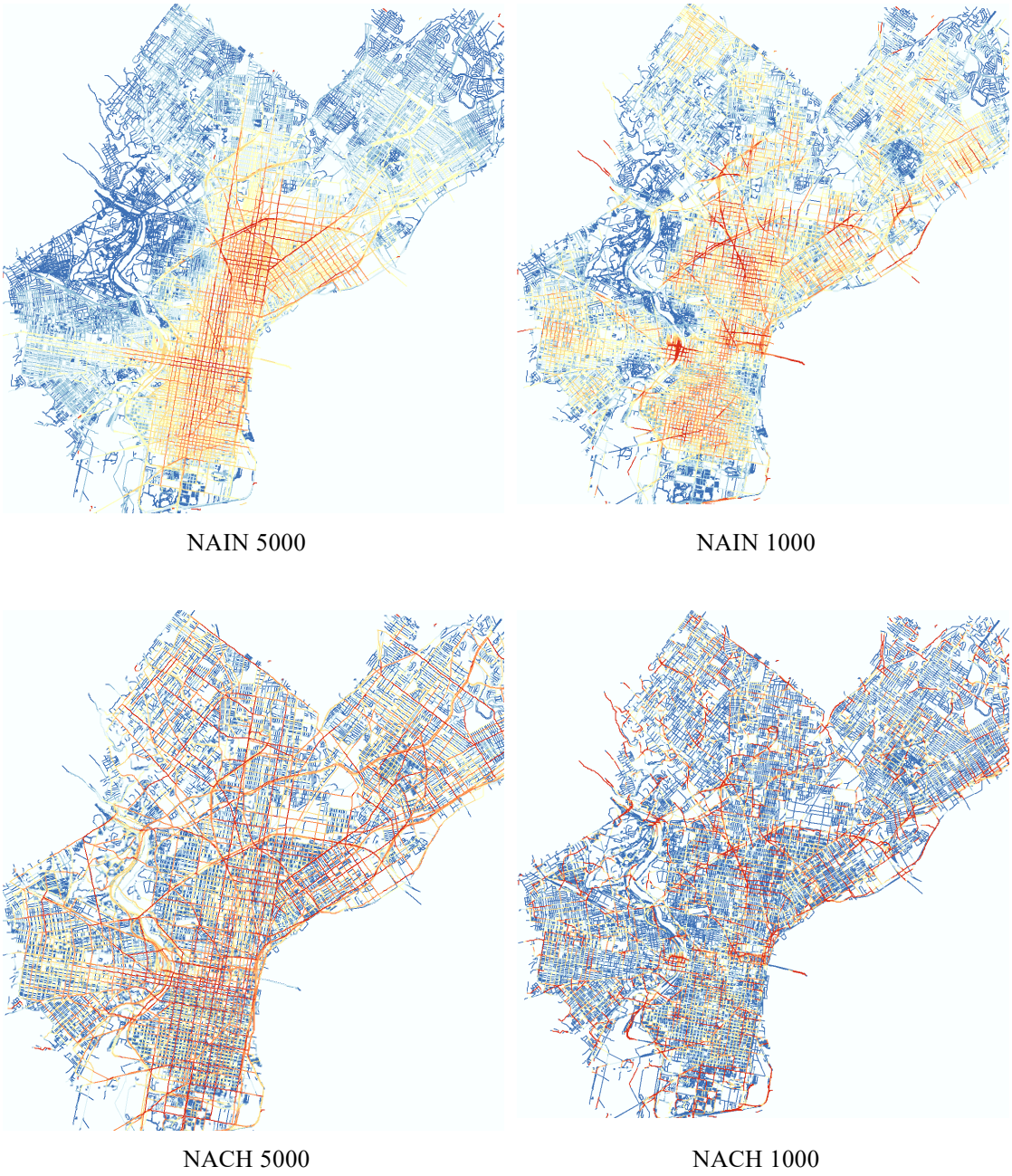


Figure 4: Philadelphia Space Syntax Analyses

5 CONCLUSIONS

To conclude, we notice how different cities in the United States have several configurational systems, leading to patterns of integration and segregation, sometimes even separation to subsystems. In these three cities, we find out that each city has its own systemic segregation story, its own development phases, and interaction patterns between its inhabitants. After addressing our hypotheses, comment on them for each of our specific cases, we draw general conclusions of the study, and discuss how it contributes to the field.

H 1: The historically underrepresented groups – especially African Americans, still experience less interaction with other racial and ethnic groups, because of systemic segregation patterns from the past that somehow persist in cities today.

In our case studies, we notice only in two cities that African Americans reside in extremely segregated neighbourhoods: Washington DC and Philadelphia. Only in Washington DC, those patterns are persistent through the century and almost exclusively deriving from the grading (HOLC, FHA) maps. In Philadelphia, Whites replaces African Americans in the south, and we can observe that the reason behind this is gentrification. In Baltimore, on the contrary, the areas where African American live seem the most locally and globally integrated. We therefore cannot draw a generalization out of these patterns in our cases. However, we can speculate that systemic segregation patterns might correlate with the current segregation patterns of historically underrepresented groups living in a configurationally segregated space and having low levels of interaction with other groups.

H 2: Whites self-segregate in upper class neighbourhoods within cities with high levels of mobility, or in some suburbs with the same qualities.

According to our specific examples, whites self-segregate in upper class neighbourhoods and suburbs, that seem to be well connected to the rest of the city in terms of through-movement. Whites also can have locally integrated neighbourhoods but not necessarily. We also observe a trend in White communities to gradually locate in gentrifying areas. As market prices rise, we can speculate that gentrified neighbourhoods also gradually lose diversity and intergroup contact potentials.

H 3: Ethnic communities – especially Latinos, live in ethnic enclaves within cities where interaction levels between groups are high and highly locally integrated, but these neighbourhoods might be challenged with gentrification issues.

In all three of our examples, Latino community lives compactly around other similar people, much like an ethnic enclave. The interaction levels with other groups are seem on average, except with low levels of interaction with Asians. Baltimore Latino community lives in the outskirts of the city, an ethnoburb, but DC and Philadelphia Latinos live in enclaves within the city centres. The places they occupy are going through the risk of gentrifying.

The main conclusion of the study is that we find a correlation between low configurational quality of street networks and historically segregated neighbourhoods. Underrepresented groups who have been living in historically segregated neighbourhoods struggle because of poorly connected and segregated nature of the configurational networks around them, confirming place stratification theory on a configurational level. Another main conclusion of the research is that we note a correlation between well integrated and connected local urban areas which were historically segregated with gentrified neighbourhoods. Underrepresented groups and individuals who move to configurationally integrated neighbourhoods face two major risks: first, the lack of exposure and intergroup contact, resulting in ethnic and racial enclaves facing social segregation in a configurationally integrated neighbourhood. Secondly, potential gentrification appears to be a major risk in configurationally integrated spatial networks. This usually results in the displacement of groups which is detrimental for the established social networks in those urban areas.

Our study contributes to the field proposing a new challenge to understand systemic inequality looking into spatialities of urban change and configurational networks in cases in the Northeast of the United States. Our research reveals that those configurational networks – in terms of how they connect urban spaces to each other and how they relate to or segregate from the whole system, play a role in determining the social fabric of racial and ethnic groups.

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