Modeled Biases, Remodeling Possibilities

How Big Data, Machine Learning, and Quantitative Analysis Reinforce Social Inequality and What We Can Do About It

Provost's Diversity Institute for Faculty Development

University of Pittsburgh

14 May 2019

Junia Howell

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Pronouns: she/her

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School of Computing and Information

Pronouns: he/his

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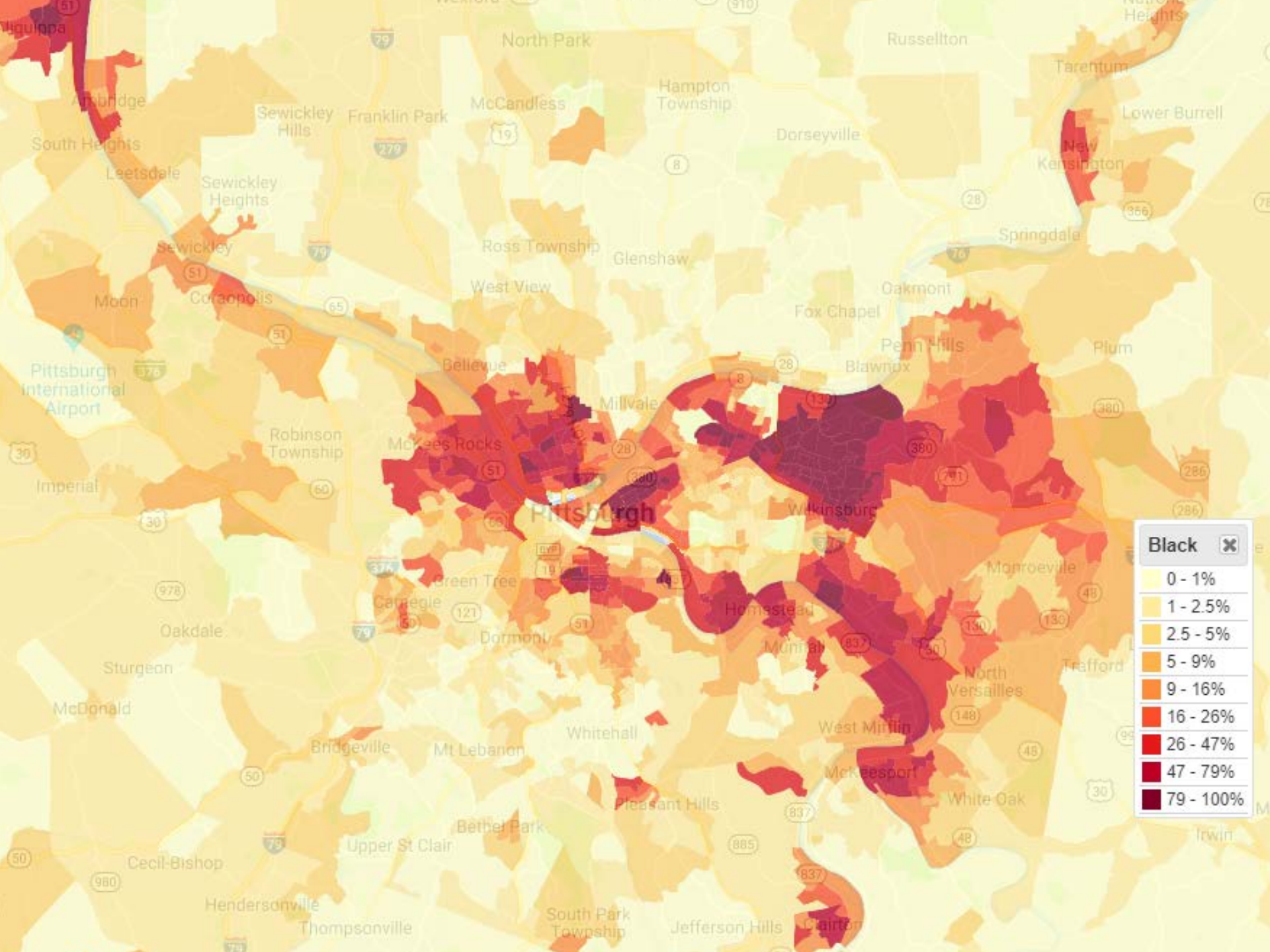
Black
0 - 1%
1 - 2.5%
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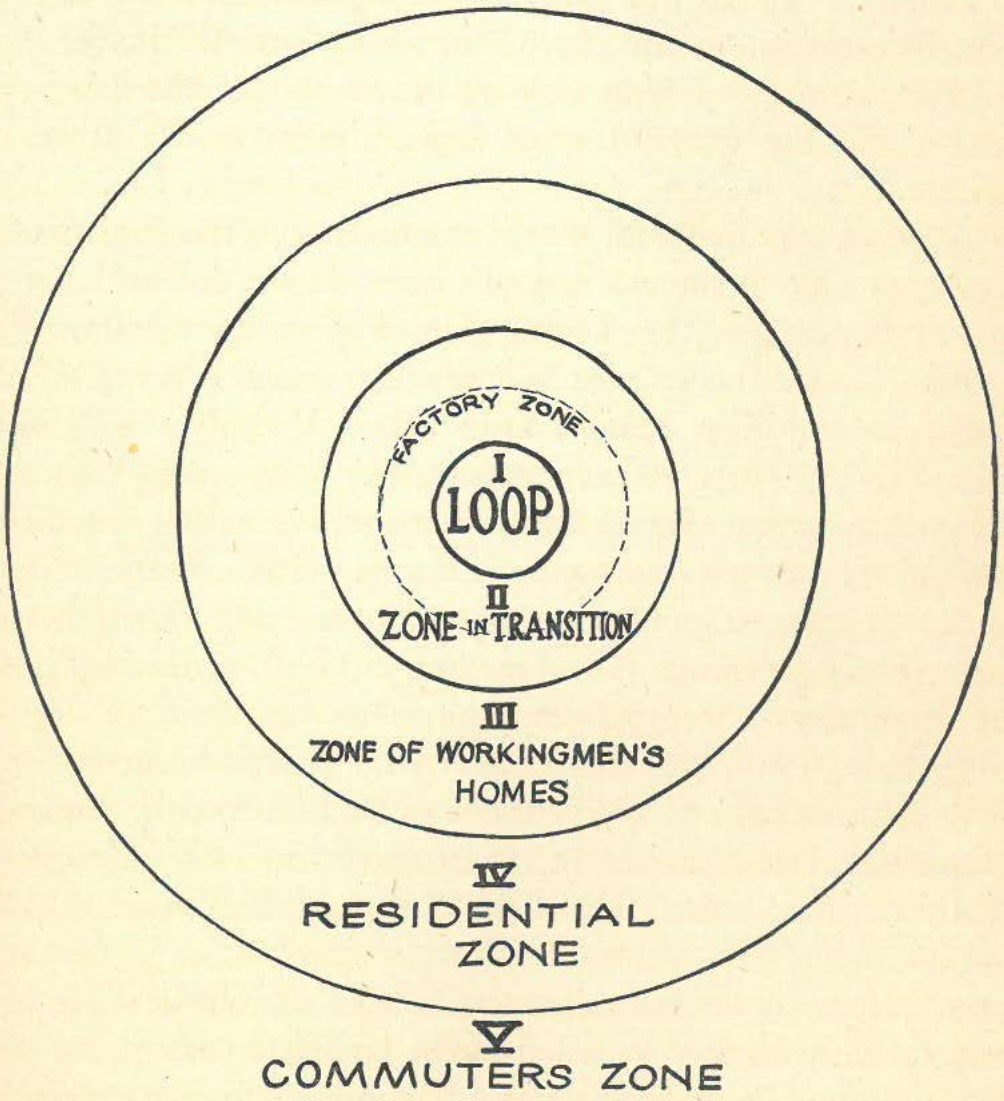
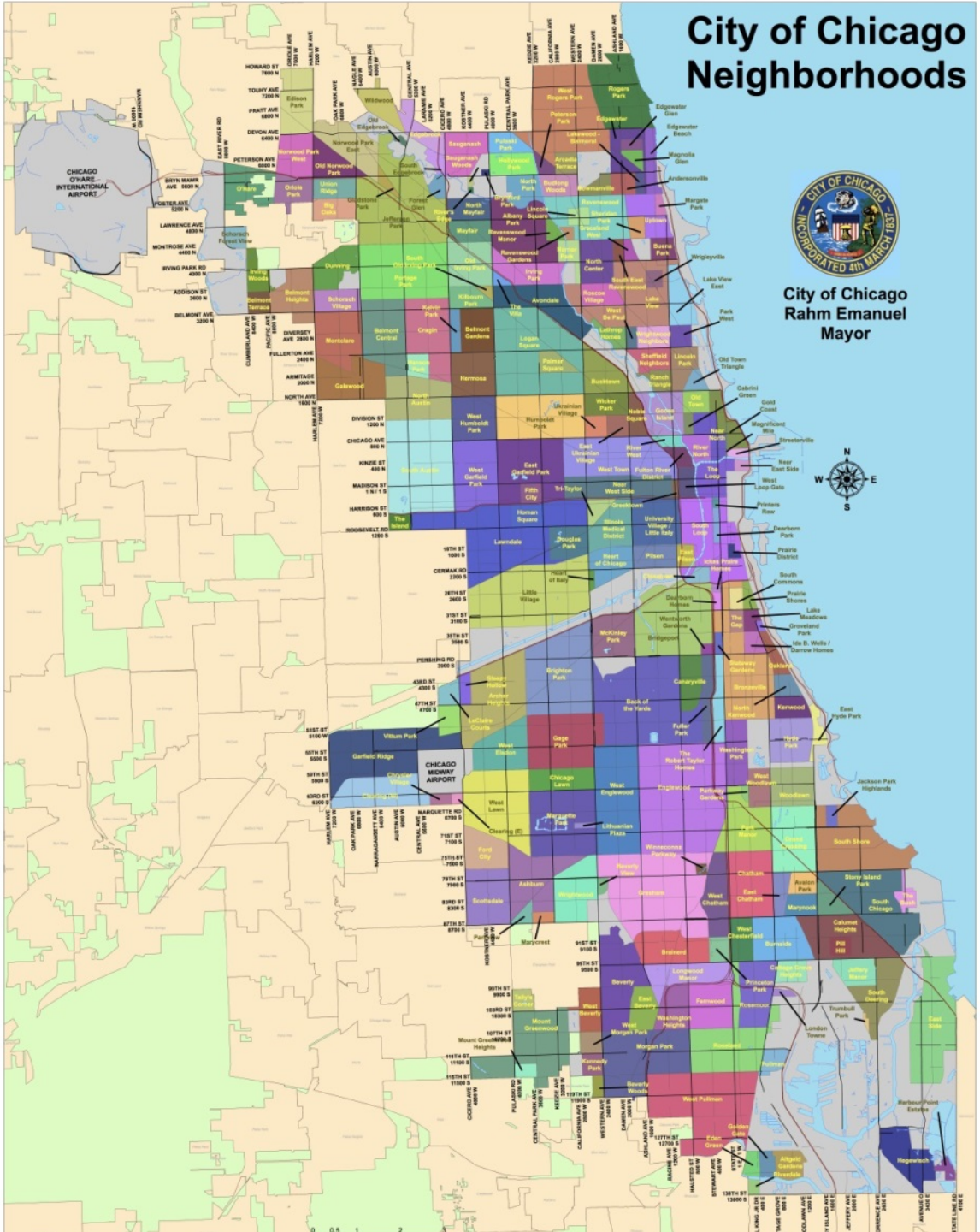
16 - 26%
26 - 47%
47 - 79%
79 - 100%
Pittsburgh
North Park
Franklin Park
McCandless
Hampton Township
Dorseyville
Russellton
Tarentum
Lower Burrell
New Kensington
Springdale
Sewickley Hills
Sewickley Heights
Sewickley
South Heights
Leetsdale
Moon
Coraopolis
Pittsburgh International Airport
Ross Township
Glenshaw
West View
Oakmont
Fox Chapel
Penn Hills
Plum
Blawnox
Bellevue
Millvale
Robinson Township
McKees Rocks
Imperial
Wilkinsburg
Monroeville
Green Tree
Carnegie
Oakdale
Dormont
Homestead
Munhall
Sturgeon
McDonald
North Versailles
Trafford
Whitehall
West Mifflin
Bridgeville
Mt Lebanon
McKeesport
Pleasant Hills
White Oak
Irwin
Bethel Park
Upper St Clair
Cecil-Bishop
Hendersonville
Thompsonville
South Park Township
Jefferson Hills
Clairton

Dissimilarity Index

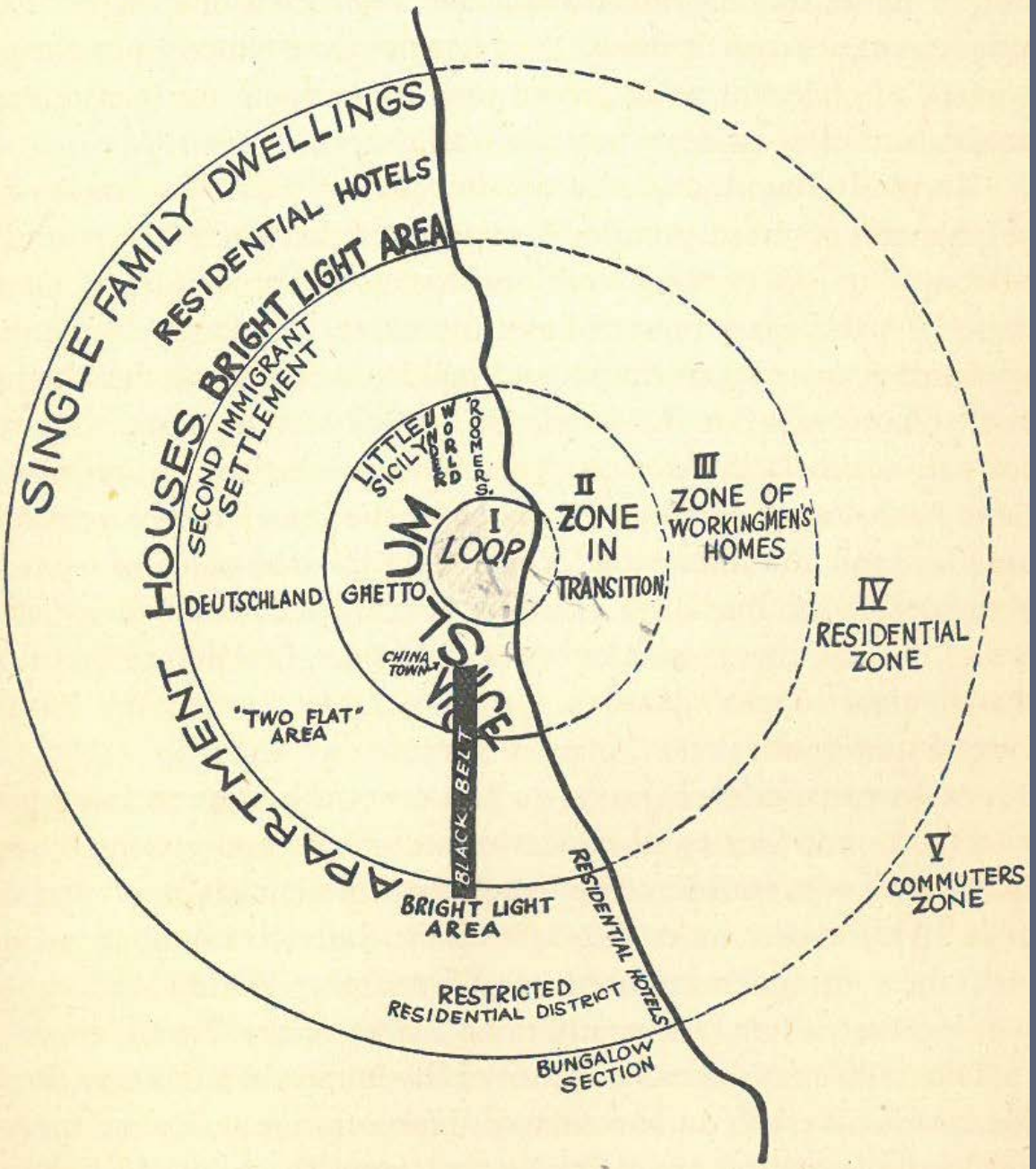
$$D = \frac{1}{2}\sum_{i=0}^{N}\left|\frac{n_i}{N} - \frac{w_i}{W}\right|$$

The GROWTH OF THE CITY




City of Chicago
Neighborhoods
City of Chicago
Rahm Emanuel
Mayor
CHICAGO O'HARE INTERNATIONAL AIRPORT
CHICAGO MIDWAY AIRPORT
N
S
E
W

URBAN AREAS


SINGLE FAMILY DWELLINGS
RESIDENTIAL HOTELS
BRIGHT LIGHT AREA
APARTMENT HOUSES
SECOND IMMIGRANT SETTLEMENT
LITTLE SICILY
UNDER WORLD
ROOMERS
I
LOOP
II
ZONE IN TRANSITION
III
ZONE OF WORKINGMEN'S HOMES
IV
RESIDENTIAL ZONE
V
COMMUTERS ZONE
DEUTSCHLAND
GHETTO
CHINA TOWN
SOUTH SIDE
BLACK BELT
"TWO FLAT" AREA
BRIGHT LIGHT AREA
RESIDENTIAL HOTELS
RESTRICTED RESIDENTIAL DISTRICT
BUNGALOW SECTION

Measuring Assimilation

Residential Integration

=

Assimilation

Measuring Assimilation

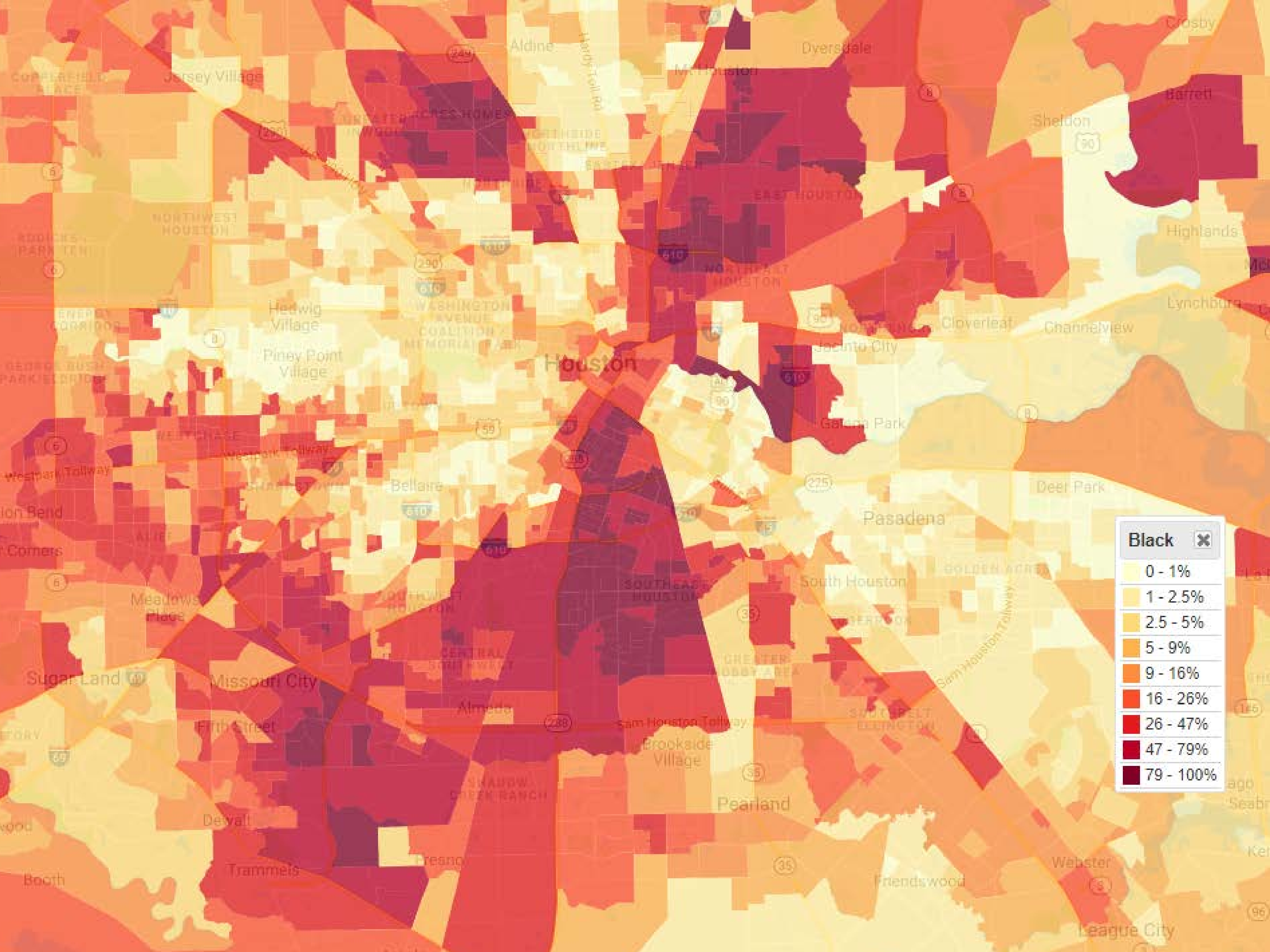
Segregation

=

Migrant Failure to Acculturate

Dissimilarity Index

$$D = \frac{1}{2}\sum_{i=0}^{N}\left|\frac{n_i}{N} - \frac{w_i}{W}\right|$$


Black
0 - 1%
1 - 2.5%
2.5 - 5%
5 - 9%
9 - 16%
16 - 26%
26 - 47%
47 - 79%
79 - 100%
Aldine
Crosby
Jersey Village
Sheldon
Barrett
East Houston
Northwest Houston
Highlands
Lynchburg
Hedwig Village
Cloverleaf
Channelview
Jacinto City
Piney Point Village
Houston
Galena Park
Westpark Tollway
Bellaire
Deer Park
Pasadena
South Houston
Southeast Houston
Meadows Place
Sugar Land
Missouri City
Almeda
Fifth Street
Sam Houston Tollway
Brookside Village
Pearland
Dewalt
Fresno
Trammels
Booth
Friendswood
Webster
League City

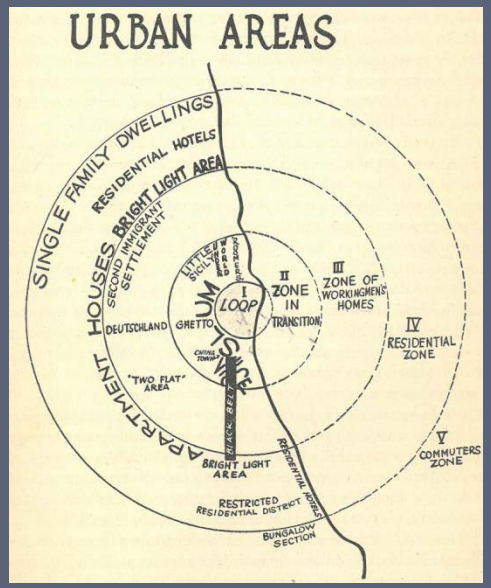
1925

1955

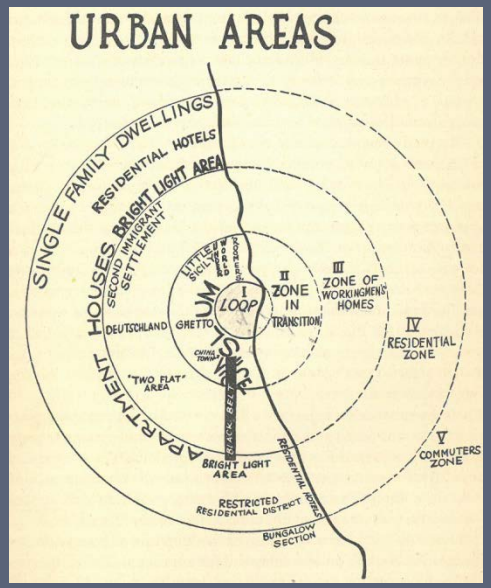
1976

1985

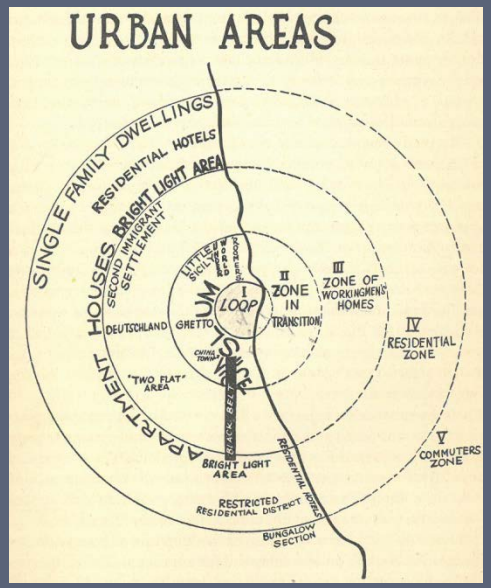
1988



1925 1955 1976 1985 1988



1925 1955 1976 1985 1988



FURTHER CONSIDERATIONS ON THE METHODOLOGICAL ANALYSIS OF SEGREGATION INDICES *

CHARLES F. CORTESE, R. FRANK FALK and JACK K. COHEN
University of Denver

American Sociological Review 1976, Vol. 41 (August): 630-637

The process of developing an adequate measure of segregation occupied the literature for over a decade and culminated in the widespread use of the Index of Dissimilarity. The inadequacies of this index, although identified by the Duncans (1955), remain with us and largely have come to be ignored. This research further explores the difficulties pertaining to limitations in the use and interpretation of the Index of Dissimilarity, demonstrates some of the systematic biases resulting from these inadequacies and provides a mathematical refinement which overcomes some of the major problems inherent in the use of this index.

The concept of ecological segregation has never been dealt with adequately in definitional terms (cf. Duncan and Duncan, 1955:217). Instead of defining *segregation*, most work has considered how the opposite of segregation—often called *assimilation*—should be defined. A clear and proper definition of assimilation is especially necessary since, in fact, most attempts (including ours) to measure relative segregation are article was followed by criticism as well as the development of different measures (Hornseth, 1947; Jahn et al., 1948; Jahn, 1950; Williams, 1948; Cowgill and Cowgill, 1951) which eventually led to Duncan and Duncan (1955) demonstrating the mathematical relationships between the segregation indices previously presented.

The Duncans suggested that the Index of Dissimilarity (D) was the most useful

1955

MEASURES OF SEGREGATION

David R. James
INDIANA UNIVERSITY

Karl E. Taeuber
UNIVERSITY OF WISCONSIN – MADISON

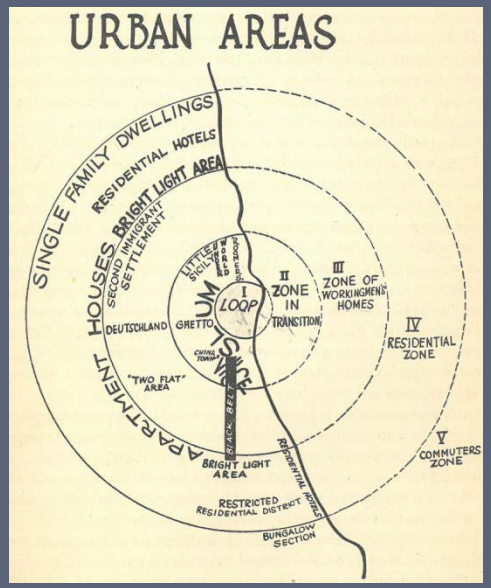
Analyzing the characteristics of segregation measures is a venerable tradition in sociology. (See Wright, 1937; Jahn, Schmid, and Schrag, 1947; Williams, 1948; Cowgill and Cowgill, 1951; Bell, 1954; Duncan and Duncan, 1955; Isard, 1960, chap. 7; Taeuber and Taeuber, 1965, app. A; Coleman, Kelly, and Moore, 1975; Zoloth,

1985

1925

1976

1988



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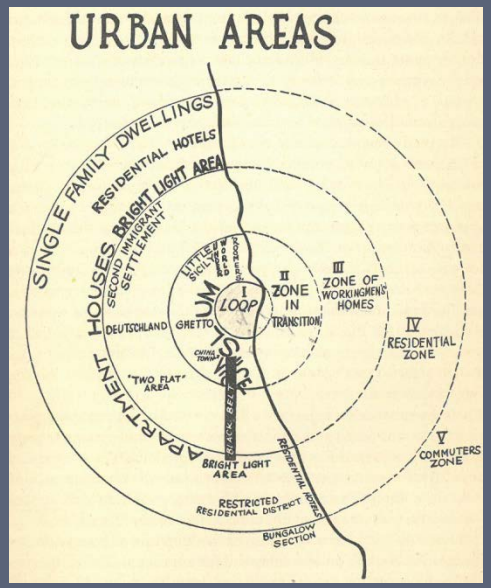
1976

1988



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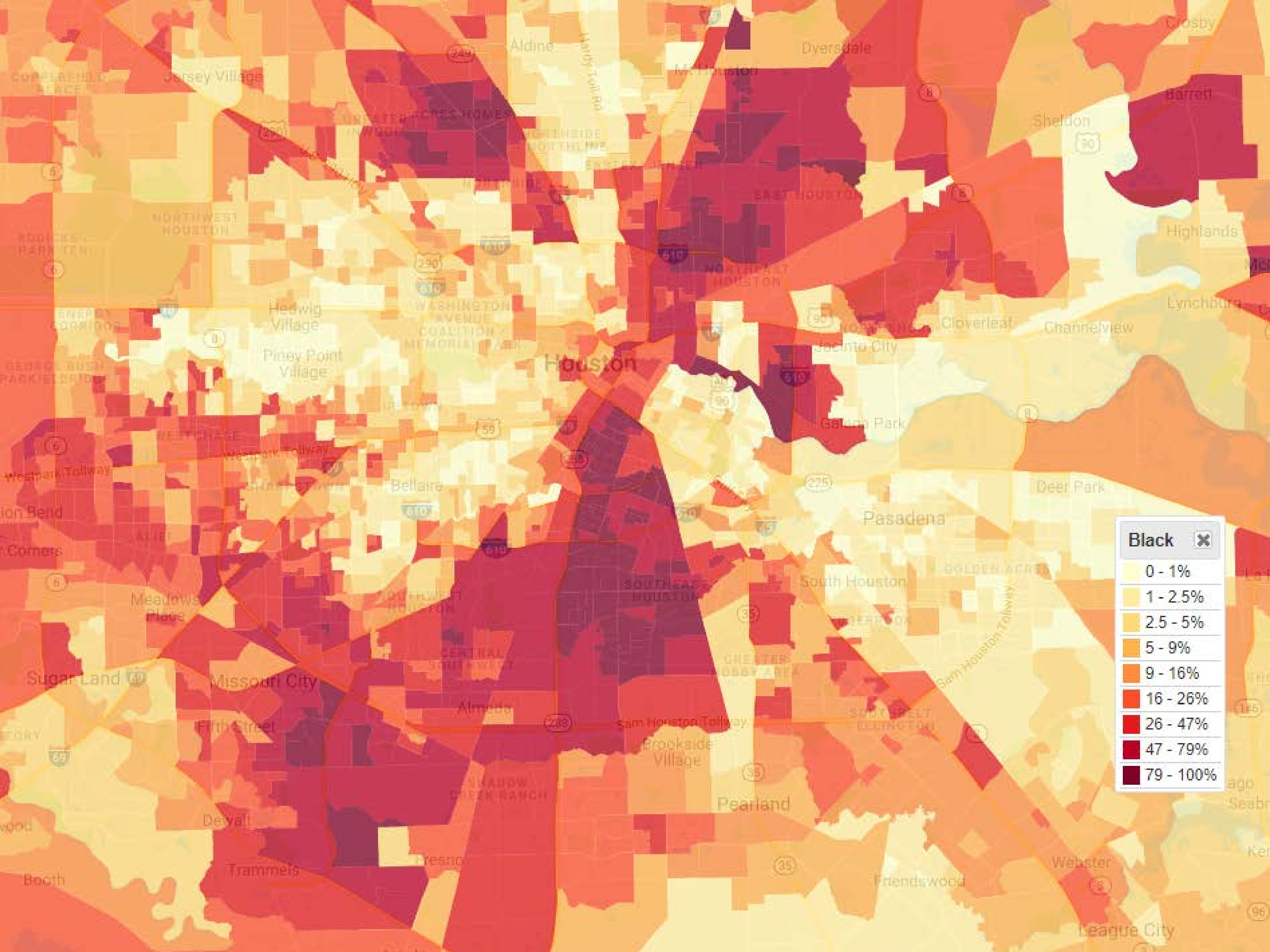
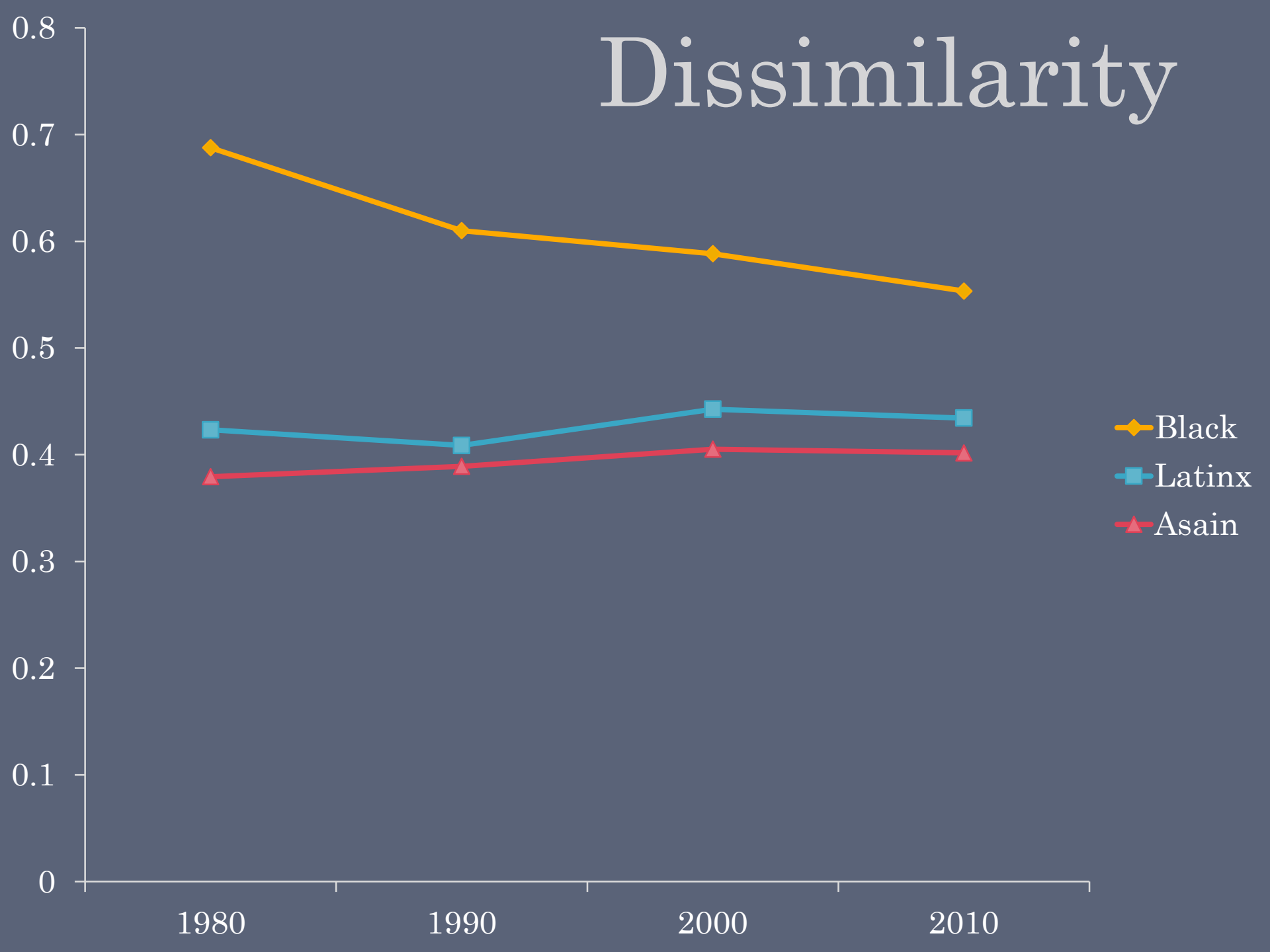
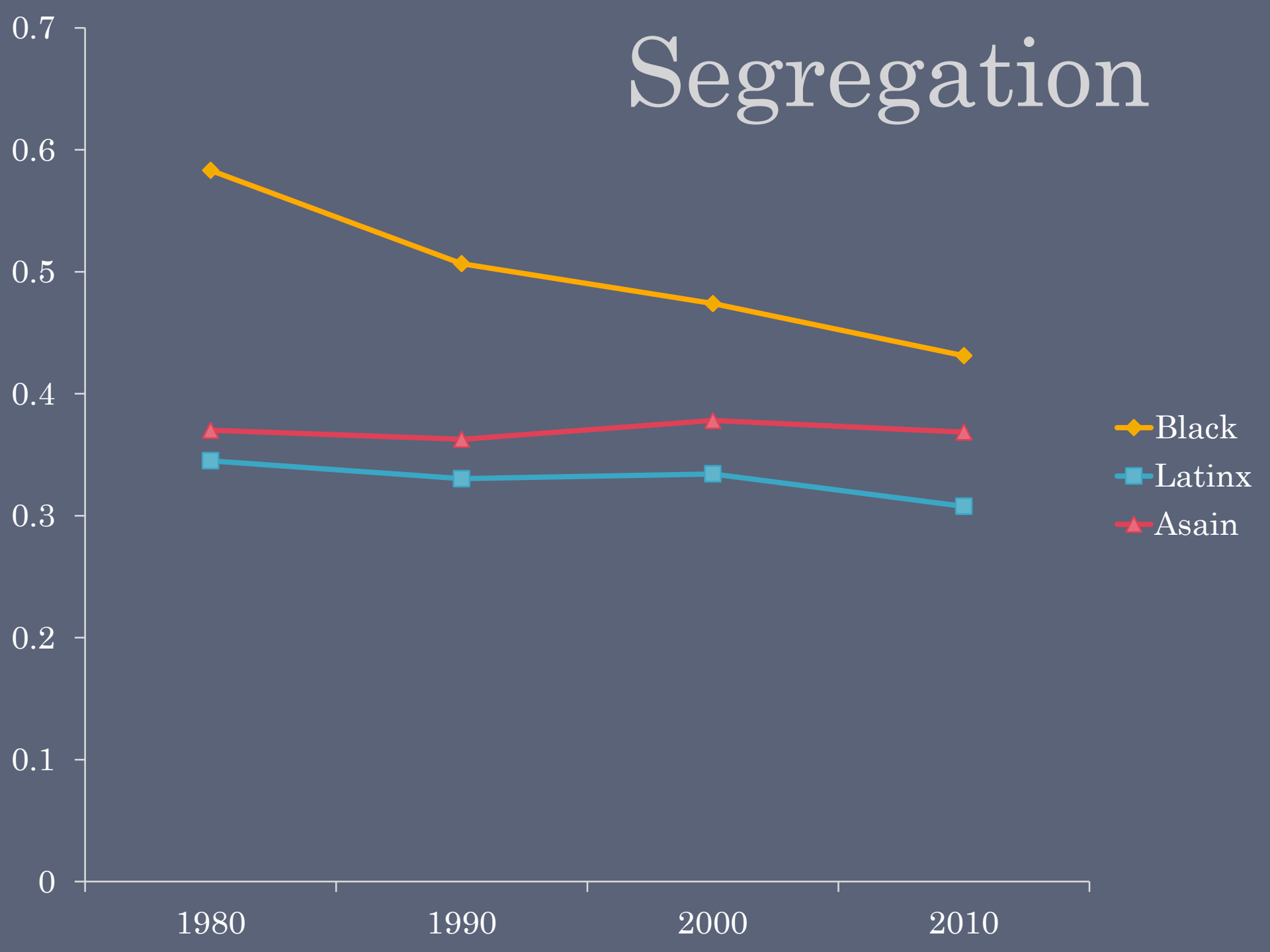

Black
0 - 1%
1 - 2.5%
2.5 - 5%
5 - 9%
9 - 16%
16 - 26%
26 - 47%
47 - 79%
79 - 100%
Aldine
Jersey Village
Dyersdale
Crosby
Barrett
Sheldon
Highlands
Lynchburg
Channelview
Cloverleaf
Jacinto City
Galena Park
Houston
Hedwig Village
Piney Point Village
Bellaire
Westpark Tollway
Deer Park
Pasadena
South Houston
Sugar Land
Missouri City
Fifth Street
Almeda
Sam Houston Tollway
Sam Houston Tollway
Brookside Village
Pearland
Dewalt
Trammels
Booth
Fresno
Friendswood
Webster
League City
Meadows Place

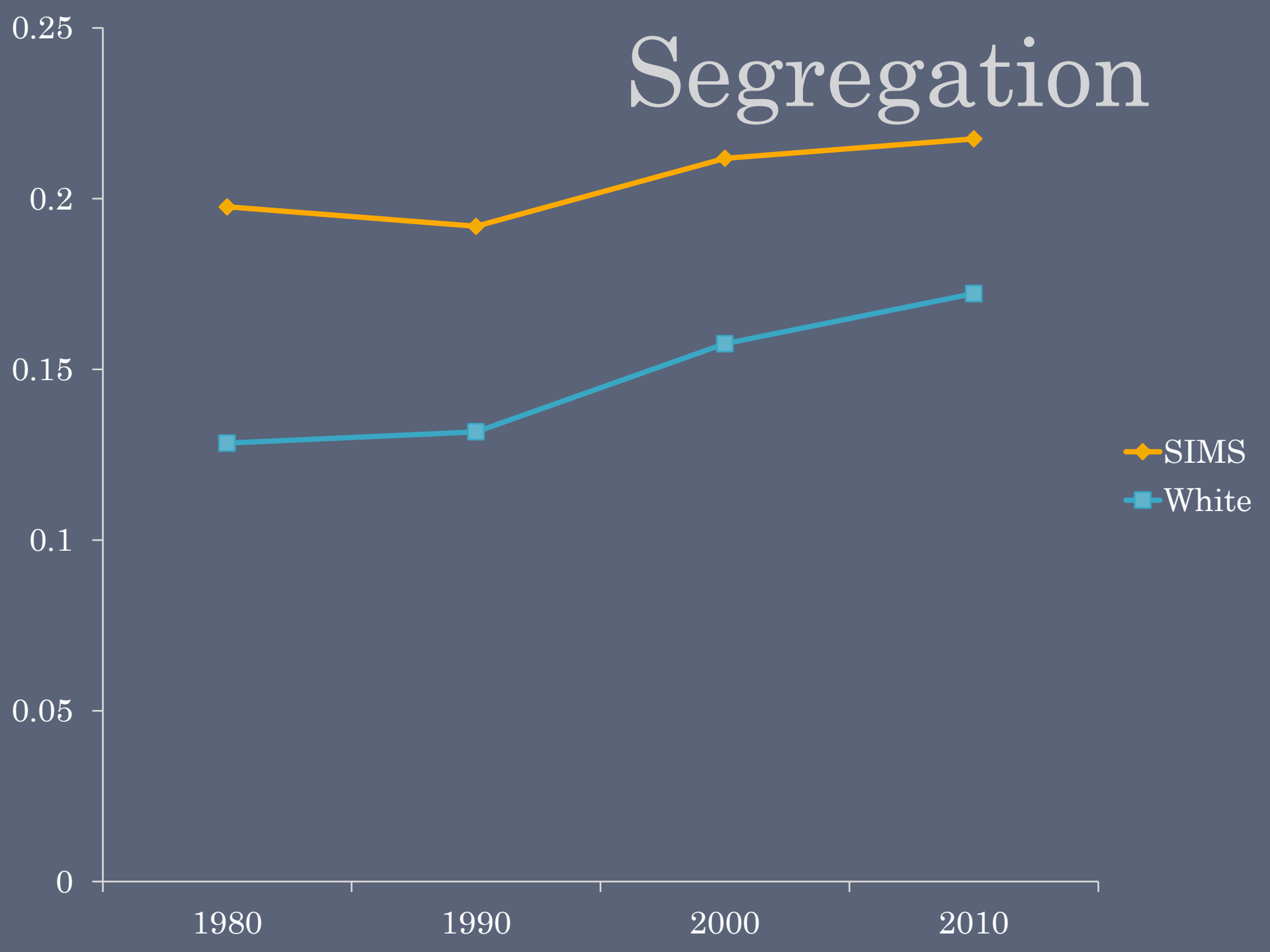
Segregation Index

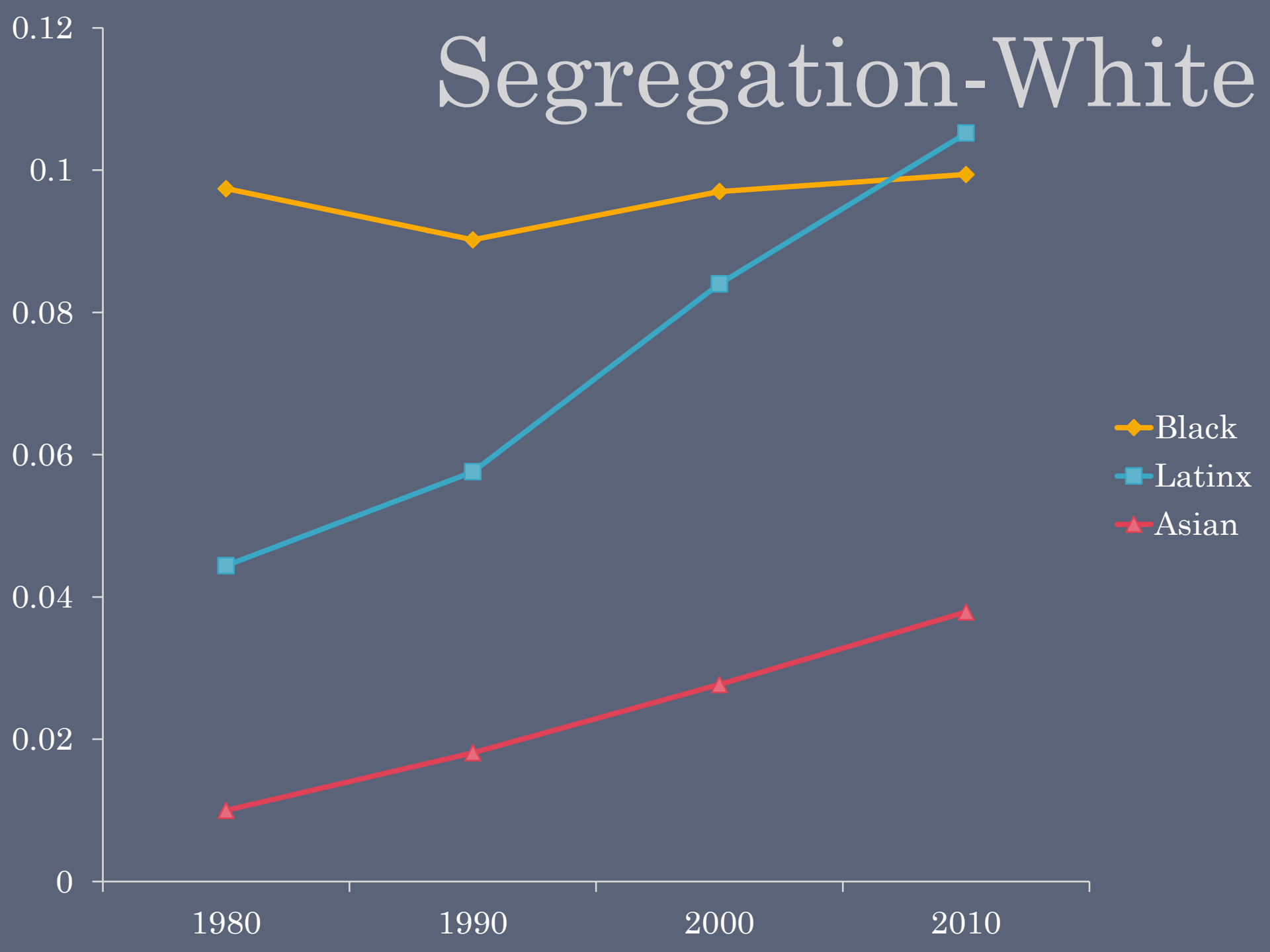
$$S = \frac{1}{2}\sum_{i=0}^{N}\left|\frac{a_i}{A} - \frac{t_i}{T}\right|$$


Dissimilarity
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1980
1990
2000
2010
Black
Latinx
Asain

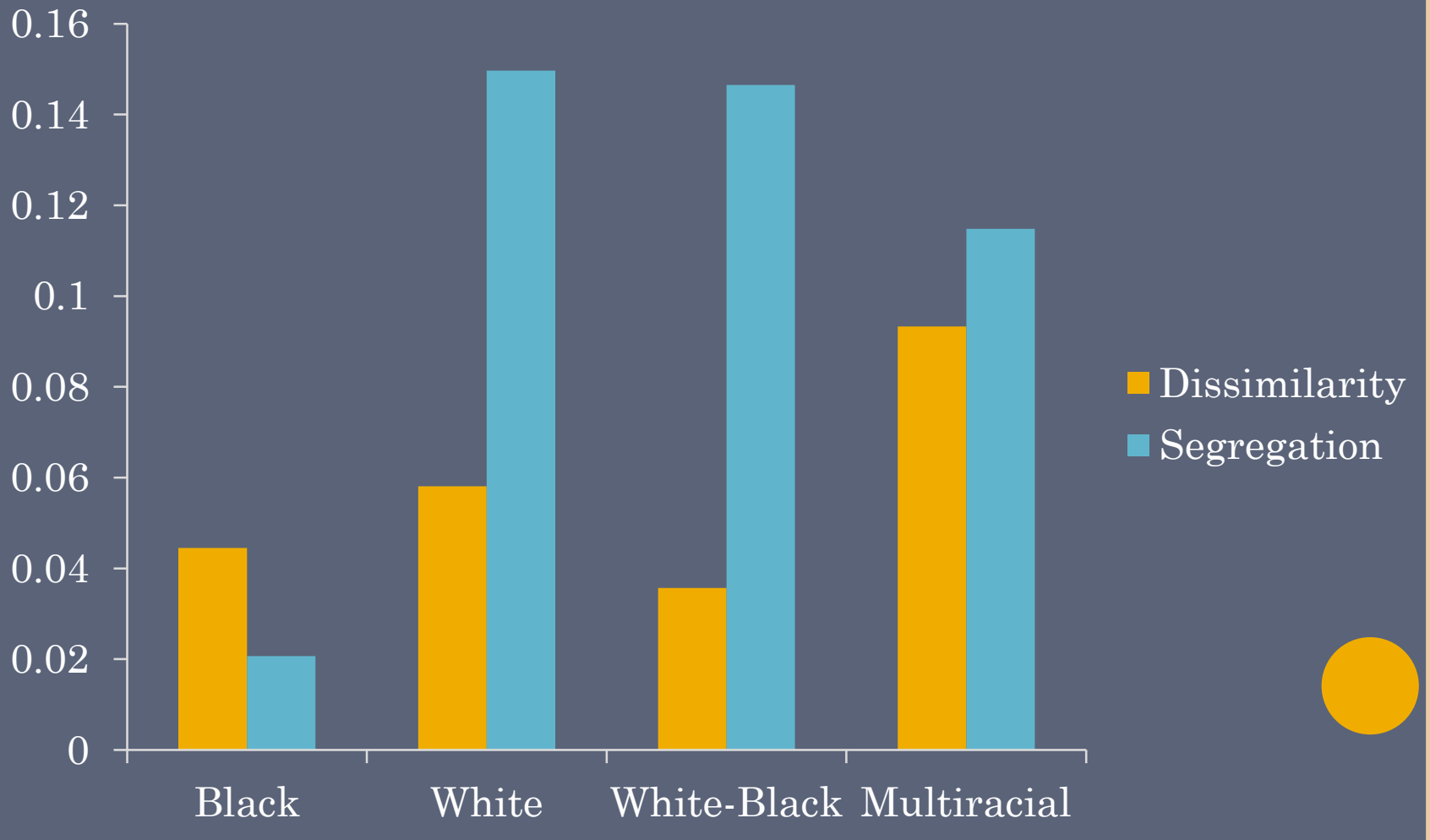
Segregation



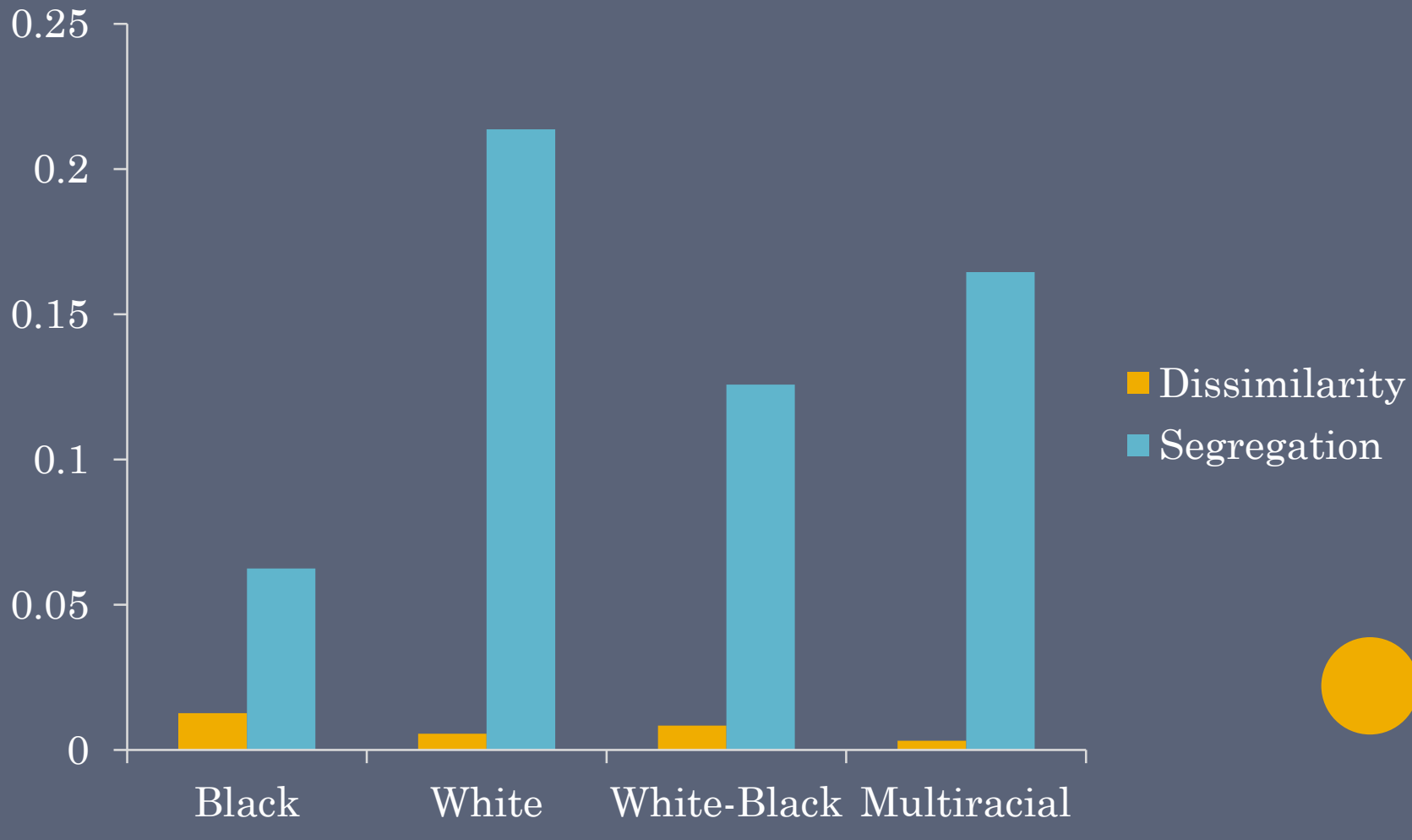

Segregation
0.25
0.2
0.15
0.1
0.05
0
1980
1990
2000
2010
SIMS
White

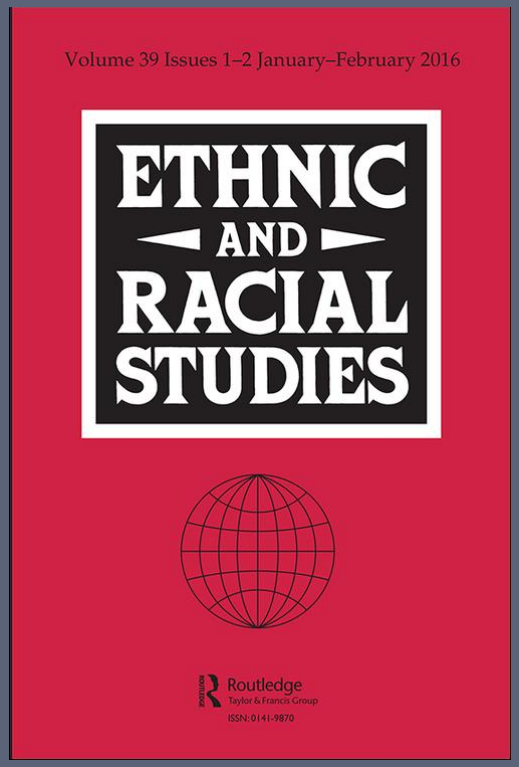

Segregation-White
0.12
0.1
0.08
0.06
0.04
0.02
0
1980
1990
2000
2010
Black
Latinx
Asian

Income Inequality 2010



Income Inequality 80-10





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https://doi.org/10.1080/01419870.2017.1398833

Routledge
Taylor & Francis Group

Preserving racial hierarchy amidst changing racial demographics: how neighbourhood racial preferences are changing while maintaining segregation

Junia Howell[a] and Michael O. Emerson[b]

[a]Department of Sociology, University of Pittsburgh, Pittsburgh, USA; [b]Provost, North Park University, Chicago, USA

ABSTRACT

Despite long-term, documented declines in racialized attitudes, racial inequality persists. Scholars have theorized why this dissonance exists but few have empirically demonstrated how views can become more progressive while simultaneously maintaining inequality. The present study uses neighbourhood racial preferences and their influence on racial residential segregation to demonstrate how in a diversifying context residents can become more "accepting" while simultaneously maintaining the racial hierarchy, the opposite of what most of the literature currently assumes. Using data from three distinct sources in the United States, this research finds that U.S. residents are increasingly willing to live amidst diversity yet whites still concentrate in white neighbourhoods. In short, white Americans are more willing to live in diverse neighbourhoods than in the past, but they are not willing to desegregate. We argue this preserves racial inequality. We conclude with a discussion of our findings and their implications for future research and practice.

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https://doi.org/10.1080/00380253.2019.1580546

The Truly Advantaged: Examining the Effects of Privileged Places on Educational Attainment

Junia Howell

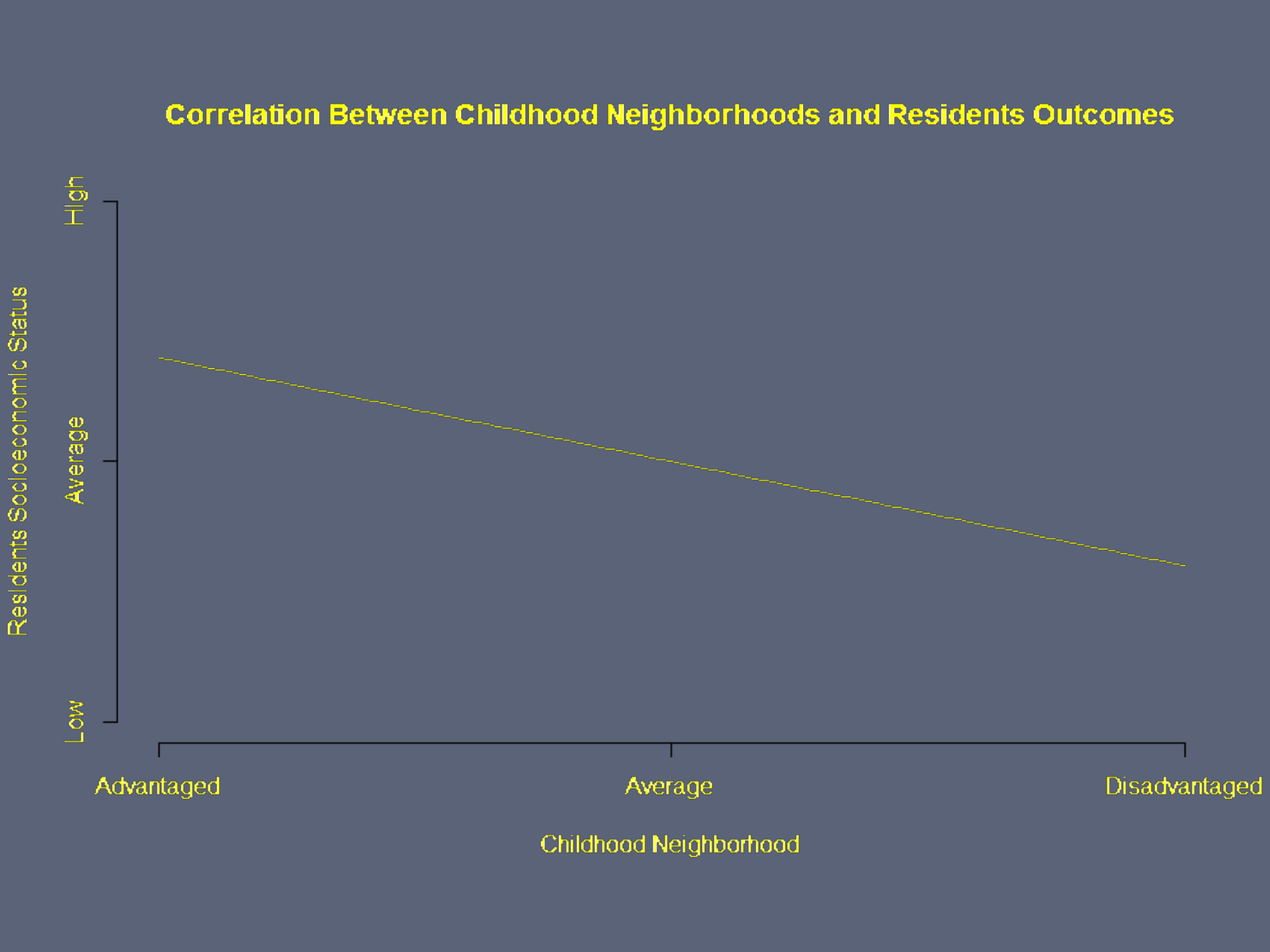
Department of Sociology, University of Pittsburgh, Pittsburgh, Pennsylvania, USA

ABSTRACT

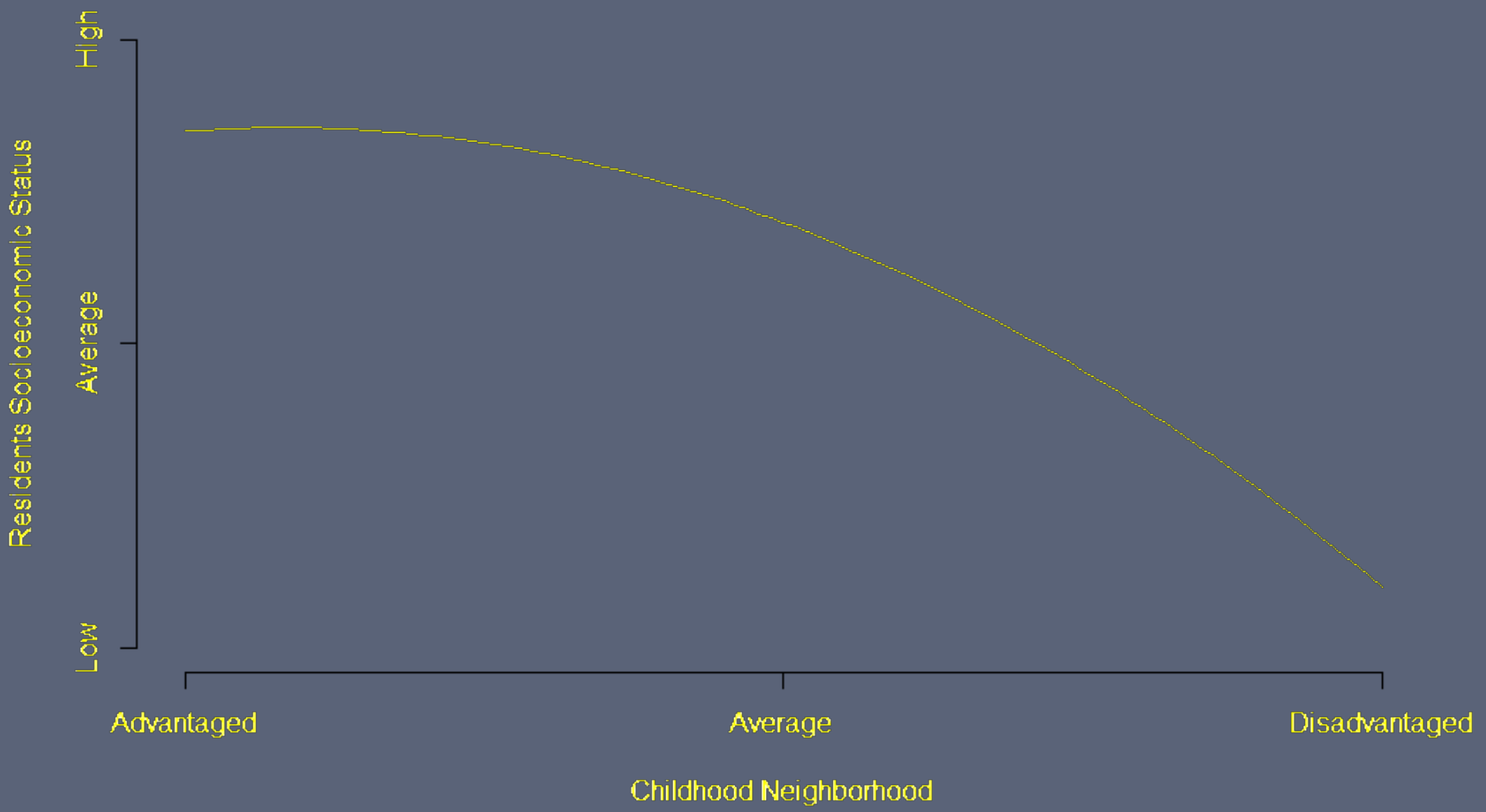
Inspired by William J. Wilson's *The Truly Disadvantaged*, hundreds of studies have focused on the detrimental effects of disadvantaged neighborhoods. Consequently, far less is known about the contextual effects of advantaged neighborhoods, and what is known does not take into consideration long-term exposure. The present study extends research on advantaged neighborhoods by examining how respondents' neighborhood contexts across their entire childhoods influence adult educational attainment. Findings indicate that structural effects in advantaged neighborhoods influence residents' educational attainment—especially for White residents. Results suggest that addressing the issues associated with the truly disadvantaged requires examining the compounding privilege of the truly advantaged.

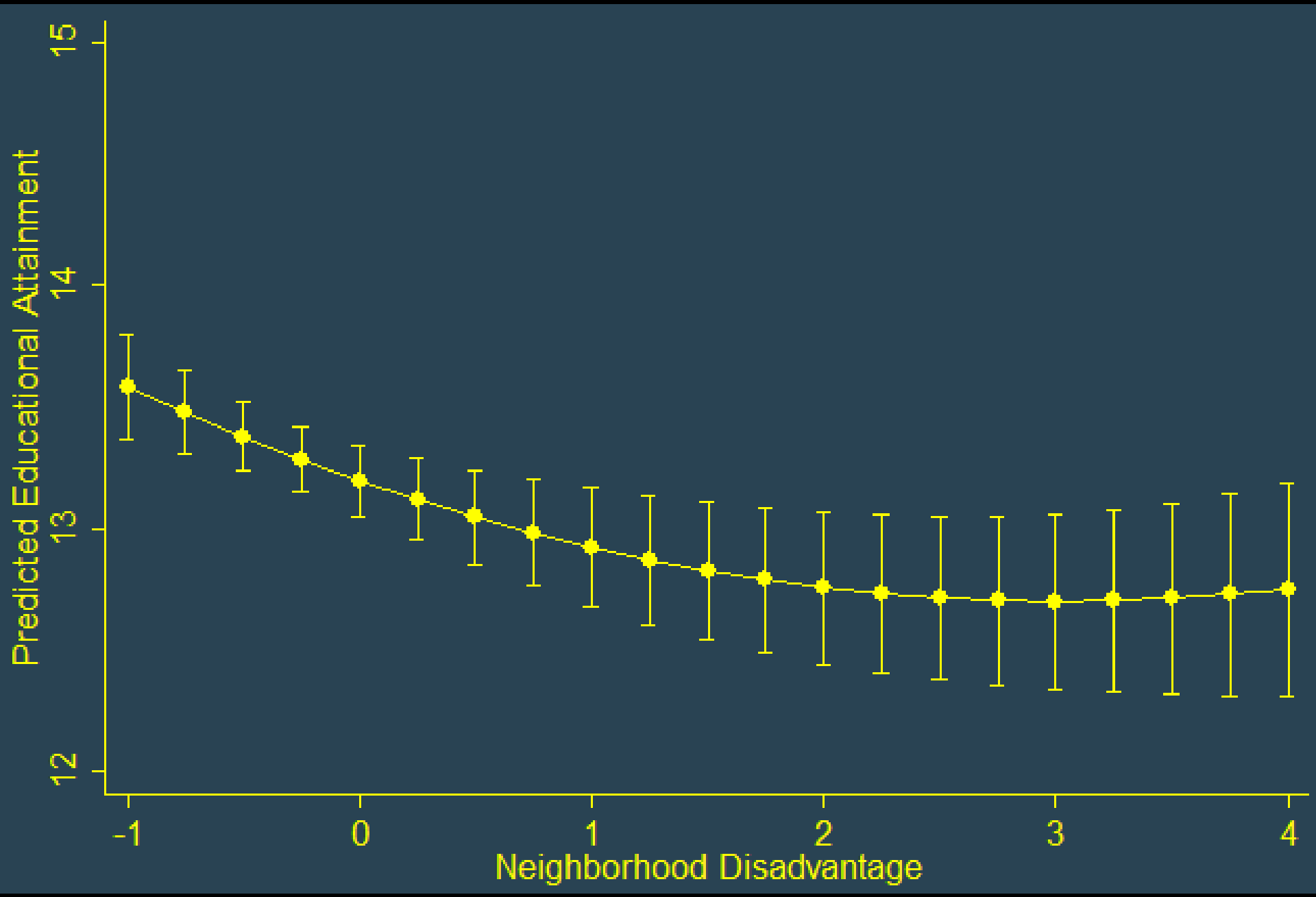
KEYWORDS

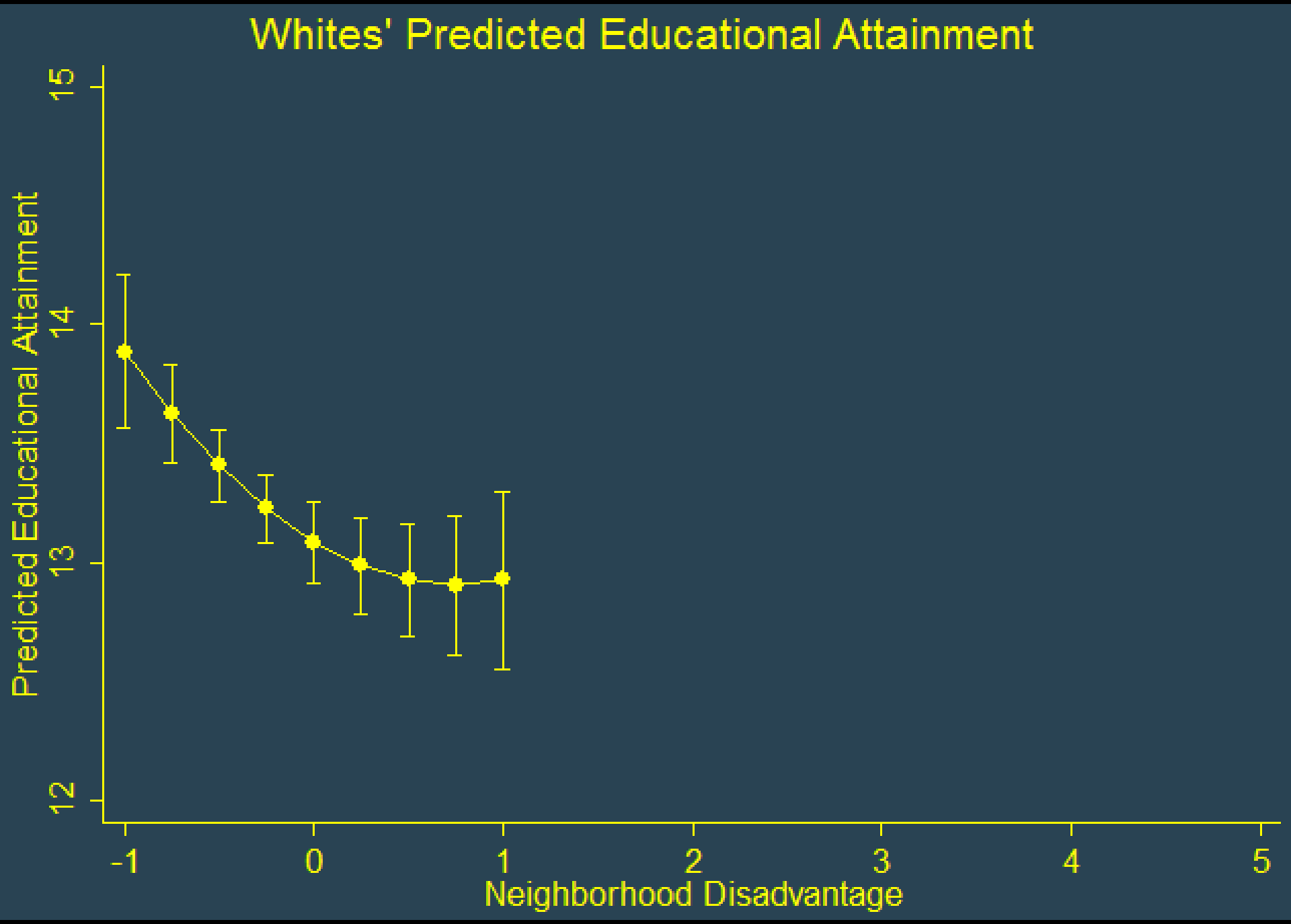
Neighborhood effects; disadvantaged neighborhoods; neighborhood inequality educational mobility

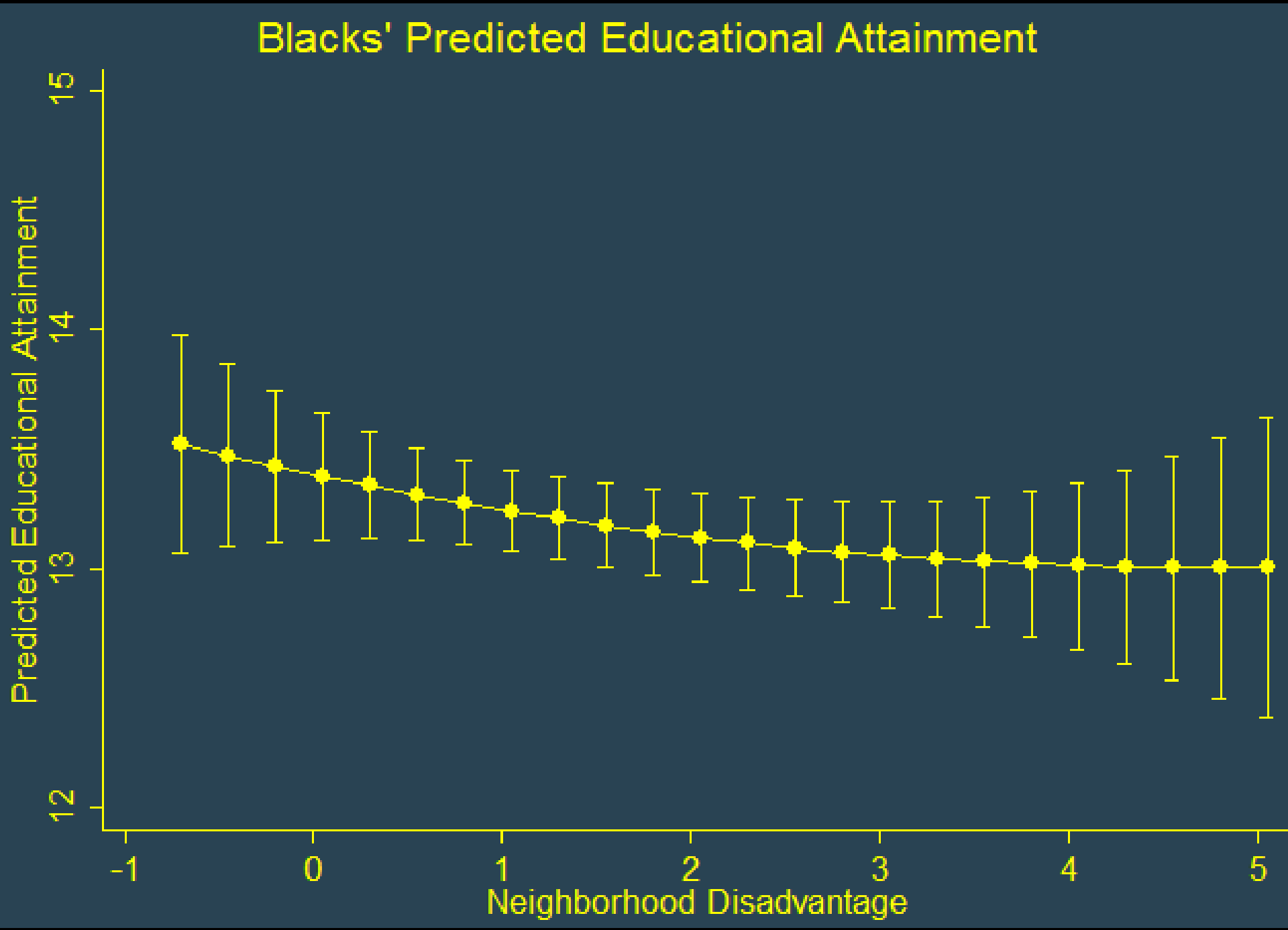

Correlation Between Childhood Neighborhoods and Residents Outcomes
Residents Socioeconomic Status
High
Average
Low
Advantaged
Average
Disadvantaged
Childhood Neighborhood

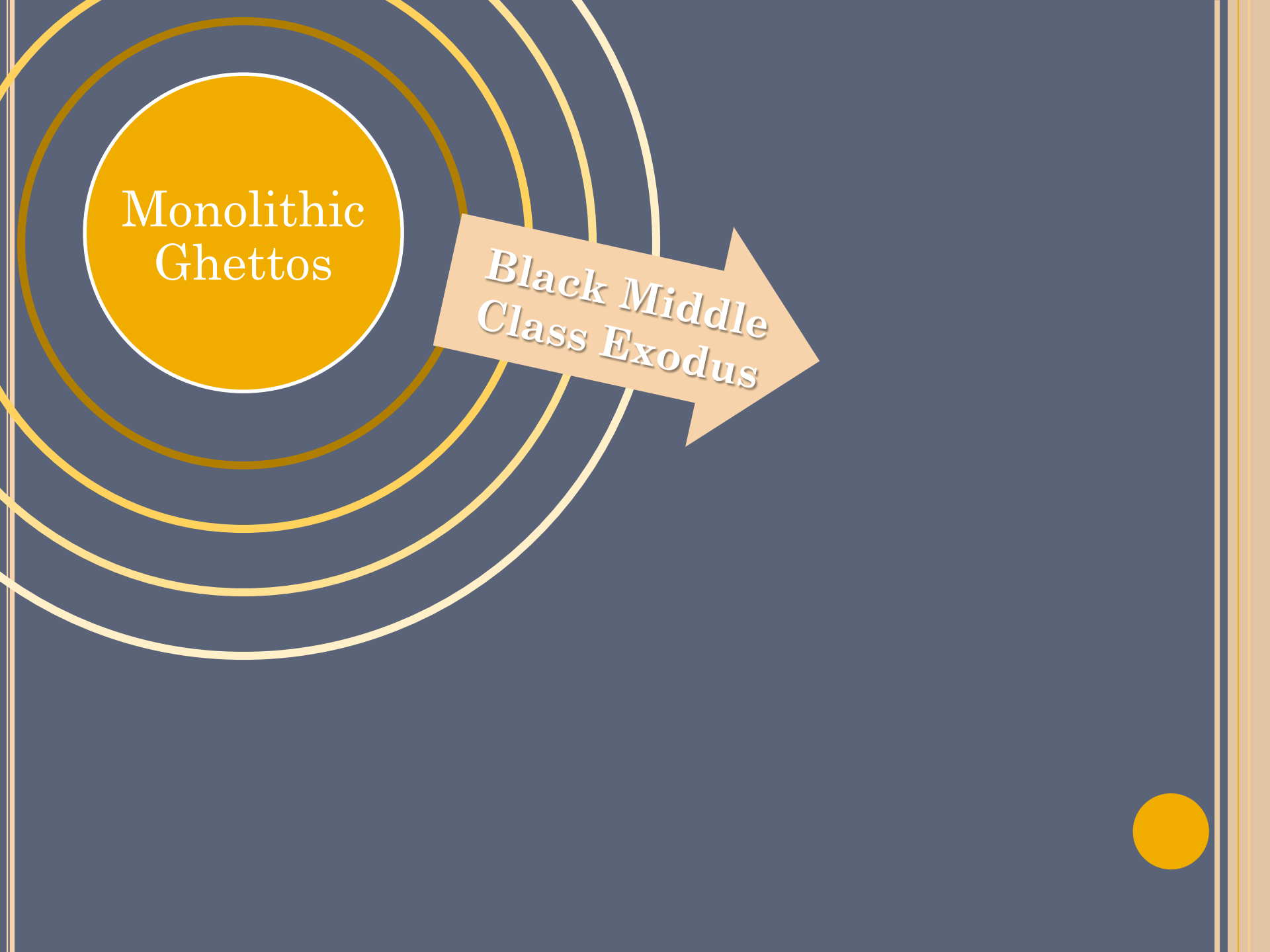
Hypothesized Relationship Between Childhood Neighborhoods and Residents Outcomes



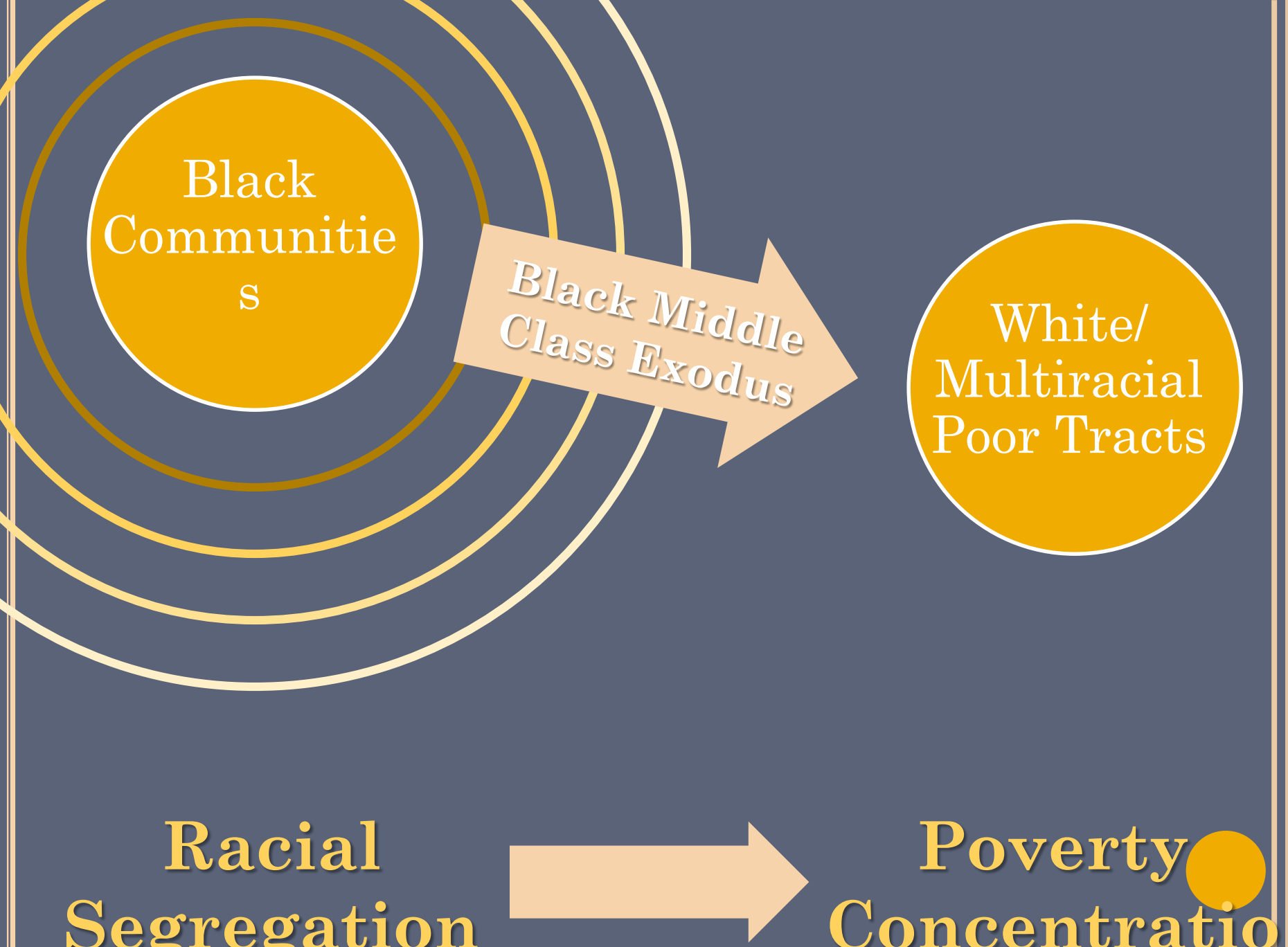

Predicted Educational Attainment
12
13
14
15
-1
0
1
2
3
4
Neighborhood Disadvantage


Whites' Predicted Educational Attainment
Predicted Educational Attainment
15
14
13
12
-1
0
1
2
3
4
5
Neighborhood Disadvantage


Blacks' Predicted Educational Attainment
Predicted Educational Attainment
12
13
14
15
-1
0
1
2
3
4
5
Neighborhood Disadvantage


Monolithic Ghettos
Black Middle Class Exodus


Black Communities
Black Middle Class Exodus
White/ Multiracial Poor Tracts


Black Communities
Black Middle Class Exodus
White/ Multiracial Poor Tracts
Racial Segregation
Poverty Concentratio

Racial Segregation

Poverty Concentration

1980

Racial Segregation → **Poverty Concentration**

1980

Evolutionary Ecological Frequentist Statistics

Racial Segregation → **Poverty Concentration**

1980

Evolutionary Ecological Frequentist Statistics

$$City\ Variation = Change\ over\ Time$$

Racial Segregation → **Poverty Concentration**

$$Y_{poor} = \beta_1 X_{seg} + \beta_2 X_{inequal} + \beta_3 X_{seg} X_{inequal}$$

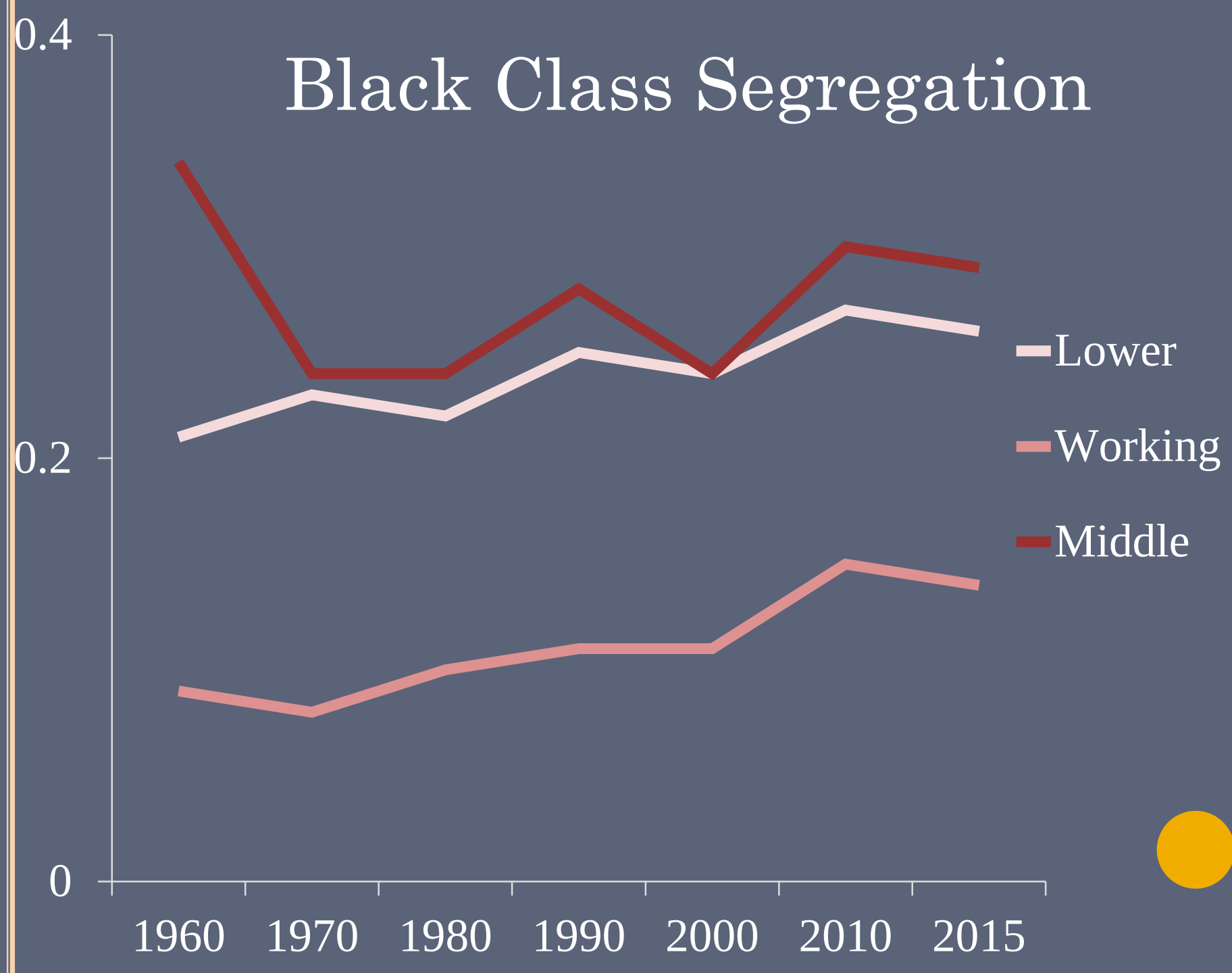
Racial Segregation → **Poverty Concentration**

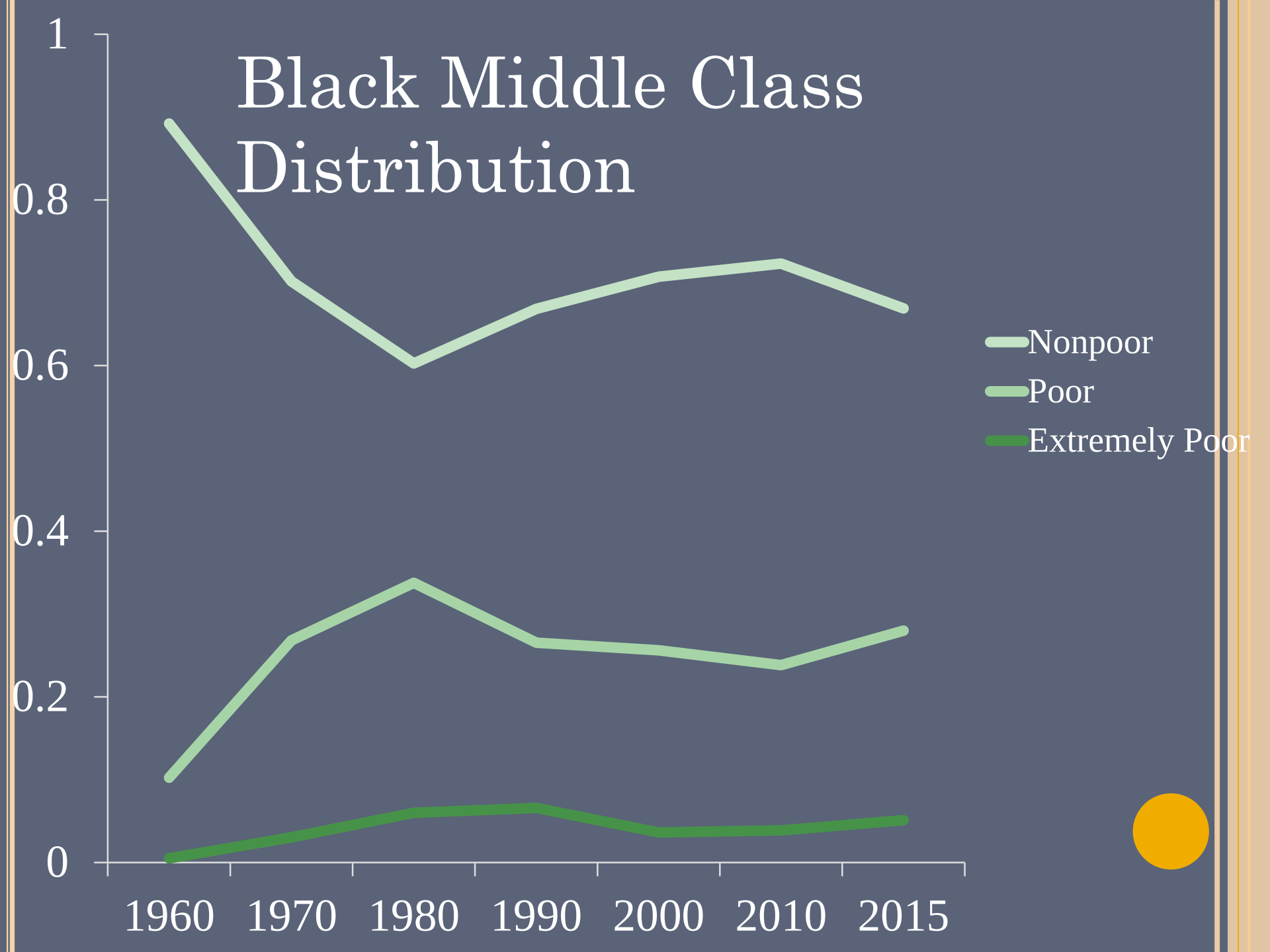
$$Y_{poor} = \beta_1 X_{seg} + \beta_2 X_{inequal} + \beta_3 X_{seg} X_{inequal}$$

$$Y_{poor} = \beta_1 X_{seg} + \beta_2 X_{inequal}$$

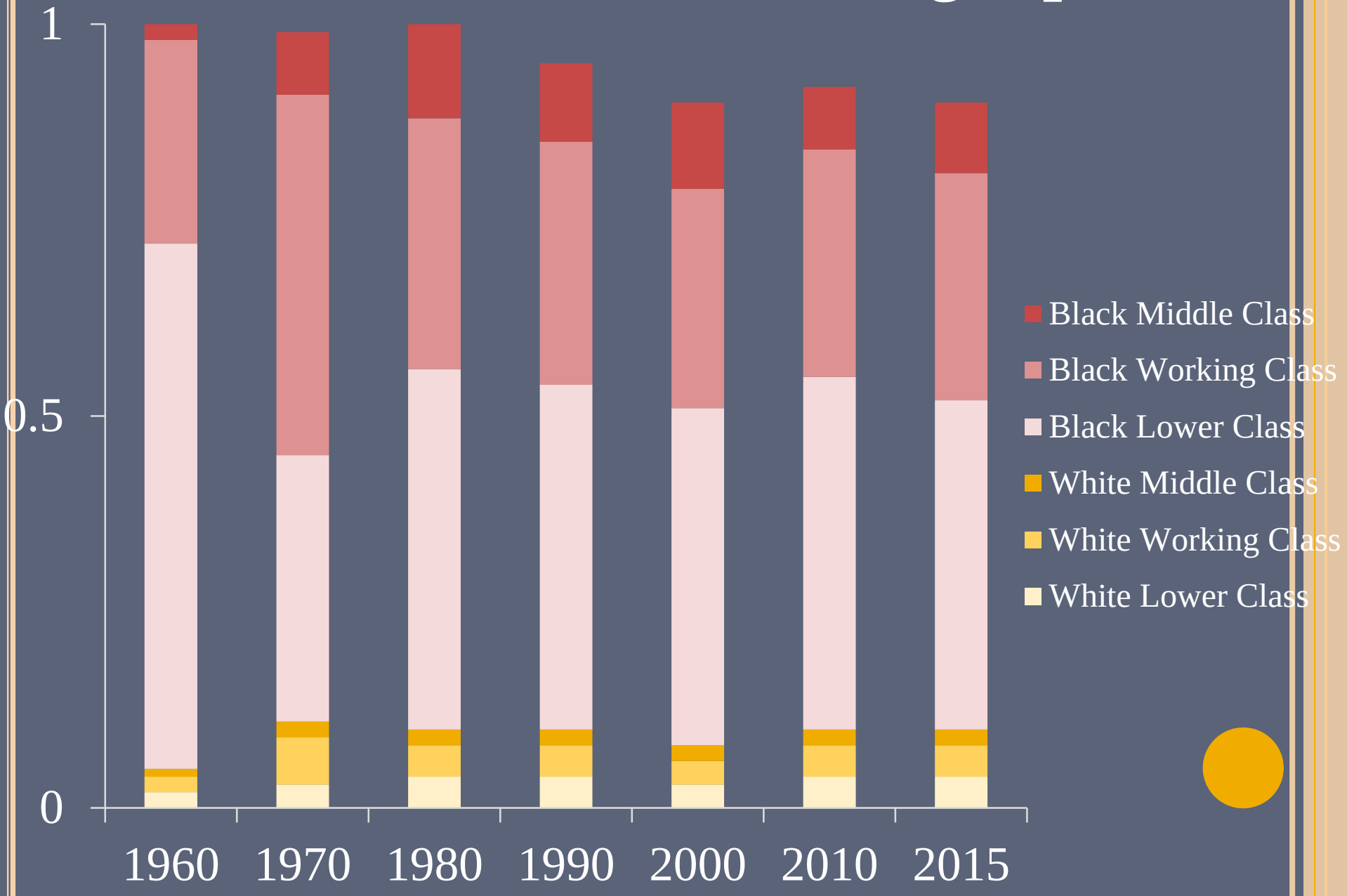
$$Y_{poor} = \beta_3 X_{seg} X_{inequal}$$

Black Class Segregation

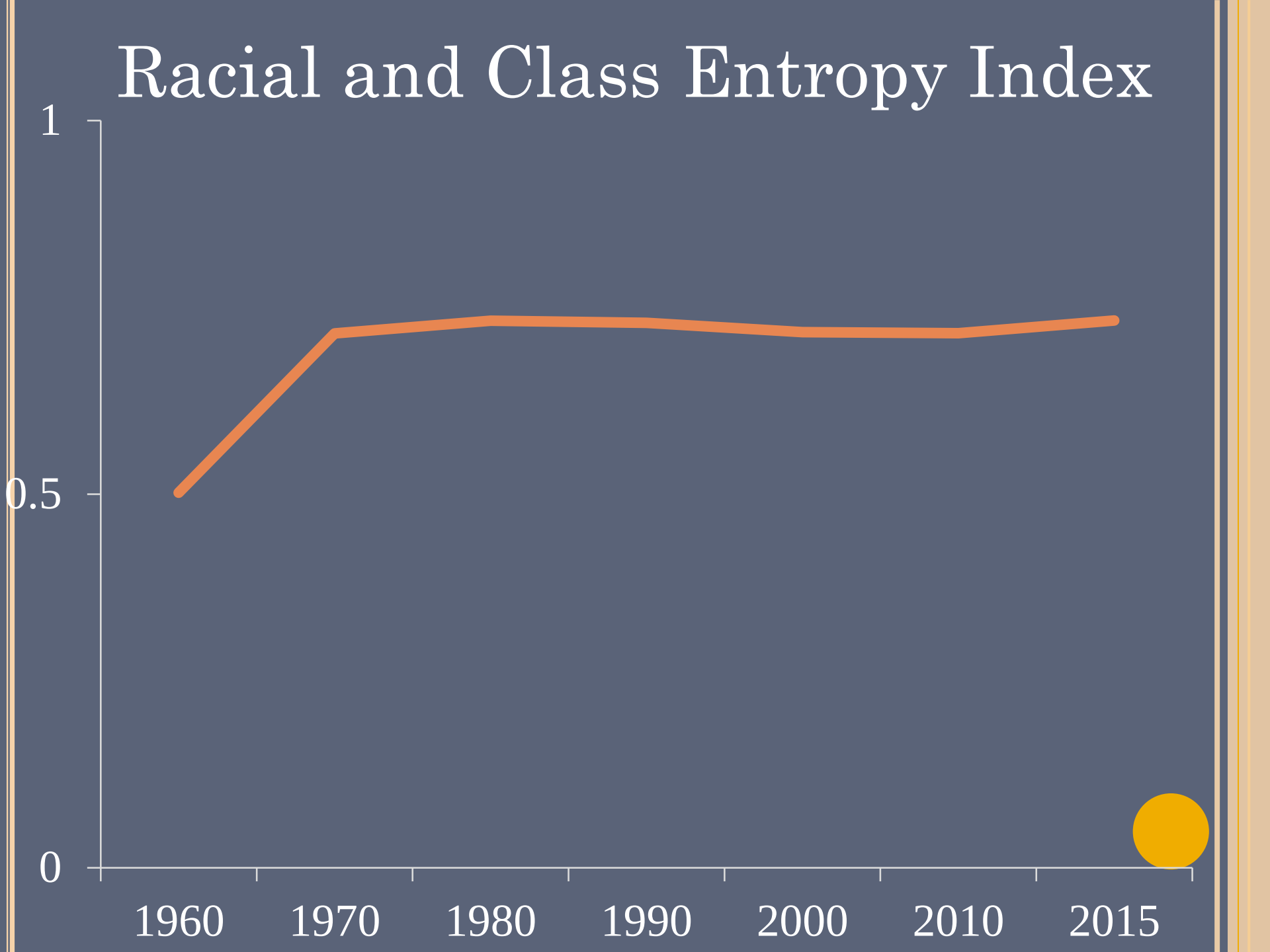



Black Middle Class Distribution
1
0.8
0.6
0.4
0.2
0
1960
1970
1980
1990
2000
2010
2015
Nonpoor
Poor
Extremely Poor

Racial and Class Demographics

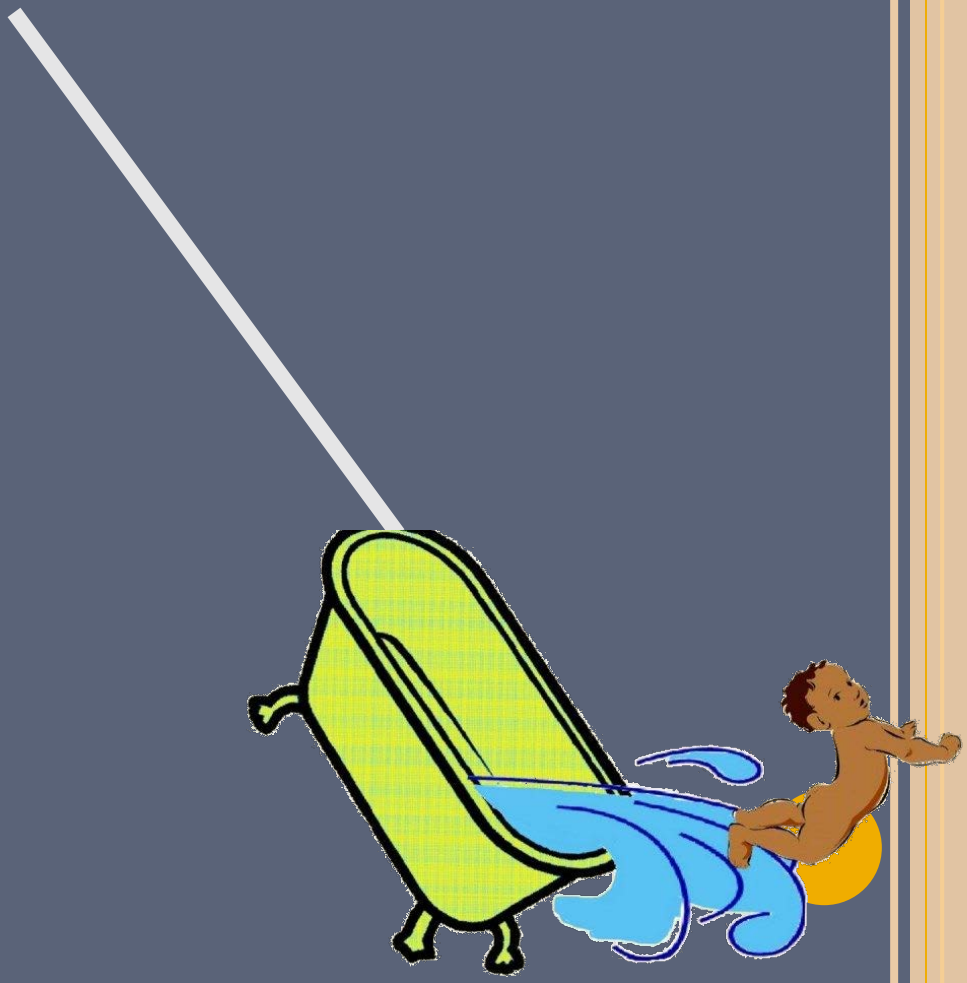


Racial and Class Entropy Index

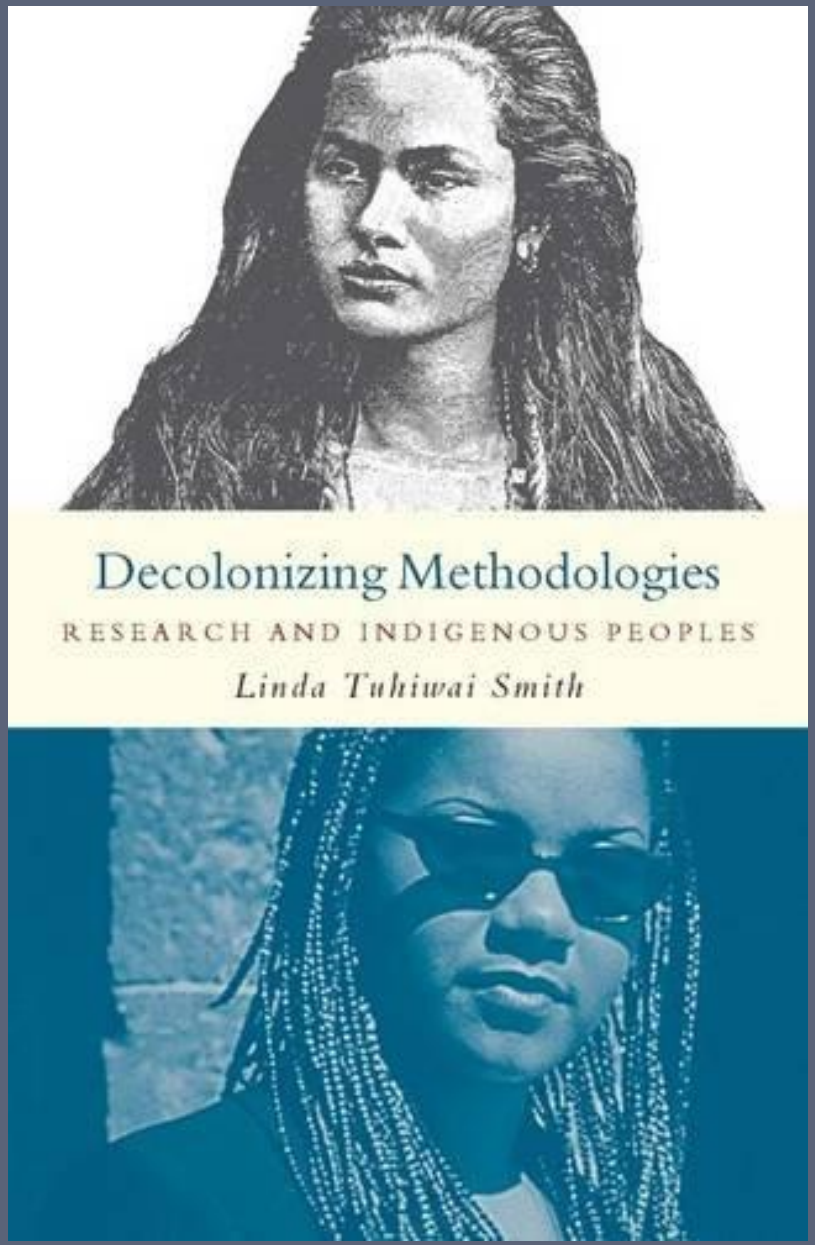


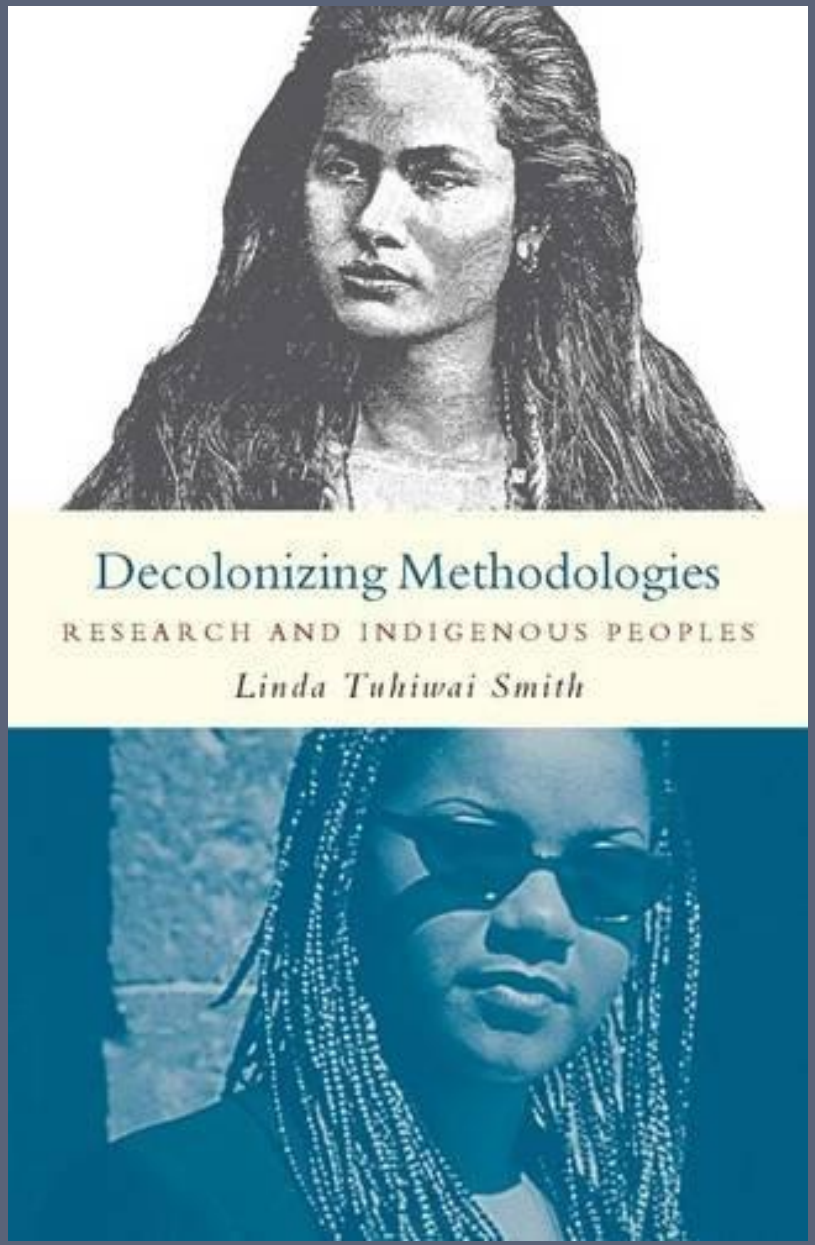
Pendulum

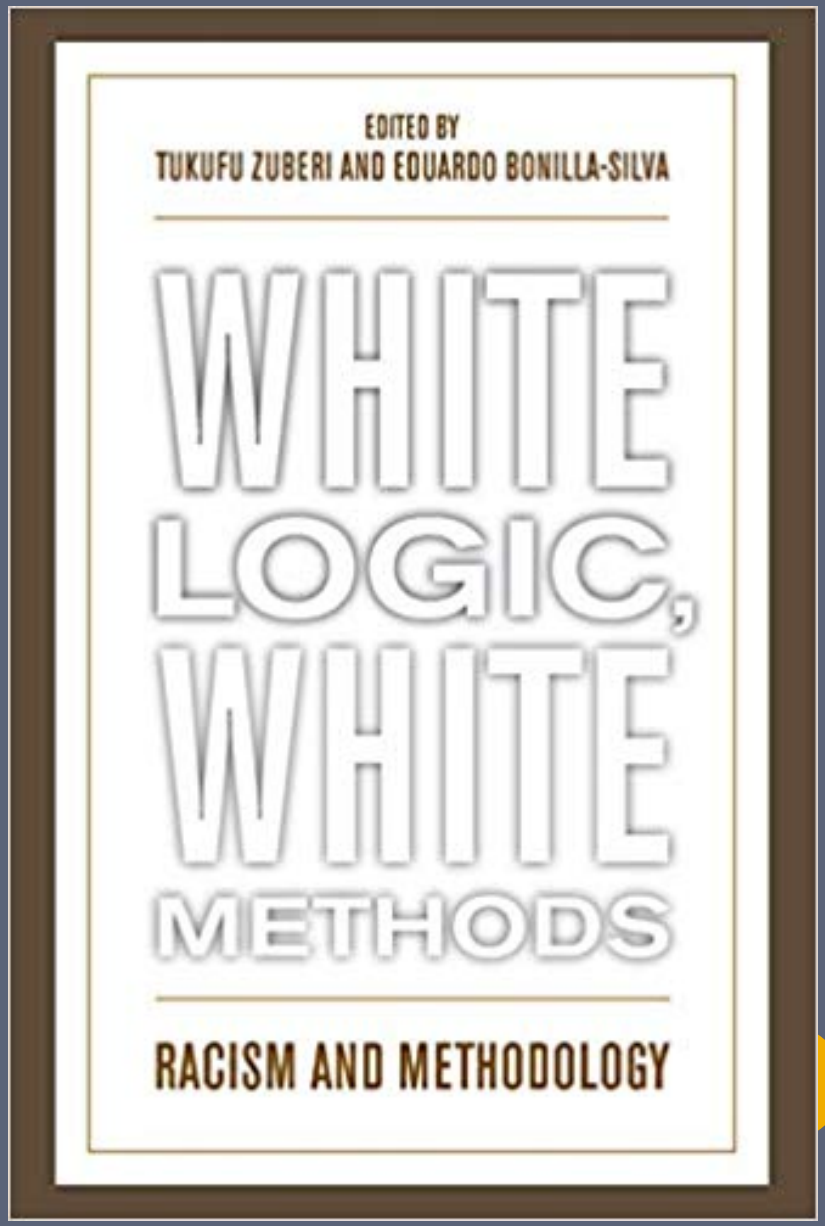
Pendulum



Pendulum


Decolonizing Methodologies
RESEARCH AND INDIGENOUS PEOPLES
Linda Tuhiwai Smith


Decolonizing Methodologies
RESEARCH AND INDIGENOUS PEOPLES
Linda Tuhiwai Smith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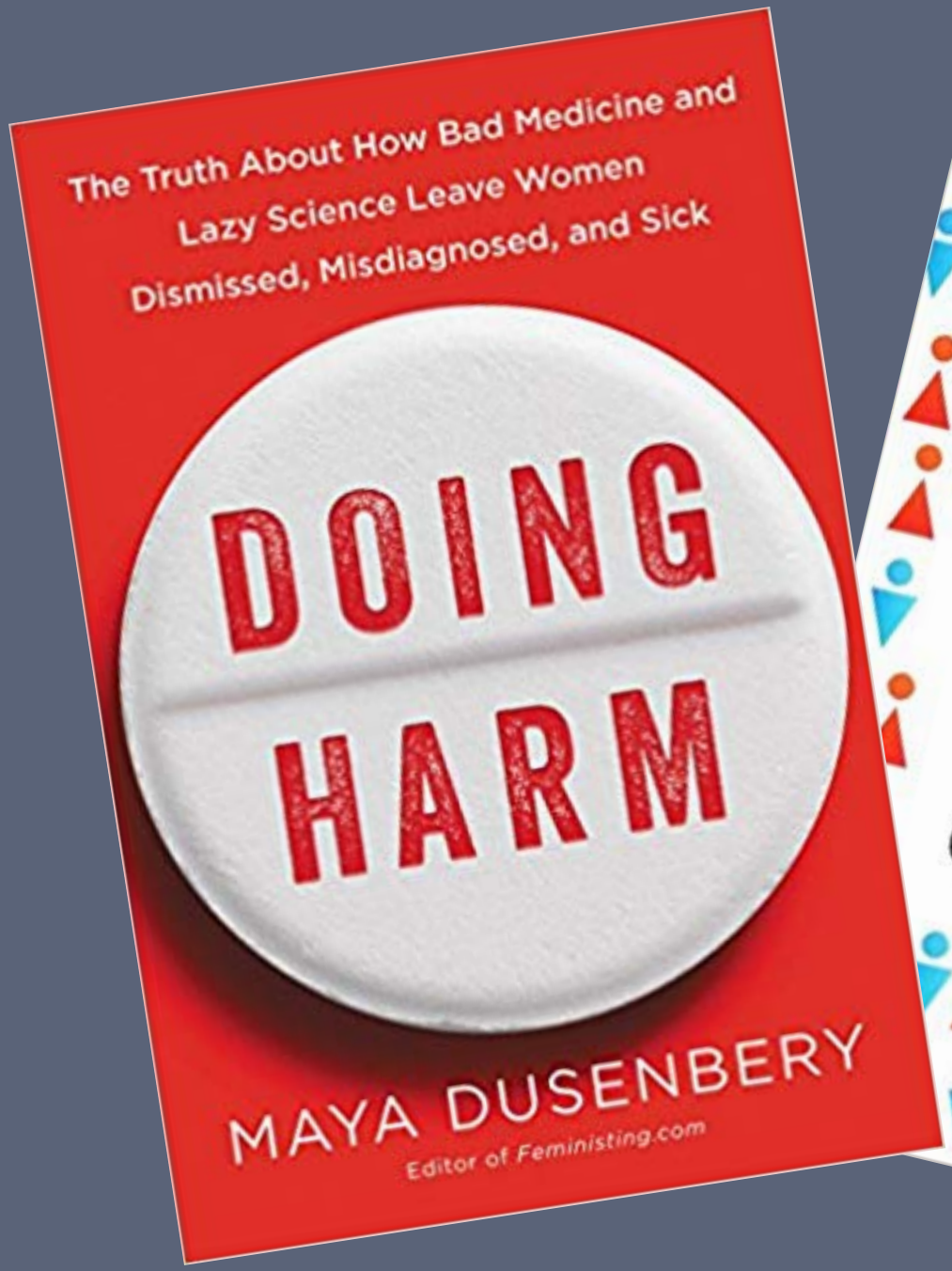
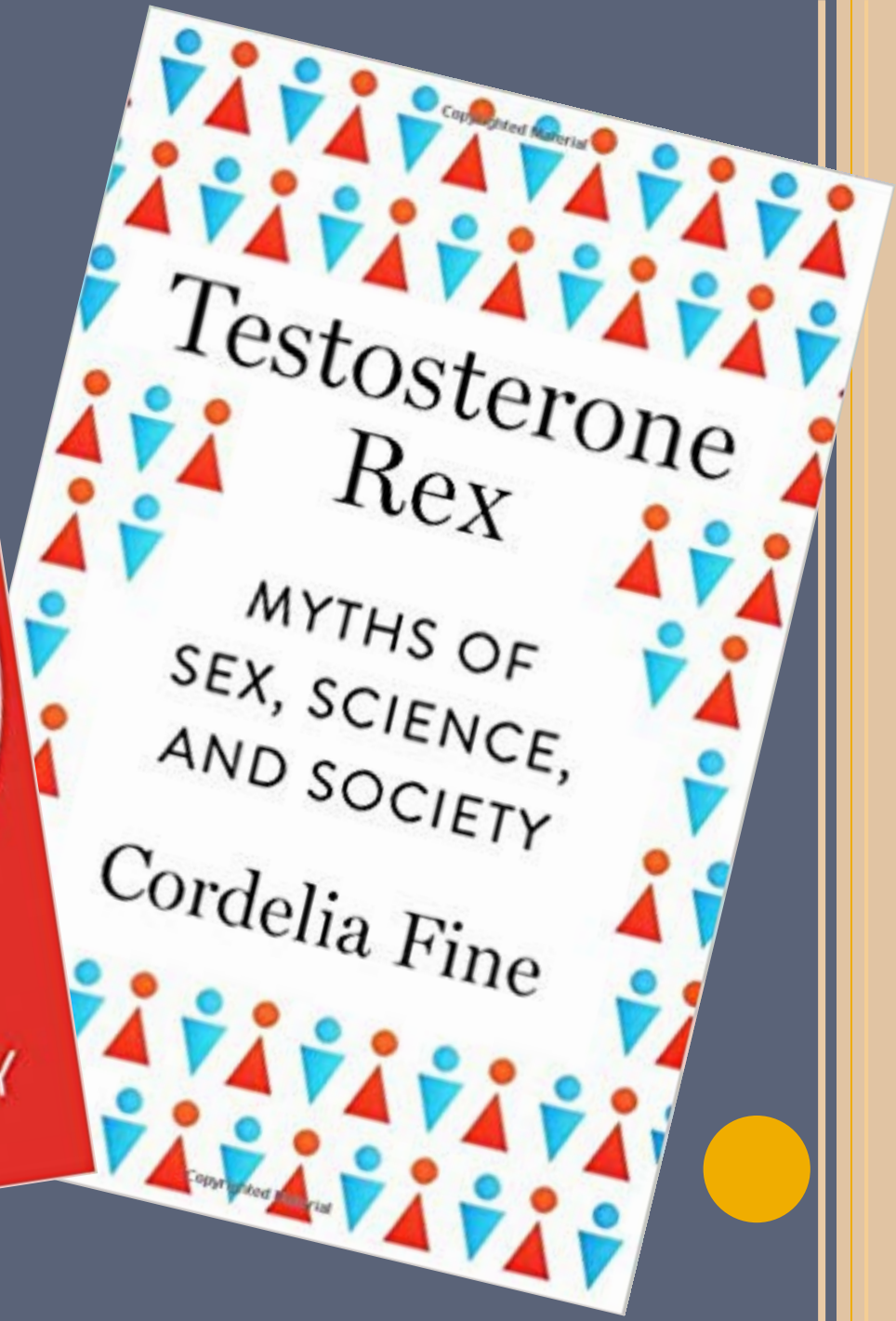
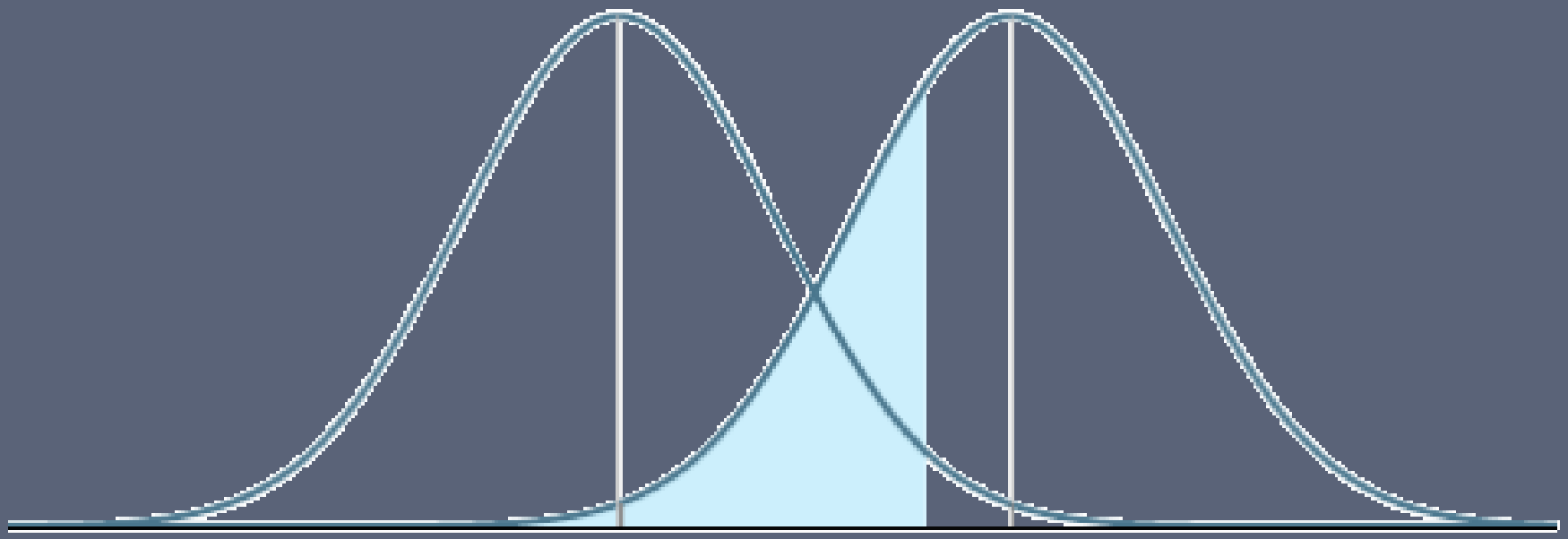
TUKUFU ZUBERI AND EDUARDO BONILLA-SILVA
WHITE LOGIC, WHITE METHODS
RACISM AND METHODOLOGY


The Truth About How Bad Medicine and Lazy Science Leave Women Dismissed, Misdiagnosed, and Sick
DOING HARM
MAYA DUSENBERY
Editor of Feministing.com


Testosterone Rex
MYTHS OF SEX, SCIENCE, AND SOCIETY
Cordelia Fine

Gender



$$md = \frac{\sum |x - \bar{x}|}{n}$$

$$s^2 = \frac{\sum(x - \bar{x})^2}{n - 1}$$

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$

Significance

- **Substantive Significance**— Distinctions with real world and/or theoretical implications

- **Statistical Significance**— Distinctions with a sample that likely also exist in the corresponding population

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