Cohort and Period Effects of Segregation in U.S. Cities, 1990-2000

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Summary

This study examines changes in age-specific segregation among blacks and non-Hispanic whites from 1990 to 2000 in 122 U.S. cities. Using Summary File 1 of the U.S. Census, we find that on average, young adults (ages 25-34) have the lowest levels of segregation, while the elderly have the highest levels of segregation. This age difference is most pronounced in the cities with the lowest segregation, suggesting that movement of younger people is driving desegregation in those cities. But between 1990 and 2000, the largest overall declines in segregation occurred among the oldest age-groups (age 85 and up). Cohort change was greatest among the youngest and oldest adults, though probably for different reasons. Our findings suggest that for younger cohorts, black-white segregation may be slightly lower than is often thought.

Introduction

While the overall level of segregation between blacks and non-Hispanic whites has only slowly declined in the past 30 years, the pace of that decline has varied. Segregation has decreased fastest in the South and West, especially in younger cities with newer housing and those with smaller black populations (Farley and Frey, 1994; Logan et al., 2004). High levels of black-white segregation have come to be viewed as evidence of a "place stratification" model in which members of minority groups blacks in particular are filtered by their group social standing (Alba and Logan, 1991; Charles, 2003; South et al., 2008). Because people tend to move less once they reach middle age (Rossi, 1955), and because declines in segregation can occur only when people move to new areas, we examine the change in black-white segregation between 1990 and 2000 by age and cohort to see the extent to which declines in segregation are concentrating among the young.

Methods

We calculate total Theil's Information Index (H) comparing blacks to whites in 122 US Cities. Additionally, we calculate Theil's Information Indices comparing blacks and whites by 10 year age-groups. Theil's H is a non-parametric index of residential heterogeneity (Reardon and Firebaugh, 2002). Our age-specific Theil's Index is expressed as the difference between the weighted average deviation of each tract's diversity from total diversity in the city. Each age-specific index is calculated in two parts as:

$$E_{ij} = \pi_{ij} * ln\frac{1}{\pi_{ij}} \qquad (1)$$

Where π_{ij} is the age-specific (i) proportion of blacks to whites in tract j and $ln(0) = 0$. E_{ij} is the total age-specific diversity of blacks to whites in track i.

$$H_i = \sum_{j=1}^{N} \frac{p_{ij} * (E_i - E_{ij})}{E_i * P_i} \qquad (2)$$

Where, p_{ij} is the age-specific population of tract j, E_i is the total age-specific diversity in the city ($E_i = \sum_{j=1}^{N} E_{ij}$), and P_i is the total age-specific black and white population in the city.

H_i is bounded by 0 and 1, where a value of 0 indicates perfect heterogeneity of the proportion of blacks across the city and a value of 1 indicates all blacks are segregated in a single tract, given the total amount of diversity possible. The calculation of Total H is conducted by aggregating across all i ages (thus, on the total adult populations).

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Results

Table 1: Top Ten Least and Most Black-White Segregated Cities in 1990 and 2000

1990 Top 10 Most Segregated Cities		2000 Top 10 Most Segregated Cities	
City	**Total H**	**City**	**Total H**
Detroit-Ann Arbor-Flint, MI CMSA	0.75	Detroit-Ann Arbor-Flint, MI CMSA	0.70
Chicago-Gary-Kenosha, IL-IN-WI CMSA	0.73	Chicago-Gary-Kenosha, IL-IN-WI CMSA	0.66
Cleveland-Akron, OH CMSA	0.69	Milwaukee-Racine, WI CMSA	0.64
Milwaukee-Racine, WI CMSA	0.68	Cleveland-Akron, OH CMSA	0.62
Saginaw-Bay City-Midland, MI MSA	0.68	Buffalo-Niagara Falls, NY MSA	0.60
Buffalo-Niagara Falls, NY MSA	0.65	Saginaw-Bay City-Midland, MI MSA	0.60
St. Louis, MO-IL MSA	0.62	St. Louis, MO-IL MSA	0.59
New York City, NY-NJ-CT-PA CMSA	0.61	New York City, NY-NJ-CT-PA CMSA	0.57
Indianapolis, IN MSA	0.60	Birmingham, AL MSA	0.56
Dayton-Springfield, OH MSA	0.60	Dayton-Springfield, OH MSA	0.55

1990 Top 10 Most Integrated Cities		2000 Top 10 Most Integrated Cities	
City	**Total H**	**City**	**Total H**
Jacksonville, NC MSA	0.09	Victoria, TX MSA	0.12
Danville, VA MSA	0.13	Jacksonville, NC MSA	0.12
Charlottesville, VA MSA	0.15	Fayetteville, NC MSA	0.13
Fayetteville, NC MSA	0.15	Fort Walton Beach, FL MSA	0.13
Victoria, TX MSA	0.16	Lawton, OK MSA	0.15
Fort Walton Beach, FL MSA	0.17	Charlottesville, VA MSA	0.17
Clarksville-Hopkinsville, TN-KY MSA	0.18	Danville, VA MSA	0.18
Killeen-Temple, TX MSA	0.19	Clarksville-Hopkinsville, TN-KY MSA	0.18
Lawton, OK MSA	0.20	Las Vegas, NV-AZ MSA	0.20
Gainesville, FL MSA	0.20	Lynchburg, VA MSA	0.20

Table 1 reports the population level segregation indices for the top 10 most segregated and most integrated cities in this study.

- There is consistency across time in the least and most segregated cities.
- The most segregated cities tend to be located in the "rust-belt."
- The most integrated cities tend to be located in the South.

Theil's Index by Age-Group for 122 Cities
1990 – 2000
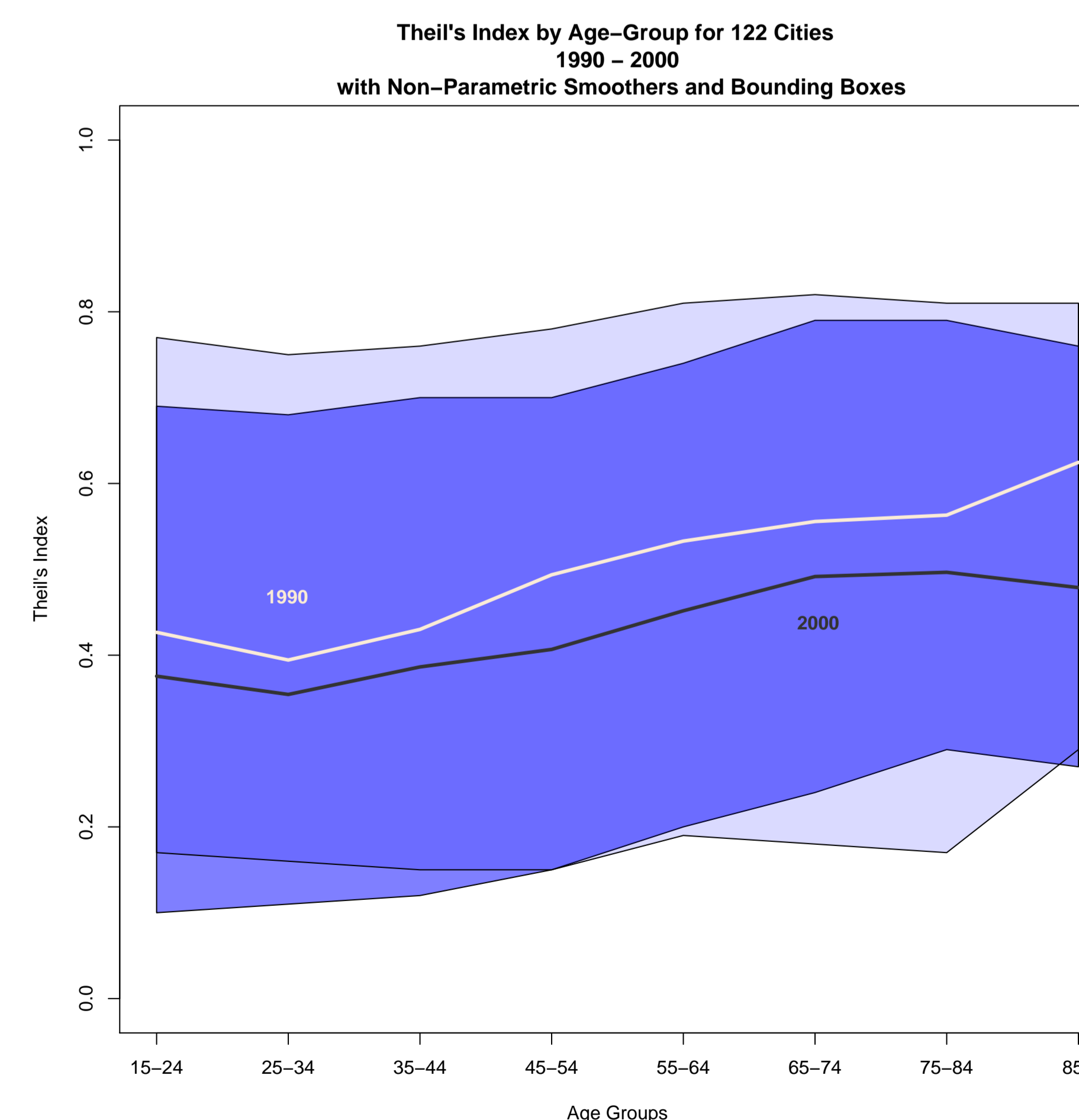with Non-Parametric Smoothers and Bounding Boxes

Figure 1: Trends in Age-Specific Segregation, 1990-2000

Figure 1 plots the distribution of age-specific Theil's Index for 1990 and 2000.

- There was an overall decline in segregation for all age-groups.
- Differences in segregation between age-groups has also declined.

Results (continued)

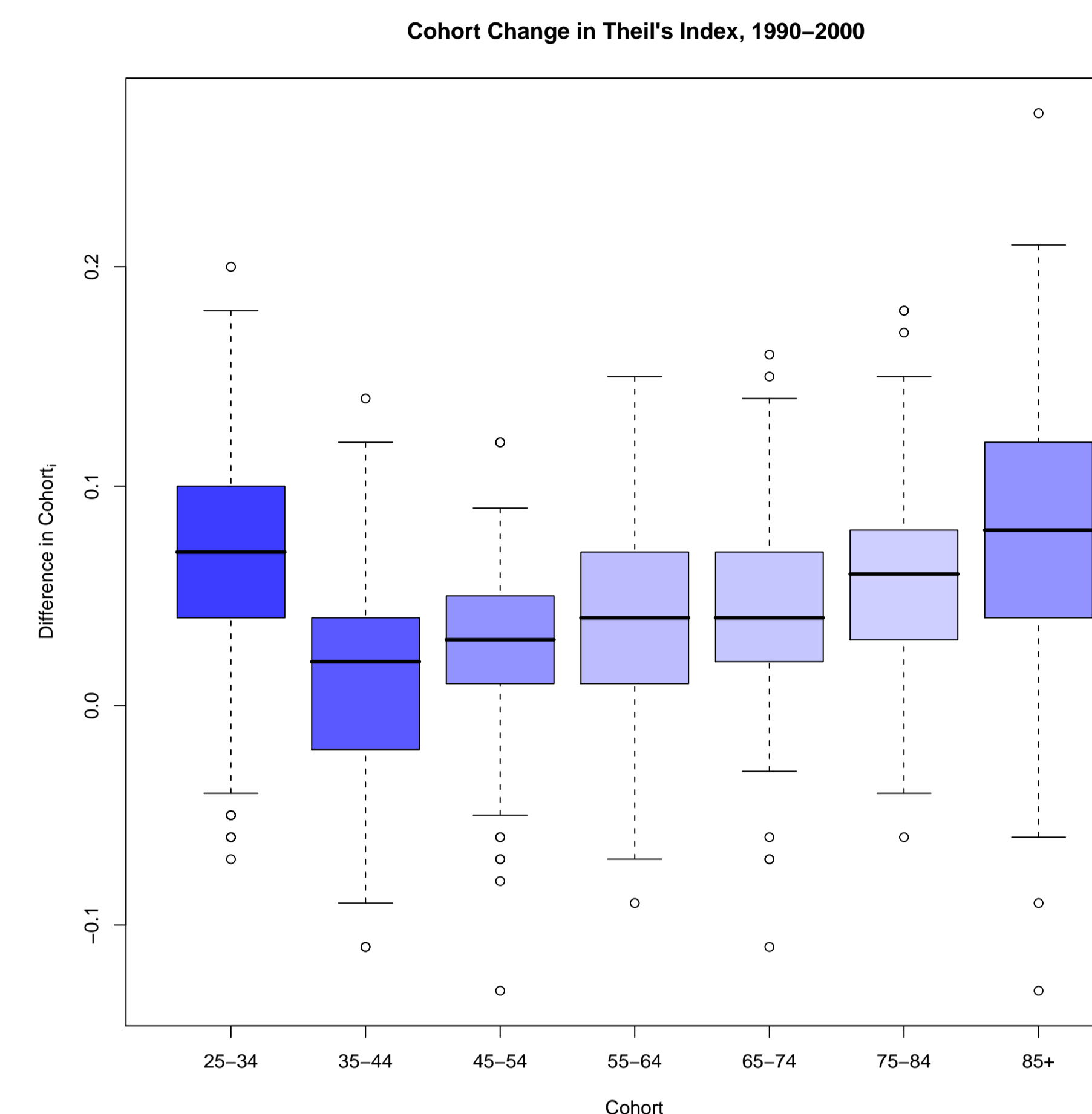

Cohort Change in Theil's Index, 1990–2000

Figure 2: Cohort Change in Segregation, 1990-2000

Figure 2 is a box-and-whisker plot of the distribution of simple differences in segregation for cohorts between 1990 and 2000. The color density of the boxes is proportional to the relative difference in segregation for cohorts; darker colors indicate greater overall change in segregation. Negative values indicate increased segregation and positive values indicate increased integration.

- On average, people belonging to all cohorts experienced increased integration over time.
- The oldest and youngest cohorts had the highest absolute average increase in integration.
- The middle-age cohorts changed the least, but people aged 35-44 in 2000 experienced high change overall relative to being 25-34 in 1990.
- The decreasing color saturation from the 25-34 to the 75-84 cohorts suggests that the older one is, the less change in segregation one can expect in ten years.
- The oldest cohort exhibited the greatest variance in change.

Conclusions

While black-white segregation is substantial in all age ranges, it is considerably more pronounced among older people than the young. Although further research is needed to determine the mechanism for this difference, the finding suggests that many older people may have settled in their neighborhoods years ago, when segregation levels were even higher, and aged in place. The age difference is particularly striking in cities where the segregation levels are lowest overall. However, between 1990 and 2000, the age difference in segregation receded, suggesting that the decline in segregation attributable to the replacement of the oldest, most highly segregated cohorts may be tapering off. Future gains in desegregation may be more concentrated among only the young, rather than at each end of the adult age spectrum.

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