

## Patterns of Persistent Extraordinary Segregation in Pennsylvania: 1990-2000

by

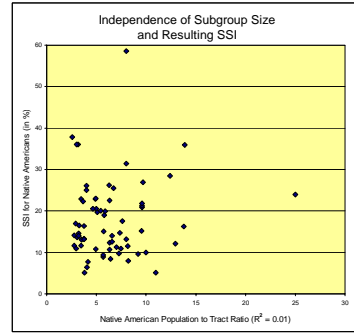
Dr. Richard S. Courtney

• Revisiting, Revising and Extending an Earlier Paper:

- Courtney, R.S. 1998. *Trends in Racial Segregation in the Commonwealth of Pennsylvania 1980-1990*. *The Pennsylvania Geographer* 36(1):24-38.
- The article introduced the Spatial Segregation Index (SSI) as a measure of distributional evenness.

• Deriving the Spatial Segregation Index

- Based on the Coefficient of Variation (CV)
- Standard deviation divided by the mean of a distribution
- CV is zero for an even distribution across all observational units (e.g. census tracts in a county).
- CV maximizes when all of a distribution is found in a single observational unit.



• CV is a measure of relative variability

- Allows comparisons of distributions of virtually any size.

• Maximum CV increases with the number of observational units (n)

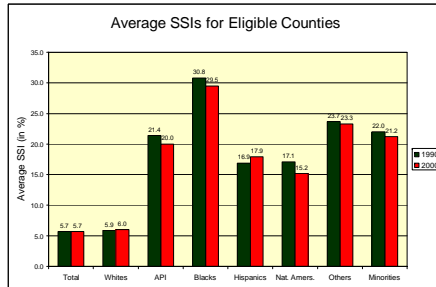
- Maximum CV for  $\sigma = \sqrt{(n-1)}$
- Maximum CV for  $s = \sqrt{n}$

- Standardizing the Coefficient of Variation

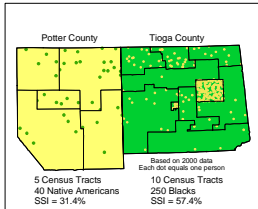
- Express an observed CV as a percentage of the maximum possible CV given the number of observational units.

• The Spatial Segregation Index (SSI)

- $(CV_{obs} / CV_{max}) \times 100$
- Allows the comparison of distributions of any size over any number of observational units.



- Interpreting the Spatial Segregation Index

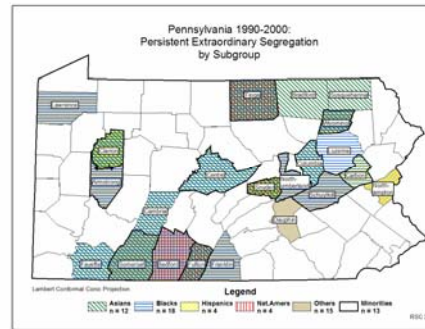
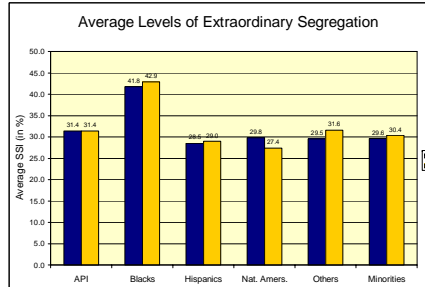
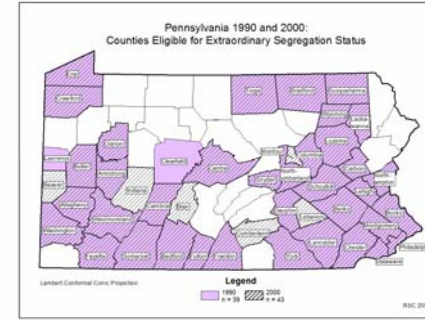
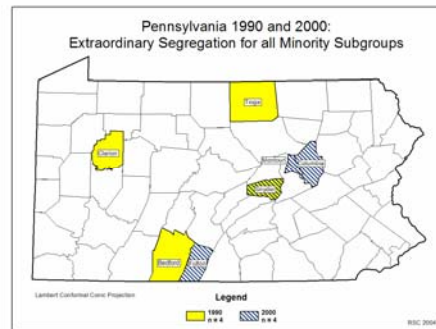


- An SSI of 31.4%

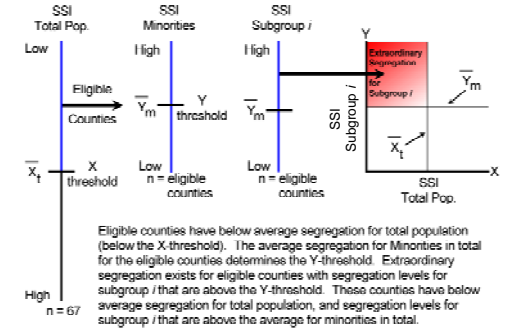
- The observed variability in the distribution of Native Americans in Potter Co. is 31.4% of what it would be if all of this group were segregated into a single tract.

- Potter and Tioga Counties 2000

- We may confidently conclude that Blacks are more segregated in Tioga County than Native Americans are in Potter County regardless of either their different population sizes or the different numbers of census tracts in the two counties.



Determining Extraordinary Segregation Status



Eligible counties have below average segregation for total population (below the X threshold). The average segregation for minorities in total for the eligible counties determines the Y-threshold. Extraordinary segregation exists for eligible counties with segregation levels for subgroup i that are above the Y-threshold. These counties have below average segregation for total population, and segregation levels for subgroup i that are above the average for minorities in total.

• The Data

- 1990 Pennsylvania Census Tracts
  - ESRI Data Disk and Maps disk 4
  - With error correction: Native American and Asian/Pacific Islander population data were transposed on the disk.
- 2000 Pennsylvania Census Tracts
  - ESRI Data and Maps 2003 CD

• Subgroup Formation

- Whites
- Asian/Pacific Islanders (API)
- Blacks
- Hispanics
- Native Americans
- Others
- Minorities
  - API, Blacks, Native Americans, and Others

Significance of Differences in Average Subgroup SSIs From the Average for Minorities in Total

Population Subgroup	Avg. SSI 1990 <sup>a</sup> in % n = 39		Avg. SSI 2000 <sup>a</sup> in % n = 43		Significance of difference from avg. for Minorities	
	(Direction of difference from Minorities average)		(Direction of difference from Minorities average)		(Two-sample t test of independent samples)	
					1990	2000
Asian/Pacific Islanders	21.4	<	20.0	<	I	I
Blacks	30.8	>	29.5	>	0.01	0.01
Hispanics	16.9	<	17.9	<	0.01	I
Native Americans	17.1	<	15.2	<	0.02	0.001
Others	23.7	>	23.3	>	I	I
Minorities	<b>22.0</b>		<b>21.2</b>		NA	NA

I (insignificant)

NA (not applicable)

<sup>a</sup>Changes in subgroup averages from 1990 to 2000 are insignificant.