Language Segregation in U.S. Metro Areas

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Using the American Community Survey to Understand Local Communities

Estimates of detailed population characteristics for very small geographies

Block groups, tracts, counties, etc.

Maps can help local businesses and leaders understand the needs of the community

Income, education, language needs, transportation, family size, employment

Analysis

Focus on metro areas with many large populations of speakers of non-English languages.

Los Angeles: Los Angeles-Long Beach-Santa Ana, CA
New York: New York-Northern New Jersey-Long Island, NY-NJ-PA
Chicago: Chicago-Joliet-Naperville, IL-IN-WI
Atlanta: Atlanta-Sandy Springs-Marietta, GA
Seattle: Seattle-Tacoma-Bellevue, WA

Focus on languages with population large enough to see a pattern in many metro areas

Spanish
Chinese
Tagalog
Vietnamese
Russian
French

Compare visual map evidence of segregation with mathematical evidence using Index of Dissimilarity.

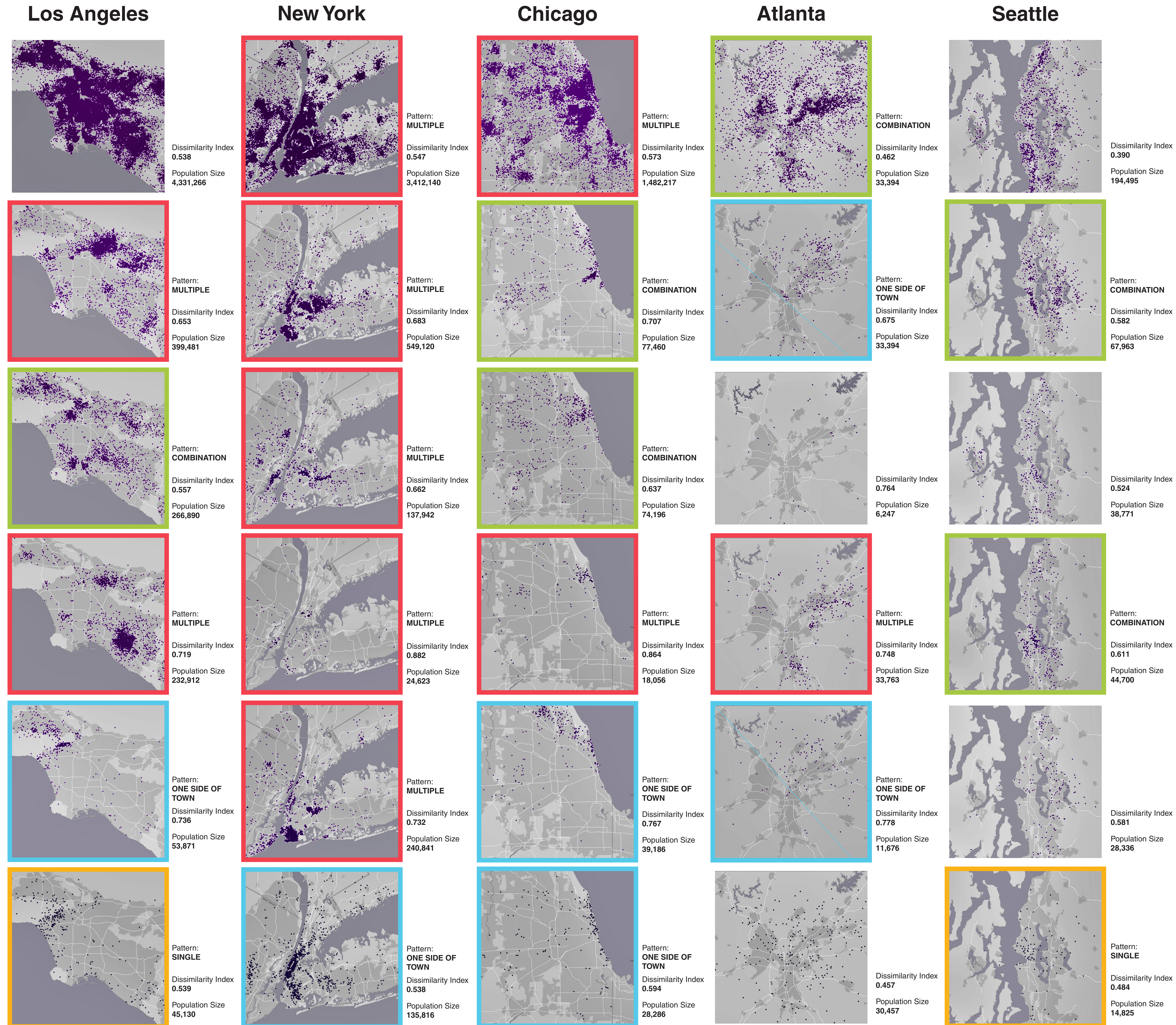$$\frac{1}{2} \sum \left| \frac{x_i}{X} - \frac{y_i}{Y} \right|$$

x_i = language speakers in tract
X = language speakers in metro area
y_i = English speakers in tract
Y = English speakers in metro area

Note: There are many other interesting languages and metro areas. The ones presented here illustrate a few of the many types of patterns found across the country.

LEGEND

Multiple Concentrations
Two or more areas in tight circles or bands

One side of town
Almost all dots one side of an imaginary line

Combination
One or more concentrations but many dots spread out in other areas

Single Concentration
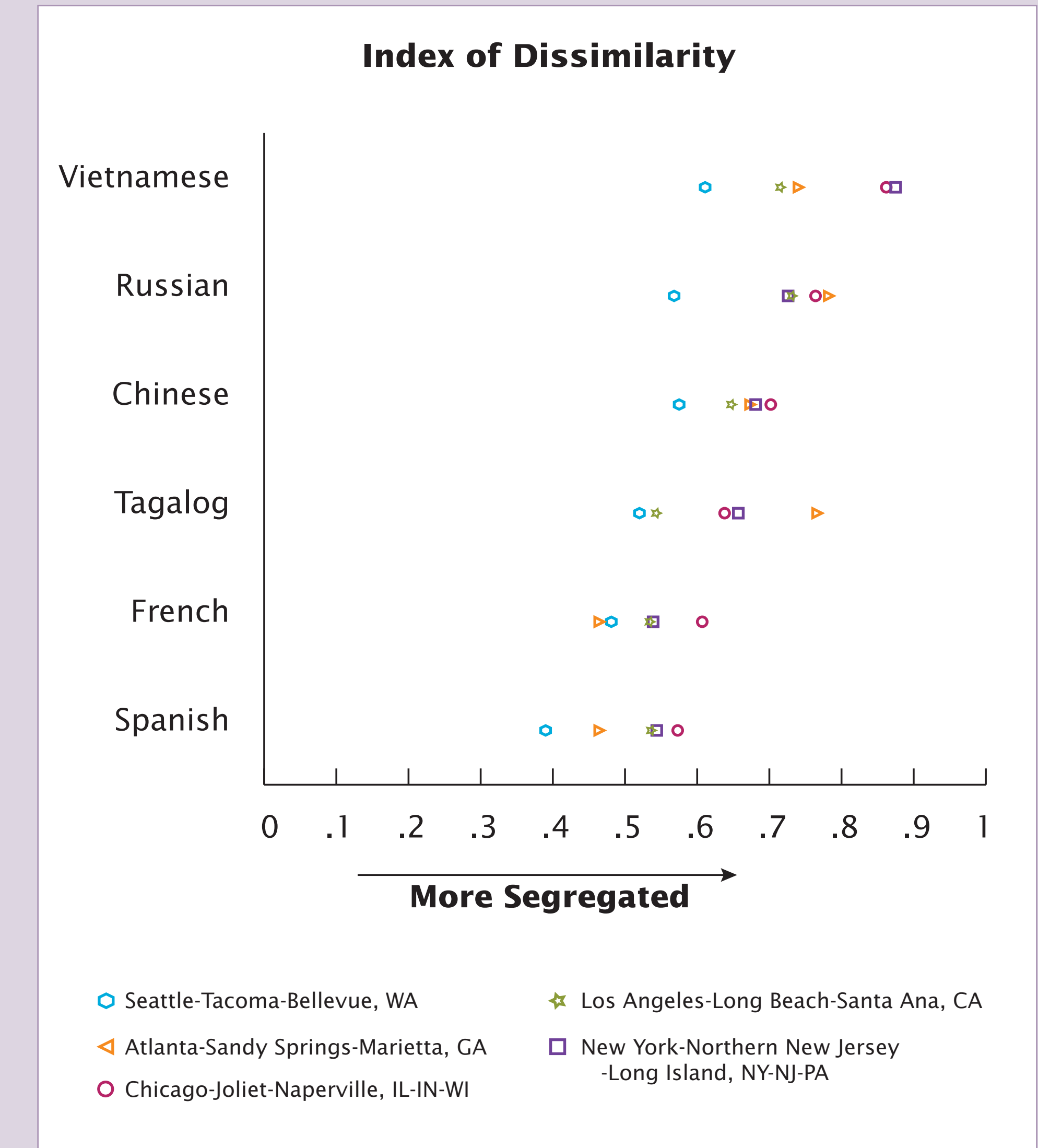Most dots in a single area on map

◦ = 100 Speakers

Los Angeles

Spanish
Dissimilarity Index 0.538
Population Size 4,331,266

Chinese
Pattern: MULTIPLE
Dissimilarity Index 0.653
Population Size 399,481

Tagalog
Pattern: COMBINATION
Dissimilarity Index 0.557
Population Size 266,890

Vietnamese
Pattern: MULTIPLE
Dissimilarity Index 0.719
Population Size 232,912

Russian
Pattern: ONE SIDE OF TOWN
Dissimilarity Index 0.736
Population Size 53,871

French
Pattern: SINGLE
Dissimilarity Index 0.539
Population Size 45,130

New York

Spanish
Pattern: MULTIPLE
Dissimilarity Index 0.547
Population Size 3,412,140

Chinese
Pattern: MULTIPLE
Dissimilarity Index 0.683
Population Size 549,120

Tagalog
Pattern: MULTIPLE
Dissimilarity Index 0.662
Population Size 137,942

Vietnamese
Pattern: MULTIPLE
Dissimilarity Index 0.882
Population Size 24,623

Russian
Pattern: MULTIPLE
Dissimilarity Index 0.732
Population Size 240,841

French
Pattern: ONE SIDE OF TOWN
Dissimilarity Index 0.538
Population Size 135,816

Chicago

Spanish
Pattern: MULTIPLE
Dissimilarity Index 0.573
Population Size 1,482,217

Chinese
Pattern: COMBINATION
Dissimilarity Index 0.707
Population Size 77,460

Tagalog
Pattern: COMBINATION
Dissimilarity Index 0.637
Population Size 74,196

Vietnamese
Pattern: MULTIPLE
Dissimilarity Index 0.864
Population Size 18,056

Russian
Pattern: ONE SIDE OF TOWN
Dissimilarity Index 0.767
Population Size 39,186

French
Pattern: ONE SIDE OF TOWN
Dissimilarity Index 0.594
Population Size 28,286

Atlanta

Spanish
Pattern: COMBINATION
Dissimilarity Index 0.462
Population Size 33,394

Chinese
Pattern: ONE SIDE OF TOWN
Dissimilarity Index 0.675
Population Size 33,394

Tagalog
Dissimilarity Index 0.764
Population Size 6,247

Vietnamese
Pattern: MULTIPLE
Dissimilarity Index 0.748
Population Size 33,763

Russian
Pattern: ONE SIDE OF TOWN
Dissimilarity Index 0.778
Population Size 11,676

French
Dissimilarity Index 0.457
Population Size 30,457

Seattle

Spanish
Dissimilarity Index 0.390
Population Size 194,495

Chinese
Pattern: COMBINATION
Dissimilarity Index 0.582
Population Size 67,963

Tagalog
Dissimilarity Index 0.524
Population Size 38,771

Vietnamese
Pattern: COMBINATION
Dissimilarity Index 0.611
Population Size 44,700

Russian
Dissimilarity Index 0.581
Population Size 28,336

French
Pattern: SINGLE
Dissimilarity Index 0.484
Population Size 14,825

What can we learn?

The Index of Dissimilarity: language populations are segregated to varying degrees in each metro area studied.

Range from 39% of Spanish speakers in Seattle to 88% of Vietnamese speakers in New York needing to move to produce an even distribution.

Index of Dissimilarity

(Chart axis categories, top to bottom: Vietnamese, Russian, Chinese, Tagalog, French, Spanish)

0 .1 .2 .3 .4 .5 .6 .7 .8 .9 1
More Segregated →

Legend:
◦ Seattle-Tacoma-Bellevue, WA
✦ Los Angeles-Long Beach-Santa Ana, CA
◁ Atlanta-Sandy Springs-Marietta, GA
□ New York-Northern New Jersey-Long Island, NY-NJ-PA
○ Chicago-Joliet-Naperville, IL-IN-WI

Visual Analysis: Language populations segregate themselves in different ways. Speakers may be spread out, concentrated in one section of town, or found in many tight pockets all over town.

The Index of Dissimilarity allows us to measure trends quantitatively, but it doesn't give us the same qualitative understanding of how the language communities are organized.

Example: Russians have similar indexes in four cities (.73-.78), but very different sized populations (12k-241k) and extremely different visual patterns.

Data Source:
Tract-level estimates shown Table B16001, 2011 ACS 5-year estimates

Relevant Literature:
Kantrowitz, Nathan. 1973. "Ethnic and Racial Segregation in the New York Metropolis: Residential Patterns among White Ethnic Groups, Blacks, and Puerto Ricans." Praeger Special Studies in U.S. Economic, Social and Political Issues Series.

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Iceland, John, Daniel H. Weinberg and Erika Steinmetz. 2002. "Racial and Ethnic Residential Segregation in the United States: 1980-2000. Census 2000 Special Reports.

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