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Urban Transition of Races in the Denver Metro Area

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1.0 Abstract

The racial segregation of the primary racial groups, African-American, Asian, Latino and White, residing within the Denver metropolitan five-county area is analyzed using a Geographic Information System. The study uses census defined block groups to measure racial population within the study area as input to analysis methods that provide insight to the transition of racial groups within the Denver metropolitan area. Markov chain analysis is used to compute the probability that the ratio of a block group of a race will change. The Monte Carlo method is then applied using the probabilities to predict what the segregation in the Denver metropolitan area could be.
Keywords: Markov chain, Monte Carlo, neighborhood transition, racial segregation, Denver metropolitan area, geographic information system.

2.0 Introduction

Racial succession is a term that describes the transition of the racial composition of a neighborhood. The Denver metropolitan area, like many other metropolitan areas in the United States is undergoing a constant change in racial composition. The racial composition of an area is very important to understand for many reasons. Race has been demonstrated to be strongly associated to many forms of inequality in background, treatment, expectations and opportunities. Opportunities in education,

employment, and housing are greatly affected by the racial composition of neighborhoods.

For these many reasons, if the racial succession of a neighborhood could be predicted, the information could greatly influence the way a neighborhood and a metropolitan area would develop. Using the patterns of segregation in Denver from 2000 and 2010, what will the future segregation of the of the Denver metropolitan five-county area possible look like?

2.1 Statement of Objectives

The study attempts to identify and predict the spatial transitions of the four primary races including African-American, Asian, Latino and White races within the Denver metropolitan five-county area.

2.2 Research Questions

The research questions for this study are:

1. How has the spatial dispersion of each of the four primary races changed between 2000 and 2010?
2. What is the probability of a block group in the Denver metropolitan five county area increasing, decreasing, or remaining the same in terms of the ratio of a single race of residents?

3. What might the spatial dispersion of each of the four primary races be in the future?

Comment[SRH1]: Meaning 10 years from now? Or further down the road?

3.0 Literature Review

The impact of segregation affects almost every facet of society including social treatment, expectations and opportunities. The impact of segregation on opportunities in education, crime, employment, and housing has been widely studied. Education is severely impacted by racial segregation. In the past 20 years, the discussion around school reform in the United States has centered on racial inequality. The *No Child Left Behind Act* combined with the enhanced testing of high schools was designed to end the "soft racism of low expectations" (Orfield and Lee 2005). However, the schools that are consistently failing under these sanctions are disproportionately segregated minority schools. Segregation also has a direct link with crime rates. Even though the rate of violent crime fell between 1980 and 1990 for all groups, the crime rate remained disproportionately high for African-Americans (Massey 1995). Douglas Massey and Nancy Denton demonstrated that the economy can adversely affect areas that are extremely segregated. Under conditions of hypersegregation, an increase in the rate of African-American poverty produces a distinct increase in the geographic concentration of poverty along with decline of social and economic conditions in African-American

communities (Massey and Denton 1993). The impact of segregation on society is far-reaching and often studied.

The amount of literature and research on the subject of racial segregation and urban transition, also known as racial succession, is tremendous and varied. Racial segregation has been a popular subject of study since 1928 when Ernest Burgess, a sociologist published his work titled *Residential Segregation in American Cities* in which he examined the "residential separation of the Negro from the rest of the community" (Burgess 1928). Burgess described the process of racial succession as the following steps:

1. Invasion – beginning usually as an unnoticed or gradual penetration
2. Reaction – mild or violent resistance of the community
3. Influx – arrival of newcomers and abandonment by the old-time residents
4. Climax – achievement of a stable community

Along with the observation of the process of racial succession, there was a need to measure the amount of segregation. Initially, the primary measurement that was agreed upon in 1955 with the publication of *A Methodological Analysis of Segregation Indexes* (Duncan and Duncan 1955) was the Index of Dissimilarity. The measurement is simply the overall difference between the percentages of two distributions. The measurement represents the proportion of cases that would need to be reallocated in order

to balance the two distributions. In 1976, a new study suggested that there were some limitations and inadequacies in use of the Index of Dissimilarity for measuring segregation (Cortese, Falk, and Cohen 1976). In 1988, Douglas Massey and Nancy Denton introduced the idea that segregation was really constructed of five different dimensions of spatial variation: evenness, exposure, clustering, concentration and centralization (U.S. Census Bureau. and Iceland 2002). Hypersegregation is a pattern that describes a racial group that is experiencing extreme segregation in each of these five dimensions of measurement (Massey and Denton 1989). These five dimensions of measurement have remained the primary measurement of segregation since their introduction in 1988.

Much of the research on segregation initially sought to determine if there was a specific point at which a neighborhood would start to quickly transition into a predominately racial neighborhood (Goering 1978). Goering's research sought to find any social evidence that would demonstrate there was a point that a neighborhood would start to rapidly change to a predominately non-white neighborhood.

In contrast, there is evidence that 'white flight' could be coming to an end. In an article written for the *Wall Street Journal* (Dougherty 2008), there is evidence that the large cities including Boston, Seattle and San Francisco have experienced an increase in the proportion of white residents. Studies support findings that the tipping-point hypothesis, which asserts that racially

mixed neighborhoods will migrate to a predominately black composition, should be questioned. The three factors leading to doubts about the tipping-point hypothesis include declining levels of segregation since 1970, observed greater stability of the composition of neighborhood and the larger number of Whites that have been moving into racially mixed neighborhoods (Ottensmann 1995).

The primary method for predicting the future state of segregation of the Denver metropolitan five county area is a combination of two methods: Markov Chain method and Monte Carlo analysis which is often referred to as Markov Chain Monte Carlo (MCMC).

The Markov Chain method is used to determine the probability that an event will occur. It is a process that is used on events that are classified as dependent events. The Markov process is named for Andrey Markov, a Russian mathematician, who primarily worked on theory of stochastic processes.

The Monte Carlo Analysis is used to simulate many outcomes depending on the probability. The name and the method itself were created by Stanislaw Ulam (Spence 1983), a mathematician and physicist who worked on the Manhattan Project. Since the statistical calculations of nuclear material were too complex to be solved using traditional analysis, Ulam thought that a simulation of the process would prove useful. The simulation used random numbers, which gave the process the name *Monte*

Carlo. The method may be use in certain situations where a thorough analysis of a problem may be too difficult to solve using traditional statistical methods. A model employing a Monte Carlo method is a *stochastic numerical model* that incorporates a random process simulation (Montello and Sutton 2006). With the advent of readily available computing power, the Monte Carlo method has been used more often than in the past to develop empirical models that provide empirical demonstrations. The empirical demonstrations can provide insight into the process and often open other avenues for research. However, it can never be considered a complete replacement for thorough mathematical analysis (Spence 1983).

4.0 Methodologies

The primary research will be comprised of five major steps including data gathering, data preparation, Markov analysis, Monte Carlo simulation and final analysis.

First, data will be obtained from the United States Census Bureau web site from both the 2000 and 2010 collections. The specific census summary files captured at the census block group level are 'QT-P6 Race Alone or in Combination and Hispanic'. These files, obtained by county, will contain counts and percentages of each race in each individual block group. The spatial data used to identify each block group will also be obtained from the United States Census Bureau in the form of Tiger/line shapefiles

Next, the data will be prepared for the Markov analysis. The preparation includes combining data from the 2000 and 2010 census summary files and then joining them with the spatial layer using the block identification fields from the spatial and data layers.

Following the data preparation, the Markov chain analysis will be performed to determine the probability that a block will change classification. The percentage classifications for each race will be determined individually. Once the classes have been determined, the probability of the block groups changing can be computed.

Next, the Monte Carlo simulation will be performed. Using Microsoft Excel (or a potentially a programming language like PERL), each block group, by race, will have a transition simulated 1,000 times using a generated random number and the probability captured in the previous step for that particular classification change.

Comment[T2]: At this point in time you don't have a proposal anymore so you can say exactly what you did.

Finally, the information obtained from the Monte Carlo analysis will be analyzed and reported. The information will provide critical input into the conclusion of the research.

4.1 Markov Chain Analysis

The Markov process is named for Andrey Markov, a Russian mathematician, who primarily worked on theory of stochastic processes. The Markov chain analysis is used in this research to determine the probability of

a block group transitioning from one classification to another. It is a process that is used on events that are classified as dependent events.

The method known as the *Markov chain analysis* is used to provide a probability of the change in the proportional classification of blocks for each individual race. Specifically, the racial proportion of each race within each block group is measured and probabilities that the classification will change are computed. The Markov chain analysis is an analysis process which examines a sequence of events and then computes the probability that one event will be followed by another event.

The transition is measured using the Denver metro five-county area. The counties comprising the Denver metro area include Adams, Arapahoe, Denver, Douglas, and Jefferson counties. The analysis uses block group data from both the 2000 and 2010 census. Each block group will be assigned a separate classification, for each census year, according to the percentage of racial residents on the block. The classifications are detailed in Table 1.

Table 1. Classification of Percentages

Classification	Percentage of Population
A	0-9.99
B	10-19.99
C	20-29.99
D	30-39.99
E	40-49.99

F	50-59.99
G	60-69.99
H	70-79.99
I	80-89.99
J	90-100

The classifications will then be combined to produce a measurement of the transition of each block group between 2000 and 2010. For instance, a block group can move from class C to class D and would be classified as 'CD'.

Each of these transition classifications will be placed into a probability matrix to demonstrate the probability of a block group starting with one classification and changing to another classification.

4.2 Determining Percentage Classification

Before performing the Markov chain analysis, each block group must be classified as one of ten different classifications, A-J, for both of the census years. The classifications were set to ten groupings with each group representing ten percent of the entire population as shown in Table 1. The even distribution was selected so that the distributions of each racial population could be compared with one another.

4.3 Distribution of Percentages by Race

In Figures 1-4 shown below, the distributions of population percentages of block groups are displayed in histograms for each race. The African-American and Latino races have very similar patterns of distribution. The Asian distribution is condensed between 5 and 30 percent. The distribution for the white race is vastly different than the others. While all the other races rarely have any block groups reaching 50 percent, or a majority, of the racial population, the White race has very few block groups where the White race is not a majority of the population.

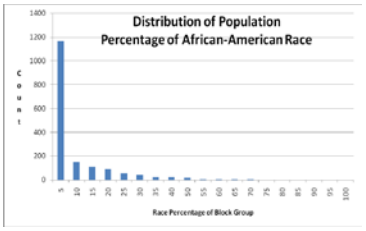


Figure 1. Histogram of African-American block group percentages.

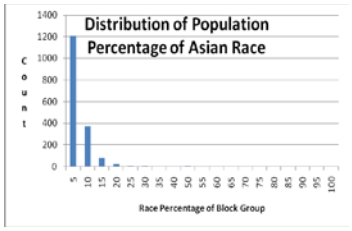


Figure 2. Histogram of Asian block group percentages.

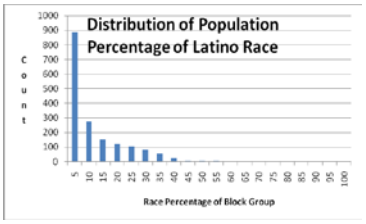


Figure 3. Histogram of Latino block group percentages.

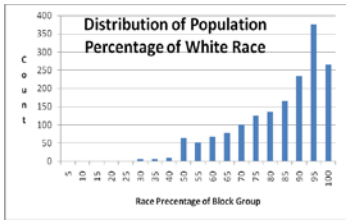


Figure 4. Histogram of White block group percentages.

4.4 Configuring Census Data

The study area block group data containing both the total population and individual race population was obtained from the U.S. Census Bureau web site for the 2000 and 2010 years. Each dataset was placed into an Excel spreadsheet. Then, using Excel functions, each row of data that represented a block group in 2000 was joined to the same block data for 2010. The result was a spreadsheet that contained a single block group's total

population along with African-American, Asian, Latino and White population data for both 2000 and 2010.

4.5 Performing Analysis

Data from each census block group is used to calculate the percentage of each race's population within the block group. A percentage is calculated for both 2000 and 2010. Once the percentages are obtained, the block group is classified with a letter A through J according to the table above.

Each block group is assigned classifications for 2000 and 2010. These classifications are then combined to represent the change of each race's population on each block group between 2000 and 2010. For instance, a block group having 9% African-American presence on a block group in 2000 would be assigned ~~a~~ with 'A' classification. If, in 2010, the block group had a 36% African-American presence, it would be assigned a 'D' classification. The resulting change for the block between 2000 and 2010 would be 'AD' which represents a change from 'A' to 'D'.

After each block is assigned one of the values representing change between 2000 and 2010, they are summarized in a matrix like the one in Table 2.

Table 2. Transition Matrix Totals.

		2010 State of Percentage of a Single Race									
		A	B	C	D	E	F	G	H	I	J
2000 State of Per. of a single Race	A	AA Total	AB Total	AC Total	AD Total	AE Total	AF Total	AG Total	AH Total	AI Total	AJ Total
	B	BA Total	BB Total	BC Total	BD Total	BE Total	BF Total	BG Total	BH Total	BI Total	BJ Total
	C	CA Total	CB Total	CC Total	CD Total	CE Total	CF Total	CG Total	CH Total	CI Total	CJ Total
	D	DA Total	DB Total	DC Total	DD Total	DE Total	DF Total	DG Total	DH Total	DI Total	DJ Total
	E	EA Total	EB Total	EC Total	ED Total	EE Total	EF Total	EG Total	EH Total	EI Total	EJ Total
	F	FA Total	FB Total	FC Total	FD Total	FE Total	FF Total	FG Total	FH Total	FI Total	FJ Total
	G	GA Total	GB Total	GC Total	GD Total	GE Total	GF Total	GG Total	GH Total	GI Total	GJ Total
	H	HA Total	HB Total	HC Total	HD Total	HE Total	HF Total	HG Total	HH Total	HI Total	HJ Total
	I	IA Total	IB Total	IC Total	ID Total	IE Total	IF Total	IG Total	IH Total	II Total	IJ Total
	J	JA Total	JB Total	JC Total	JD Total	JE Total	JF Total	JG Total	JH Total	JI Total	JJ Total

The information from this table is then converted into a probability matrix (Table 3) to show the probability that a block group starting within one classification will move into another classification.

Table 3. Probability Matrix.

		2010 State									
		A	B	C	D	E	F	G	H	I	J
2000 State	A	P00	P01	P02	P03	P04	P05	P06	P07	P08	P09
	B	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19
	C	P20	P21	P22	P23	P24	P25	P26	P27	P28	P29
	D	P30	P31	P32	P33	P34	P35	P36	P37	P38	P39
	E	P40	P41	P42	P43	P44	P45	P46	P47	P48	P49
	F	P50	P51	P52	P53	P54	P55	P56	P57	P58	P59
	G	P60	P61	P62	P63	P64	P65	P66	P67	P68	P69
	H	P70	P71	P72	P73	P74	P75	P76	P77	P78	P79
	I	P80	P81	P82	P83	P84	P85	P86	P87	P88	P89
	J	P90	P91	P92	P93	P94	P95	P96	P97	P98	P99

The probability matrix is created by calculating the relative frequency of probability. For this research, the following formula was used to compute the probability of each cell:

$$P_{ij} = \frac{f_{ij}}{\sum_{j=1}^{3} f_{ij}}$$

P_{ij} - Probability of a block group moving from one classification to another

f_{ij} - Observed number of transitions from state i to state *j*

4.6 Index of Dissimilarity

The index of dissimilarity provides a demographic measure of equality between two groups that are dispersed within measurable units of a geographic area. NEED MORE HERE

Comment[T3]: Can't wait to see it!

4.7 Spatial Directional Dispersion

Discuss Directional Dispersion. NEED MORE HERE

Comment[T4]: Ditto.

5.0 Data Sources

The research is conducted using data obtained from the U.S. Census Bureau using their American FactFinder tool (Anon.) The data consisted of block group level data for the Denver metropolitan five county area from

both the 2000 and 2010 census. Using the American Factfinder tool, census summary files containing racial data for each census block group were downloaded. The specific census summary file obtained is labeled as "QT-P6 Race Alone or in Combination and Hispanic" by the U.S. Census Bureau. The data contained counts and percentages of each race in each individual block group. The data from each block group for the 2000 census was compared to the data from the same block group's data for 2010.

The spatial data used to identify each block in the Denver County area was also obtained from the U.S. Census Bureau in the form of Tiger/line Shape-files as shown in Figure 2.

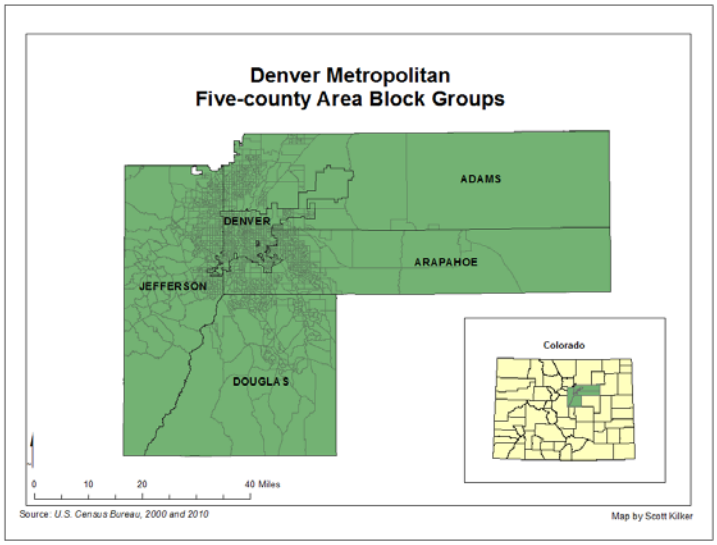


Figure 2. Denver County Census Blocks

5.1 ~~Meta and~~ Metadata

Data from each race is represented below. The tag '<RACE>' represents African-American, Asian, Latino and White in the tables below.

Table 4. Data used for Analysis.

Type of Data	Description	Unit of Measurement
BlockGroupID	Identifies unique block group	Primary Key
TotPop_2000	Count of entire population for the block group from 2000 census	Cardinal – count

<RACE>Pop_2000	Count of African-American (alone or combo) population in block group in 2000	Cardinal – count
TotPop_2010	Count of entire population for the block from 2010 census	Cardinal – count
<RACE>Pop_2010	Count of African-American (alone or combo) population in block group in 2010	Cardinal – count
Pct<RACE>_2000	Percentage of total block group classified as African-American (alone or combo) in 2000	Percentage – computed: (<RACE>Pop_2000/TotPop_2000)
Pct<RACE>_2010	Percentage of total block group classified as African-American (alone or combo) in 2010	Percentage – computed: (<RACE>Pop_2010/TotPop_2010)
Class<RACE>_2000	Classification of percentage of African-American in block group in 2000	Ordinal - A 0-9.99%, B 10-19.99%, C 20-29.99%, D 30-39.99%, E 40-49.99%, F 50-59.99%, G 60-69.99%, H 70-79.99%, I 80-89.99%, J 90-100%
Class<RACE>_2010	Classification of percentage of African-American in block group in 2010	Ordinal - A 0-9.99%, B 10-19.99%, C 20-29.99%, D 30-39.99%, E 40-49.99%, F 50-59.99%, G 60-69.99%, H 70-79.99%, I 80-89.99%, J 90-100%
Class<RACE>Chg_0010	Change of classification for African-American in the block group from 2000 to 2010	Nominal – concatenation of Class<RACE>_2000 and ClassBlack_2010

5.2 Assumptions

A critical assumption for the research is that the census block group identification keys that identify each individual block group have remained the same between the 2000 and 2010.

5.3 Scope and Limitations

One limitation of the data is that there is not a one-to-one correspondence between the all block groups used in the 2000 census and the 2010 census. There are 1,610 entries for blocks in Denver metropolitan five-county area for 2000. In 2010, there are 1,714 entries resulting in a difference of 104 entries.

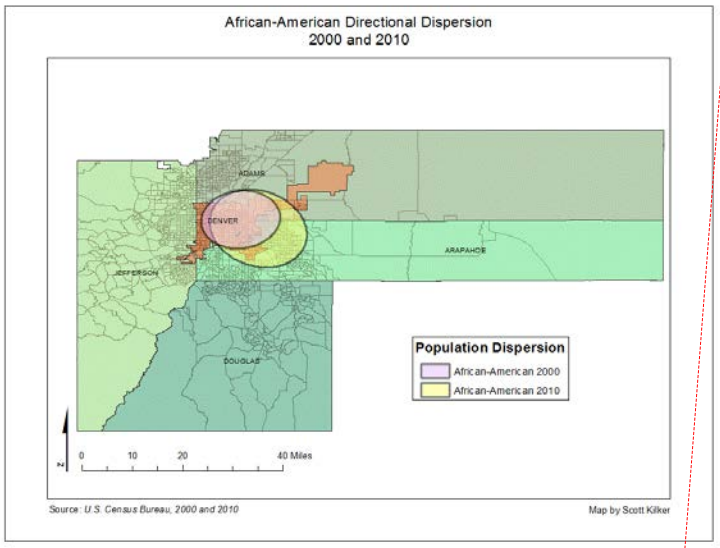
Any block groups in the 2000 census that did not have a corresponding block group in the 2010 census was not included in the analysis. For instance, new block groups defined in the Denver metropolitan five-county area for the 2010 census were not included. Additionally, if block groups have split for the 2010, they were not included in the analysis.

6.0 Results

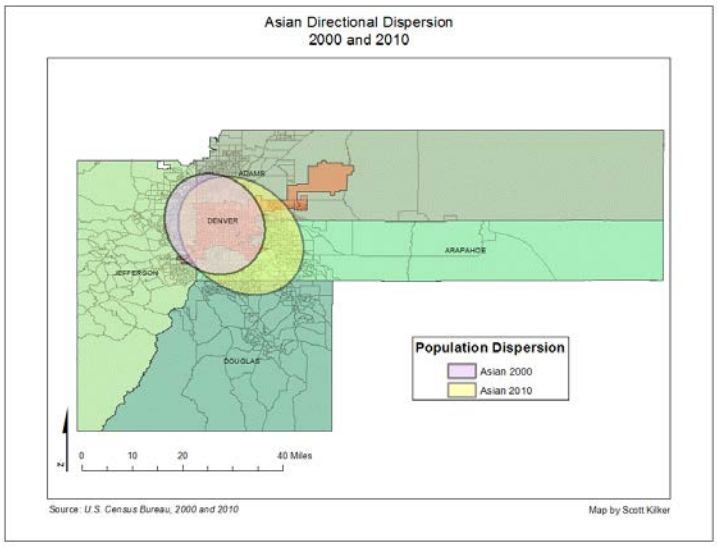
Overview of results

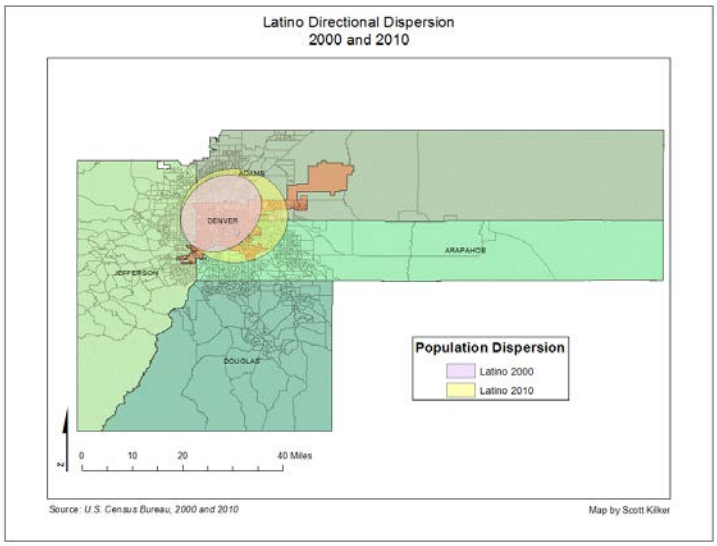
6.1 Spatial Dispersion of Races

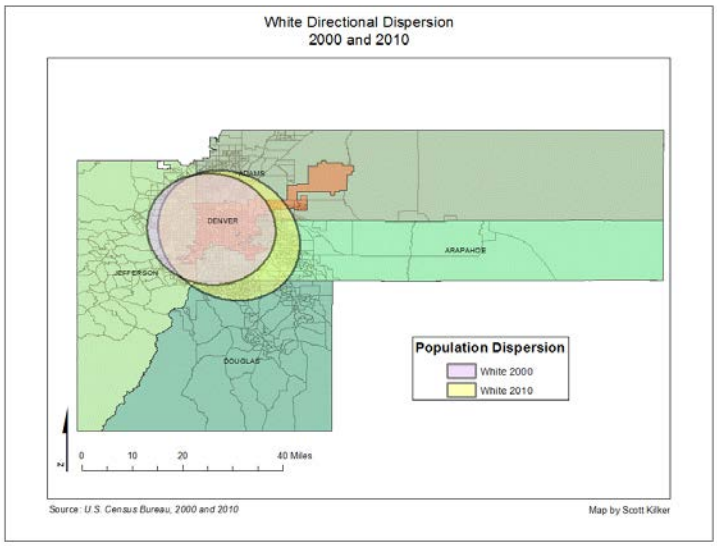
Overview of findings shown on maps below



Comment [T5]: Overlapping ellipses work if printing in color. If limited to B&W you might have issue.


Asian Directional Dispersion
2000 and 2010
ADAMS
DENVER
ARAPAHOE
JEFFERSON
DOUGLAS
Population Dispersion
Asian 2000
Asian 2010
0
10
20
40 Miles
N
Source: U.S. Census Bureau, 2000 and 2010
Map by Scott Kilker


Latino Directional Dispersion
2000 and 2010
ADAMS
DENVER
ARAPAHOE
JEFFERSON
DOUGLAS
Population Dispersion
Latino 2000
Latino 2010
0
10
20
40 Miles
N
Source: U.S. Census Bureau, 2000 and 2010
Map by Scott Kilker



6.2 Probability of Changing Classification

The probabilities for each XXXXXXXX add description

Black

		2010									
		A	B	C	D	E	F	G	H	I	J
2000	A	96.90%	3.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	B	17.91%	58.21%	23.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	C	10.53%	36.84%	47.37%	5.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	D	11.11%	5.56%	44.44%	33.33%	5.56%	0.00%	0.00%	0.00%	0.00%	0.00%
	E	0.00%	10.00%	20.00%	70.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	F	0.00%	0.00%	7.69%	61.54%	30.77%	0.00%	0.00%	0.00%	0.00%	0.00%
	G	0.00%	0.00%	0.00%	0.00%	71.43%	28.57%	0.00%	0.00%	0.00%	0.00%

H	0.00%	0.00%	0.00%	0.00%	18.18%	45.45%	36.36%	0.00%	0.00%	0.00%
I	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%
J	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Increase	49	39.8374
Decrease	74	60.1626

Asian

		2010									
		A	B	C	D	E	F	G	H	I	J
2000	A	98.75%	1.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	B	54.17%	41.67%	4.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	C	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	D	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	E	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	F	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	G	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	H	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	I	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	J	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Increase	15	53.57143
Decrease	13	46.42857

Latino

		2010									
		A	B	C	D	E	F	G	H	I	J
2000	A	88.13%	10.51%	1.36%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	B	20.38%	42.04%	35.03%	2.55%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	C	2.33%	26.74%	52.33%	18.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	D	2.00%	18.00%	44.00%	34.00%	2.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	E	3.23%	12.90%	35.48%	45.16%	3.23%	0.00%	0.00%	0.00%	0.00%	0.00%
	F	0.00%	7.69%	23.08%	69.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	G	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	H	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	I	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	J	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Increase	168	55.81395
Decrease	133	44.18605

White

		2010									
		A	B	C	D	E	F	G	H	I	J
2000	A	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	B	0.00%	7.14%	35.71%	28.57%	28.57%	0.00%	0.00%	0.00%	0.00%	0.00%
	C	0.00%	0.00%	0.00%	31.58%	52.63%	15.79%	0.00%	0.00%	0.00%	0.00%
	D	0.00%	0.00%	0.00%	5.00%	35.00%	35.00%	20.00%	5.00%	0.00%	0.00%
	E	0.00%	0.00%	0.00%	0.00%	8.70%	52.17%	34.78%	0.00%	4.35%	0.00%
	F	0.00%	0.00%	0.00%	2.99%	8.96%	28.36%	41.79%	10.45%	5.97%	1.49%
	G	0.00%	0.00%	0.00%	0.00%	1.52%	16.67%	43.94%	21.21%	13.64%	3.03%
	H	0.00%	0.00%	0.00%	0.00%	0.74%	7.35%	26.47%	41.18%	24.26%	0.00%
	I	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.60%	24.40%	55.60%	14.40%
	J	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.27%	14.88%	83.85%

Increase	83	26.43312
Decrease	231	73.56688

6.3 Simulation of Change

Overview of Simulation results

African-American

Changed	76
Not Changed	1613
	1689
AA	1313
BB	203

CC	96
DC	47
ED	17
FD	7
GE	5
Total	1688

Asian

Changed	101
Not Changed	1587
	1688

AA	1581
BA	100
CC	7
EA	1
Total	1689

Latino

Changed	93
Not Changed	1616

AA	1159
BB	272
BC	2
CC	185
DC	84
ED	5
FD	2
Total	1709

White

Changed	205
Not Changed	1484
	1689

BC	1
CE	6
DE	9
DF	6
EF	64
FG	119
GG	179
HH	262
II	400
JJ	643

7.0 Conclusion

Write conclusion

8.0 Further Research

Describe potential further research

References

Anon. "American FactFinder." http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml.

Burgess, Ernest W. 1928. "Residential Segregation in American Cities." *Annals of the American Academy of Political and Social Science* 140 (November 1): 105-115.

Cortese, Charles F., R. Frank Falk, and Jack K. Cohen. 1976. "Further Considerations on the Methodological Analysis of Segregation Indices." *American Sociological Review* 41 (4): 630-637. doi:10.2307/2094840.

Dougherty, Conor. 2008. "The End of White Flight." *Wall Street Journal*, July 20.

Duncan, Otis Dudley, and Beverly Duncan. 1955. "A Methodological Analysis of Segregation Indexes." *American Sociological Review* 20 (2) (April 1): 210-217. doi:10.2307/2088328.

Goering, John M. 1978. "Neighborhood Tipping and Racial Transition: A Review of Social Science Evidence." *Journal of the American Institute of Planners* 44 (January): 68-78. doi:10.1080/01944367808976879.

Massey, Douglas S. 1995. "Getting Away with Murder: Segregation and Violent Crime in Urban America." *University of Pennsylvania Law Review* 143 (5) (May 1): 1203-1232. doi:10.2307/3312474.

Massey, Douglas S., and Nancy A. Denton. 1989. "Hypersegregation in U.S. Metropolitan Areas: Black and Hispanic Segregation Along Five Dimensions." *Demography* 26 (3): 373-391. doi:10.2307/2061599.

———. 1993. *American Apartheid: Segregation and the Making of the Underclass*. Harvard University Press.

Montello, Daniel R., and Paul Sutton. 2006. *An Introduction to Scientific Research Methods in Geography*. 1st ed. Sage Publications, Inc.

Orfield, Gary, and Chungmei Lee. 2005. *Why Segregation Matters: Poverty and Educational Inequality*. Harvard Education Publishing Group, 8 Story Street, 1st Floor, Cambridge, MA 02138.

Ottensmann, John R. 1995. "Requiem for the Tipping-Point Hypothesis." *Journal of Planning Literature* 10 (2) (November 1): 131 -141. doi:10.1177/088541229501000201.

Spence, Ian. 1983. "Monte Carlo Simulation Studies." *Applied Psychological Measurement* 7 (4): 405 -425. doi:10.1177/014662168300700403.

U.S. Census Bureau., and John Iceland. 2002. *Racial and Ethnic Residential Segregation in the United States, 1980-2000 : Census 2000 Special Reports*.