MAPPING OF SAME-SEX COUPLES; MINNESOTA

By Tyler Dardis

RESEARCH QUESTIONS

- 1) How does each county vary from the state average of same-sex couples?
- 2) What are the hot and cold spots of same-sex couples?
- 3) Do same-sex couples cluster in certain parts of the state?
- 4) Are there any movement trends with same-sex couples?

- Using 2009-2017 data, movement and change of same-sex populations will be observed.

LITERATURE REVIEW

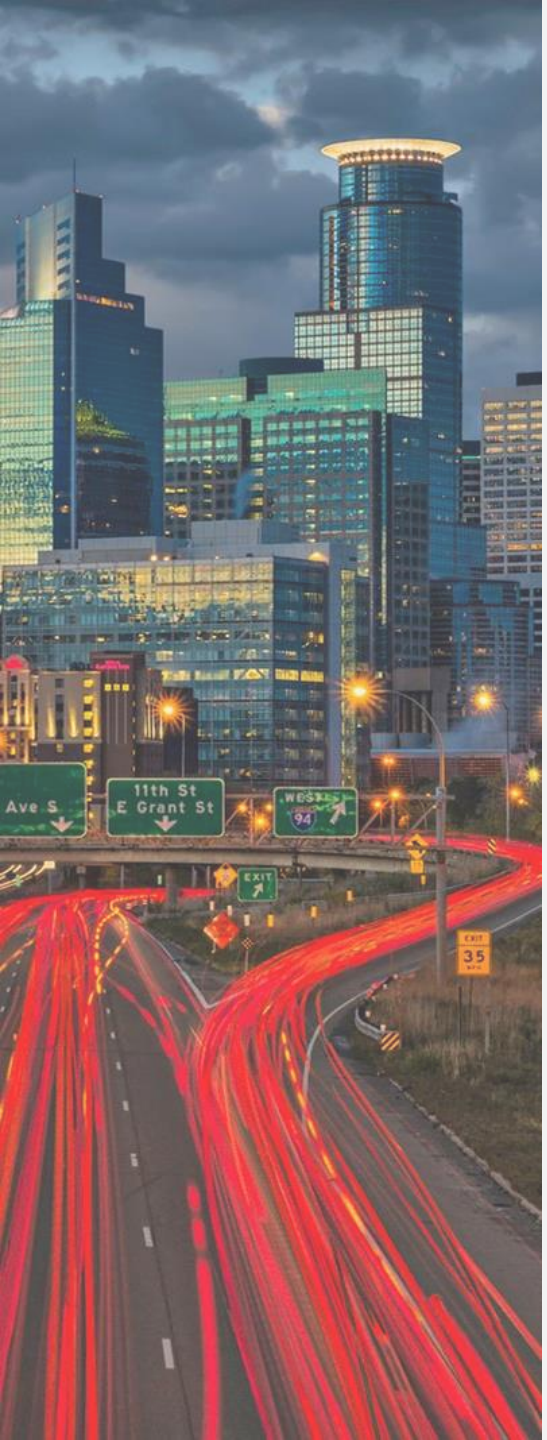
"Mapping same-sex couple family households in Australia" By Andrew Gorman-Murray, et al.

- Used Australian Census Data (2006) to map out same-sex couples. Used *Location Quotient (LQ)* to spot areas of high or low rates of same-sex couples; using the average % of same-sex couples nationwide (.595%)
  - Stressed the importance of having an accurate and representative denominator for the LQ equation
- States how data on sexual orientation is rapidly growing and improving; but still under represented
- Looked at both small and large scale (national, and urban settings)
- Found inner cities have greatest concentration of same-sex couples; with the highest LQ of 12 for Inner Sydney.

LITERATURE REVIEW

"Mapping the Lesbian, Gay, Bisexual and Transgender Community in Atlanta" By Zachary Adriaenssens

- Motivated by lack of research of LGBT populations in the south; even though Atlanta rivals LA; etc., as a "gay mecca"
- Looks at same-sex populations, LGBT centers (gay bars/clubs, activist sites, etc.), and LGBT policies and their effects and relationships with each other
  - Obstacles because of visibility of certain variables; "closeted", mostly white populations
- Literature Review:
- Use of "gay guides", publications, magazines extensively to location and map out LGBT locations
- Still concentration around urban cores, but a trend towards outward movement into suburbs
  - Economic reasons; clash against idea of gay identity correlated with the *city*.



HYPOTHESES

- Urban centers such as Minneapolis/Metro area will have a concentration of same-sex couples, with low to no same-sex couples in rural county subdivisions of the state.
  - Because of the close proximity of the metro area, and concentration of people (3 million+ of the 5 million people in Minnesota), clustering will occur in this area.
- Same-sex couples will spread out, and increase as the years go on.

METHODS

- Used *Mean Center* and *Central Feature* to see movement and distribution of same-sex couples
- Found and mapped *Location Quotients* to see countries that are above or below the state average of same-sex (SS) couples
  - **LQ = # of unmarried SS couples in county division/# of unmarried couples in county division**

    total # of unmarried SS couples in state/total # of unmarried couples in state
- Conducted *Hot Spot* analysis
- Conducted *Moran's spatial autocorrelation* to see if same-sex couples cluster

DATA

- Census TIGER/Line shapefiles of county subdivisions of the state of Minnesota
  - 2010-2017; used 2010 boundaries for 2009 data
- Census table of unmarried couples in the state of Minnesota at county subdivision spatial scale
  - 2009-2017 American Community Survey (ACS) 5-Year Estimates
  - Included male household-female partner, male household-male partner, female household-male partner, and female household-female partner
  - Modified the CSV file with MS Excel to add "Total Same-Sex Couples", "Total Opposite-Sex Couples", and the location quotient calculations

United States™ Census Bureau

RESULTS

Moran's Spatial Autocorrelation

YEAR	MORAN'S I	Z-SCORE	P-VALUE
2009	0.1	6.3	0
2010	0.18	8.05	0
2011	0.073	5.45	0
2012	0.067	5.26	0
2013	0.07	5.06	0
2014	0.071	4.89	0
2015	0.074	5.11	0
2016	0.074	6.37	0
2017	0.079	6.47	0

All Moran values close to 0, Z-score values all above 5, and P-values all 0

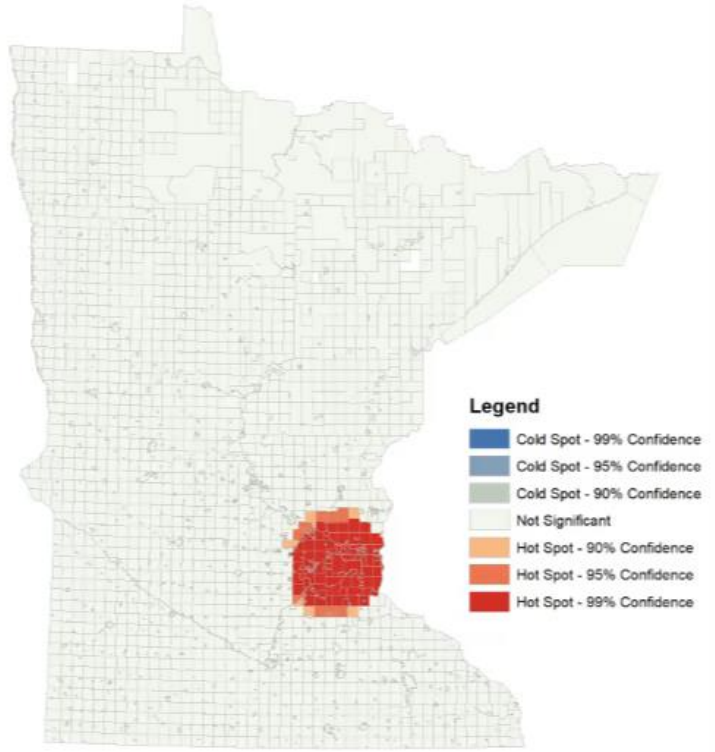
Location Quotient Denominators

YEAR	% SAME SEX COUPLES STATE WIDE
2009	9.97
2010	9.2
2011	8.57
2012	8.262
2013	8.2
2014	7.4
2015	6.5
2016	5.6
2017	4.7

Legalization

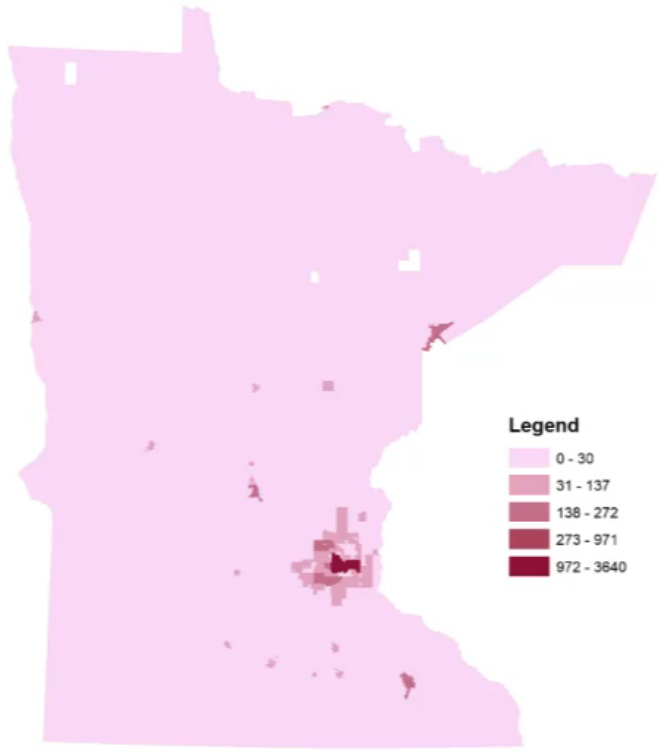
Same-sex couple decrease after legalization of gay marriage

Same-Sex Couples Hot-Spot Analysis; 2009



Map Produced by Tyler Dardis

Number of Same-Sex Couples per County Subdivision; 2009



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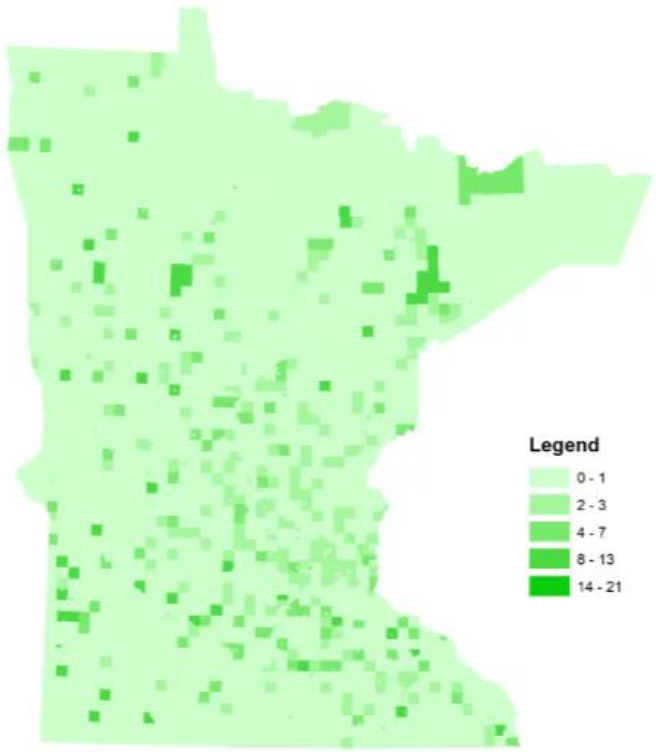
Same-Sex Couple Location Quotients; 2010



***2009 outlier data**

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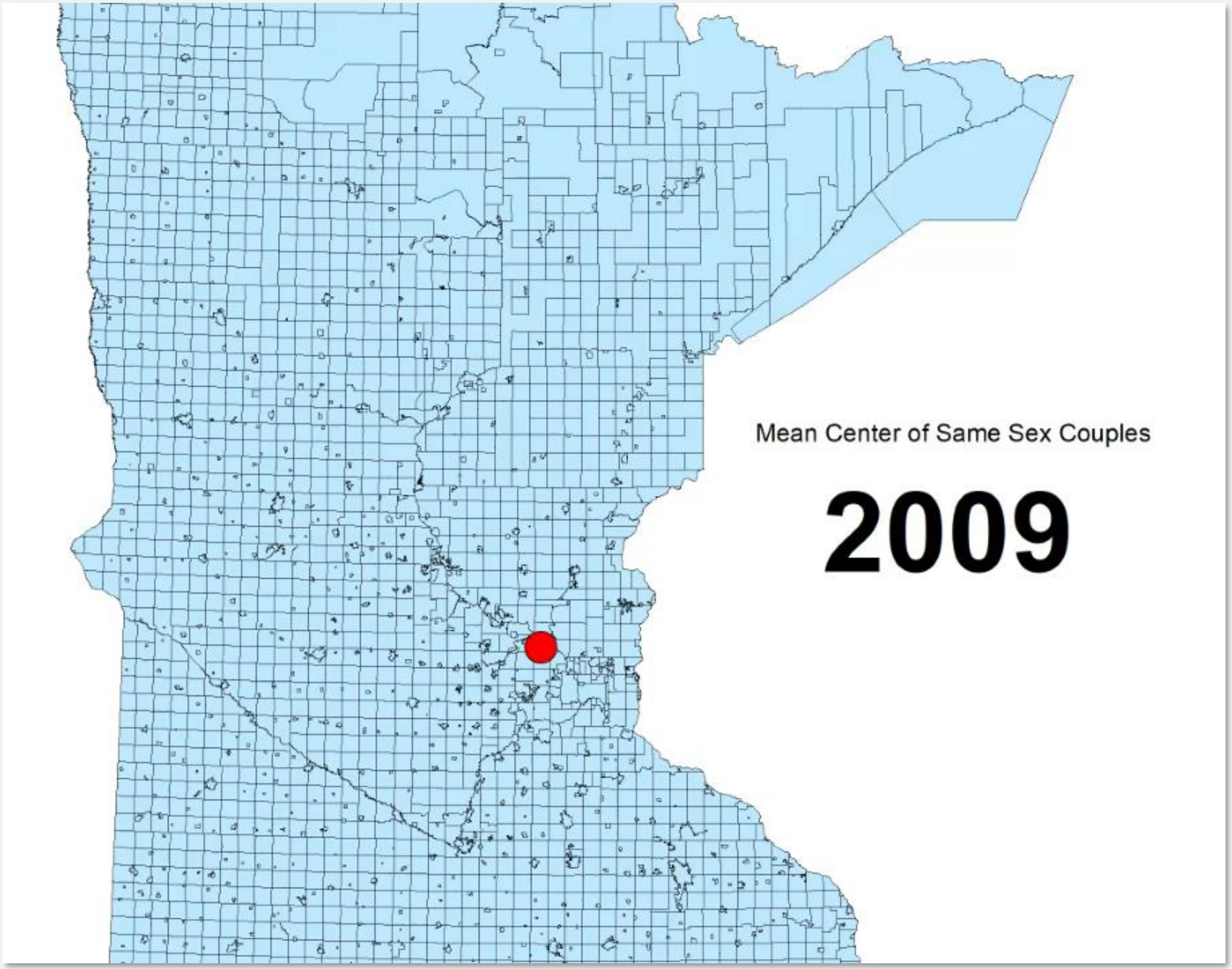
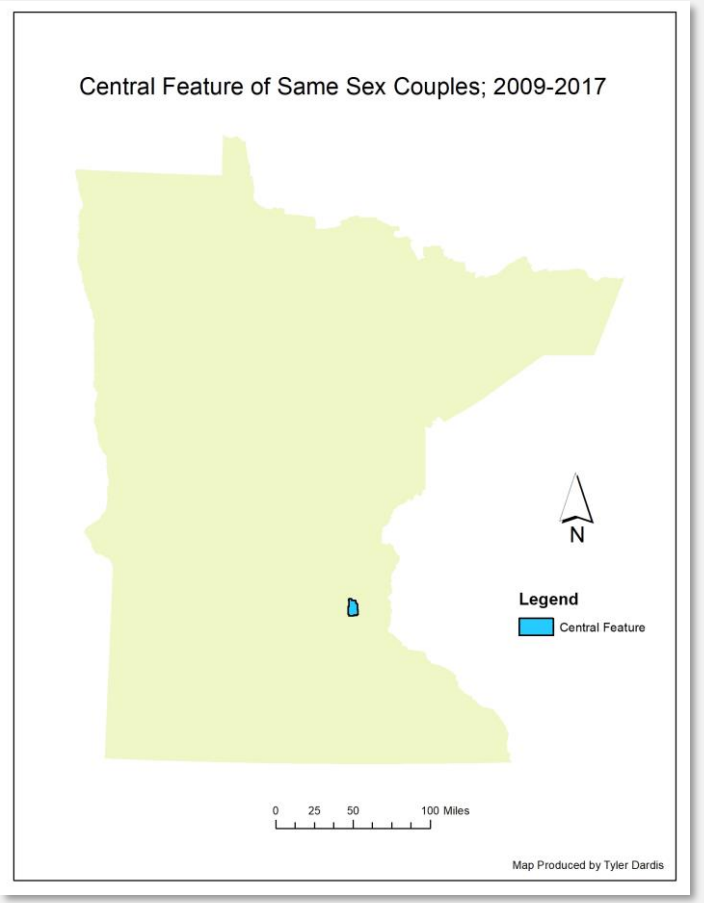

Mean Center of Same Sex Couples
2009


Central Feature of Same Sex Couples; 2009-2017
N
Legend
Central Feature
0 25 50 100 Miles
Map Produced by Tyler Dardis

CONCLUSION

- Due to z-values reaching over critical values (1.96), and Moran's I close to 0 (clustered), the null hypothesis of randomness can be rejected; same-sex couples appear to be clustered
- Significant hot spot directly over the metro area, expanding and contracting over the years; absence of any other statistically significant hot spot or cold spot
- Spots that have the highest location quotient (higher than state same-sex couple %) values appear to be rural, scattered county divisions
- Movement and centrality seem to be over the Minneapolis area, with slight pull towards the core of the metro, but in recent years there has been a recession
- Couples are getting married now that gay marriage is legalized?
- **Room for improvement; lack of quality LGBT geospatial data**

REFERENCES

Literature Review

Adriaenssens, Zachary. "Mapping the Lesbian, Gay, Bisexual and Transgender Community in Atlanta." *Applied Research Paper*, 2011.

Gorman-Murray, Andrew, et al. "Mapping Same-Sex Couple Family Households in Australia." *Journal of Maps*, vol. 6, no. 1, 2010, pp. 382–392., doi:10.4113/jom.2010.1094.

Data

US Census American Fact Finder; Table B11009: Unmarried-Partner Households by Sex of Partner. 2009-2017.

US Census TIGER/Line Shapefiles; Minnesota's County Subdivision Boundaries. 2010-2017.