Everyday Civic Participation: Sociospatial Variation in Non-Emergency Calls for Service in St. Louis, MO

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Introduction

Modern cities are collecting unsurpassed amounts of data. Of which, one of the largest sources is non-emergency service requests. Similar to the 311 systems of many other cities, the City of St. Louis operates the Citizens' Service Bureau (CSB). From potholes to graffiti, the CSB forwards requests to appropriate departments. Over one million requests have been made in the last ten years.

Little is known about whether these data accurately reflect problems in the community, or if they are influenced by similar phenomena as the most well studied form of civic participation: voting.

Data & Methods

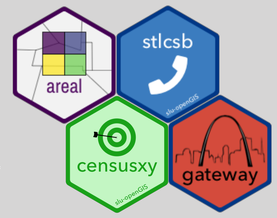
A voter file indicating voting history and registered address was obtained from a 3rd party company and geocoded. Multiple elections were chosen to account for the difference in types of elections (General, Primary and Non-Presidential Primary)

CSB calls in the 6 months surrounding (3 before, 3 after) the election date were obtained from the City of St. Louis.

Demographic data were obtained from American Community Survey 5-Year Estimates ending in the year of each election.

Data were aggregated to grid squares and appropriate OLS and spatial lag models were fit for each election.

Software



This work is supported by the development of several R packages.

areal - Provides methods for areal weighted interpolation of incongruent polygons

censusxy - Provides the ability to geocode R data.frames using the Census Bureau geocoder

stlcsb - Provides access to and methods for working with Citizens' Service Bureau request data

gateway - Provides access to geospatial assets for mapping in the City of St. Louis

These packages may serve as a framework for similar research in other cities.

Results

2014 General Election

Variables	Main Effect (OLS)	Full Model (OLS)	Full Model (Spatial Lag)
Voter Turnout	4.071 (0.447)***	4.479 (0.466)***	4.336 (0.458)***
Total Population	-	-0.006 (0.006)	-0.012 (0.007)
Non-White	-	0.637 (0.386)	0.355 (0.403)
Rate of Poverty	-	-0.293 (0.806)	-0.180 (0.783)
High-school	-	1.957 (0.976)*	1.938 (0.946)*
Spatial Lag Term	-	-	0.040 (0.022)
Constant	51.549 (11.421)***	-31.223 (31.072)	-38.814 (30.388)
F-statistic	82.976***	23.066***	-
Adjusted R^2	0.286	0.350	0.387
Spatial Pseudo R^2	-	-	0.373
Breusch-Pagan	208.778***	308.167***	-
Diagnostic for Spatial Dependence	6.876**	4.786*	-

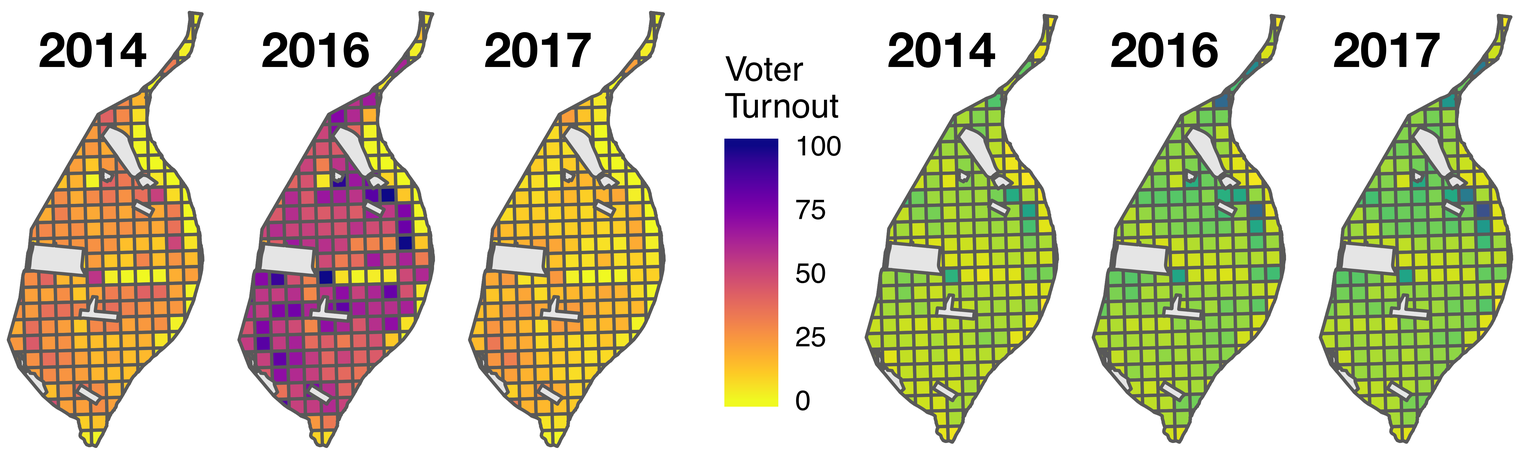
*** p<.05 ** p<.01 *** p<.001**

2016 Primary Election

Variables	Main Effect (OLS)	Full Model (OLS)	Full Model (Spatial Lag)
Voter Turnout	2.138 (0.328)***	2.806 (0.347)***	2.578 (0.345)***
Total Population	-	-0.018 (0.008)*	-0.026 (0.008)**
Non-White	-	0.917 (0.479)	0.558 (0.483)
Rate of Poverty	-	-0.598 (1.042)	-0.638 (0.994)
High-school	-	2.643 (1.237)*	2.394 (1.185)*
Spatial Lag Term	-	-	0.050 (0.022)*
Constant	89.116 (16.868)***	-20.038 (39.634)	-28.823 (38.002)
F-statistic	42.498***	16.427***	-
Adjusted R^2	0.168	0.273	0.336
Spatial Pseudo R^2	-	-	0.300
Breusch-Pagan	0.260	127.669***	-
Diagnostic for Spatial Dependence	12.782***	9.792**	-

2017 Primary Election

Variables	Main Effect (OLS)	Full Model (OLS)	Full Model (Spatial Lag)
Voter Turnout	4.947 (0.848)***	6.631 (0.861)***	6.013 (0.816)***
Total Population	-	-0.001 (0.007)	-0.019 (0.008)*
Non-White	-	1.345 (0.461)**	0.711 (0.452)
Rate of Poverty	-	0.111 (1.101)	-0.395 (1.033)
High-school	-	1.454 (1.218)	1.399 (1.137)
Spatial Lag Term	-	-	0.088 (0.019)***
Constant	130.052 (13.021)***	-11.169 (36.539)	-29.886 (34.356)
F-statistic	34.044***	14.912	-
Adjusted R^2	0.139	0.253	0.346
Spatial Pseudo R^2	-	-	0.313
Breusch-Pagan	3.160	105.100***	-
Diagnostic for Spatial Dependence	26.331***	17.514***	-



Discussion

Increasingly, crowdsourced data is being used to allocate resources in Cities like St. Louis. It will become imperative that we understand how closely these data relate to the actual incidence of problems in the community, or we risk allocating resources in an unfair manner.

These results suggest a strong statistical relationship between voter turnout and CSB call density. This was especially true in elections with lower overall turnout. These everyday forms of participation may be different than rites like voting, however, they are likely affected by similar social and cultural influences. It is also possible that the barriers to participation are similar. Knowledge of and access to these systems will be important to the fairness of them.

Future Directions

A manuscript of this research is being prepared. Additionally, other covariates such as crime and vacancy are being investigated.

Given the paucity of information about these new and increasing data, this work will need to be replicated in other cities. We predict that these systems will increase in adoption as cities look to technological means to cut costs or better service their communities.

Non-emergency service request data is promising as a tool to observe many other social and spatial local phenomena in the future as well.

Find replication materials at: https://osf.io/6ycrq/

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