

Analyzing the impact of low voter turnout on the outcome of the 2019 Canadian Federal Election

A multi-level regression and post-stratification analysis

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Abstract

My abstract goes here. Keywords: MRP, elections, voter turnout, surveys.

Code supporting this analysis can be found at: <https://github.com/>

Introduction

For most advanced democracies across the world, many citizens do not participate in the democratic process, and those who turn out to vote are usually unrepresentative of the eligible voting population (Fowler, 2013). While many argue that the right to abstention is equally important as the ability to vote, low voter turnout can lead to unequal political representation across the population, often for young voters of lower socioeconomic status (Uppal and LaRochelle-Côté, 2012).

In Canada, voter turnout rates range from 60 to 70% , however, this has been on decline in the last 20 years (Rubenson et al., 2007). Low voter turnout most commonly occurs among youth, and their low participation is believed to drive party bias towards the Conservative party in past federal elections (Grenier, 2019).

This analysis will examine whether levels of voter turnout have implications in Canadian election results. To do so, we employ a multi-level regression and post-stratification (MRP) technique to estimate the probability of voting for each of the major 6 parties based for a population representative to Canada's demographics. Two data sets will be used to first derive models that estimate voter intent based on demographic characteristics, then to predict the election outcome of voters on a post-stratified census dataset.

Methods

This analysis uses polling survey data from the 2019 Canadian Election Survey (Stephenson et al., 2020), accessed through the `cesR` R package (Hodgetts and Alexander, 2020). We then employ a post-stratification technique to estimate the proportion of voters for each candidate at a national scale to determine the popular vote, then at the provincial scale to determine the outcome of the votes. All data cleaning, modeling, and calculations are carried out using R statistical language (R Core Team, 2020) and the `tidyverse` and `lme4` packages (Wickham et al., 2019; Bates et al., 2015). The model specifics and post-stratification calculations are described in subsequent sections.

Data

Here I will describe the data sources used.

Variables and data cleaning

To aggregate the variables into meaningful groups and to ensure that the survey data corresponds to census data, each variable was reclassified into new categories. We chose the factors of sex, age, province, and education level. Age was aggregated into 4 groups: 18-29, 30-44, 45-60, and 60+ and subjects under 18 were filtered out. Education level was categorized into 4 groups: less than high school, high school graduate, some college, and college graduate.

Model Specifics

Here I will discuss the model, and provide the equations.

Post-Stratification

Poststratification is a method frequently used to aggregate survey-level estimates to the population and correct for non-probability sampling (Little, 1993; Wang et al., 2015). With poststratification, estimation of the response variable arises from cell-level estimates that are partitioned into different combinations of variables, which are then aggregated up to a population level by weighting each cell by its relative proportion in the population (Wang et al., 2015). In our analysis, we use post-stratification to estimate the proportion of voters that will vote for each of the 6 major federal parties in Canada. With the response variable, \hat{y}^{PS} representing the national proportion of voters for each candidate, the post-stratification estimate is defined by

$$\hat{y}^{PS} = \frac{\sum_{j=1}^J N_j \hat{y}_j}{\sum_{j=1}^J N_j}$$

where \hat{y}_j is the estimated proportion of votes for a given party within cell j , and N_j is the size of the j^{th} cell in the population.

Results

Here I will present the results of my analysis.

Table 1: Estimates of national proportion of voters for 2019 Canadian Election

Party	Proportion
Liberal	0.263
Conservative	0.262
NDP	0.117
Green	0.0776
People's Party	0.0191

Our post-stratification calculations estimate that Liberals will receive 0.26 of the federal vote (Table 1).

Discussion

Here I will discuss and provide interpretation of the results, then talk about weaknesses and next steps.

Weaknesses

Next steps

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