# The relationship between socioeconomic status and lottery rollover effects in Toronto

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## Does an increasing jackpot shift lottery purchasing differently by SES, and does this spill over to other lottery games?

### Background

Social disadvantage in various forms is a risk factor for gambling harm and can be studies using geospatial methods (Sulkunen et al., 2021; Fu et al., 2021).

In a lottery with a progressive jackpot, the roll-over effect refers to the increase in revenue as the jackpot accumulates (DeBoer, 1990; Forrest et al., 2002; Shapira & Venezia, 1992).

A previous geospatial study in Connecticut investigated how this fluctuation varied by neighborhood SES: higher SES zipcodes showed a greater increase in sales at high jackpots (Oster, 2004).

The rollover effect also provides some insight into a second question of how sales of other gambling products (e.g. fixed prize lotteries, available from the same stores) are affected as progressive lottery sales vary. This effect, of substitution vs complementarity, has not been examined in relation to neighborhood SES.

### Methods

We used data from 2012-2015 from 3 progressive-prize lotteries in Toronto (Lotto 649, Lotto Max, and Lottario).

Three sets of mixed-effects linear regression models were used to estimate the effects of:

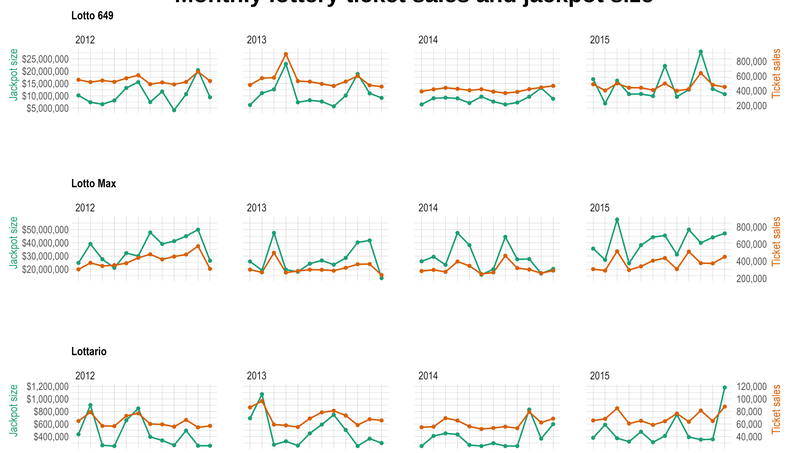
- Jackpot size upon progressive-prize lottery sales
- Jackpot size and SES upon progressive-prize lottery sales
- Jackpot size / progressive-prize sales and SES upon fixed-prize lottery sales

List of nuisance variables in the models include year, month, day of week, statutory holidays and pay days.

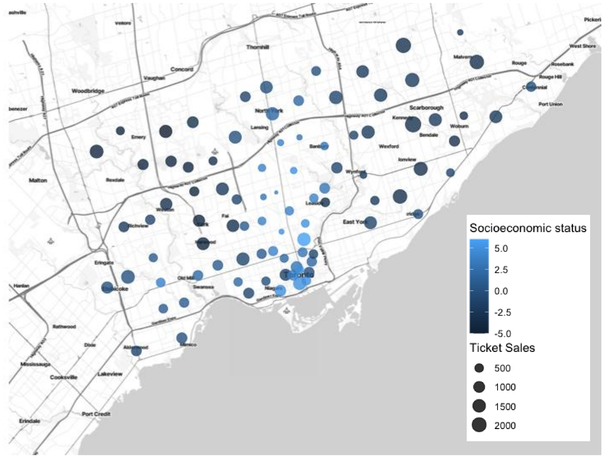
We are also interested in the interaction effects between the variables of interest on lottery product sales.

### Results

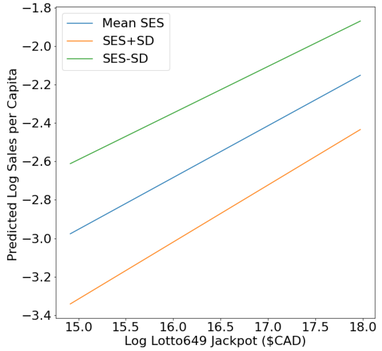
**Monthly lottery ticket sales and jackpot size**



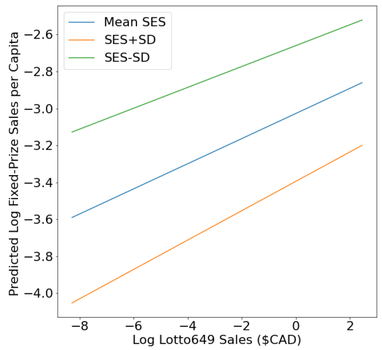

**Socioeconomic status and per capital sales**




**Jackpot size and sales per capita as function of SES**




**Progressive-prize sales and fixed-prize lottery sales as function of SES**




**Mixed-effects regression coefficients (Lotto 649)**

| | | Jackpot size/ lottery sales | SES | Interaction effect |
|---|---|---|---|---|
| **Model 1** | Sales ~ Jackpot size | β = 0.27, $p < 0.001$ | NA | NA |
| **Model 2** | Sales ~ SES and Jackpot size | β = 0.27, $p < 0.001$ | β = -0.28, $p < 0.001$ | β = 0.01, $p < 0.001$ |
| **Model 3** | Fixed sales ~ SES and progressive sales | β = 0.07, $p < 0.001$ | β = -0.13, $p < 0.001$ | β = 0.004, $p < 0.001$ |

**Model one** showed that jackpot size and sales were positive and significant across all three progressive-prize lottery games.
**Model two** showed that sales per capita tended to be higher in neighbourhoods with lower SES.
**Model three** showed that sales of fixed-prize lotteries were positively related to sales of progressive-prize lotteries supporting complementarity. Further, fixed-prize sales were more affected by progressive-prize sales in higher SES neighbourhoods.