Tutorial 07, Hilary Term

Research Methods for Political Science (PO3600)

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Outline

1. Questions?
2. Regression Diagnostics
3. Discussion of Homework # 3

Regression Diagnostics

Multicollinearity: If (at least) two independent variables share a linear (or almost linear) relationship, we will very likely observe multicollinearity among them.

Autocorrelation: Usually refers to values taken from different points in time (temporal autocorrelation) or from places close to each other (spatial autocorrelation). Although we might have two different measurements, the data might not be independent of each other.

Question 2 Run a linear regression with `fttrump` as the DV and four IVs (e.g. `compromise`, `ftsci`, `equalpay`, `gender`).

General question: How do we proceed before running the regression?

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General question: How do we proceed before running the regression?

1. Check codebook
2. Create descriptive statistics
3. Recode missing values (into new variables)

Question 2 Run and interpret the regression model (especially the unstandardised beta coefficients)

Create an interaction term (e.g. between `gender` and `equalpay`)

Interpreting interaction of two dummies

Base model: $y = a + b_1 * x_1 + b_2 * x_2$

If there were no interaction term, b_1 would be interpreted the unique effect of b_1 on y holding b_2 constant.

Basel model + interaction: $y = a + b_1 x_1 + b_2 x_2 + b_3 \times (x_1 \times x_2)$

Adding an interaction term to a model drastically changes the interpretation of all of the coefficients. The interaction means that the effect of b_1 on y is different for different values of b_2. The effect of b_1 on y is not limited to b_1, but also depends on the values of b_2 and x_2. The unique effect of b_1 is represented by everything that is multiplied by b_1 in the model: x_2 and $x_1 * x_2$. b_1 is now interpreted as the unique effect of Bacteria on Height only when $x_2 = 0$.

Useful Resources

- Code to replicate analysis in SPSS:
  https://github.com/stefan-mueller/research-methods/blob/master/code/ht06/code_ht_07.sps
- A. F. Zuur et al. (2010). "A Protocol for Data Exploration to Avoid Common Statistical Problems". In: *Methods in Ecology and Evolution* 1.1, pp. 3–14