Government 10: Quantitative Political Analysis

Sean Westwood

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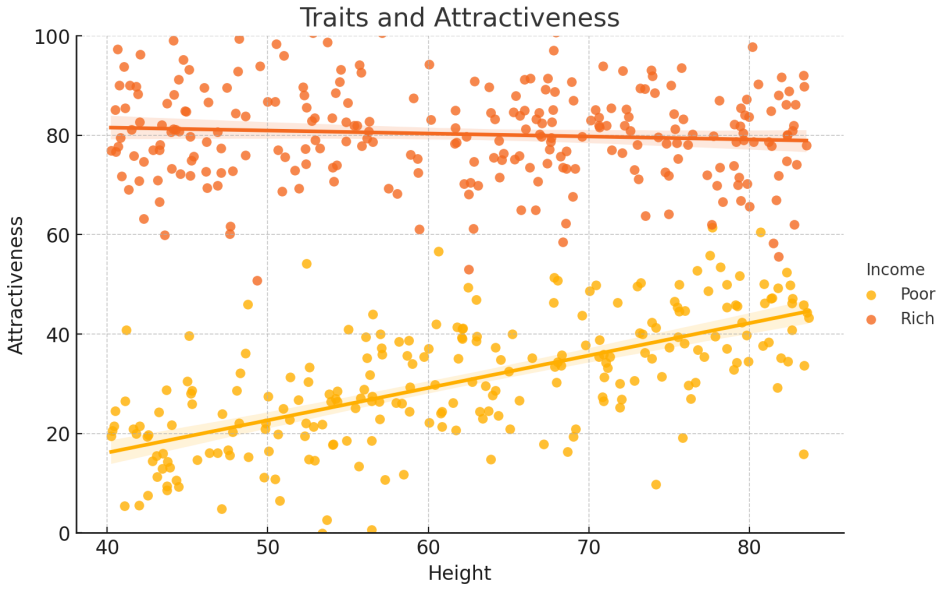
  - There is a relationship between both height and income, and attractiveness, but the effects of our predictors are not consistent.
  - Observation: tall poor people are seen as just as attractive as short rich people.

Visualizing this relationship



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- Is the relationship between educational attainment and political participation different for men and women?
- Does the effect of perceived national security threats on immigration attitudes differ among liberals and conservatives?

What is an interaction term?

An interaction term in regression captures the combined effect of two (or more) variables on the outcome, beyond their individual effects.

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Now let's account for the interaction:

$$\text{VoterSupport} = \alpha + \beta_1 \text{EconPerf} + \beta_2 \text{RegimeType} + \beta_3 (\text{EconPerf} \times \text{RegimeType}) + \mu$$

The components of an interaction model

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- β_3 is the coefficient for the interaction term between economic performance and regime type. This term shows how the effect of economic performance on voter support differs in authoritarian regimes compared to democratic ones.

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- μ represents the error term

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Interpretation Tips: - A positive interaction term means the effect of one variable increases when the other variable increases. - A negative interaction term means the effect of one variable decreases as the other variable increases. - Example: If β_3 is positive, higher education might increase income more for men than for women (or vice versa if negative).

Educational attainment, political participation and gender

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$$\text{Expected Political Participation} = 10.01 + 3.22 \times 15 + (-1.87) \times 1 + 1.5 \times (15 \times 1) = 78.94$$

National security threats, immigration attitudes, and ideology

Does the effect of perceived national security threats on immigration attitudes differ among liberals and conservatives?

$$\text{Expected Immigration Attitude} = \alpha + \beta_1 \times \text{NationalSecurityThreat} + \beta_2 \times \text{PoliticalIdeology} +$$

$$\beta_3 \times (\text{NationalSecurityThreat} \times \text{PoliticalIdeology})$$

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What is the expected immigration attitudes for liberals where national security threat is 10

$$\text{Expected Immigration Attitude} = 20 + 1.5 \times 10 - 5 + 2 \times (10 \times 1) = 50$$

How to run a model with an interaction term in R

Running a model with interaction between Education and Gender

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model <- lm(Income ~ Education * Gender, data = dataset)

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- Example: How does media consumption influence political beliefs?
- Importance: Drives the research by clarifying the issue, variables, and possible directions of investigation.

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- Purpose: To create a foundation for empirical testing and establish expectations for research outcomes.

How Research Questions and Hypotheses Work Together in Social Science

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- **Regression Model**:

$$\text{Voter Turnout} = \alpha + \beta_1 \times \text{Community Engagement} + \beta_2 \times \text{Education} + \beta_3 \times \text{Income}$$

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$$\text{Trust in Government} = \alpha + \beta_1 \times \text{Economic Inequality} + \beta_2 \times \text{Education} + \beta_3 \times \text{Political Ideol}$$

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$$\text{Productivity} = \alpha + \beta_1 \times \text{Remote Work} + \beta_2 \times \text{Experience} + \beta_3 \times \text{Job Role}$$

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- **Regression Model**:

$$\text{Political Ideology} = \alpha + \beta_1 \times \text{Education Level} + \beta_2 \times \text{Income} + \beta_3 \times \text{Age}$$