Tutorial 07, Michaelmas Term

Research Methods for Political Science (PO3600)

Stefan Müller

28 November 2017

Trinity College Dublin
http://muellerstefan.net/research-methods

Session Outline

1. Questions asked online
2. Gamma and lambda
3. Cross-tables in SPSS
4. Measurement error
5. Research proposal

Questions asked Online

1. Difference between confidence intervals and t-test? When shall we use which approach?
2. Calculating lambda and gamma by hand?
3. How can I create a dataset with multiple observations easily to check my results?

Feel free to use this service: https://tinyurl.com/questionspo3600.

Calculate Lambda

- Relationship between two nominal variables
- Question: Can we reduce the amount of error by introducing an explanatory variable?

Lambda: Example

We know distribution of party ID: Lab 50%, Con 30%, Lib Dem 20%

		Father's party identification			
		Lab	Con	Lib Dem	
Resp. party ID	Lab	45	2	3	50
	Con	5	23	2	30
	Lib Dem	10	5	5	20
		60	30	10	100

Father party ID	Our guess	Correct	Wrong
Labour	Labour	45	15
Conservative	Conservative	23	7
Lib Dem	Lib Dem	5	5
Total		73	27

Lambda: Example

- Original error was 50 (when guessing)
- With the additional information (father's party ID) we have 27 errors remaining

General formula: $\textit{Association} = \frac{\textit{Original error} - \textit{Remaining error}}{\textit{Original error}} = \frac{50-27}{50} = .46$

A value of lambda = 0.46 means that the number of errors of prediction can be reduced by 46% if the IV, father's party identification, is know.

Cross-Tables and Lambda in SPSS

- Download data with party ID: https://tinyurl.com/datapartyid
- Create a cross-table
- Calculate Lambda
- What is the difference between `father_party_id Dependent` and `party_id Dependent`?

Calculate Gamma

- Measure for relationship between two variables (e.g. time spent studying and grade)
- Values between -1 and 1: -1 strong negative relationship; 0 no relationship; +1 strong positive relationship

	Time Spent Studying	
Grades	Minimal	Extensive
Bad	20	5
Good	6	10

- Find number of concordant pairs, N_c
- Find number of disconcordant pairs, N_d

Gamma: Calculate Gamma

Concordant pairs

	Time Spent Studying	
Grades	Minimal	Extensive
Bad	**20**	5
Good	6	**10**

$N_c = 10 \times 20 = 200$

Gamma: Calculate Disconcordant Pairs

	Time Spent Studying	
Grades	Minimal	Extensive
Bad	20	**5**
Good	**6**	10

$N_c = 10 \times 20 = 200$

$N_d = 6 \times 5 = 30$

Gamma: Insert values into formula

$$N_c = 10 \times 20 = 200$$

$$N_d = 6 \times 5 = 30$$

$$\gamma = \frac{N_c - N_d}{N_c + N_d}$$

$$\gamma = \frac{200 - 30}{200 + 30} = 0.73$$

Measurement error

Measurement error

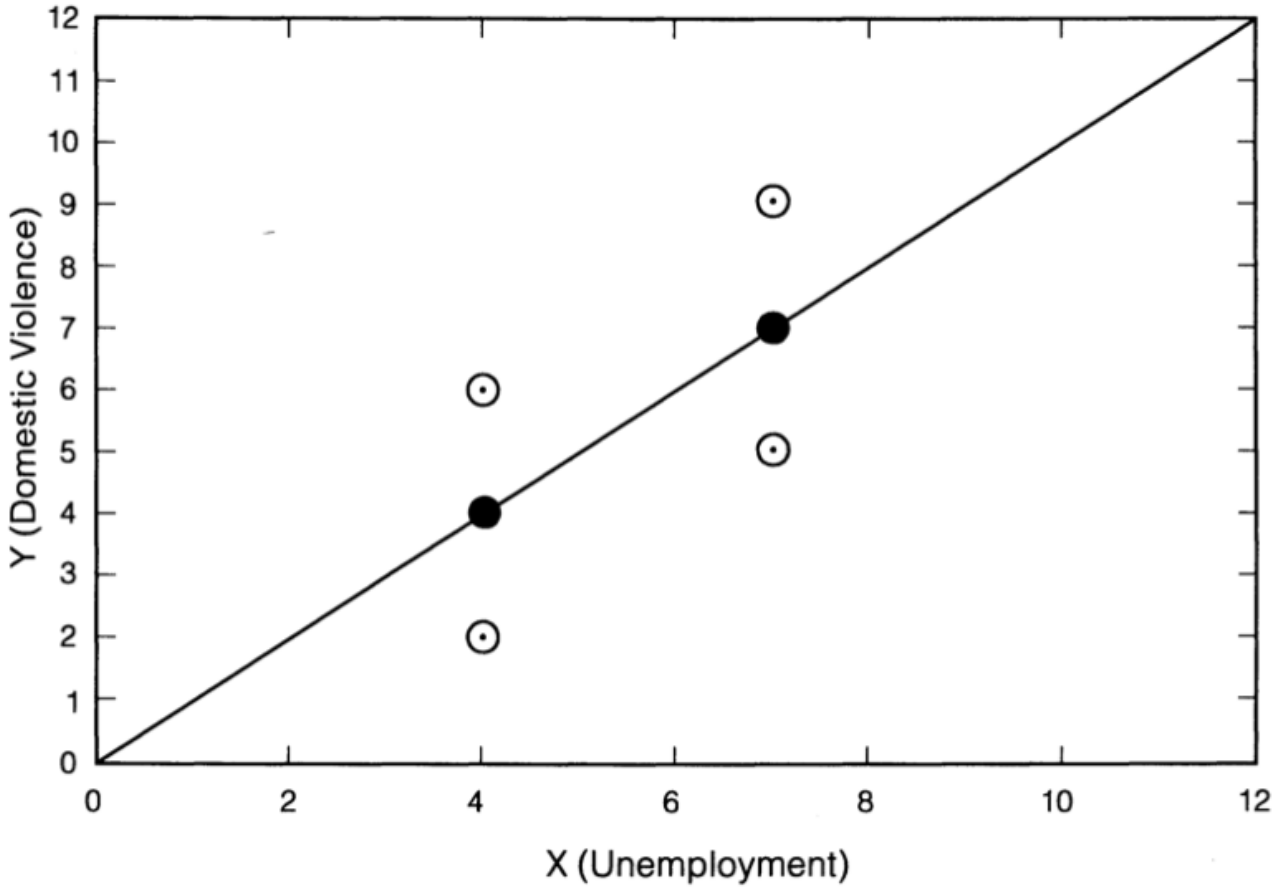
Systematic:

- Consistently overestimate values for certain types of units (e.g. students always over-reporting their income)
- Biased inferences
- Examples: quantitative text analysis; misreporting/consistent misunderstanding; sample selection bias

Random:

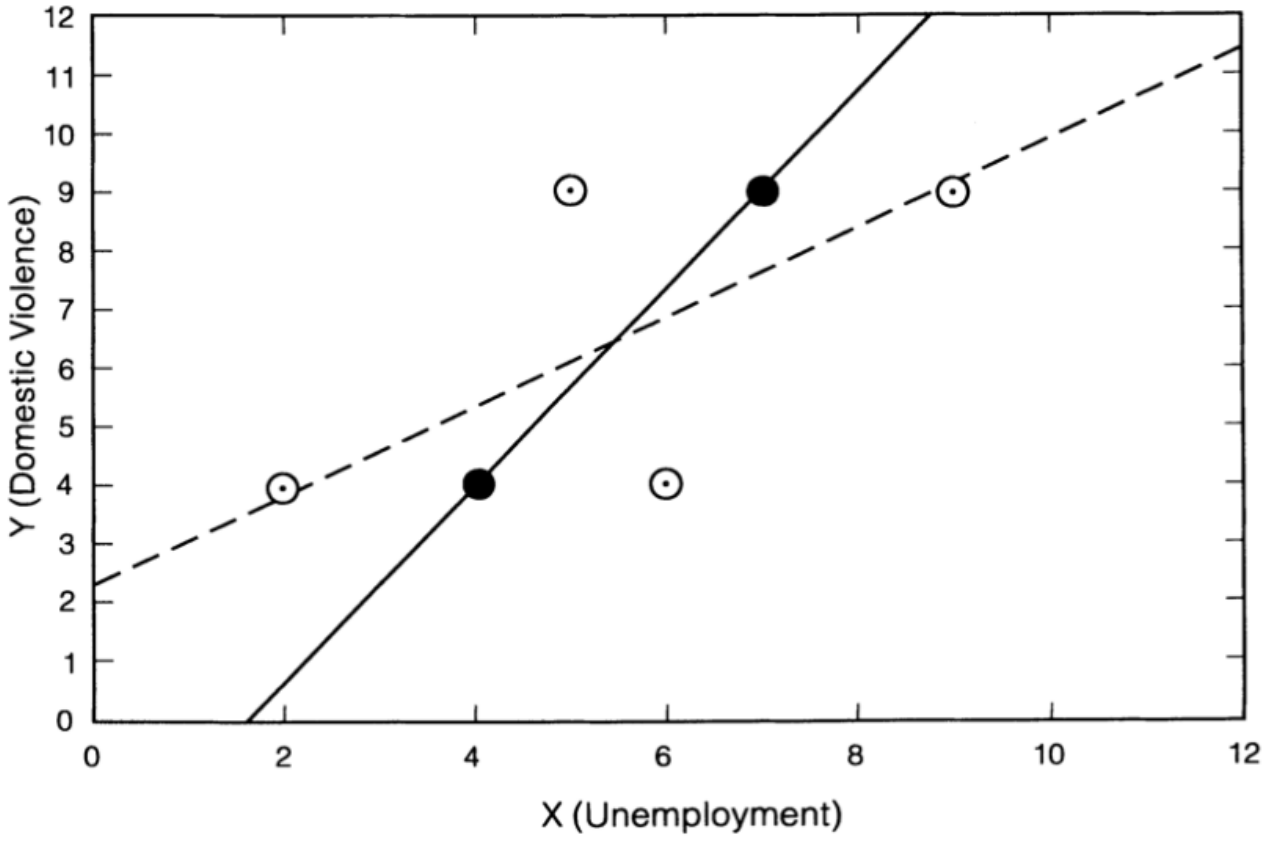
- Random fluctuations without a clear pattern
- More uncertainty in results, only sometimes biased inferences
- Examples: human coding (if not depending on codebook); therefore multiple codings recommended (Benoit et al. 2016)

Measurement Error in Dependent Variable



King et al. (1994, p. 161)

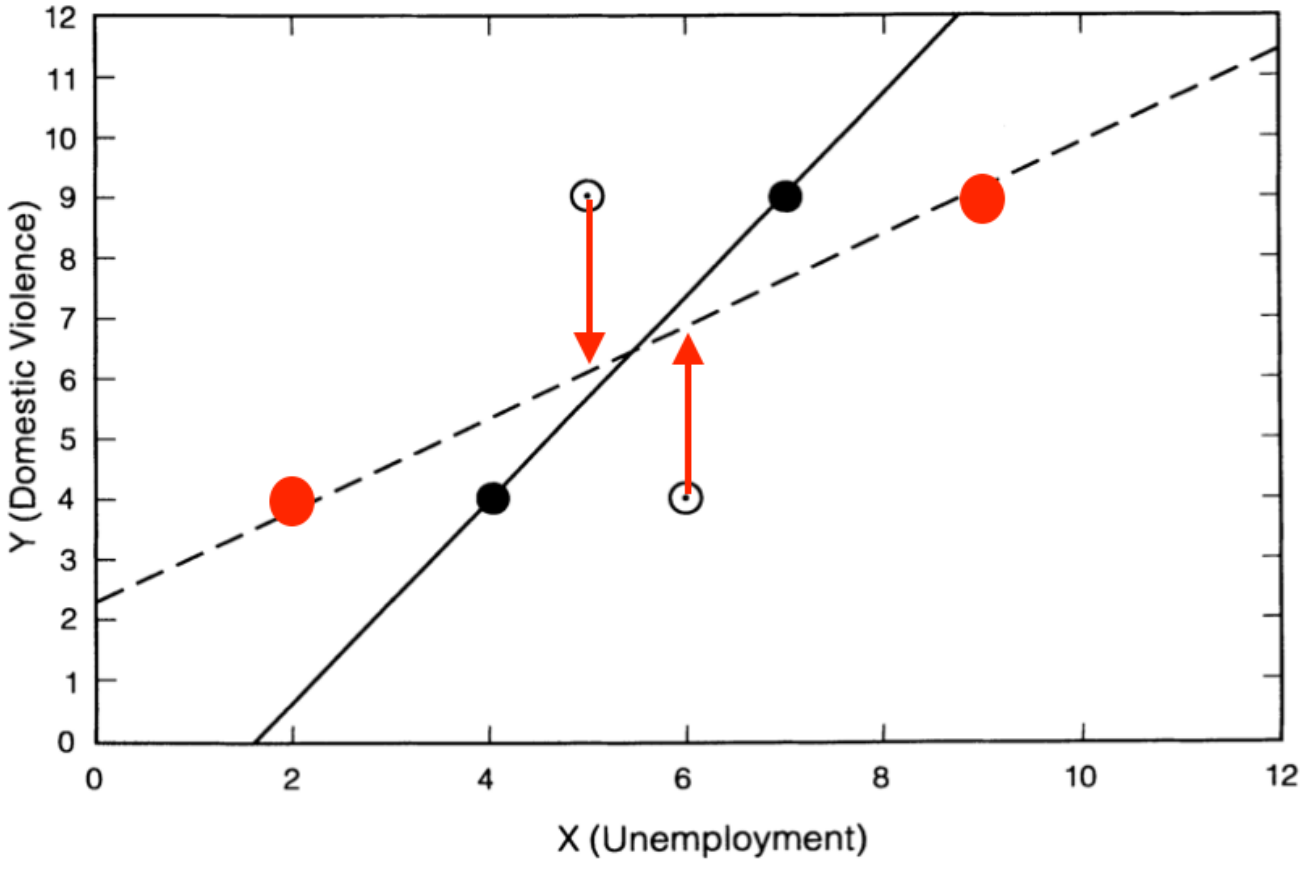
Measurement Error in Independent Variable: Problemetic!



King et al. (1994, p. 165)

Measurement Error in Independent Variable: Problemetic!

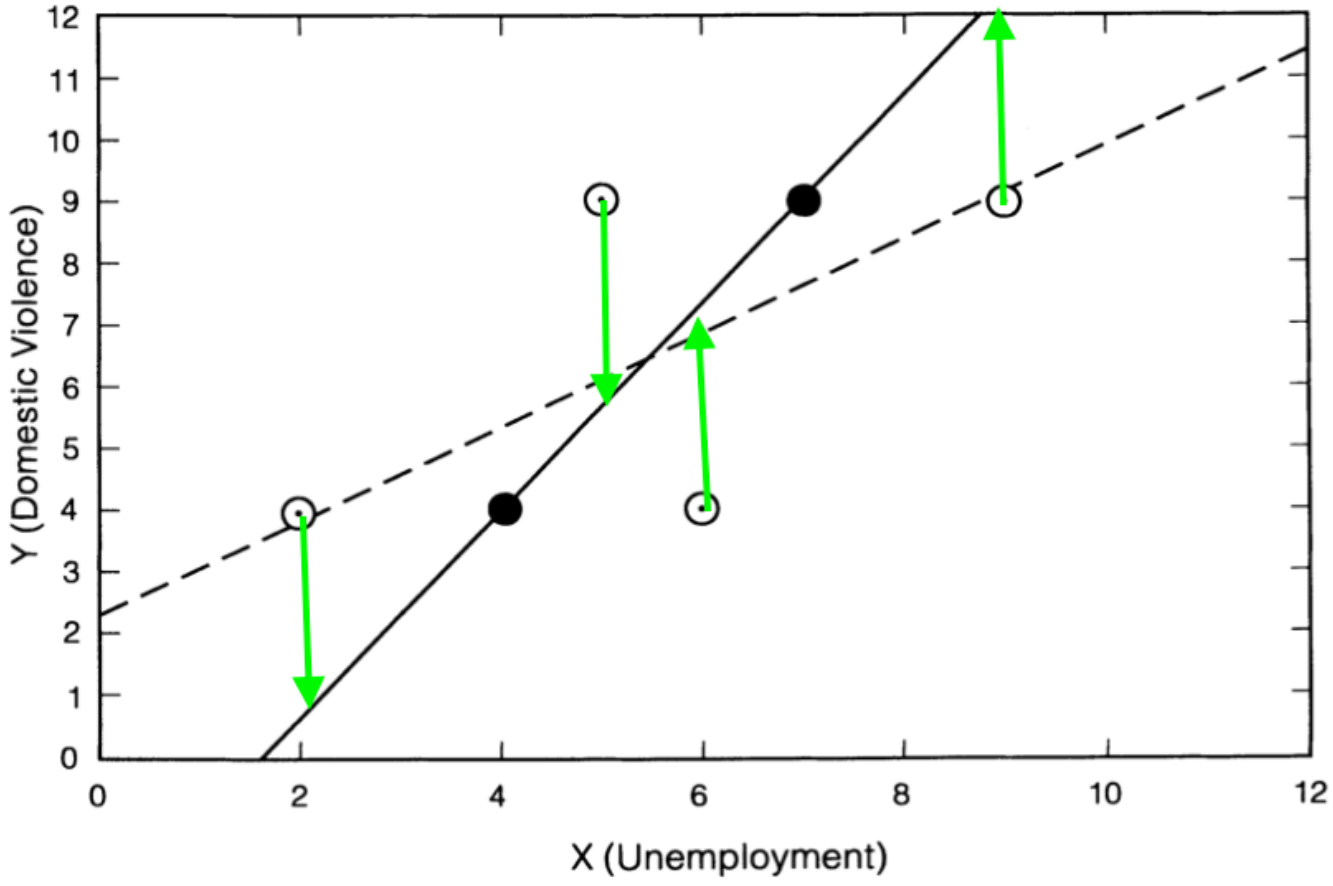
"False" assumed relationship



King et al. (1994, p. 165)

Measurement Error in Independent Variable: Problemetic!

"True" relationship: much larger deviation of the observations from the line



King et al. (1994, p. 165)

Research Proposal

Team up and discuss (some of) the following aspects:

1. Research question + relevance
2. Theoretical argument + hypothesis
3. Type of data + operationalisation of variables
4. Ways of analysing your data