

Tutorial 01, Michaelmas Term

Research Methods for Political Science (PO3600)

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10 October 2017

Trinity College Dublin

<http://muellerstefan.net/research-methods>

1. Tutorial Structure
2. Support & Additional Material
3. How to Use SPSS
4. Mean, Standard Deviation and Standard Error
5. Distribution of the Sample Mean

Tutorial Structure

- Deepen and apply knowledge from the lectures
- Learn how to use SPSS
- Apply theories, concepts and statistical methods to real-world data
- Clarify questions, discuss homework
- **But tutorials do not replace the lectures!**

Students taking the entire module:

1. 60% of mark based on end-of-year exam (covers methods and statistics).
2. 2 homework assignments counting 4% (1 during MT, 1 during HT).
3. 2 papers counting 10% (one at the end of each term). Work will be done *in pair* submitting joint papers.
4. 8 homework exercises (4 per term), worth 12% of overall mark. Submit online via Turnitin *before class*.

Exchange students (one term only)

1. 1 homework assignment counting 12%.
2. 80% of the mark based on two papers: a research proposal (30%) and a final paper based on that proposal (50%).
3. 8% based on the 4 homework exercises to be submitted *before* the tutorials.

Separate Turnitin modules per term.

MT: Class ID: **16383023**; Password: **po3600**

HT: TBD

Please register as soon as possible!

Homework

Submit 4 homework exercises per term on Monday evening (11:59pm) preceding the tutorial session

- Week 4: HW 1 (next Monday!)
- Week 6: HW 2
- Week 9: HW 3
- Week 11: HW 4

Paper deadlines

- Homework 1: 10/11 2017, 11:59pm
- Research proposal (one-term students only!): 24/11 2017, 11:59pm
- Paper 1: 15/12 2017, 11:59pm

Support & Additional Material

- Constant feedback through short surveys
- Notes, useful links and literature:
<http://muellerstefan.net/research-methods>
- Questions: mullers@tcd.ie

How to Use SPSS

- How to open (data) in SPSS?
- How to work reproducibly in SPSS?

Mean, Standard Deviation and Standard Error

Application: Mean and standard deviation (#COYBIG)

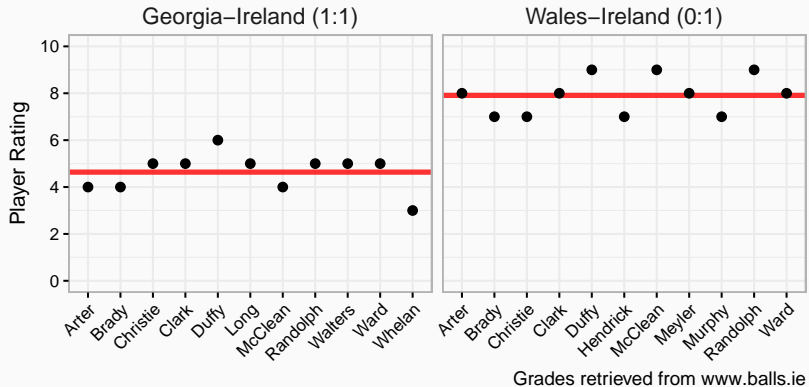
The Ireland Player Ratings From A Truly Woeful Performance In Tbilisi



The Ireland Player Ratings From A Bloody Heroic Performance In Cardiff



Application: Mean and Standard Deviation (#COYBIG)



Match	\bar{x}	σ
Georgia-Ireland	4.63	0.81
Wales-Ireland	7.91	0.83

Estimate mean, standard deviation, and standard error

1. Estimate mean: $\bar{x} = \frac{\sum x}{n}$
2. Estimate standard deviation: $\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}$
3. Estimate standard error of the mean: $sd(\bar{X}) = \frac{\sigma}{\sqrt{n}}$

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Hands-on exercise: Estimate \bar{x} , σ , $sd(\bar{X})$ for the following sample:
9, 2, 5, 4

$$\text{Mean: } \bar{x} = \frac{9+2+5+4}{4} = \frac{20}{4} = 5$$

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$$(9 - 5)^2 = 4^2 = 16$$

$$(2 - 5)^2 = (-3)^2 = 9$$

$$(5 - 5)^2 = (0)^2 = 0$$

$$(4 - 5)^2 = (1)^2 = 1$$

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$$\text{Standard error: } sd(\bar{X}) = \frac{\sigma}{\sqrt{n}} = \frac{2.94392}{\sqrt{4}} = 1.47196$$

Distribution of the Sample Mean

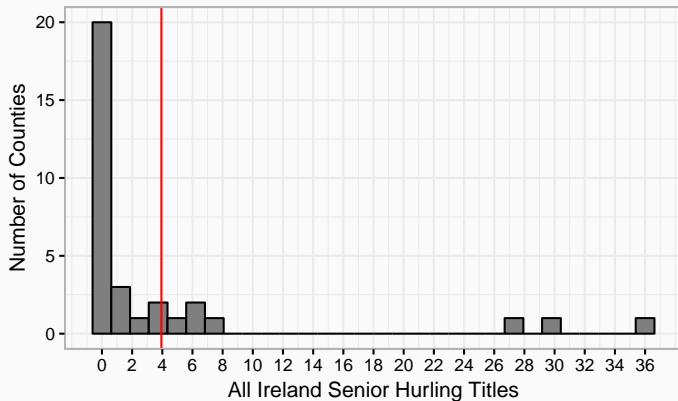
As your sample size (n) increases, we find a normal distribution when (for example) taking sample mean or sample sum.

Irish Example of Skewed Distribution

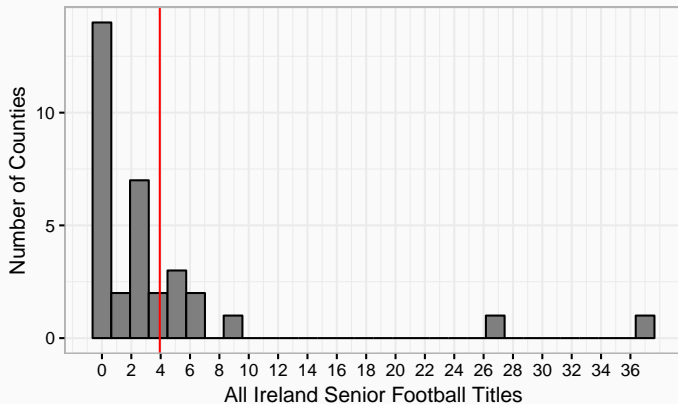
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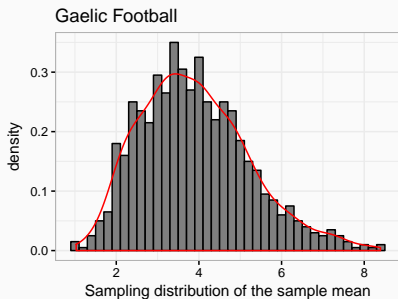
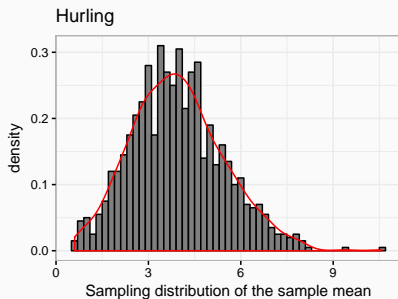
Distribution of All-Ireland Hurling Titles per County



Distribution of All-Ireland Football Titles per County



Distribution of Bootstrapped Sample Means



Note: 1000 random draws, plot distribution of means; hypothetical example as we draw from the population!