

Unit 1: Introduction to data

4. Review of Unit 1

Sta 101 - Fall 2015

Duke University, Department of Statistical Science

1. Housekeeping

2. Be aware of Simpson's paradox

3. Application exercises

- ▶ Prof. C-R will be available on Piazza to answer any questions
- ▶ Reminders:
 - Problem set (PS) 1 is due Friday night (11:55pm)
 - Performance assessment (PA) 1 is due Sunday night (11:55pm)
 - Readiness assessment (RA) 2 is next Monday, so start reviewing resources for Unit 2, don't wait till Sunday!
- ▶ We will start grading for clickers on Monday, so make sure you have yours by then (no problem if you haven't yet registered it, you'll get a chance again on Monday)

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A 1991 study by Radelet and Pierce on race and death-penalty (DP) sentences gives the following table:

Defendant's race	DP	No DP	Total	% DP
Caucasian	53	430	483	
African American	15	176	191	
Total	68	606	674	

Adapted from Subsection 2.3.2 of A. Agresti (2002), *Categorical Data Analysis*, 2nd ed., and

<http://math.stackexchange.com/questions/83756/examples-of-simpsons-paradox>.

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Who is more likely to get the death penalty?

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Same data, taking into consideration victim's race:

Victim's race	Defendant's race	DP	No DP	Total	% DP
Caucasian	Caucasian	53	414	467	
Caucasian	African American	11	37	48	
African American	Caucasian	0	16	16	
African American	African American	4	139	143	
Total		68	606	674	

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Who is more likely to get the death penalty?

- ▶ People of one race are more likely to murder others of the same race, murdering a Caucasian is more likely to result in the death penalty, and there are more Caucasian defendants than African American defendants in the sample.

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- ▶ Controlling for the victim's race reveals more insights into the data, and changes the direction of the relationship between race and death penalty.

- ▶ People of one race are more likely to murder others of the same race, murdering a Caucasian is more likely to result in the death penalty, and there are more Caucasian defendants than African American defendants in the sample.
- ▶ Controlling for the victim's race reveals more insights into the data, and changes the direction of the relationship between race and death penalty.
- ▶ This phenomenon is called *Simpson's Paradox*: An association, or a comparison, that holds when we compare two groups can disappear or even be reversed when the original groups are broken down into smaller groups according to some other feature (a confounding/lurking variable).

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If you finish one, move on to the next.

Application exercise: 1.2 Scientific studies in the press

See the course website for instructions.

Application exercise: 1.3 Histogram to boxplot

See the course website for instructions.

Application exercise: 1.4 Randomization testing

See the course website for instructions.