



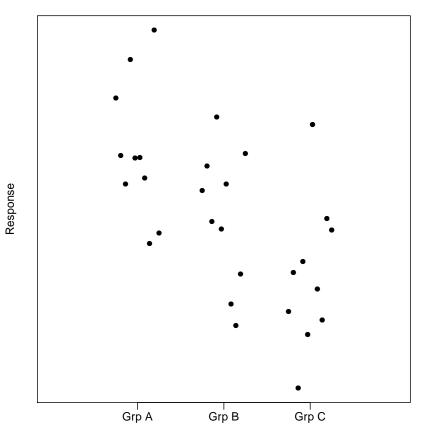
Workshop 9.5a: ANCOVA

Murray Logan June 14, 2015

Т	able of contents	
1	Analysis of Covariance	1
2	Worked Examples	5

1. Analysis of Covariance

1.1. Analysis of Covariance (ANCOVA)



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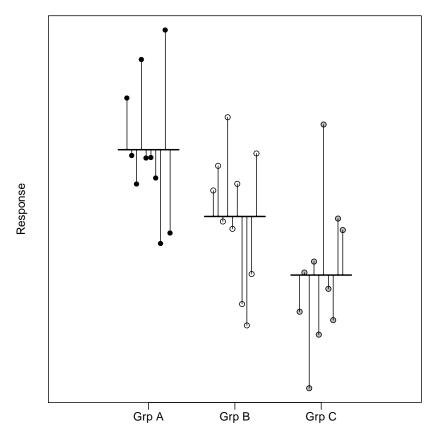




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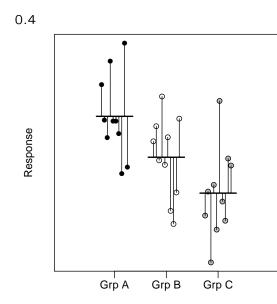
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1.2. Analysis of Covariance (ANCOVA)



1.3. Analysis of Covariance (ANCOVA)

- add continuous covariate
 - reduce unexplained variance
 - increase **power** of test





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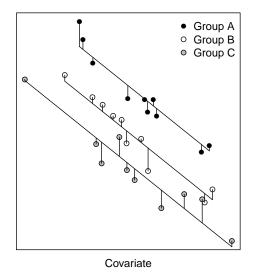
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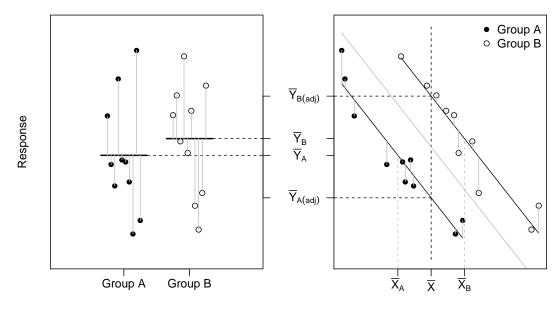


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-3-



1.4. Analysis of Covariance (ANCOVA)



1.5. Analysis of Covariance (ANCOVA)

1.5.1. Assumptions

- 1. Normality (residuals)
- 2. Homogeneity of variance (residuals)
- 3. Independence
- 4. Homogeneity of slopes

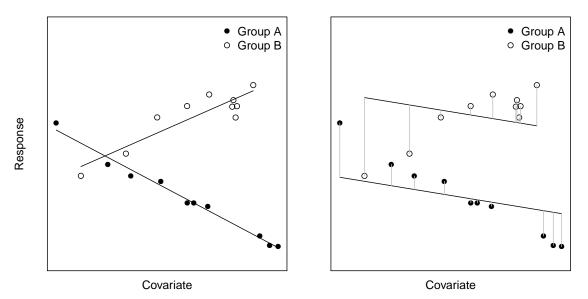
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1.6. Homogeneity of Slopes



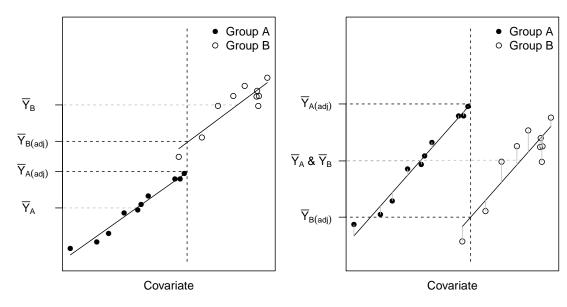
• no interaction effects

1.7. Analysis of Covariance (ANCOVA)

1.7.1. Assumptions

- 1. Normality (residuals)
- 2. Homogeneity of variance (residuals)
- 3. Independence
- 4. Homogeneity of slopes
- 5. Similar covariate range

1.8. Covariate range



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-5-

1.9. Analysis of Covariance (ANCOVA)

1.9.1. Design balance

- ANCOVA designs are inherently imbalanced
- Need to use Type II or III SS

1.10. Analysis of Covariance (ANCOVA)

1.10.1. Offsets

- Standardize the response for a covariate
- Does not cost a degree of freedom

2. Worked Examples

2.1. Worked Examples

> partridge <- read.csv('../data/partridge1.csv', strip.white=T) > head(partridge)

TREATMENT THORAX LONGEV

1	Preg8	0.64	35
2	Preg8	0.68	37
3	Preg8	0.68	49
4	Preg8	0.72	46
5	Preg8	0.72	63
6	Preg8	0.76	39

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