Multiple Comparison Procedures To A Control

For AN(C)OVA Models

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Contents

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Basic Information

Automatic statistics for the file:

File
warpbreaks.csv

Your selection for the encoding: UTF-8
Your selection for the decimal character: .
Observations (rows with at least one non-missing value): 54
Variables (columns with at least one non-missing value): 3
Variables considered continuous: 1

Variables considered continuous
breaks

Variables considered categorical: 2

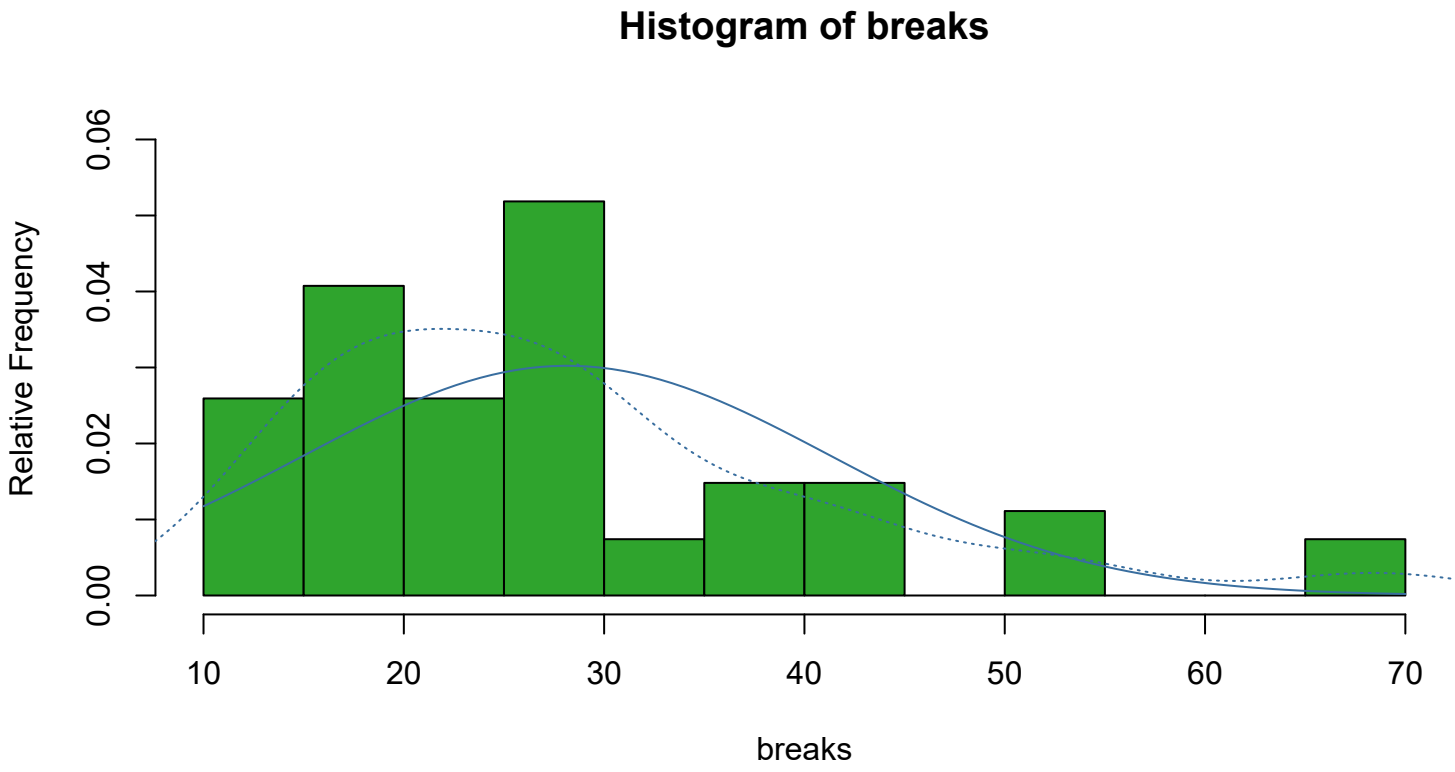
Variables considered categorical
wool
tension

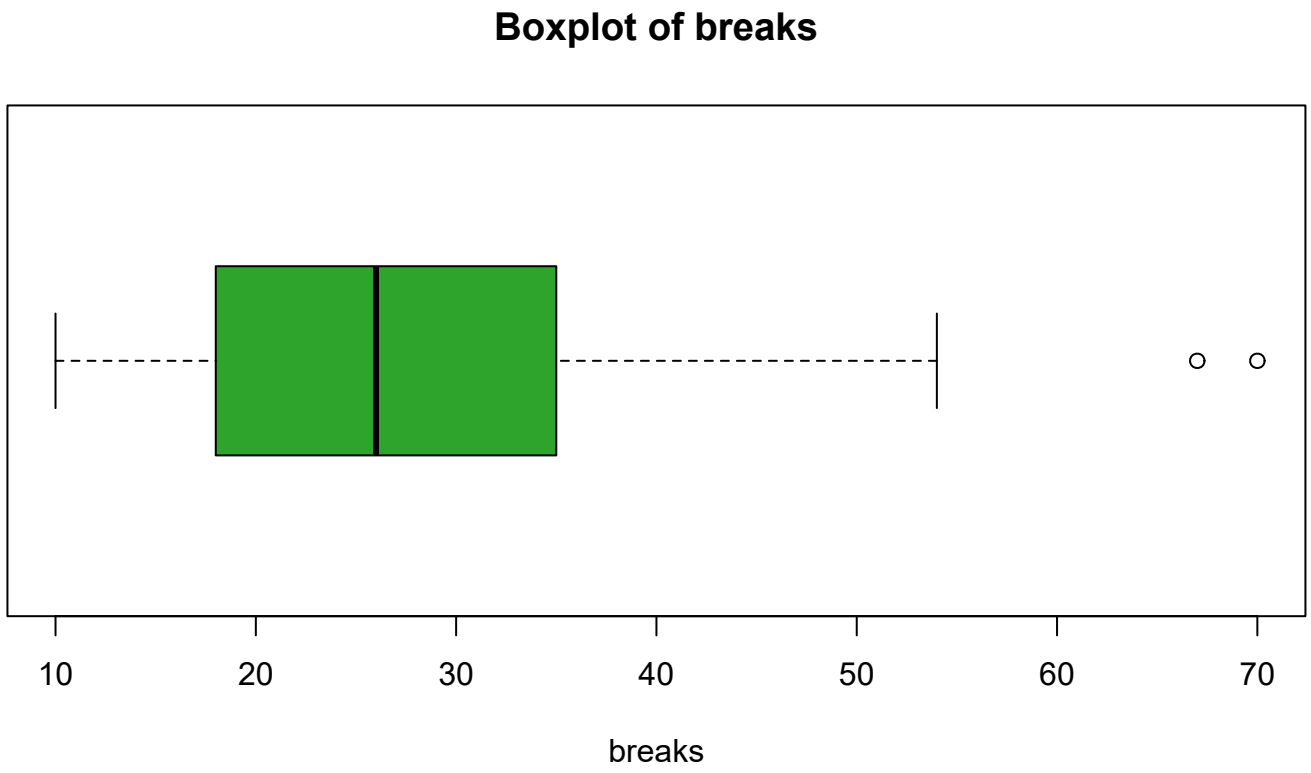
Model Information

You defined the following linear model: breaks~wool+tension
You are interested in the factor: wool
You are interested in pairwise comparisons to the control factor level: A

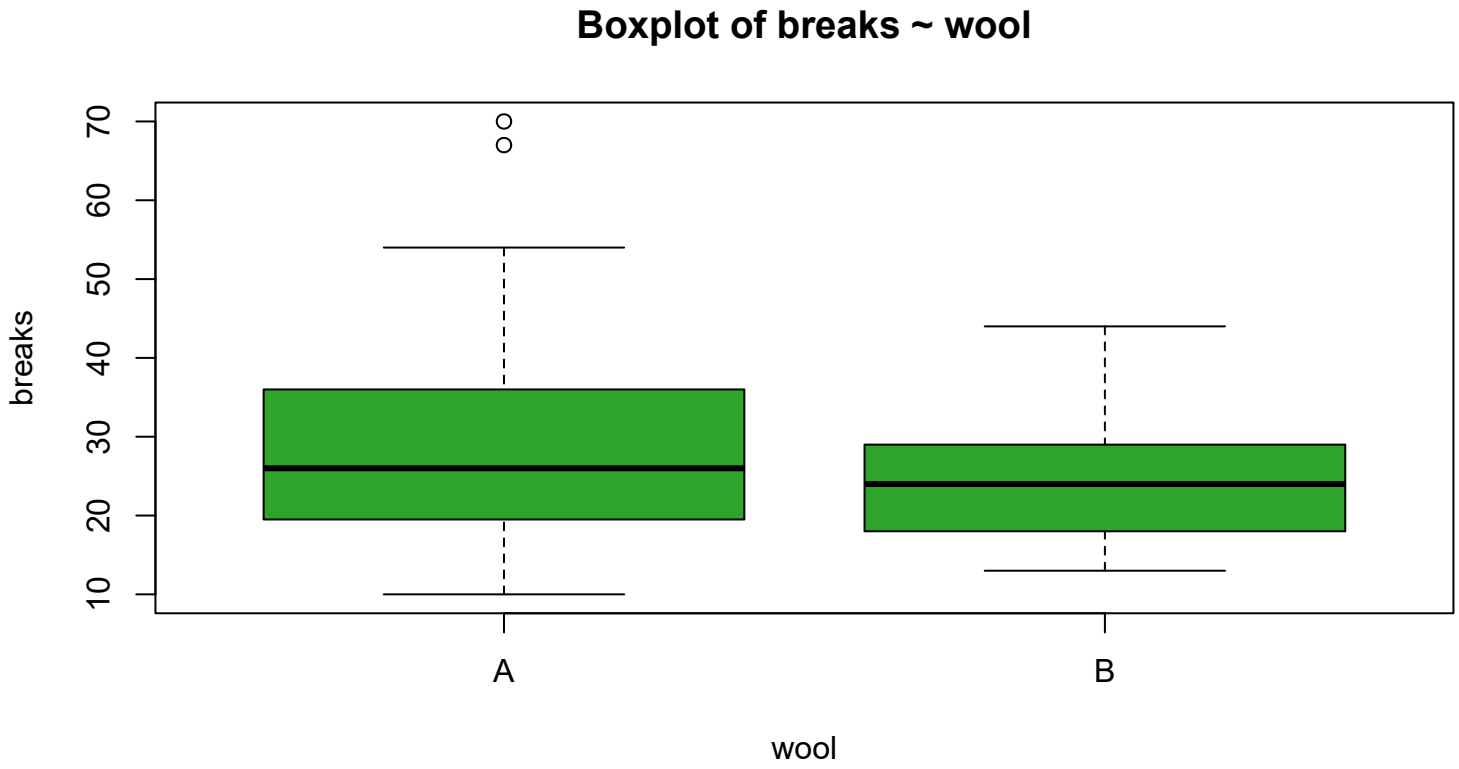
Descriptive Plots

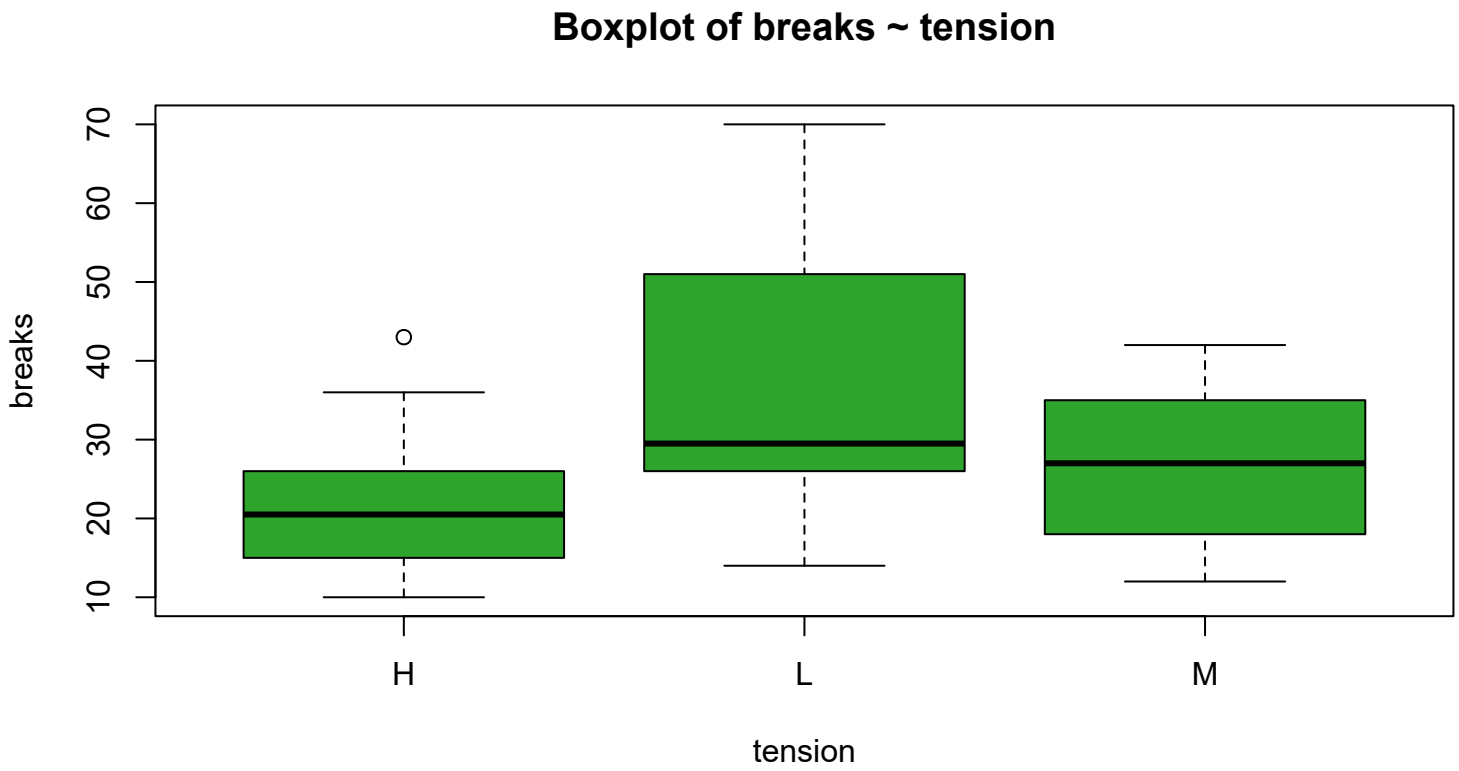
Dependent Variable




Boxplot of breaks
10
20
30
40
50
60
70
breaks

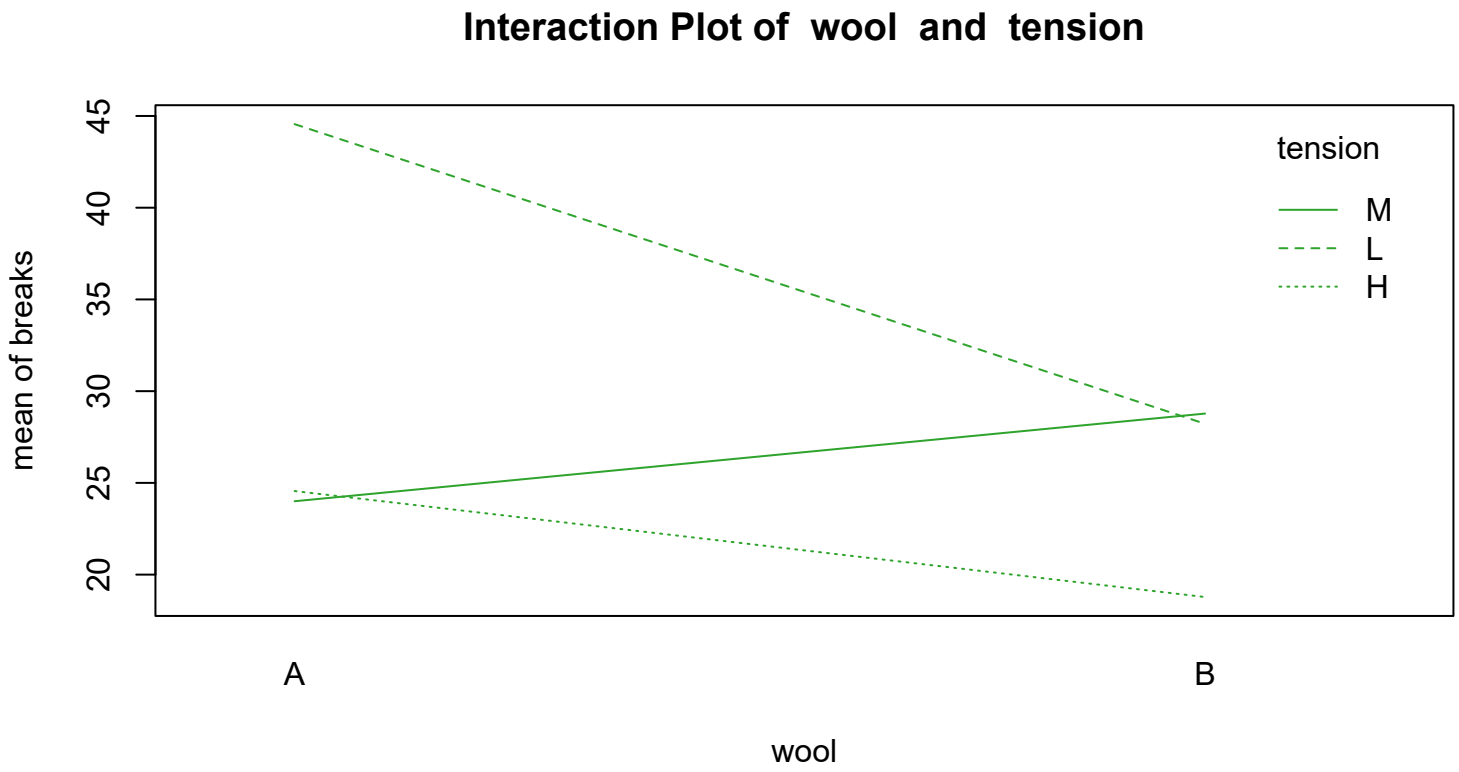
Dependent Against Categorical Factors




Boxplot of breaks ~ tension
breaks
10
20
30
40
50
60
70
H
L
M
tension

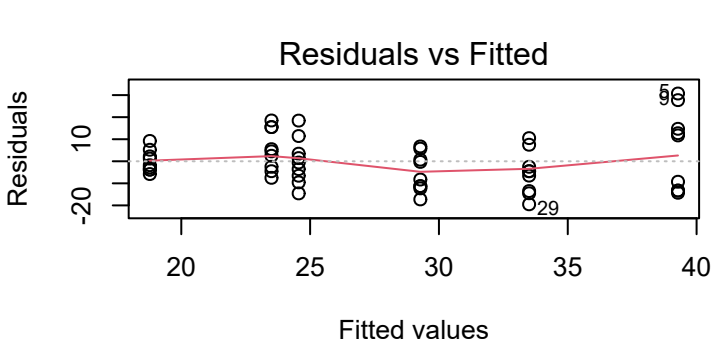
Interaction Plot for Factors

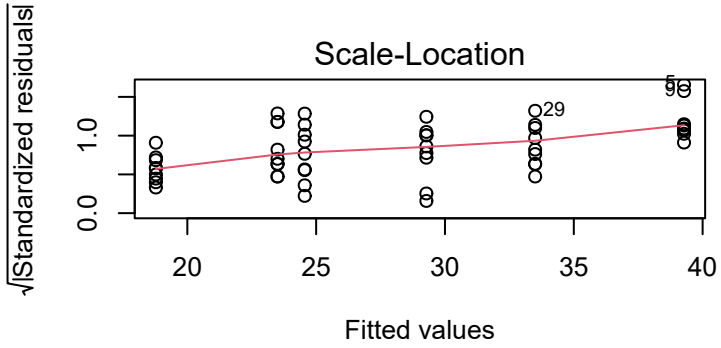
Note: The more parallel the lines, the less likely is the significance of the interaction of the factors.

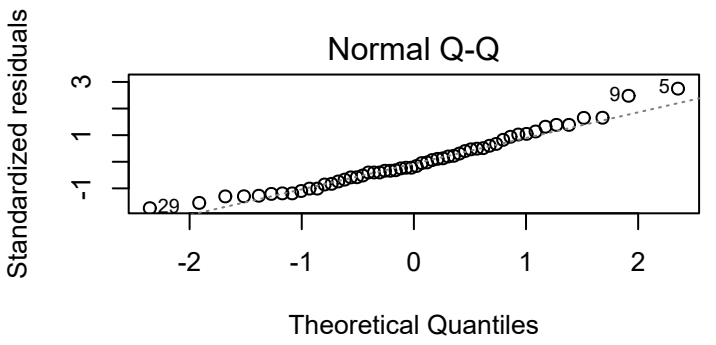


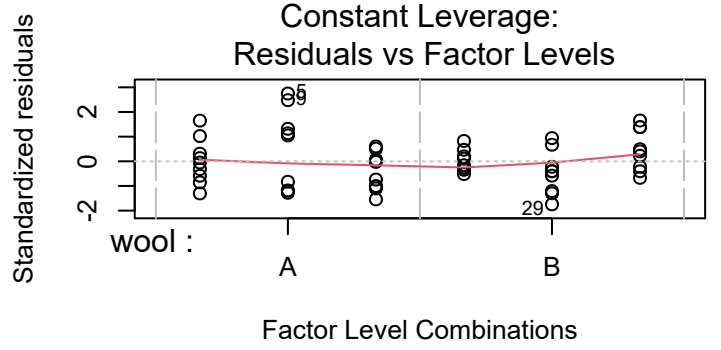

```
Anova Table (Type III tests)

Response: breaks
            Sum Sq Df F value    Pr(>F)
(Intercept) 8140.2  1 60.3164 3.828e-10 ***
wool         450.7  1  3.3393  0.073614 .
tension     2034.3  2  7.5367  0.001378 **
Residuals   6747.9 50
```

```
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```










```
     Simultaneous Tests for General Linear Hypotheses

Multiple Comparisons of Means: Dunnett Contrasts


Fit: lm(formula = modelfunction, data = df_factorized)

Linear Hypotheses:
           Estimate Std. Error t value Pr(<t)
```

```
B - A >= 0   -5.778      3.162  -1.827 0.0368 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Adjusted p values reported -- single-step method)

     Simultaneous Confidence Intervals

Multiple Comparisons of Means: Dunnett Contrasts


Fit: lm(formula = modelfunction, data = df_factorized)

Quantile = 1.6759
95% family-wise confidence level


Linear Hypotheses:
           Estimate lwr     upr
B - A >= 0 -5.7778     -Inf -0.4789
```

References

Fox, John, and Sanford Weisberg. 2019. *An R Companion to Applied Regression*. Third. Thousand Oaks CA: Sage. https://socialsciences.mcmaster.ca/jfox/Books/Companion/.

Gross, Juergen, and Uwe Ligges. 2015. *Nortest: Tests for Normality*. https://CRAN.R-project.org/package=nortest.

Madsen, Jacob H. 2018. *DDoutlier: Distance & Density-Based Outlier Detection*. https://CRAN.R-project.org/package=DDoutlier.

R Core Team. 2019. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.

Zeileis, Achim, and Torsten Hothorn. 2002. "Diagnostic Checking in Regression Relationships." *R News* 2 (3): 7–10. https://CRAN.R-project.org/doc/Rnews/.