

Multiple Comparison Procedures To A Control

For AN(C)OVA Models

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Contributors*

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*Denise Welsch, Markus Neuhäuser, Viktoria Daum, Linda Müller, Damian Nink, Simone Schüttler, Daniela Wüller

Basic Information

Automatic statistics for the file:

File
immer.csv

Your selection for the encoding: UTF-8

Your selection for the decimal character: .

Observations (rows with at least one non-missing value): 30

Variables (columns with at least one non-missing value): 4

Variables considered continuous: 2

Variables considered continuous
Y1
Y2

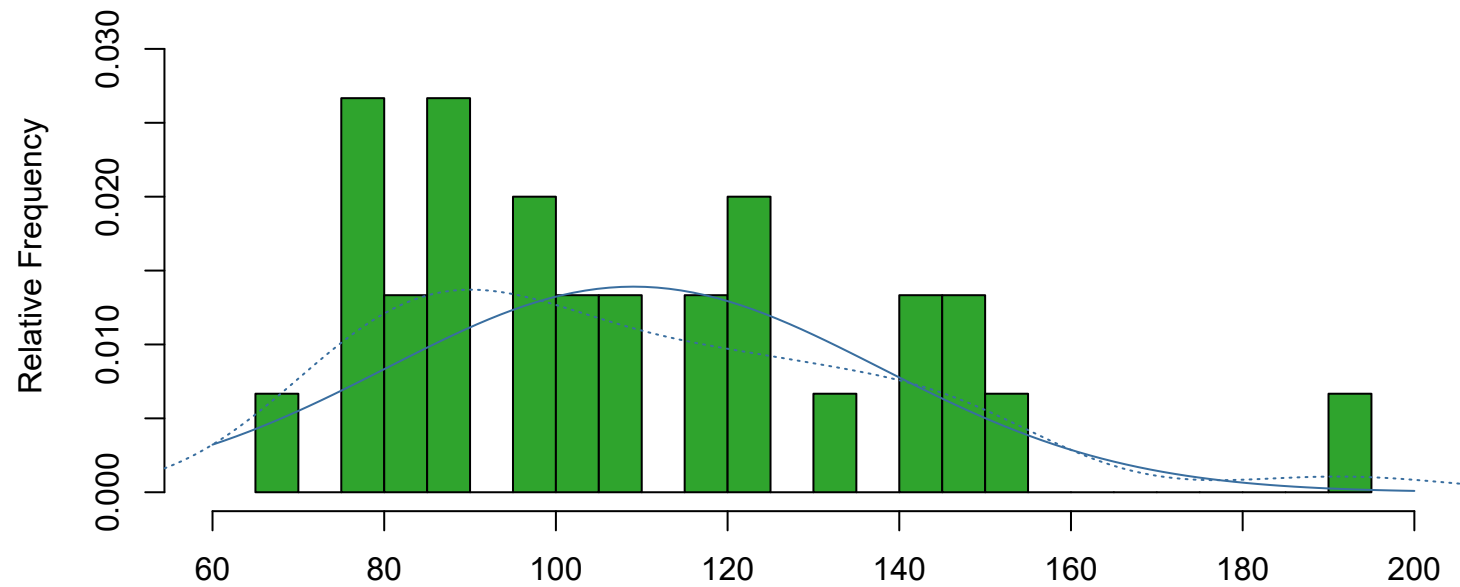
Variables considered categorical: 2

Variables considered categorical
Loc
Var

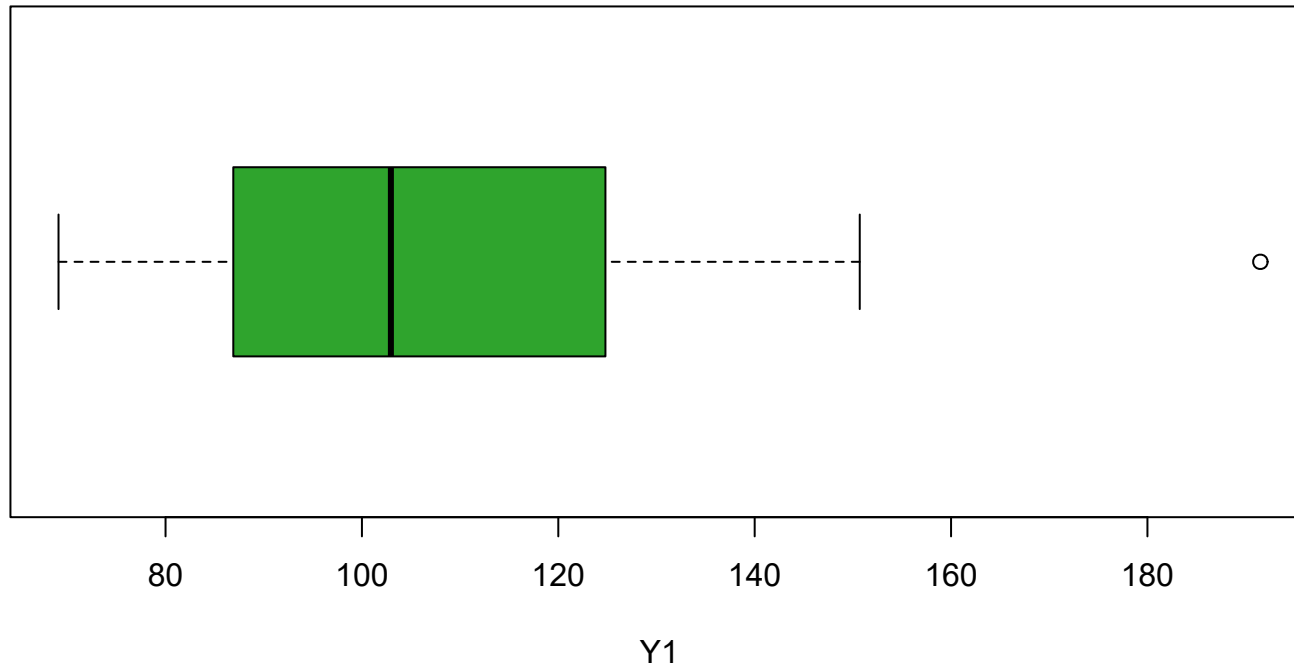
Descriptive Plots

Histogram and Boxplot for dependent Variable

Histogram of Y1

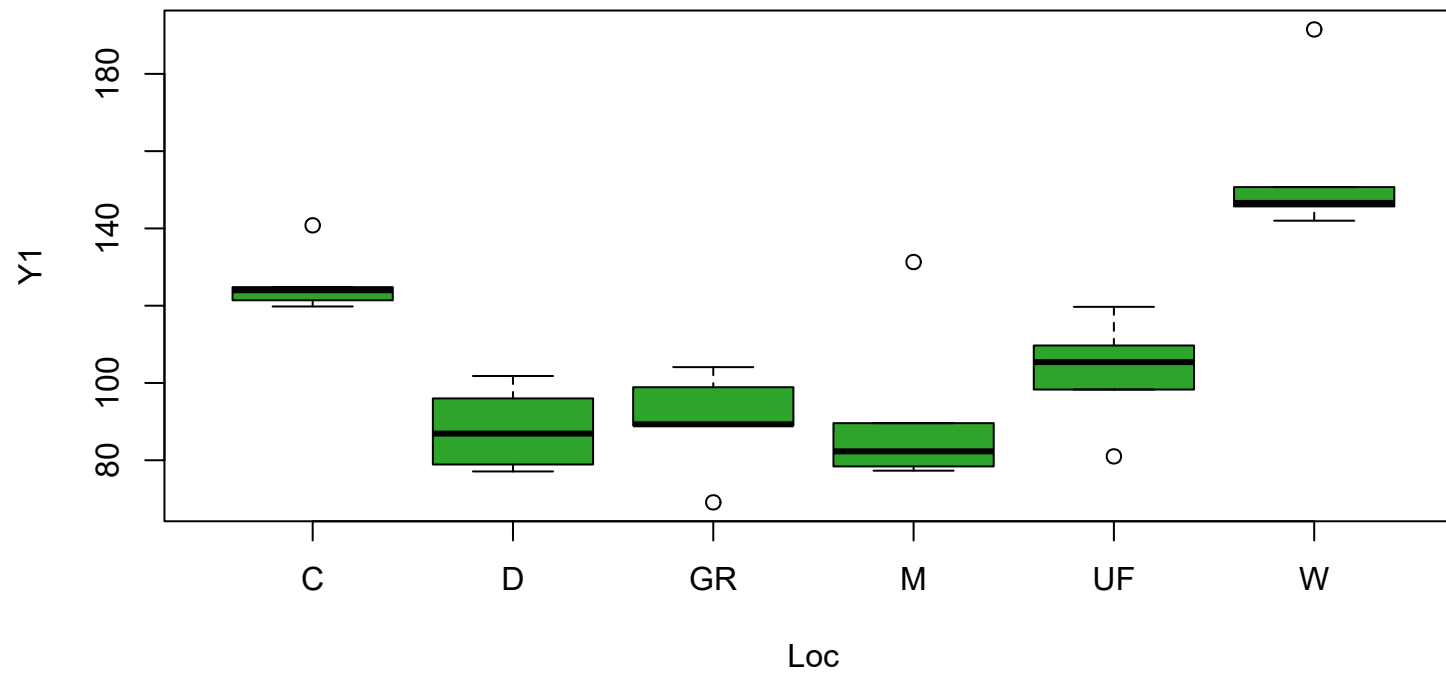


Boxplot of Y1

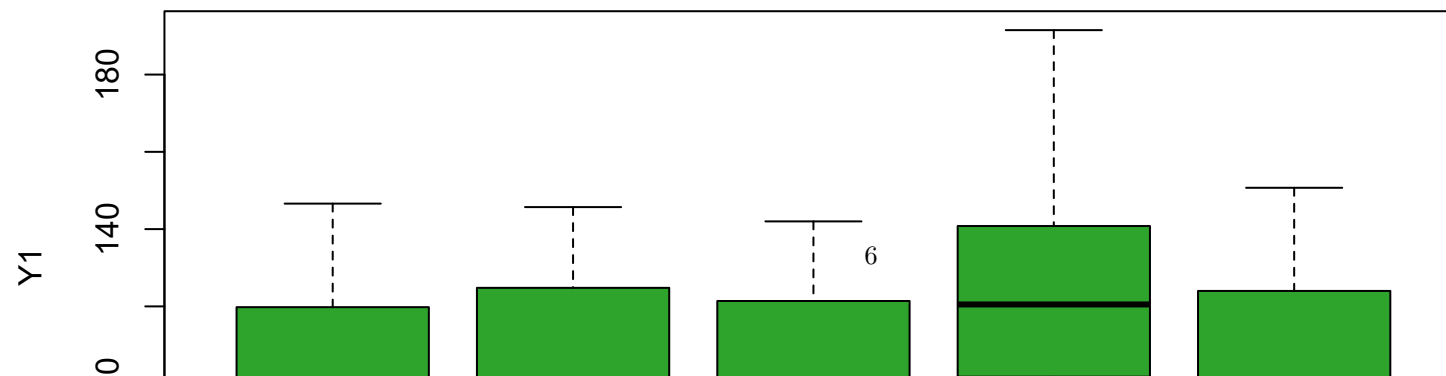


Boxplot for categorical independent Variables

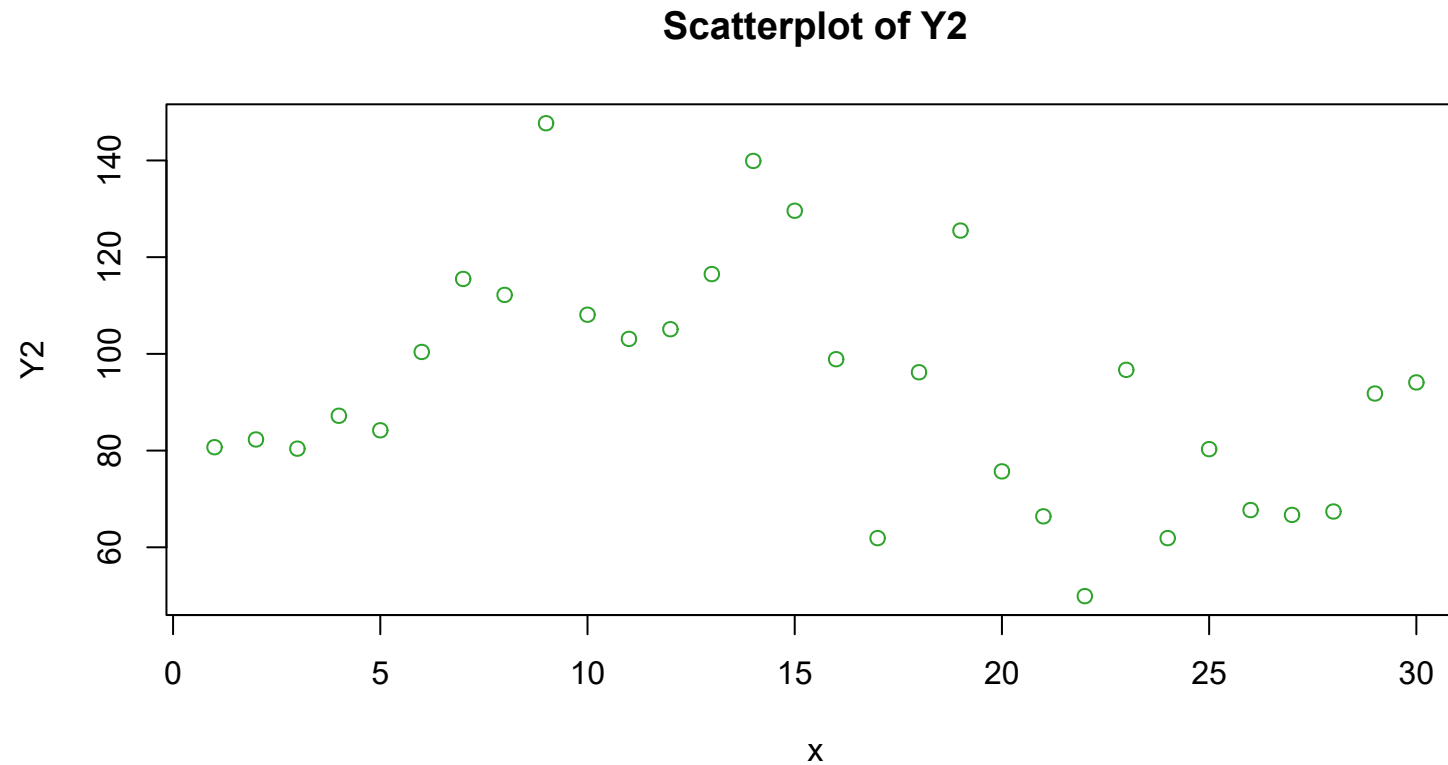
Boxplot of Y1 ~ Loc



Boxplot of Y1 ~ Var



Scatterplot for numerical independent Variables

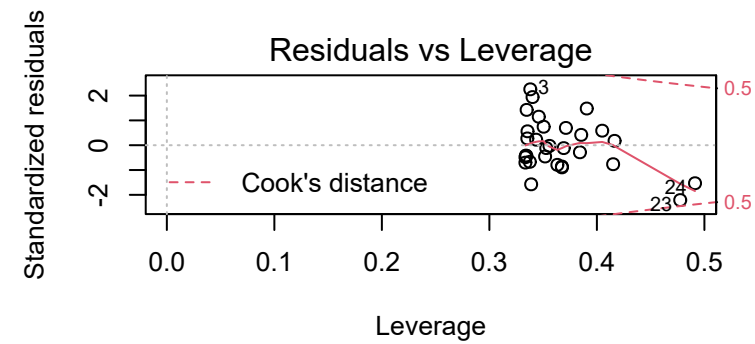
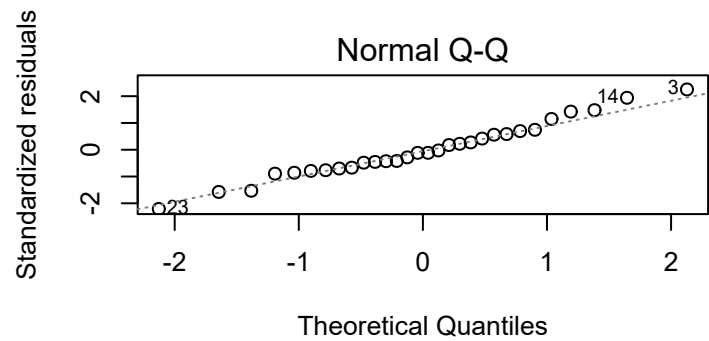
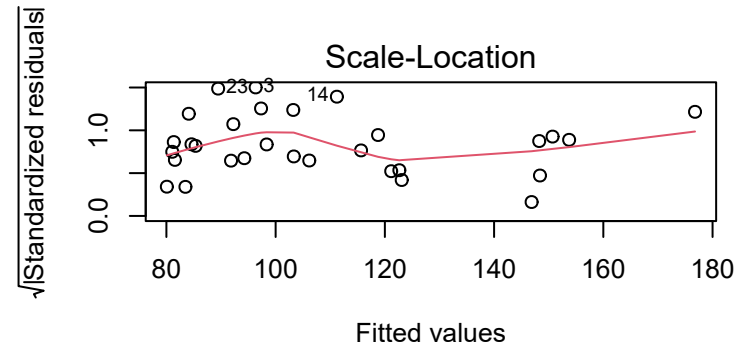
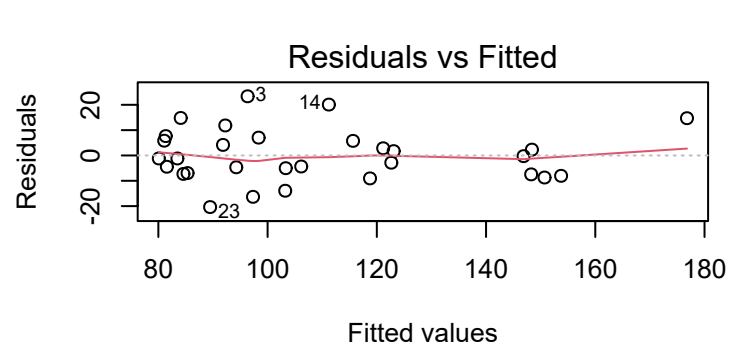


Anova Table (Type III tests)

Response: Y1

	Sum Sq	Df	F value	Pr(>F)	
(Intercept)	3616.4	1	22.2649	0.0001495	***
Loc	13522.1	5	16.6501	2.289e-06	***
Var	1295.3	4	1.9936	0.1364135	
Y2	171.6	1	1.0567	0.3168688	
Residuals	3086.1	19			

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)
C - UF >= 0	21.533	8.250	2.610	1.000

```

D - UF >= 0   -13.552      8.135  -1.666  0.187
GR - UF >= 0   -10.258      8.414  -1.219  0.346
M - UF >= 0   -18.510     10.853  -1.706  0.175
W - UF >= 0    45.438     10.578   4.296  1.000
(Adjusted p values reported -- single-step method)

```

Simultaneous Confidence Intervals

Multiple Comparisons of Means: Dunnett Contrasts

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

```
Quantile = 2.4168
95% family-wise confidence level
```

Linear Hypotheses:

	Estimate	lwr	upr
C - UF >= 0	21.5328	-Inf	41.4708
D - UF >= 0	-13.5515	-Inf	6.1084
GR - UF >= 0	-10.2582	-Inf	10.0769
M - UF >= 0	-18.5104	-Inf	7.7179
W - UF >= 0	45.4385	-Inf	71.0026

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)
C - UF >= 0	21.533	8.250	2.610	0.999
D - UF >= 0	-13.552	8.135	-1.666	0.176
GR - UF >= 0	-10.258	8.414	-1.219	0.267
M - UF >= 0	-18.510	10.853	-1.706	0.176
W - UF >= 0	45.438	10.578	4.296	1.000

(Adjusted p values reported -- free method)

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)
C - UF >= 0	21.533	6.620	3.253	1.0000
D - UF >= 0	-13.552	6.656	-2.036	0.0850 .
GR - UF >= 0	-10.258	9.679	-1.060	0.3592
M - UF >= 0	-18.510	9.479	-1.953	0.0982 .
W - UF >= 0	45.438	8.631	5.265	1.0000

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 = 2.3222

95% family-wise confidence level

Linear Hypotheses:

	Estimate	lwr	upr
C - UF >= 0	21.5328	-Inf	36.9046
D - UF >= 0	-13.5515	-Inf	1.9038
GR - UF >= 0	-10.2582	-Inf	12.2169
M - UF >= 0	-18.5104	-Inf	3.5010
W - UF >= 0	45.4385	-Inf	65.4803

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)
--	----------	------------	---------	--------

```

C - UF >= 0    21.533      6.620   3.253 0.9994
D - UF >= 0   -13.552      6.656  -2.036 0.0847 .
GR - UF >= 0   -10.258      9.679  -1.060 0.3010
M - UF >= 0   -18.510      9.479  -1.953 0.0895 .
W - UF >= 0    45.438      8.631   5.265 1.0000
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
(Adjusted p values reported -- free method)

```

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>.
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