Effect of Pre-Meeting Small Talk on Perceived Social Cohesion

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Contents

Variables

```
str(data)
```

```
## tibble [169 x 12] (S3: tbl_df/tbl/data.frame)
##  $ c_1          : num [1:169] 1 7 7 5 5 6 7 5 6 5 ...
##  $ c_2          : num [1:169] 1 7 7 6 5 4 7 4 6 5 ...
##  $ c_3          : num [1:169] 1 7 7 5 4 6 7 6 6 5 ...
##  $ c_4          : num [1:169] 1 7 7 5 3 5 4 2 5 3 ...
##  $ c_5          : num [1:169] 1 7 7 5 4 6 7 5 6 5 ...
##  $ c_6          : num [1:169] 1 7 7 5 6 5 5 5 6 5 ...
##  $ manip_ch     : num [1:169] 1 7 7 6 6 1 5 4 3 3 ...
##  $ gender       : num [1:169] 4 1 2 2 2 2 2 2 2 2 ...
##  $ age          : num [1:169] 89 36 99 38 20 24 26 18 22 28 ...
##  $ exp          : num [1:169] 2 1 1 1 1 1 1 1 1 1 ...
##  $ exp_condition: num [1:169] 0 1 1 1 1 0 0 0 0 0 ...
##  $ cohesion_mean: num [1:169] 1 7 7 5.17 4.5 ...
```

Descriptive Statistics

Global Descriptive statistics whithout group mean.

```
library(psych)
psych::describe(data)
```

```
##                vars   n  mean    sd median trimmed  mad min max range  skew
## c_1               1 169  5.24  1.24      5    5.34 1.48   1   7     6 -0.91
## c_2               2 169  4.86  1.23      5    4.91 1.48   1   7     6 -0.31
## c_3               3 169  5.24  1.24      5    5.34 1.48   1   7     6 -0.90
## c_4               4 169  3.92  1.22      4    3.92 1.48   1   7     6 -0.03
## c_5               5 169  5.05  1.36      5    5.16 1.48   0   7     7 -0.97
## c_6               6 169  4.70  1.30      5    4.77 1.48   1   7     6 -0.40
## manip_ch          7 169  3.81  1.79      4    3.80 1.48   1   7     6  0.08
## gender            8 169  1.90  0.55      2    1.91 0.00   1   5     4  1.43
## age               9 169 30.15 13.23     25   27.79 7.41  18  99    81  2.07
## exp              10 169  1.04  0.19      1    1.00 0.00   1   2     1  4.98
## exp_condition    11 169  0.53  0.50      1    0.53 0.00   0   1     1 -0.11
## cohesion_mean    12 169  4.84  1.05      5    4.90 0.99   1   7     6 -0.68
##                kurtosis   se
## c_1                0.72 0.10
## c_2               -0.10 0.09
## c_3                0.72 0.10
## c_4                0.38 0.09
## c_5                0.84 0.10
## c_6               -0.19 0.10
## manip_ch          -1.13 0.14
## gender             8.06 0.04
## age                5.66 1.02
## exp               22.89 0.01
## exp_condition     -2.00 0.04
## cohesion_mean      0.68 0.08
```

Means depending on the treatment (group: 1) vs control (group: 0)

```
psych::describeBy(data, data$exp_condition)
```

```
##
##  Descriptive statistics by group
## group: 0
##                vars  n  mean    sd median trimmed  mad min max range  skew
## c_1               1 80  5.05  1.40   5.00    5.16 1.48   1   7     6 -0.89
## c_2               2 80  4.54  1.26   4.00    4.58 1.48   1   7     6 -0.21
## c_3               3 80  5.09  1.35   5.00    5.22 1.48   1   7     6 -1.01
## c_4               4 80  3.81  1.24   4.00    3.84 1.48   1   7     6 -0.12
## c_5               5 80  4.89  1.53   5.00    5.03 1.48   0   7     7 -0.96
## c_6               6 80  4.36  1.39   4.00    4.41 1.48   1   7     6 -0.15
## manip_ch          7 80  2.91  1.40   3.00    2.83 1.48   1   7     6  0.57
## gender            8 80  1.94  0.49   2.00    1.97 0.00   1   4     3  1.14
## age               9 80 30.66 13.86  25.00   28.00 7.41  18  89    71  1.79
## exp              10 80  1.05  0.22   1.00    1.00 0.00   1   2     1  4.05
## exp_condition    11 80  0.00  0.00   0.00    0.00 0.00   0   0     0   NaN
## cohesion_mean    12 80  4.62  1.12   4.67    4.69 0.99   1   7     6 -0.59
##                kurtosis   se
## c_1                0.36 0.16
```

```
## c_2              -0.11 0.14
## c_3               0.74 0.15
## c_4               0.33 0.14
## c_5               0.49 0.17
## c_6              -0.61 0.16
## manip_ch         -0.21 0.16
## gender            7.10 0.05
## age               3.22 1.55
## exp              14.60 0.02
## exp_condition      NaN 0.00
## cohesion_mean     0.53 0.12
## ------------------------------------------------------------
## group: 1
##                vars  n  mean    sd median trimmed  mad   min max range  skew
## c_1               1 89  5.42  1.06   6.00    5.48 1.48  3.00   7  4.00 -0.59
## c_2               2 89  5.16  1.14   5.00    5.16 1.48  2.00   7  5.00 -0.31
## c_3               3 89  5.37  1.12   6.00    5.45 1.48  3.00   7  4.00 -0.56
## c_4               4 89  4.02  1.21   4.00    4.03 1.48  1.00   7  6.00  0.07
## c_5               5 89  5.20  1.17   5.00    5.27 1.48  2.00   7  5.00 -0.69
## c_6               6 89  5.00  1.14   5.00    5.03 1.48  1.00   7  6.00 -0.50
## manip_ch          7 89  4.62  1.72   5.00    4.71 1.48  1.00   7  6.00 -0.55
## gender            8 89  1.87  0.61   2.00    1.85 0.00  1.00   5  4.00  1.58
## age               9 89 29.70 12.69  25.00   27.67 7.41 18.00  99 81.00  2.34
## exp              10 89  1.02  0.15   1.00    1.00 0.00  1.00   2  1.00  6.34
## exp_condition    11 89  1.00  0.00   1.00    1.00 0.00  1.00   1  0.00   NaN
## cohesion_mean    12 89  5.03  0.95   5.17    5.09 0.74  2.33   7  4.67 -0.64
##                kurtosis   se
## c_1               -0.20 0.11
## c_2               -0.23 0.12
## c_3               -0.34 0.12
## c_4                0.29 0.13
## c_5               -0.01 0.12
## c_6                0.41 0.12
## manip_ch          -0.72 0.18
## gender             7.90 0.06
## age                8.43 1.34
## exp               38.57 0.02
## exp_condition       NaN 0.00
## cohesion_mean      0.42 0.10
```

Analysis of a variance

Without Control Variables

```
one.way <- aov(cohesion_mean ~ exp_condition, data = data)
summary(one.way)
```

```
##                Df Sum Sq Mean Sq F value Pr(>F)
## exp_condition   1   6.92   6.916   6.519 0.0116 *
## Residuals     167 177.17   1.061
## ---
```

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

So far the F(1,158) = 8.92, p = .003 is significant.

With Age and Gender Controlled

```
one.way <- aov(cohesion_mean ~ exp_condition + age + gender, data = data)
summary(one.way)
```

```
##                Df Sum Sq Mean Sq F value Pr(>F)
## exp_condition   1   6.92   6.916   6.466 0.0119 *
## age             1   0.20   0.196   0.184 0.6689
## gender          1   0.48   0.476   0.445 0.5057
## Residuals     165 176.49   1.070
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

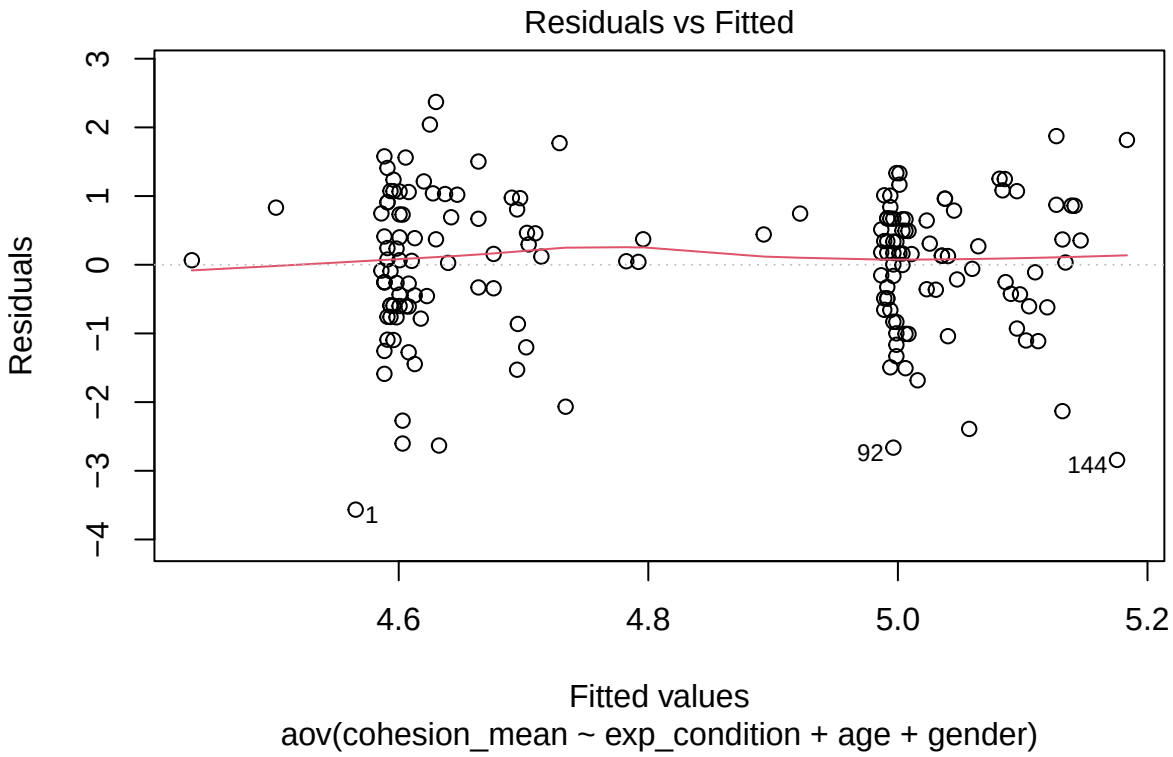
Neither gender nor age has a significant impact on team cohesion.

So far the F(1,156) = 8.84, p = .003 is significant.

ANOVA Model Diagnostic

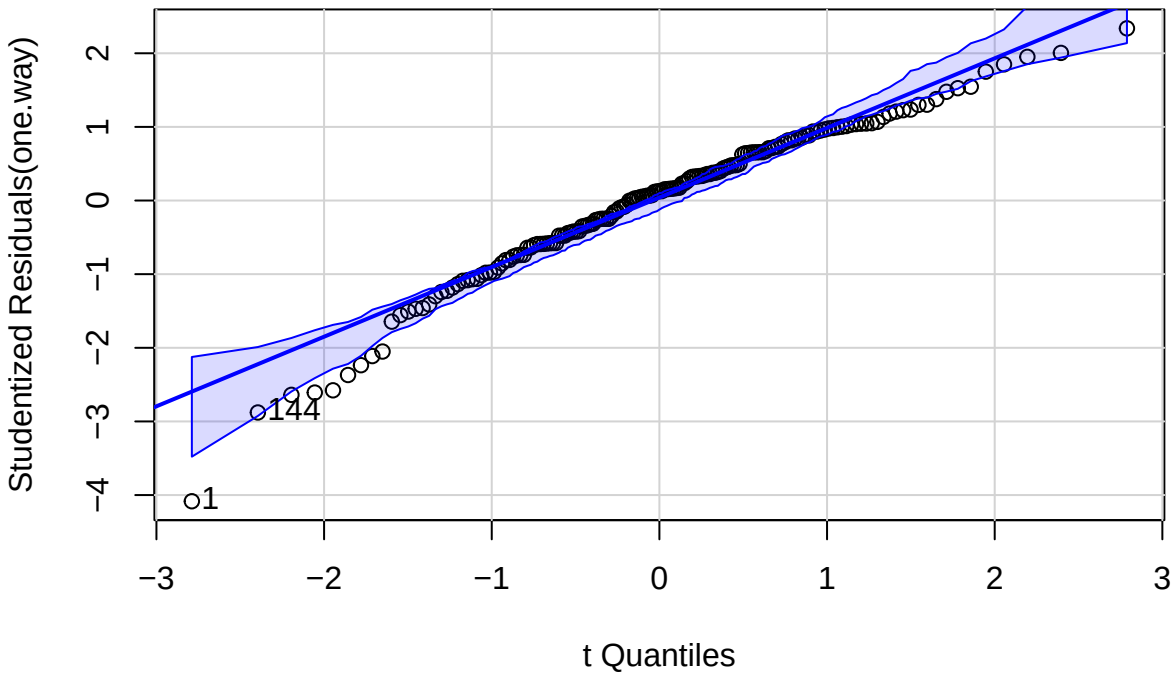
1. linearity assumption of predictors

```
plot(one.way, 1)
```



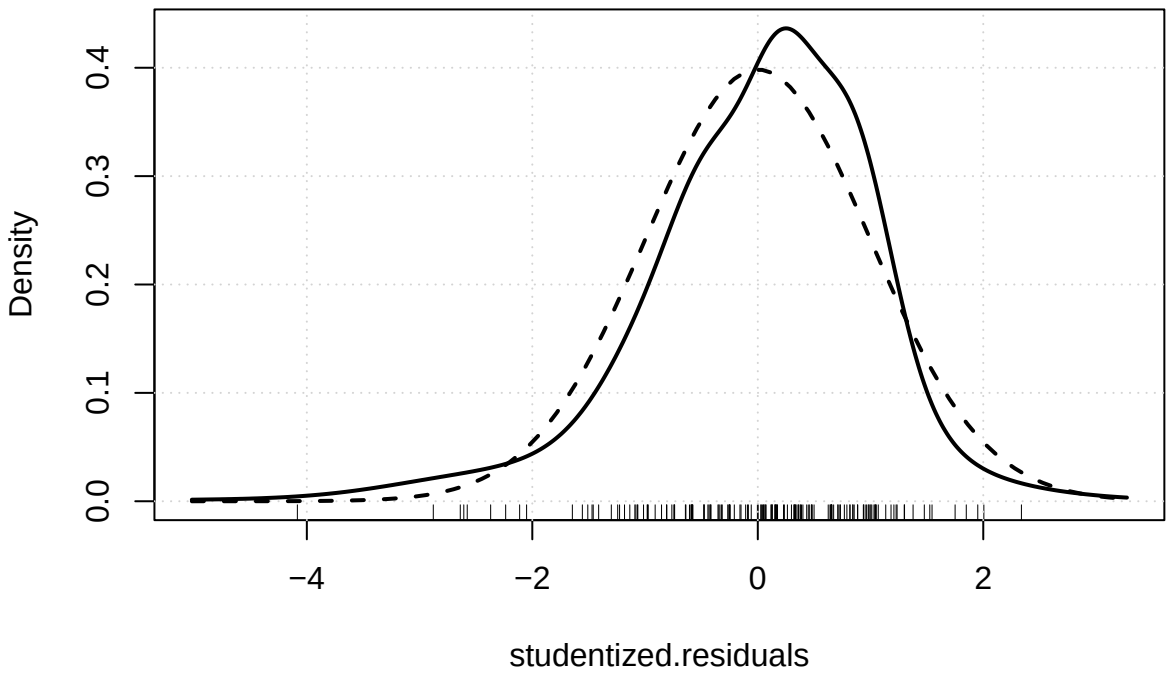
2. Normalverteilung der Residuen

```
car::qqPlot(one.way)
```



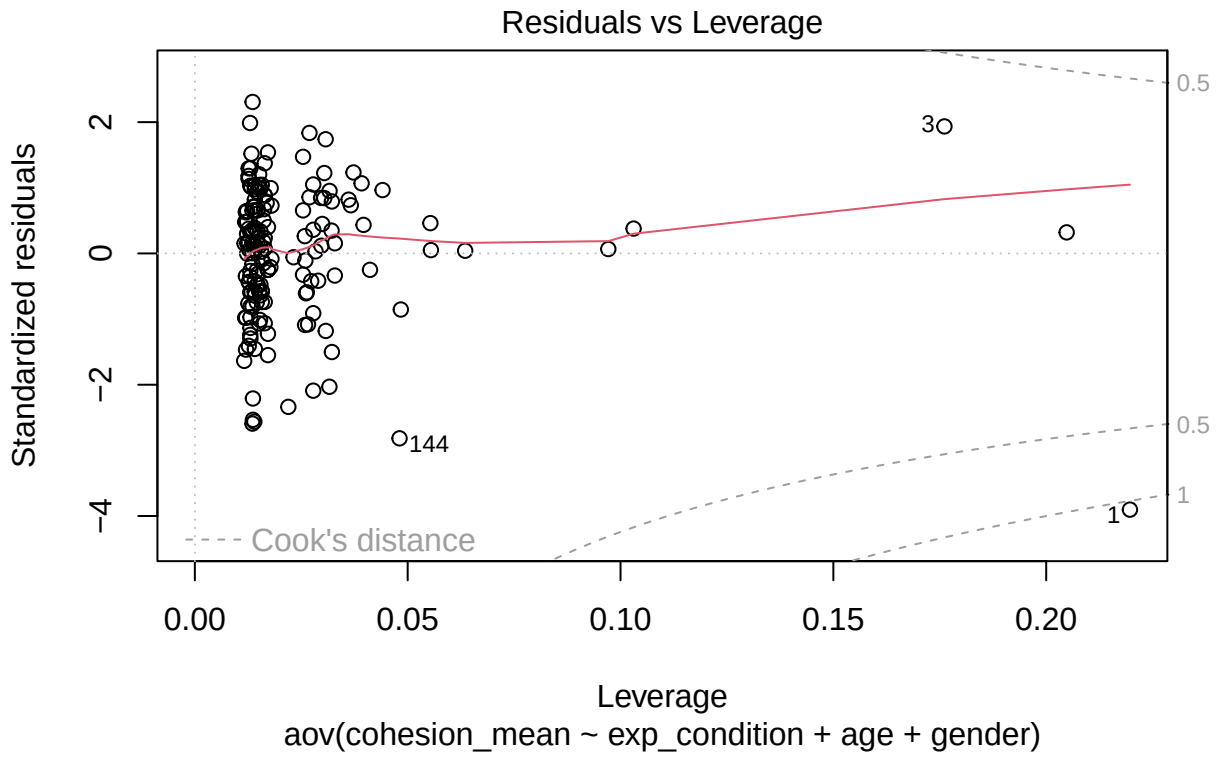

```
## [1]   1 144
```

```
studentized.residuals <- rstudent(one.way)
car::densityPlot(studentized.residuals) # Dichtekurve der Residuen
df <- one.way$df.residual
curve(dt(x, df= df), # theor. Kurve zum Vergleich
      add= TRUE, lwd= 2, lty= 2
) # graph. Parameter
```

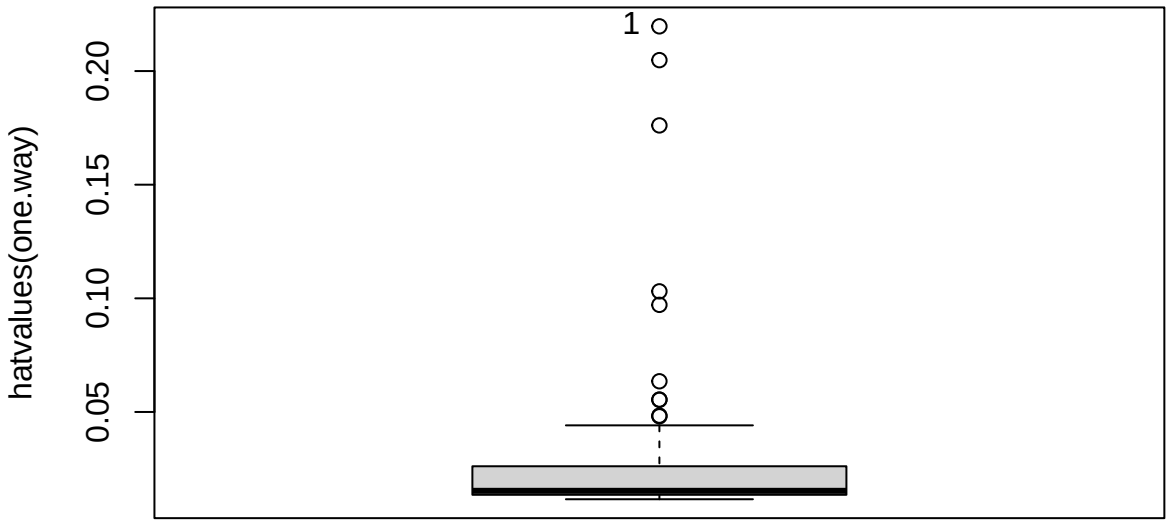


3. Outliers & leverage points

```
plot(one.way, 5)
```




```
car::Boxplot(hatvalues(one.way), id= list(n=1)) # Hebelwerte
```




```
## [1] 1
```

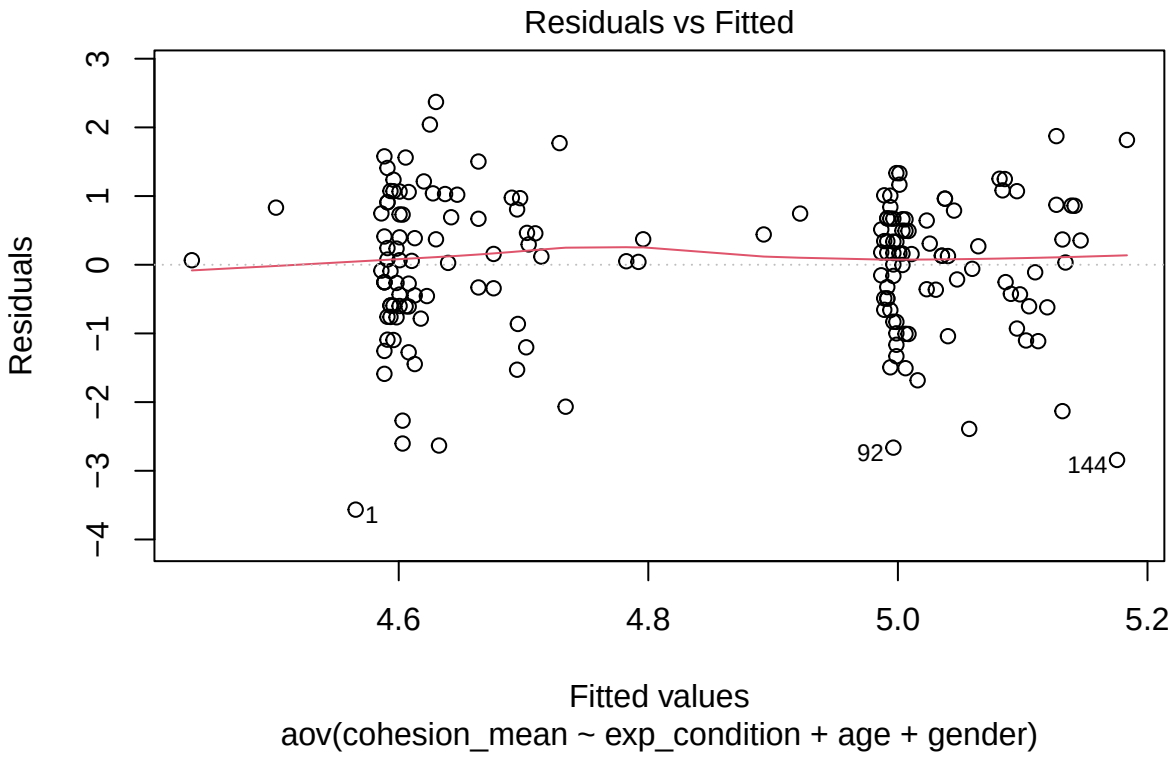
```
car::outlierTest(one.way)
```

```
##    rstudent unadjusted p-value Bonferroni p
## 1 -4.083846         6.9103e-05     0.011678
```

Invdividual 1 seams to be an outlier.

4. Homoscedacity

```
## Residuals vs Fitted Plot to observe homoscedacity
plot(one.way, which = 1)
```



5. multicollinearity

```
# "discovering statistics using R" p. 293
# If the largest VIF is greater than 10 then there is cause for concern (Bowerman & O'Connell, 1990; My
car::vif(one.way)
```

```
## exp_condition           age        gender
##      1.005850      1.002838      1.005819
```