Datenanalyse Bachelor

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24 8 2022

```
## Warning: Paket 'mosaic' wurde unter R Version 4.1.3 erstellt

## Registered S3 method overwritten by 'mosaic':
##   method                           from
##   fortify.SpatialPolygonsDataFrame ggplot2

##
## The 'mosaic' package masks several functions from core packages in order
to add
## additional features.  The original behavior of these functions should not
be affected by this.

##
## Attache Paket: 'mosaic'

## Die folgenden Objekte sind maskiert von 'package:dplyr':
##
##     count, do, tally

## Das folgende Objekt ist maskiert 'package:Matrix':
##
##     mean

## Das folgende Objekt ist maskiert 'package:ggplot2':
##
##     stat

## Die folgenden Objekte sind maskiert von 'package:stats':
##
##     binom.test, cor, cor.test, cov, fivenum, IQR, median, prop.test,
##     quantile, sd, t.test, var

## Die folgenden Objekte sind maskiert von 'package:base':
##
##     max, mean, min, prod, range, sample, sum

## Warning: Paket 'rlang' wurde unter R Version 4.1.3 erstellt

library(readr)

## Warning: Paket 'readr' wurde unter R Version 4.1.3 erstellt

DatensatzAktuell1 <- read_delim("Datensatzaktuell1.csv", #ROhdatensatz
einlesen
    delim = ";", escape_double = FALSE, trim_ws = TRUE)
```

```
## Rows: 233 Columns: 167
## -- Column specification -----------------------------------------------------
------
## Delimiter: ";"
## chr   (5): QUESTNNR, MODE, STARTED, LASTDATA, TIME_RSI
## dbl (159): CASE, SD01, SD02_01, SD03_01, D01, D02, D03, D04, D05, D06,
D07, ...
## lgl   (3): SERIAL, REF, MAILSENT
##
## i Use `spec()` to retrieve the full column specification for this data.
## i Specify the column types or set `show_col_types = FALSE` to quiet this
message.
```

```
summary(DatensatzAktuell1)
```

```
##       CASE        SERIAL          REF            QUESTNNR
##  Min.   :102.0   Mode:logical   Mode:logical   Length:233
##  1st Qu.:403.0   NA's:233       NA's:233       Class :character
##  Median :487.0                                 Mode  :character
##  Mean   :478.1
##  3rd Qu.:594.0
##  Max.   :694.0
##      MODE              STARTED               SD01          SD02_01
##  Length:233         Length:233         Min.   :1.000   Min.   :20.00
##  Class :character   Class :character   1st Qu.:1.000   1st Qu.:24.00
##  Mode  :character   Mode  :character   Median :2.000   Median :26.00
##                                        Mean   :1.695   Mean   :27.93
##                                        3rd Qu.:2.000   3rd Qu.:29.00
##                                        Max.   :3.000   Max.   :80.00
##     SD03_01            D01             D02             D03
##  Min.   : 1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000
##  1st Qu.: 2.000   1st Qu.:4.000   1st Qu.:2.000   1st Qu.:3.000
##  Median : 4.000   Median :5.000   Median :3.000   Median :3.000
##  Mean   : 5.245   Mean   :4.858   Mean   :3.335   Mean   :3.549
##  3rd Qu.: 6.000   3rd Qu.:6.000   3rd Qu.:4.000   3rd Qu.:5.000
##  Max.   :60.000   Max.   :7.000   Max.   :7.000   Max.   :7.000
##       D04             D05             D06             D07
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :2.000
##  1st Qu.:2.000   1st Qu.:2.000   1st Qu.:2.000   1st Qu.:4.000
##  Median :3.000   Median :3.000   Median :3.000   Median :5.000
##  Mean   :3.039   Mean   :3.476   Mean   :3.167   Mean   :5.056
##  3rd Qu.:4.000   3rd Qu.:5.000   3rd Qu.:4.000   3rd Qu.:6.000
##  Max.   :7.000   Max.   :7.000   Max.   :7.000   Max.   :7.000
##       D08             D09             D10             D11
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000
##  1st Qu.:3.000   1st Qu.:3.000   1st Qu.:2.000   1st Qu.:4.000
##  Median :4.000   Median :3.000   Median :3.000   Median :5.000
##  Mean   :4.202   Mean   :3.545   Mean   :3.253   Mean   :4.734
##  3rd Qu.:5.000   3rd Qu.:5.000   3rd Qu.:4.000   3rd Qu.:5.000
##  Max.   :7.000   Max.   :7.000   Max.   :7.000   Max.   :7.000
##       D12             D13             D14             D15
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000
```

```
##  1st Qu.:4.000   1st Qu.:2.000   1st Qu.:2.000   1st Qu.:3.000
##  Median :4.000   Median :3.000   Median :3.000   Median :4.000
##  Mean   :4.472   Mean   :2.961   Mean   :3.266   Mean   :4.451
##  3rd Qu.:5.000   3rd Qu.:4.000   3rd Qu.:5.000   3rd Qu.:6.000
##  Max.   :7.000   Max.   :7.000   Max.   :7.000   Max.   :7.000
##       D16             D17             D18             D19
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000
##  1st Qu.:2.000   1st Qu.:4.000   1st Qu.:3.000   1st Qu.:2.000
##  Median :3.000   Median :4.000   Median :4.000   Median :3.000
##  Mean   :3.468   Mean   :4.335   Mean   :4.206   Mean   :3.326
##  3rd Qu.:5.000   3rd Qu.:5.000   3rd Qu.:5.000   3rd Qu.:5.000
##  Max.   :7.000   Max.   :7.000   Max.   :7.000   Max.   :7.000
##       D20             D21             D22             D23
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000
##  1st Qu.:3.000   1st Qu.:2.000   1st Qu.:2.000   1st Qu.:2.000
##  Median :4.000   Median :3.000   Median :3.000   Median :2.000
##  Mean   :4.004   Mean   :3.283   Mean   :3.249   Mean   :2.511
##  3rd Qu.:5.000   3rd Qu.:4.000   3rd Qu.:4.000   3rd Qu.:3.000
##  Max.   :7.000   Max.   :7.000   Max.   :7.000   Max.   :7.000
##       D24             D25             D26            D27             D28
##  Min.   :1.000   Min.   :1.000   Min.   :1.00   Min.   :1.000   Min.
:1.000
##  1st Qu.:2.000   1st Qu.:3.000   1st Qu.:3.00   1st Qu.:3.000   1st
Qu.:2.000
##  Median :4.000   Median :4.000   Median :4.00   Median :5.000   Median
:3.000
##  Mean   :3.425   Mean   :4.013   Mean   :3.79   Mean   :4.446   Mean
:2.906
##  3rd Qu.:5.000   3rd Qu.:5.000   3rd Qu.:5.00   3rd Qu.:5.000   3rd
Qu.:4.000
##  Max.   :7.000   Max.   :7.000   Max.   :7.00   Max.   :7.000   Max.
:7.000
##       D29             D30             D31             D32            D33
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.00   Min.
:1.000
##  1st Qu.:2.000   1st Qu.:3.000   1st Qu.:4.000   1st Qu.:3.00   1st
Qu.:2.000
##  Median :3.000   Median :4.000   Median :5.000   Median :4.00   Median
:3.000
##  Mean   :3.258   Mean   :3.876   Mean   :4.966   Mean   :3.88   Mean
:3.412
##  3rd Qu.:5.000   3rd Qu.:5.000   3rd Qu.:6.000   3rd Qu.:5.00   3rd
Qu.:5.000
##  Max.   :7.000   Max.   :6.000   Max.   :7.000   Max.   :7.00   Max.
:7.000
##       D34             D35             D36             D37
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000
##  1st Qu.:2.000   1st Qu.:3.000   1st Qu.:4.000   1st Qu.:2.000
##  Median :3.000   Median :4.000   Median :5.000   Median :3.000
##  Mean   :3.472   Mean   :3.755   Mean   :4.687   Mean   :3.107
##  3rd Qu.:5.000   3rd Qu.:5.000   3rd Qu.:5.000   3rd Qu.:4.000
```

```
##  Max.   :7.000   Max.   :7.000   Max.   :7.000   Max.   :7.000  
##       D38             D39             D40             D41       
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000  
##  1st Qu.:2.000   1st Qu.:2.000   1st Qu.:3.000   1st Qu.:2.000  
##  Median :2.000   Median :3.000   Median :4.000   Median :4.000  
##  Mean   :2.773   Mean   :3.103   Mean   :4.069   Mean   :3.579  
##  3rd Qu.:4.000   3rd Qu.:4.000   3rd Qu.:5.000   3rd Qu.:5.000  
##  Max.   :6.000   Max.   :7.000   Max.   :7.000   Max.   :7.000  
##       D42             D43             D44             D45       
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000  
##  1st Qu.:4.000   1st Qu.:2.000   1st Qu.:2.000   1st Qu.:3.000  
##  Median :5.000   Median :3.000   Median :3.000   Median :4.000  
##  Mean   :4.807   Mean   :3.365   Mean   :3.476   Mean   :3.704  
##  3rd Qu.:6.000   3rd Qu.:4.000   3rd Qu.:4.000   3rd Qu.:5.000  
##  Max.   :7.000   Max.   :7.000   Max.   :7.000   Max.   :7.000  
##       D46             D47             D48             D49       
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000  
##  1st Qu.:4.000   1st Qu.:4.000   1st Qu.:4.000   1st Qu.:2.000  
##  Median :5.000   Median :5.000   Median :4.000   Median :3.000  
##  Mean   :4.867   Mean   :4.592   Mean   :4.352   Mean   :3.464  
##  3rd Qu.:5.000   3rd Qu.:6.000   3rd Qu.:5.000   3rd Qu.:5.000  
##  Max.   :7.000   Max.   :7.000   Max.   :7.000   Max.   :7.000  
##       D50             D51             D52             D53       
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000  
##  1st Qu.:2.000   1st Qu.:3.000   1st Qu.:2.000   1st Qu.:3.000  
##  Median :3.000   Median :4.000   Median :4.000   Median :4.000  
##  Mean   :3.373   Mean   :3.704   Mean   :3.631   Mean   :3.768  
##  3rd Qu.:4.000   3rd Qu.:5.000   3rd Qu.:5.000   3rd Qu.:5.000  
##  Max.   :7.000   Max.   :7.000   Max.   :7.000   Max.   :7.000  
##       D54             D55             D56             D57             D58
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   
:1.00  
##  1st Qu.:2.000   1st Qu.:1.000   1st Qu.:3.000   1st Qu.:3.000   1st 
Qu.:2.00  
##  Median :3.000   Median :2.000   Median :4.000   Median :4.000   Median 
:4.00  
##  Mean   :2.966   Mean   :2.614   Mean   :4.189   Mean   :3.768   Mean   
:3.85  
##  3rd Qu.:4.000   3rd Qu.:3.000   3rd Qu.:5.000   3rd Qu.:5.000   3rd 
Qu.:5.00  
##  Max.   :7.000   Max.   :7.000   Max.   :7.000   Max.   :7.000   Max.   
:7.00  
##       D59             D60          OC01_01        OC01_02         OC01_03
##  Min.   :1.000   Min.   :1.00   Min.   :2.00   Min.   :1.000   Min.   
:1.000  
##  1st Qu.:3.000   1st Qu.:3.00   1st Qu.:5.00   1st Qu.:5.000   1st 
Qu.:4.000  
##  Median :4.000   Median :4.00   Median :6.00   Median :6.000   Median 
:5.000  
##  Mean   :3.845   Mean   :4.12   Mean   :5.76   Mean   :5.622   Mean   
:5.013  
```

```
##  3rd Qu.:5.000   3rd Qu.:5.00   3rd Qu.:6.00   3rd Qu.:7.000   3rd
Qu.:6.000
##  Max.   :7.000   Max.   :7.00   Max.   :7.00   Max.   :7.000   Max.
:7.000
##     OC01_04         OC01_05        OC01_06         OC01_07         OC01_08
##  Min.   :1.000   Min.   :1.00   Min.   :2.000   Min.   :1.000   Min.
:1.000
##  1st Qu.:4.000   1st Qu.:4.00   1st Qu.:6.000   1st Qu.:4.000   1st
Qu.:5.000
##  Median :5.000   Median :5.00   Median :6.000   Median :6.000   Median
:5.000
##  Mean   :5.215   Mean   :5.03   Mean   :6.116   Mean   :5.219   Mean
:5.202
##  3rd Qu.:6.000   3rd Qu.:6.00   3rd Qu.:7.000   3rd Qu.:6.000   3rd
Qu.:6.000
##  Max.   :7.000   Max.   :7.00   Max.   :7.000   Max.   :7.000   Max.
:7.000
##     OC01_09         OC01_10         OC01_11         OC01_12        OC01_13
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.00   Min.
:2.000
##  1st Qu.:5.000   1st Qu.:5.000   1st Qu.:5.000   1st Qu.:4.00   1st
Qu.:5.000
##  Median :6.000   Median :6.000   Median :6.000   Median :5.00   Median
:6.000
##  Mean   :5.339   Mean   :5.768   Mean   :5.567   Mean   :5.09   Mean
:5.519
##  3rd Qu.:6.000   3rd Qu.:7.000   3rd Qu.:7.000   3rd Qu.:6.00   3rd
Qu.:6.000
##  Max.   :7.000   Max.   :7.000   Max.   :7.000   Max.   :7.00   Max.
:7.000
##     OC01_14         OC01_15         OC01_16         OC01_17
##  Min.   :2.000   Min.   :1.000   Min.   :1.000   Min.   :2.000
##  1st Qu.:5.000   1st Qu.:4.000   1st Qu.:4.000   1st Qu.:5.000
##  Median :5.000   Median :5.000   Median :5.000   Median :6.000
##  Mean   :5.318   Mean   :5.189   Mean   :5.172   Mean   :5.734
##  3rd Qu.:6.000   3rd Qu.:6.000   3rd Qu.:6.000   3rd Qu.:6.000
##  Max.   :7.000   Max.   :7.000   Max.   :7.000   Max.   :7.000
##     OC01_18         OC01_19         OC01_20           I1
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000
##  1st Qu.:3.000   1st Qu.:4.000   1st Qu.:4.000   1st Qu.:3.000
##  Median :5.000   Median :5.000   Median :5.000   Median :3.000
##  Mean   :4.554   Mean   :4.884   Mean   :4.884   Mean   :3.356
##  3rd Qu.:6.000   3rd Qu.:6.000   3rd Qu.:6.000   3rd Qu.:4.000
##  Max.   :7.000   Max.   :7.000   Max.   :7.000   Max.   :4.000
##        I2              I3              I4              I5             I6
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.00   Min.
:1.000
##  1st Qu.:2.000   1st Qu.:2.000   1st Qu.:3.000   1st Qu.:3.00   1st
Qu.:3.000
##  Median :3.000   Median :3.000   Median :3.000   Median :3.00   Median
:3.000
```

```
##  Mean   :2.575   Mean   :2.785   Mean   :3.262   Mean   :3.12   Mean   
:3.073  
##  3rd Qu.:3.000   3rd Qu.:3.000   3rd Qu.:4.000   3rd Qu.:4.00   3rd 
Qu.:4.000  
##  Max.   :4.000   Max.   :4.000   Max.   :4.000   Max.   :4.00   Max.   
:4.000  
##        I7               I8              I9              I10             I11       
##  Min.   :1.000   Min.   :1.00   Min.   :1.000   Min.   :1.000   Min.   
:1.000  
##  1st Qu.:2.000   1st Qu.:2.00   1st Qu.:3.000   1st Qu.:2.000   1st 
Qu.:2.000  
##  Median :3.000   Median :3.00   Median :3.000   Median :3.000   Median 
:3.000  
##  Mean   :2.571   Mean   :2.79   Mean   :3.034   Mean   :2.549   Mean   
:2.712  
##  3rd Qu.:3.000   3rd Qu.:3.00   3rd Qu.:4.000   3rd Qu.:3.000   3rd 
Qu.:3.000  
##  Max.   :4.000   Max.   :4.00   Max.   :4.000   Max.   :4.000   Max.   
:4.000  
##       I12             I13              I14              I15             I16      
##  Min.   :1.00   Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   
:1.00  
##  1st Qu.:2.00   1st Qu.:3.000   1st Qu.:2.000   1st Qu.:2.000   1st 
Qu.:2.00  
##  Median :3.00   Median :3.000   Median :3.000   Median :3.000   Median 
:3.00  
##  Mean   :2.73   Mean   :3.142   Mean   :2.841   Mean   :2.751   Mean   
:2.88  
##  3rd Qu.:3.00   3rd Qu.:4.000   3rd Qu.:3.000   3rd Qu.:3.000   3rd 
Qu.:3.00  
##  Max.   :4.00   Max.   :4.000   Max.   :4.000   Max.   :4.000   Max.   
:4.00  
##       I17              I18              I19              I20             I21       
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.00   Min.   
:1.000  
##  1st Qu.:3.000   1st Qu.:2.000   1st Qu.:2.000   1st Qu.:2.00   1st 
Qu.:2.000  
##  Median :3.000   Median :3.000   Median :3.000   Median :3.00   Median 
:3.000  
##  Mean   :3.129   Mean   :2.837   Mean   :2.704   Mean   :2.76   Mean   
:2.635  
##  3rd Qu.:4.000   3rd Qu.:3.000   3rd Qu.:3.000   3rd Qu.:3.00   3rd 
Qu.:3.000  
##  Max.   :4.000   Max.   :4.000   Max.   :4.000   Max.   :4.00   Max.   
:4.000  
##       I22              I23              I24              I25       
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000  
##  1st Qu.:2.000   1st Qu.:3.000   1st Qu.:2.000   1st Qu.:2.000  
##  Median :3.000   Median :3.000   Median :3.000   Median :3.000  
##  Mean   :2.833   Mean   :3.318   Mean   :2.824   Mean   :2.528  
##  3rd Qu.:3.000   3rd Qu.:4.000   3rd Qu.:3.000   3rd Qu.:3.000  
```

```
##  Max.   :4.000   Max.   :4.000   Max.   :4.000   Max.   :4.000  
##       I26             I27             I28             I29       
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000  
##  1st Qu.:3.000   1st Qu.:3.000   1st Qu.:2.000   1st Qu.:2.000  
##  Median :3.000   Median :3.000   Median :3.000   Median :3.000  
##  Mean   :3.004   Mean   :2.944   Mean   :2.691   Mean   :2.755  
##  3rd Qu.:3.000   3rd Qu.:3.000   3rd Qu.:3.000   3rd Qu.:3.000  
##  Max.   :4.000   Max.   :4.000   Max.   :4.000   Max.   :4.000  
##       I30             I31             I32             I33       
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000  
##  1st Qu.:3.000   1st Qu.:2.000   1st Qu.:2.000   1st Qu.:3.000  
##  Median :3.000   Median :3.000   Median :3.000   Median :3.000  
##  Mean   :3.283   Mean   :2.695   Mean   :2.824   Mean   :2.983  
##  3rd Qu.:4.000   3rd Qu.:3.000   3rd Qu.:3.000   3rd Qu.:3.000  
##  Max.   :4.000   Max.   :4.000   Max.   :4.000   Max.   :4.000  
##     TIME001            TIME002            TIME003          TIME004      
##  Min.   :   1.00   Min.   :    5.0   Min.   :  3.00   Min.   :  2.00  
##  1st Qu.:   4.00   1st Qu.:   10.0   1st Qu.: 18.00   1st Qu.: 15.00  
##  Median :   9.00   Median :   13.0   Median : 26.00   Median : 20.00  
##  Mean   :  61.08   Mean   :  152.1   Mean   : 33.92   Mean   : 25.06  
##  3rd Qu.:  18.00   3rd Qu.:   19.0   3rd Qu.: 39.00   3rd Qu.: 27.00  
##  Max.   :8216.00   Max.   :27983.0   Max.   :457.00   Max.   :245.00  
##     TIME005          TIME006          TIME007          TIME008      
##  Min.   :  2.00   Min.   :  2.00   Min.   :  2.00   Min.   :  2.00  
##  1st Qu.: 16.00   1st Qu.: 13.00   1st Qu.: 13.00   1st Qu.: 11.00  
##  Median : 21.00   Median : 18.00   Median : 17.00   Median : 13.00  
##  Mean   : 26.15   Mean   : 20.27   Mean   : 21.44   Mean   : 15.43  
##  3rd Qu.: 28.00   3rd Qu.: 21.00   3rd Qu.: 22.00   3rd Qu.: 17.00  
##  Max.   :163.00   Max.   :196.00   Max.   :387.00   Max.   :169.00  
##     TIME009          TIME010          TIME011         TIME012      
##  Min.   :  2.00   Min.   :  1.00   Min.   :  2.0   Min.   :  2.00  
##  1st Qu.: 10.00   1st Qu.: 13.00   1st Qu.: 12.0   1st Qu.: 13.00  
##  Median : 13.00   Median : 16.00   Median : 15.0   Median : 17.00  
##  Mean   : 17.53   Mean   : 23.67   Mean   : 19.3   Mean   : 22.38  
##  3rd Qu.: 18.00   3rd Qu.: 21.00   3rd Qu.: 21.0   3rd Qu.: 23.00  
##  Max.   :230.00   Max.   :475.00   Max.   :103.0   Max.   :390.00  
##     TIME013            TIME014          TIME015          TIME016     
##  Min.   :   2.00   Min.   :  2.00   Min.   :  2.00   Min.   : 1.00  
##  1st Qu.:  11.00   1st Qu.: 12.00   1st Qu.: 13.00   1st Qu.:10.00  
##  Median :  14.00   Median : 16.00   Median : 16.00   Median :13.00  
##  Mean   :  22.58   Mean   : 23.12   Mean   : 20.14   Mean   :16.68  
##  3rd Qu.:  18.00   3rd Qu.: 21.00   3rd Qu.: 21.00   3rd Qu.:18.00  
##  Max.   :1516.00   Max.   :494.00   Max.   :268.00   Max.   :98.00  
##     TIME017          TIME018            TIME019          TIME020      
##  Min.   :  2.00   Min.   :   2.00   Min.   :  2.00   Min.   :  1.00  
##  1st Qu.: 14.00   1st Qu.:  11.00   1st Qu.: 11.00   1st Qu.: 10.00  
##  Median : 18.00   Median :  14.00   Median : 14.00   Median : 13.00  
##  Mean   : 23.87   Mean   :  30.94   Mean   : 20.86   Mean   : 17.41  
##  3rd Qu.: 24.00   3rd Qu.:  18.00   3rd Qu.: 18.00   3rd Qu.: 17.00  
##  Max.   :294.00   Max.   :1483.00   Max.   :338.00   Max.   :281.00  
##     TIME021         TIME022          TIME023            TIME024      
```

```
##  Min.   : 2.0   Min.   :  2.00   Min.   :   12.0   Min.   :   2.00
##  1st Qu.:11.0   1st Qu.: 12.00   1st Qu.:   77.0   1st Qu.:  18.00
##  Median :13.0   Median : 16.00   Median :   95.0   Median :  26.00
##  Mean   :15.5   Mean   : 21.02   Mean   :  207.4   Mean   :  39.39
##  3rd Qu.:17.0   3rd Qu.: 21.00   3rd Qu.:  118.0   3rd Qu.:  38.00
##  Max.   :88.0   Max.   :357.00   Max.   :21920.0   Max.   :1855.00
##     TIME025          TIME026          TIME027          TIME028
##  Min.   :  3.00   Min.   :  2.00   Min.   :  2.00   Min.   :  2.00
##  1st Qu.: 12.00   1st Qu.: 14.00   1st Qu.: 11.00   1st Qu.: 14.00
##  Median : 14.00   Median : 17.00   Median : 14.00   Median : 18.00
##  Mean   : 18.34   Mean   : 20.58   Mean   : 21.25   Mean   : 22.24
##  3rd Qu.: 18.00   3rd Qu.: 21.00   3rd Qu.: 19.00   3rd Qu.: 25.00
##  Max.   :330.00   Max.   :336.00   Max.   :789.00   Max.   :202.00
##     TIME029         TIME030           TIME031          TIME032
##  Min.   :  2.0   Min.   :   2.00   Min.   :  2.00   Min.   : 2.00
##  1st Qu.: 12.0   1st Qu.:  12.00   1st Qu.: 13.00   1st Qu.:13.00
##  Median : 15.0   Median :  15.00   Median : 16.00   Median :16.00
##  Mean   : 21.9   Mean   :  25.24   Mean   : 21.48   Mean   :18.14
##  3rd Qu.: 20.0   3rd Qu.:  19.00   3rd Qu.: 21.00   3rd Qu.:21.00
##  Max.   :799.0   Max.   :1347.00   Max.   :290.00   Max.   :77.00
##     TIME033          TIME034          TIME_SUM     MAILSENT
##  Min.   :  2.00   Min.   :  1.00   Min.   : 95.0   Mode:logical
##  1st Qu.:  9.00   1st Qu.: 12.00   1st Qu.:530.0   NA's:233
##  Median : 11.00   Median : 15.00   Median :624.0
##  Mean   : 16.36   Mean   : 21.06   Mean   :624.6
##  3rd Qu.: 16.00   3rd Qu.: 21.00   3rd Qu.:737.0
##  Max.   :560.00   Max.   :325.00   Max.   :991.0
##    LASTDATA            FINISHED    Q_VIEWER    LASTPAGE     MAXPAGE
##  Length:233         Min.   :1   Min.   :0   Min.   :34   Min.   :34
##  Class :character   1st Qu.:1   1st Qu.:0   1st Qu.:34   1st Qu.:34
##  Mode  :character   Median :1   Median :0   Median :34   Median :34
##                     Mean   :1   Mean   :0   Mean   :34   Mean   :34
##                     3rd Qu.:1   3rd Qu.:0   3rd Qu.:34   3rd Qu.:34
##                     Max.   :1   Max.   :0   Max.   :34   Max.   :34
##     MISSING     MISSREL    TIME_RSI            DEG_TIME
##  Min.   :0   Min.   :0   Length:233         Min.   :  0.00
##  1st Qu.:0   1st Qu.:0   Class :character   1st Qu.:  2.00
##  Median :0   Median :0   Mode  :character   Median :  7.00
##  Mean   :0   Mean   :0                      Mean   : 17.63
##  3rd Qu.:0   3rd Qu.:0                      3rd Qu.: 16.00
##  Max.   :0   Max.   :0                      Max.   :294.00
```

if (!require(“pacman”)) install.packages(“pacman”)

p_load(tidyverse ,haven ,psych ,labelled ,corx ,digest ,lavaan ,lmerTest ,GPArotation ,lavaanPlot ,corrr ,lmerTest, mosaic, apa, apaTables, dplyr, apaText, tidyr, ggplot2, car, psychometric, MAAS)

Nicht benötigte Spalten aus Rohdatensatz entfernen.

```
daten <- DatensatzAktuell1 #Umbennen des Datensatzes in daten
daten[,1:6] <- list(NULL)
daten[,117:165] <- list(NULL)

head(daten)

## # A tibble: 6 x 116
##    SD01 SD02_01 SD03_01   D01   D02   D03   D04   D05   D06   D07   D08
D09
##   <dbl>   <dbl>   <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>
<dbl>
## 1     1      22       3     6     2     4     4     5     6     6     6
3
## 2     1      44      13     5     6     4     2     5     1     5     5
5
## 3     2      30       5     6     6     2     4     4     2     6     5
4
## 4     1      63      20     4     4     5     4     5     2     4     3
2
## 5     1      31      15     4     5     5     4     3     6     6     6
3
## 6     1      41       1     6     3     5     7     6     7     7     4
5
## # ... with 104 more variables: D10 <dbl>, D11 <dbl>, D12 <dbl>, D13 <dbl>,
## #   D14 <dbl>, D15 <dbl>, D16 <dbl>, D17 <dbl>, D18 <dbl>, D19 <dbl>,
## #   D20 <dbl>, D21 <dbl>, D22 <dbl>, D23 <dbl>, D24 <dbl>, D25 <dbl>,
## #   D26 <dbl>, D27 <dbl>, D28 <dbl>, D29 <dbl>, D30 <dbl>, D31 <dbl>,
## #   D32 <dbl>, D33 <dbl>, D34 <dbl>, D35 <dbl>, D36 <dbl>, D37 <dbl>,
## #   D38 <dbl>, D39 <dbl>, D40 <dbl>, D41 <dbl>, D42 <dbl>, D43 <dbl>,
## #   D44 <dbl>, D45 <dbl>, D46 <dbl>, D47 <dbl>, D48 <dbl>, D49 <dbl>, ...
```

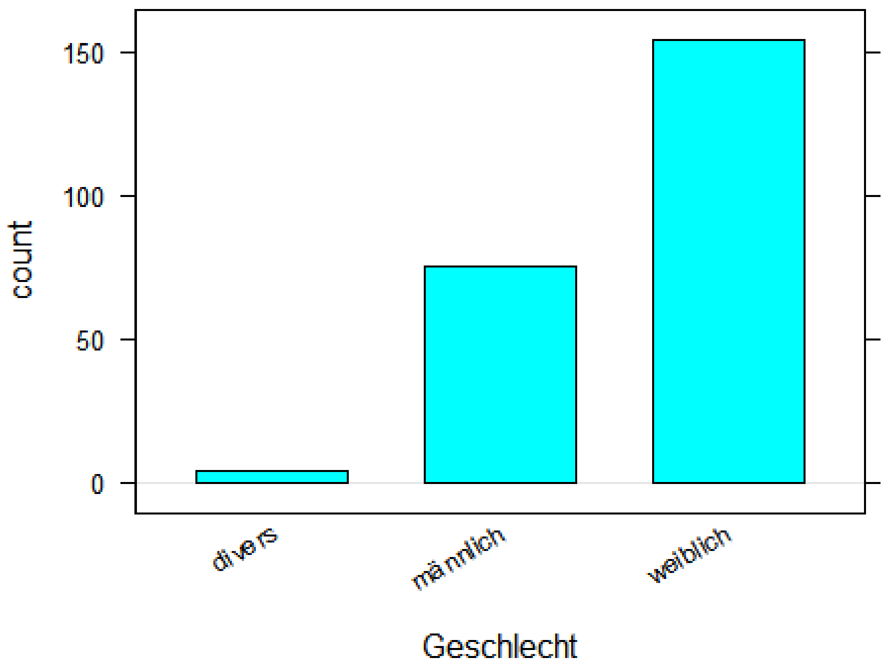
1 Deskriptivstatistik der soziodemographiscen Variabeln

Soziodemographische Variablen umbennen.

```
names(daten)[names(daten) == 'SD01'] <- 'Geschlecht'

daten$Geschlecht[daten$Geschlecht == "1"] <- "männlich" # Beobachtungen den
jeweiligen Geschlechtern zuweisen
daten$Geschlecht[daten$Geschlecht == "2"] <- "weiblich" # Beobachtungen den
jeweiligen Geschlechtern zuweisen
daten$Geschlecht[daten$Geschlecht == "3"] <- "divers"   # Beobachtungen den
jeweiligen Geschlechtern zuweisen

names(daten)[names(daten) == 'SD02_01'] <- 'Alter'
names(daten)[names(daten) == 'SD03_01'] <- 'DDB' # Dauer der
Betriebszugehörigket
```

Verteilung von Geschlecht

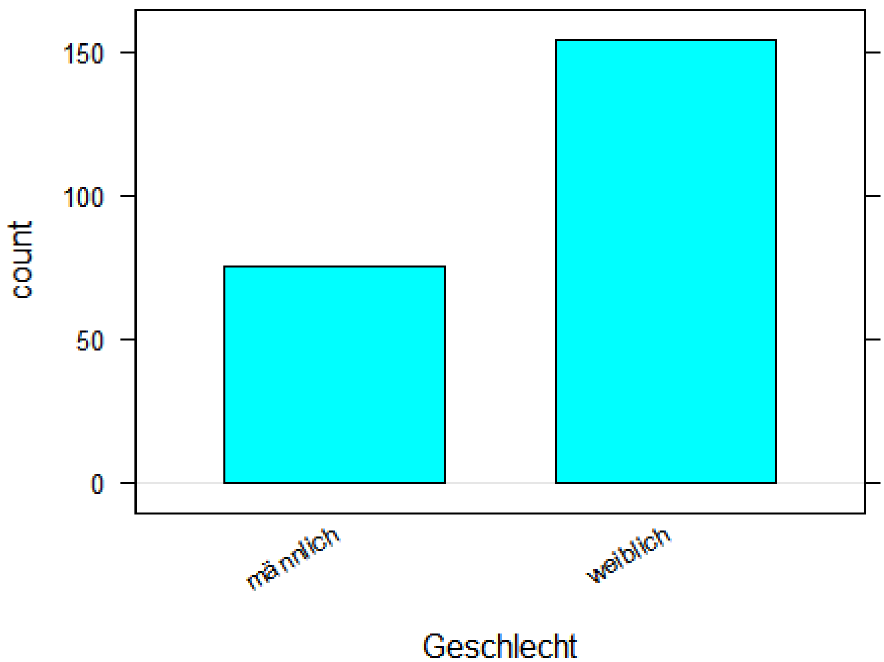
```
bargraph (~Geschlecht, daten)
```




```
tally(~Geschlecht, daten)

## Geschlecht
##   divers männlich weiblich
##        4       75      154

tally(~Geschlecht, format = "percent" ,daten)

## Geschlecht
##    divers  männlich  weiblich
##  1.716738 32.188841 66.094421
```

Geschlecht Divers zu verlässigen wegen N = 4

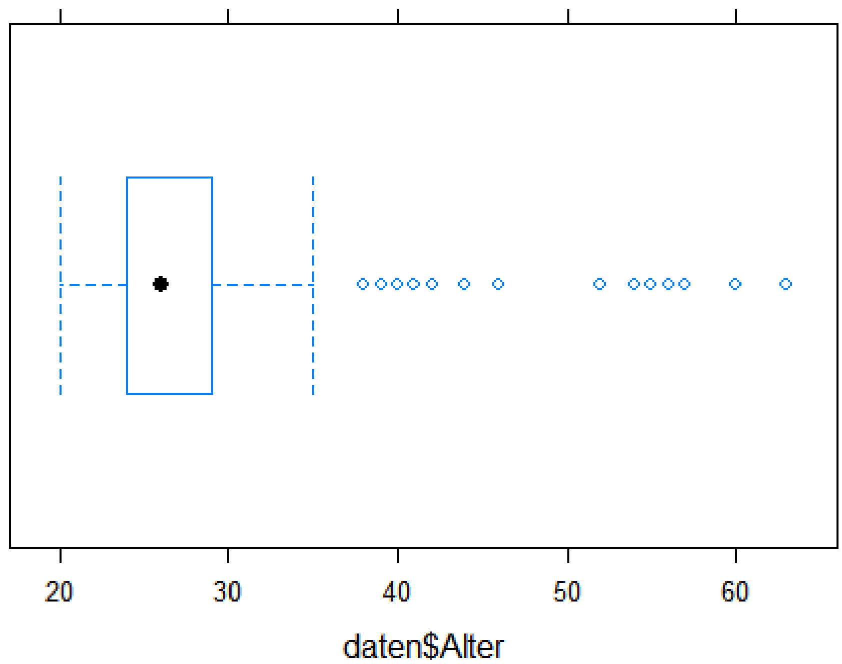
```
daten <- daten[daten$Geschlecht !='divers',] # Divers aus Datensatz entfernen

bargraph (~Geschlecht, daten)
```



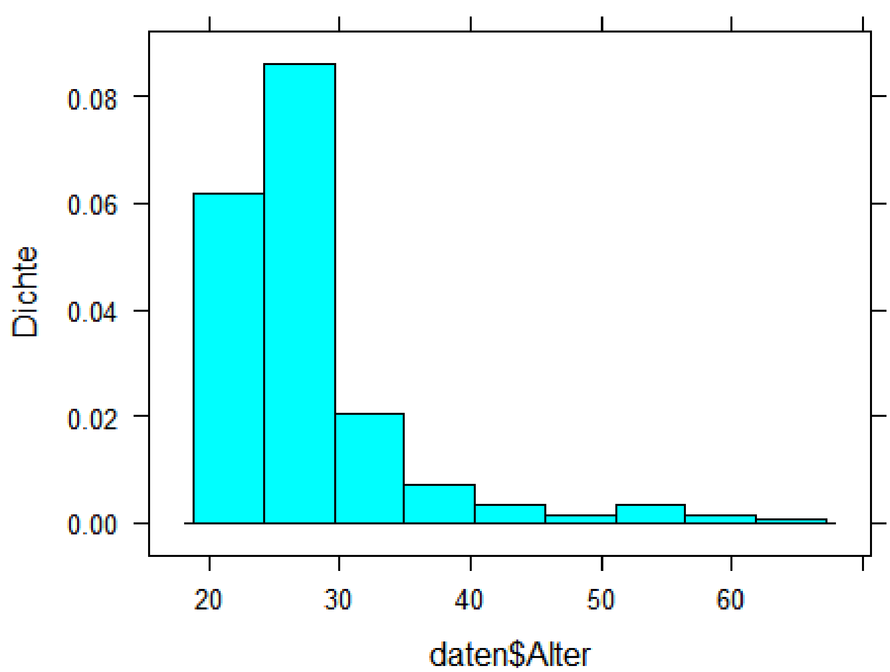

```
tally(~Geschlecht, daten)

## Geschlecht
## männlich weiblich
##       75      154

tally(~Geschlecht, format = "percent" ,daten)

## Geschlecht
## männlich weiblich
## 32.75109 67.24891
```

Verteilung von Alter

```
favstats(daten$Alter)

##  min Q1 median Q3 max     mean       sd   n missing
##   20 24     26 29  63 27.61572 6.932059 229       0

bwplot(daten$Alter)
```



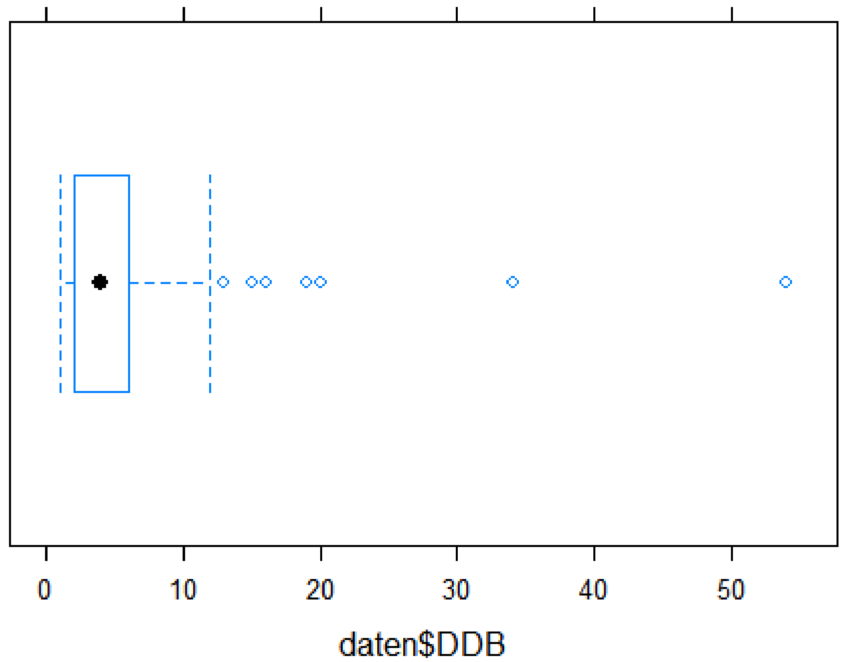

```
histogram(daten$Alter)
```



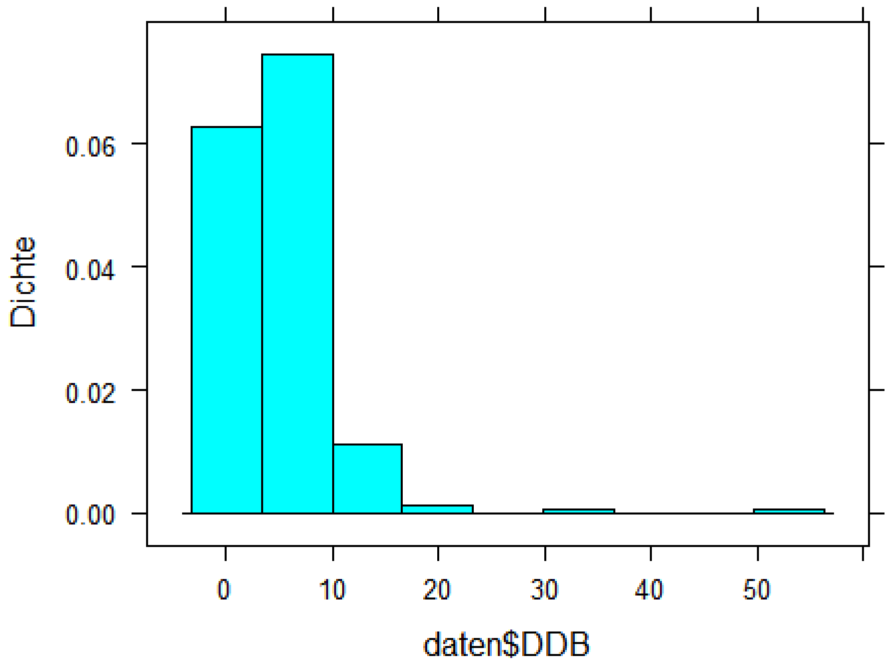
Verteilung von Dauer der Betriebszgehörigkeit

```
favstats(daten$`DDB`)
```

```
##   min Q1 median Q3 max     mean       sd   n missing
##     1  2      4  6  54 5.017467 5.128152 229       0

bwplot(daten$`DDB`)
```




```
histogram(daten$`DDB`)
```



2 Skalenkonstruktion

2.1 Dunkle Triade

Subskala Unsentimentaliät von MA (UNMA)

```
daten$UNMA <- rowMeans(subset(daten, select = c(D02, D08, D26, D39, D49)))
```

Subkala Skepsis von MA (SKMA)

```
daten$SKMA <- rowMeans(subset(daten, select = c(D24, D28, D43, D45, D57)))
```

Subkala Durchsetzungsglaube von MA (DUMA)

```
daten$DUMA <- rowMeans(subset(daten, select = c(D06, D20, D22, D38, D42, D54,
D55)))
```

Konstrukt MA insgesamt

```
daten$MA <- rowMeans(subset(daten, select = c(UNMA, SKMA, DUMA)))
inspect(daten$MA)
```

```
## # A tibble: 1 x 10
##   class      min    Q1 median    Q3   max  mean    sd     n missing
## * <chr>    <dbl> <dbl>  <dbl> <dbl> <dbl> <dbl> <dbl> <int>   <int>
## 1 numeric   1.30  2.89   3.42  4.14  6.15  3.45 0.918   229       0
```

Subskala Führungsanspruch von NA (FUNA)

```
daten$FUNA <- rowMeans(subset(daten, select = c(D01, D15, D17, D25, D40, D53,
D56)))
```

Subskala Überzeugungsglaube von NA (ZENA)

```
daten$ZENA <- rowMeans(subset(daten, select = c(D07, D11, D30, D31, D36, D46,
D47, D48, D60)))
```

Subskala Autoritätsbedürfnis von NA (AUNA)

```
daten$AUNA <- rowMeans(subset(daten, select = c(D13, D16, D21, D41)))
```

Subskala Risikofreude von NA (RINA)

```
daten$RINA <- rowMeans(subset(daten, select = c(D12, D27, D51)))
```

Subskala Überlegenheitsgefühl von NA (LENA)

```
daten$LENA <- rowMeans(subset(daten, select = c(D04, D10, D18, D23, D32, D35,
D50, D59)))
```

Konstrukt NA (NAR) insgesamt. NAR musste aus syntaxgründen so gewählt werden.

```
daten$NAR <- rowMeans(subset(daten, select = c(FUNA, ZENA, AUNA, RINA,
LENA)))
```

Subskala Flexibilität von Psychopathie (FLPP)

```
daten$FLPP <- rowMeans(subset(daten, select = c(D03, D09, D19, D34, D44)))
```

Subskala Impulsivität von Psychopathie (IMPP)

```
daten$IMPP <- rowMeans(subset(daten, select = c(D05, D33, D37)))
```

Subskala Beschönigung von Psychopathie (BEPP)

```
daten$BEPP <- rowMeans(subset(daten, select = c(D14, D29, D52, D58)))
```

Konstrukt Psychopathie (PP) insgesamt

```
daten$PP <- rowMeans(subset(daten, select = c(FLPP, IMPP, BEPP)))
```

Konsrukt Dunkle Triade insgesamt

```
daten$DT <- rowMeans(subset(daten, select = c(MA, NAR, PP)))
```

2.2 OCB

Subskala OCB-Hilfsbereitschaft bilden

```
daten$OCBH<- rowMeans(subset(daten, select = c(OC01_01, OC01_05, OC01_09,
OC01_13, OC01_17)))
```

Subskala OCB-Gewissenhaftigkeit

```
daten$OCBG <- rowMeans(subset(daten, select = c(OC01_02, OC01_06, OC01_10,
OC01_14, OC01_18)))
```

Subskala OCB-Unkompliziertheit

```
daten$OCBU <- rowMeans(subset(daten, select = c(OC01_03, OC01_07, OC01_11,
OC01_15, OC01_19)))
```

Subskala OCB-Eigeninitative

```
daten$OCBE <- rowMeans(subset(daten, select = c(OC01_04, OC01_08, OC01_12,
OC01_16, OC01_20)))
```

Konstrukt OCB insgesamt

```
daten$OCB <- rowMeans(subset(daten, select = c(OCBH, OCBG, OCBU, OCBE)))
```

2.3 Soziale Kompetenzen

Subskala soziale Orientierung

```
daten$SKSO <- rowMeans(subset(daten, select = c(I1, I5, I9, I14, I18, I21,
I23, I27, I31)))
```

Subskala Offensivität

```
daten$SKO <- rowMeans(subset(daten, select = c(I2, I6, I10, I15, I19, I24,
I28, I32)))
```

Subskala Selbststeuerung

```
daten$SKSS <- rowMeans(subset(daten, select = c(I3, I7, I11, I16, I12, I20,
I24, I25, I33)))
```

Subskala Reflexibilität

```
daten$SKR <- rowMeans(subset(daten, select = c(I4, I8, I13, I17, I22, I26,
I30, I25)))
```

Konstrukt soziale Kompetenzen insgesamt

```
daten$SK <- rowMeans(subset(daten, select = c(SKSO, SKO, SKSS,SKR)))
```

3 Reliabilitäten und Trennschärfe der Konstrukte

3.1 MA

Trennschärfeanalyse

rit unter .3 (Döring & Bortz, 2016, S.478) -> eliminieren

```
library(psychometric)

## Warning: Paket 'psychometric' wurde unter R Version 4.1.3 erstellt
```

```
## Lade nötiges Paket: multilevel

## Warning: Paket 'multilevel' wurde unter R Version 4.1.3 erstellt

## Lade nötiges Paket: nlme

##
## Attache Paket: 'nlme'

## Das folgende Objekt ist maskiert 'package:dplyr':
##
##     collapse

## Lade nötiges Paket: MASS

##
## Attache Paket: 'MASS'

## Das folgende Objekt ist maskiert 'package:dplyr':
##
##     select

## Lade nötiges Paket: purrr

##
## Attache Paket: 'purrr'

## Die folgenden Objekte sind maskiert von 'package:rlang':
##
##     %@%, as_function, flatten, flatten_chr, flatten_dbl, flatten_int,
##     flatten_lgl, flatten_raw, invoke, splice

## Das folgende Objekt ist maskiert 'package:mosaic':
##
##     cross

##
## Attache Paket: 'psychometric'

## Das folgende Objekt ist maskiert 'package:ggplot2':
##
##     alpha
```

Trennschärfenalyse Subskala Unsentimentalität

```
TS_UNMA <- as.data.frame(cbind(daten$D02, daten$D08, daten$D26, daten$D39,
daten$D49))
tab <- item.exam(TS_UNMA, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.444032  0.7593957    0.6025364   3.340611       2.342105
NA
## V2  1.343199  0.6210919    0.4284494   4.205240       1.802632
```

```
NA
## V3  1.575496  0.8100304    0.6616392   3.790393       2.828947
NA
## V4  1.587896  0.5540768    0.2972544   3.069869       1.973684
NA
## V5  1.543143  0.8408298    0.7154050   3.462882       2.947368
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   1.0941950    0.8681802            NA
## V2   0.8324264    0.5742348            NA
## V3   1.2734103    1.0401314            NA
## V4   0.8778931    0.4709773            NA
## V5   1.2946848    1.1015594            NA
```

Cronbach alpha Unsentimentalität

```
psychometric::alpha(TS_UNMA)

## [1] 0.7638967
```

Trennschärfenalyse Subskala Skepsis

```
TS_SKMA <- as.data.frame(cbind(daten$D24, daten$D28, daten$D43, daten$D45,
daten$D57))
tab <- item.exam(TS_SKMA, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.672475  0.7330255    0.5449409   3.419214       2.750000
NA
## V2  1.526785  0.7987390    0.6631885   2.895197       2.736842
NA
## V3  1.463072  0.7161883    0.5517148   3.349345       2.342105
NA
## V4  1.480471  0.7880146    0.6527479   3.681223       2.513158
NA
## V5  1.573927  0.6915170    0.5005899   3.751092       2.434211
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1    1.223287    0.9094079            NA
## V2    1.216837    1.0103332            NA
## V3    1.045545    0.8054342            NA
## V4    1.164083    0.9642622            NA
## V5    1.086018    0.7861699            NA
```

Cronbach alpha Skepsis:

```
psychometric::alpha(TS_SKMA)

## [1] 0.7984014
```

Trennschärfe Subskala Durchsetzungsglaube

```
TS_DUMA <- as.data.frame(cbind(daten$dD06, daten$D20, daten$D22, daten$D38,
daten$D42, daten$D54, daten$D55))

## Warning: Unknown or uninitialised column: `dD06`.

tab <- item.exam(TS_DUMA, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.555875  0.7800435    0.6521124   4.017467       2.789474
NA
## V2  1.520059  0.7136386    0.5631493   3.248908       2.342105
NA
## V3  1.466446  0.7829151    0.6657003   2.755459       2.697368
NA
## V4  1.508397  0.4615324    0.2479952   4.799127       1.381579
NA
## V5  1.601515  0.7085973    0.5458567   2.969432       2.421053
NA
## V6  1.531295  0.7553288    0.6196117   2.606987       2.460526
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   1.2109972    1.0123875            NA
## V2   1.0824018    0.8541491            NA
## V3   1.1455931    0.9740797            NA
## V4   0.6946525    0.3732577            NA
## V5   1.1323489    0.8722870            NA
## V6   1.1541027    0.9467342            NA
```

Cronbach alpha Durchsetzungsglaube

```
psychometric::alpha(TS_DUMA)

## [1] 0.792252
```

Cronbach alpha für MA

```
MAalpha <- as.data.frame(cbind(daten$dD06, daten$D20, daten$D22, daten$D38,
daten$D42, daten$D54, daten$D55, daten$D24, daten$D28, daten$D43, daten$D45,
daten$D57, daten$D02, daten$D08, daten$D26, daten$D39, daten$D49))

## Warning: Unknown or uninitialised column: `dD06`.

tab <- item.exam(MAalpha, discrim = TRUE)
tab

##     Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1   1.555875  0.6766024    0.6125779   4.017467       2.276316
NA
## V2   1.520059  0.6665738    0.6027434   3.248908       2.289474
NA
## V3   1.466446  0.6779034    0.6181189   2.755459       2.289474
```

```
NA
## V4   1.508397  0.4783914    0.3933460   4.799127       1.421053
NA
## V5   1.601515  0.5219591    0.4357329   2.969432       1.710526
NA
## V6   1.531295  0.6453580    0.5780361   2.606987       2.157895
NA
## V7   1.672475  0.5347468    0.4458398   3.419214       2.092105
NA
## V8   1.526785  0.6777884    0.6152619   2.895197       2.368421
NA
## V9   1.463072  0.7026727    0.6465779   3.349345       2.250000
NA
## V10  1.480471  0.6646564    0.6023936   3.681223       2.131579
NA
## V11  1.573927  0.5575013    0.4768320   3.751092       1.815789
NA
## V12  1.444032  0.4854588    0.4049067   3.340611       1.578947
NA
## V13  1.343199  0.4899432    0.4157448   4.205240       1.447368
NA
## V14  1.575496  0.6924061    0.6298933   3.790393       2.434211
NA
## V15  1.587896  0.4624378    0.3710963   3.069869       1.578947
NA
## V16  1.543143  0.6997988    0.6398408   3.462882       2.394737
NA
##      Item.Reliab Item.Rel.woi Item.Validity
## V1     1.0504077    0.9510111            NA
## V2     1.0110169    0.9142030            NA
## V3     0.9919357    0.9044566            NA
## V4     0.7200270    0.5920251            NA
## V5     0.8340982    0.6963075            NA
## V6     0.9860731    0.8832088            NA
## V7     0.8923959    0.7440260            NA
## V8     1.0325754    0.9373195            NA
## V9     1.0258138    0.9439226            NA
## V10    0.9818538    0.8898771            NA
## V11    0.8755485    0.7488583            NA
## V12    0.6994859    0.5834204            NA
## V13    0.6566526    0.5572073            NA
## V14    1.0884986    0.9902253            NA
## V15    0.7326979    0.5879743            NA
## V16    1.0775294    0.9852080            NA
```

```
psychometric::alpha(MAalpha) # Cronbach alpha für MA
```

```
## [1] 0.882367
```

3.2 NA

Trennschärfe Subskala Führungsanspruch

```
TS_FUNA <- as.data.frame(cbind(daten$D01, daten$D15, daten$D17, daten$D25,
daten$D40, daten$D53, daten$D56))
tab <- item.exam(TS_FUNA, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.180033  0.7200446    0.6390013   4.895197       1.868421
NA
## V2  1.607364  0.8056793    0.7174686   4.471616       2.921053
NA
## V3  1.361497  0.8711263    0.8207423   4.358079       2.552632
NA
## V4  1.531670  0.7442151    0.6410213   4.021834       2.578947
NA
## V5  1.389209  0.8846885    0.8379057   4.065502       2.723684
NA
## V6  1.425155  0.8923097    0.8468806   3.781659       2.802632
NA
## V7  1.406990  0.8865660    0.8397232   4.205240       2.631579
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   0.8478189    0.7523942            NA
## V2   1.2921897    1.1507128            NA
## V3   1.1834432    1.1149954            NA
## V4   1.1374003    0.9796869            NA
## V5   1.2263307    1.1614817            NA
## V6   1.2688996    1.2042977            NA
## V7   1.2446632    1.1788999            NA
```

Cronbach alpha Führungsanspruch

```
psychometric::alpha(TS_FUNA)

## [1] 0.9228505
```

Trennschärfe Subskala Überzeugungsglaube

```
TS_ZENA<- as.data.frame(cbind(daten$D07, daten$D11, daten$D30, daten$D31,
daten$D36, daten$D46, daten$D47, daten$D48, daten$D60))
tab <- item.exam(TS_ZENA, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.164955  0.6890026    0.5948196   5.082969       1.842105
NA
## V2  1.148630  0.7147429    0.6278517   4.751092       1.789474
NA
## V3  1.162783  0.5574990    0.4385158   3.890830       1.355263
NA
## V4  1.186475  0.7526947    0.6718359   4.986900       1.986842
NA
```

```
## V5  1.169435  0.6723372    0.5741041   4.703057       1.671053
NA
## V6  1.055097  0.7140329    0.6351533   4.882096       1.552632
NA
## V7  1.341287  0.7252447    0.6237412   4.615721       2.197368
NA
## V8  1.191066  0.7720509    0.6959204   4.371179       2.013158
NA
## V9  1.418554  0.7271289    0.6190779   4.135371       2.289474
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   0.8009028    0.6914236            NA
## V2   0.8191810    0.7195933            NA
## V3   0.6468335    0.5087842            NA
## V4   0.8911012    0.7953740            NA
## V5   0.7845361    0.6699100            NA
## V6   0.7517276    0.6686838            NA
## V7   0.9706348    0.8347872            NA
## V8   0.9175540    0.8270757            NA
## V9   1.0292172    0.8762760            NA
```

Cronbach alpha Überzeugungsglaube

```
psychometric::alpha(TS_ZENA)

## [1] 0.8708335
```

Trennschärfe Subskala Autoritätsbedürfnis

```
TS_AUNA <- as.data.frame(cbind(daten$D13, daten$D16, daten$D21, daten$D41))
tab <- item.exam(TS_AUNA, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.407317  0.7129022    0.5207664   2.956332       2.276316
NA
## V2  1.526321  0.8903778    0.7872328   3.480349       3.026316
NA
## V3  1.552301  0.8423572    0.6997383   3.292576       2.881579
NA
## V4  1.518761  0.8335374    0.6894352   3.576419       2.723684
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1    1.001086    0.7312814            NA
## V2    1.356032    1.1989436            NA
## V3    1.304734    1.0838301            NA
## V4    1.263177    1.0447984            NA
```

Cronbach alpha Autoritätsbedürfnis

```
psychometric::alpha(TS_AUNA)
```

```
## [1] 0.8393202
```

Trennschärfe Subskala Risikofreude

```
TS_RINA <- as.data.frame(cbind(daten$D12, daten$D27, daten$D51))
tab <- item.exam(TS_RINA, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.419040  0.7920507    0.5296093   4.475983       2.407895
NA
## V2  1.421104  0.7918528    0.5286533   4.441048       2.513158
NA
## V3  1.505181  0.8000267    0.5188875   3.716157       2.684211
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1    1.121495    0.7498942            NA
## V2    1.122845    0.7496290            NA
## V3    1.201553    0.7793127            NA
```

Cronbach alpha Risikofreude

```
psychometric::alpha(TS_RINA)

## [1] 0.7077842
```

Trennschärfe Subskala Überlegenheitsgefühl

```
TS_LENA <- as.data.frame(cbind(daten$D04, daten$D10, daten$D18, daten$D23,
daten$D32, daten$D35, daten$D50, daten$D59))
tab <- item.exam(TS_LENA, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.589053  0.7901573    0.7074337   3.034934       2.881579
NA
## V2  1.535816  0.8051164    0.7304478   3.240175       2.736842
NA
## V3  1.369380  0.7757247    0.7028060   4.192140       2.289474
NA
## V4  1.275817  0.6558724    0.5628355   2.475983       1.763158
NA
## V5  1.392761  0.7474835    0.6657129   3.890830       2.131579
NA
## V6  1.372984  0.8438074    0.7898569   3.742358       2.473684
NA
## V7  1.450121  0.8662437    0.8158919   3.371179       2.868421
NA
## V8  1.439329  0.7967197    0.7252828   3.842795       2.526316
NA
##    Item.Reliab Item.Rel.woi Item.Validity
```

```
## V1   1.2528576    1.1216926            NA
## V2   1.2338076    1.1193810            NA
## V3   1.0599399    0.9603047            NA
## V4   0.8349444    0.7165058            NA
## V5   1.0387906    0.9251525            NA
## V6   1.1560014    1.0820902            NA
## V7   1.2534122    1.1805555            NA
## V8   1.1442357    1.0416391            NA
```

Cronbach alpha Überlegenheitsgefühl

```
psychometric::alpha(TS_LENA)

## [1] 0.911333
```

Cronbach alpha NAR

```
NARalpha <- as.data.frame(cbind(daten$D01, daten$D15, daten$D17, daten$D25,
daten$D40, daten$D53, daten$D56, daten$D07, daten$D11, daten$D30, daten$D31,
daten$D36, daten$D46, daten$D47, daten$D48, daten$D60, daten$D13, daten$D16,
daten$D21, daten$D41, daten$D12, daten$D27, daten$D51, daten$D04, daten$D10,
daten$D18, daten$D23, daten$D32, daten$D35, daten$D50, daten$D59))
tab <- item.exam(TS_LENA, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.589053  0.7901573    0.7074337   3.034934       2.881579
NA
## V2  1.535816  0.8051164    0.7304478   3.240175       2.736842
NA
## V3  1.369380  0.7757247    0.7028060   4.192140       2.289474
NA
## V4  1.275817  0.6558724    0.5628355   2.475983       1.763158
NA
## V5  1.392761  0.7474835    0.6657129   3.890830       2.131579
NA
## V6  1.372984  0.8438074    0.7898569   3.742358       2.473684
NA
## V7  1.450121  0.8662437    0.8158919   3.371179       2.868421
NA
## V8  1.439329  0.7967197    0.7252828   3.842795       2.526316
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   1.2528576    1.1216926            NA
## V2   1.2338076    1.1193810            NA
## V3   1.0599399    0.9603047            NA
## V4   0.8349444    0.7165058            NA
## V5   1.0387906    0.9251525            NA
## V6   1.1560014    1.0820902            NA
## V7   1.2534122    1.1805555            NA
## V8   1.1442357    1.0416391            NA
```

```
psychometric::alpha(NARalpha)

## [1] 0.9422707
```

3.3 PP

Trennschärfe Subskala Flexibilität

```
TS_FLPP <- as.data.frame(cbind(daten$D03, daten$D09, daten$D19, daten$D34,
daten$D44))
tab <- item.exam(TS_FLPP, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.390242  0.4736482    0.1506638   3.550218       1.315789
NA
## V2  1.313001  0.5353985    0.2465107   3.528384       1.671053
NA
## V3  1.793002  0.6013963    0.2006522   3.310044       2.368421
NA
## V4  1.443157  0.6777768    0.4047338   3.458515       2.210526
NA
## V5  1.309437  0.5177613    0.2255477   3.462882       1.500000
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   0.6570466    0.2090013            NA
## V2   0.7014422    0.3229613            NA
## V3   1.0759476    0.3589833            NA
## V4   0.9760001    0.5828176            NA
## V5   0.6764939    0.2946949            NA
```

Cronbach alpha Flexibilität

```
psychometric::alpha(TS_FLPP)

## [1] 0.4550576
```

Trennschärfe Subskala Impulsivität

```
TS_IMPP <- as.data.frame(cbind(daten$D05, daten$D33, daten$D37))
tab <- item.exam(TS_IMPP, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.628765  0.8127760    0.5622715   3.458515       2.973684
NA
## V2  1.475871  0.8673405    0.7014088   3.393013       2.815789
NA
## V3  1.494762  0.8731550    0.7095088   3.082969       3.013158
NA
##    Item.Reliab Item.Rel.woi Item.Validity
```

```
## V1    1.320928    0.9138066            NA
## V2    1.277285    1.0329266            NA
## V3    1.302306    1.0582287            NA
```

Cronbach alpha Impulsivität

```
psychometric::alpha(TS_IMPP)

## [1] 0.8064436
```

Trennschärfe Subskala Beschönigung

```
TS_BEPP <- as.data.frame(cbind(daten$D14, daten$D29, daten$D52, daten$D58))
tab <- item.exam(TS_BEPP, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.559183  0.7230995    0.4979694   3.262009       2.421053
NA
## V2  1.591919  0.7878383    0.5938109   3.257642       2.789474
NA
## V3  1.494019  0.7949751    0.6222146   3.637555       2.539474
NA
## V4  1.693189  0.7127378    0.4548271   3.847162       2.605263
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1    1.124980    0.7747282            NA
## V2    1.251434    0.9432327            NA
## V3    1.185112    0.9275684            NA
## V4    1.204162    0.7684249            NA
```

Cronbach alpha Beschönigung

```
psychometric::alpha(TS_BEPP)

## [1] 0.7450751
```

Cronbach alpha PP

```
PPalpha <- as.data.frame(cbind(daten$D03, daten$D09, daten$D19, daten$D34,
daten$D44, daten$D05, daten$D33, daten$D37, daten$D14, daten$D29, daten$D52,
daten$D58))
tab <- item.exam(PPalpha, discrim = TRUE)
tab#

##     Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1   1.390242  0.3287332    0.1787233   3.550218       1.157895
NA
## V2   1.313001  0.3681807    0.2299985   3.528384       1.171053
NA
## V3   1.793002  0.3192437    0.1220421   3.310044       1.171053
NA
```

```
## V4   1.443157  0.3645192    0.2113492   3.458515       1.144737
NA
## V5   1.309437  0.4781461    0.3518205   3.462882       1.263158
NA
## V6   1.628765  0.5096074    0.3537969   3.458515       1.947368
NA
## V7   1.475871  0.5831424    0.4560395   3.393013       2.000000
NA
## V8   1.494762  0.6420127    0.5250658   3.082969       2.210526
NA
## V9   1.559183  0.5791653    0.4430555   3.262009       1.894737
NA
## V10  1.591919  0.5941214    0.4577504   3.257642       1.986842
NA
## V11  1.494019  0.5923430    0.4652164   3.637555       1.789474
NA
## V12  1.693189  0.4699651    0.3009256   3.847162       1.565789
NA
##     Item.Reliab Item.Rel.woi Item.Validity
## V1    0.4560199    0.2479256            NA
## V2    0.4823649    0.3013281            NA
## V3    0.5711533    0.2183434            NA
## V4    0.5249085    0.3043433            NA
## V5    0.6247336    0.4596797            NA
## V6    0.8282167    0.5749926            NA
## V7    0.8587620    0.6715845            NA
## V8    0.9575586    0.7831330            NA
## V9    0.9010507    0.6892945            NA
## V10   0.9437260    0.7271088            NA
## V11   0.8830372    0.6935228            NA
## V12   0.7940003    0.5084102            NA
```

```
psychometric::alpha(PPalpha)
```

```
## [1] 0.7032693
```

3.4 Cronbach Alpha OCB

OCB

```
OCBalpha <- as.data.frame(cbind(daten$OC01_01, daten$OC01_05, daten$OC01_09,
daten$OC01_13, daten$OC01_17,
                                daten$OC01_02, daten$OC01_06, daten$OC01_10,
daten$OC01_14, daten$OC01_18,
                                daten$OC01_03, daten$OC01_07, daten$OC01_11,
daten$OC01_15, daten$OC01_19,
                                daten$OC01_04, daten$OC01_08, daten$OC01_12,
daten$OC01_16, daten$OC01_20))
tab <- item.exam(OCBalpha, discrim = TRUE)
tab
```

```
##     Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
```

```
## V1   1.016620  0.5464185    0.4862153   5.777293      1.1447368
NA
## V2   1.220657  0.5050736    0.4278235   5.034934      1.3815789
NA
## V3   1.381564  0.6214029    0.5471273   5.366812      1.9736842
NA
## V4   1.028253  0.6118088    0.5569774   5.528384      1.2500000
NA
## V5   1.037266  0.6460697    0.5942946   5.746725      1.3421053
NA
## V6   1.381564  0.4611647    0.3686396   5.633188      1.2631579
NA
## V7   1.082815  0.5301639    0.4643155   6.126638      1.2368421
NA
## V8   1.352959  0.4762336    0.3871425   5.794760      1.3026316
NA
## V9   1.115539  0.5109696    0.4412993   5.318777      1.0526316
NA
## V10  1.683683  0.3355320    0.2100128   4.563319      1.2105263
NA
## V11  1.385910  0.5049222    0.4163743   5.017467      1.7631579
NA
## V12  1.403023  0.4725142    0.3795250   5.248908      1.5657895
NA
## V13  1.322941  0.4265149    0.3352646   5.598253      1.1052632
NA
## V14  1.390380  0.4195270    0.3227566   5.200873      1.3289474
NA
## V15  1.443488  0.2601401    0.1494649   4.908297      0.6052632
NA
## V16  1.288975  0.5358546    0.4570802   5.248908      1.4473684
NA
## V17  1.317791  0.5595314    0.4814702   5.209607      1.5000000
NA
## V18  1.283988  0.4872114    0.4039682   5.096070      1.3026316
NA
## V19  1.302706  0.5307148    0.4504921   5.187773      1.5263158
NA
## V20  1.342700  0.5146610    0.4300788   4.886463      1.4078947
NA
##     Item.Reliab Item.Rel.woi Item.Validity
## V1    0.5542860    0.4932161            NA
## V2    0.6151738    0.5210840            NA
## V3    0.8566312    0.7542390            NA
## V4    0.6277193    0.5714620            NA
## V5    0.6686815    0.6150943            NA
## V6    0.6357358    0.5081858            NA
## V7    0.5728148    0.5016690            NA
## V8    0.6429163    0.5226432            NA
## V9    0.5687605    0.4912104            NA
## V10   0.5636948    0.3528220            NA
```

```
## V11   0.6982471    0.5757960            NA
## V12   0.6614995    0.5313185            NA
## V13   0.5630206    0.4425657            NA
## V14   0.5820270    0.4477735            NA
## V15   0.3746885    0.2152793            NA
## V16   0.6891936    0.5878772            NA
## V17   0.7357339    0.6330904            NA
## V18   0.6242061    0.5175565            NA
## V19   0.6898542    0.5855760            NA
## V20   0.6895247    0.5762044            NA
```

```
psychometric::alpha(OCBalpha)
```

```
## [1] 0.8302836
```

Cronbach alpha OCBH

```
OCBHalpha <- as.data.frame(cbind(daten$OC01_01, daten$OC01_05, daten$OC01_09,
daten$OC01_13, daten$OC01_17))
tab <- item.exam(OCBHalpha, discrim = TRUE)
tab
```

```
##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.016620  0.6732621    0.4980321   5.777293       1.460526
NA
## V2  1.220657  0.6751301    0.4547153   5.034934       1.763158
NA
## V3  1.381564  0.7606795    0.5458057   5.366812       2.302632
NA
## V4  1.028253  0.7208095    0.5607008   5.528384       1.578947
NA
## V5  1.037266  0.7603449    0.6150833   5.746725       1.618421
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   0.6829559    0.5052030            NA
## V2   0.8223007    0.5538380            NA
## V3   1.0486301    0.7524172            NA
## V4   0.7395547    0.5752823            NA
## V5   0.7869562    0.6366106            NA
```

```
psychometric::alpha(OCBHalpha)
```

```
## [1] 0.7592392
```

OCBG

```
OCBGalpha <- as.data.frame(cbind(daten$OC01_02, daten$OC01_06, daten$OC01_10,
daten$OC01_14, daten$OC01_18))
tab <- item.exam(OCBGalpha, discrim = TRUE)
tab
```

```
##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
```

```
## V1  1.381564  0.7460761    0.5355493   5.633188       2.144737
NA
## V2  1.082815  0.6496902    0.4618974   6.126638       1.447368
NA
## V3  1.352959  0.6538369    0.4065860   5.794760       1.802632
NA
## V4  1.115539  0.6313564    0.4305131   5.318777       1.526316
NA
## V5  1.683683  0.5602946    0.1961267   4.563319       2.263158
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   1.0284987    0.7382782            NA
## V2   0.7019568    0.4990564            NA
## V3   0.8826811    0.5488919            NA
## V4   0.7027631    0.4792043            NA
## V5   0.9412966    0.3294935            NA
```

```
psychometric::alpha(OCBGalpha)

## [1] 0.6326005
```

Item OC01_18 eliminieren da rit = .2

```
OCBGalphaNEU <- as.data.frame(cbind(daten$OC01_02, daten$OC01_06,
daten$OC01_10, daten$OC01_14))
tab <- item.exam(OCBGalphaNEU, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.381564  0.8221835    0.6105586   5.633188       2.315789
NA
## V2  1.082815  0.7436662    0.5525501   6.126638       1.631579
NA
## V3  1.352959  0.6494874    0.3390926   5.794760       1.868421
NA
## V4  1.115539  0.7028384    0.4838650   5.318777       1.671053
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   1.1334161    0.8416818            NA
## V2   0.8034930    0.5970019            NA
## V3   0.8768093    0.4577757            NA
## V4   0.7823296    0.5385903            NA
```

```
psychometric::alpha(OCBGalphaNEU)

## [1] 0.7013653
```

Reliabilität von OCBG erhöht sich, wenn Item OC01_18 elimiminiert wird.

```
OCBGalpha <- as.data.frame(cbind(daten$OC01_02, daten$OC01_06, daten$OC01_10,
daten$OC01_14))
```

```
tab <- item.exam(OCBGalpha, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.381564  0.8221835    0.6105586   5.633188       2.315789
NA
## V2  1.082815  0.7436662    0.5525501   6.126638       1.631579
NA
## V3  1.352959  0.6494874    0.3390926   5.794760       1.868421
NA
## V4  1.115539  0.7028384    0.4838650   5.318777       1.671053
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   1.1334161    0.8416818            NA
## V2   0.8034930    0.5970019            NA
## V3   0.8768093    0.4577757            NA
## V4   0.7823296    0.5385903            NA
```

OCBU

```
OCBUalpha <- as.data.frame(cbind(daten$OC01_03, daten$OC01_07, daten$OC01_11,
daten$OC01_15, daten$OC01_19))
tab <- item.exam(OCBUalpha, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.385910  0.7598514    0.5917012   5.017467       2.394737
NA
## V2  1.403023  0.7112964    0.5175138   5.248908       2.276316
NA
## V3  1.322941  0.7253401    0.5518134   5.598253       1.894737
NA
## V4  1.390380  0.7272308    0.5428089   5.200873       2.171053
NA
## V5  1.443488  0.6101390    0.3701585   4.908297       1.960526
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   1.0507837    0.8182520            NA
## V2   0.9957842    0.7244969            NA
## V3   0.9574845    0.7284208            NA
## V4   1.0089172    0.7530611            NA
## V5   0.8788035    0.5331516            NA

psychometric::alpha(OCBUalpha)

## [1] 0.7477922
```

OCBE

```
OCBEalpha <- as.data.frame(cbind(daten$OC01_04, daten$OC01_08, daten$OC01_12,
daten$OC01_16, daten$OC01_20))
```

```
tab <- item.exam(OCBEalpha, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.288975  0.7032453    0.5143195   5.248908       1.934211
NA
## V2  1.317791  0.7019224    0.5069161   5.209607       1.973684
NA
## V3  1.283988  0.7404693    0.5686900   5.096070       1.973684
NA
## V4  1.302706  0.7000301    0.5071442   5.187773       2.000000
NA
## V5  1.342700  0.7159380    0.5222204   4.886463       2.065789
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   0.9044844    0.6614960            NA
## V2   0.9229654    0.6665496            NA
## V3   0.9486754    0.7285951            NA
## V4   0.9099401    0.6592157            NA
## V5   0.9591885    0.6996525            NA

psychometric::alpha(OCBEalpha)

## [1] 0.757075
```

OCB neue Konstruktion ohne OC01_18

```
daten$OCBG <- rowMeans(subset(daten, select = c(OC01_02, OC01_06, OC01_10,
OC01_14)))

daten$OCB <- rowMeans(subset(daten, select = c(OCBH, OCBG, OCBU, OCBE)))
```

Cronbach alpha OCB neu berechnen

```
psychometric::alpha(OCBalpha)

## [1] 0.8302836
```

Cronbach alpha SK

Soziale Orientierung SO

```
TS_SOSK <- as.data.frame(cbind(daten$I1, daten$I5, daten$I9, daten$I14,
daten$I18, daten$I21, daten$I23, daten$I27, daten$I31)) #Trennschärfe
tab <- item.exam(TS_SOSK, discrim = TRUE)
tab

##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1 0.6920215  0.4654139    0.2914972   3.366812      0.7105263
NA
## V2 0.7112119  0.5110915    0.3392393   3.126638      0.8157895
```

```
NA
## V3 0.8627794  0.6000438    0.4066298   3.034934      1.1578947
NA
## V4 0.6340162  0.4536365    0.2942134   2.847162      0.6842105
NA
## V5 0.8541452  0.5063699    0.2935754   2.842795      0.9342105
NA
## V6 0.8808813  0.5230906    0.3060475   2.637555      0.9868421
NA
## V7 0.7011499  0.5818620    0.4265786   3.323144      0.9210526
NA
## V8 0.7079189  0.5549293    0.3922443   2.943231      0.8157895
NA
## V9 0.6939837  0.5060084    0.3379898   2.703057      0.7631579
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   0.3213724    0.2012814            NA
## V2   0.3626998    0.2407437            NA
## V3   0.5165738    0.3500650            NA
## V4   0.2869842    0.1861283            NA
## V5   0.4315680    0.2502079            NA
## V6   0.4597736    0.2690022            NA
## V7   0.4070807    0.2984418            NA
## V8   0.3919863    0.2770702            NA
## V9   0.3503940    0.2340467            NA
```

```
psychometric::alpha(TS_SOSK) #
```

```
## [1] 0.6651761
```

Offensitivät (OF)

```
TS_OF <- as.data.frame(cbind(daten$I2, daten$I6, daten$I10, daten$I15,
daten$I19, daten$I24, daten$I28, daten$I32)) #Trennschärfe
tab <- item.exam(TS_OF, discrim = TRUE)
tab
```

```
##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1 0.6820414  0.5161758    0.3647268   2.572052      0.7763158
NA
## V2 0.7888657  0.5204109    0.3426306   3.096070      0.8552632
NA
## V3 0.8495811  0.5280647    0.3360516   2.554585      1.0000000
NA
## V4 0.9063858  0.6560489    0.4826656   2.746725      1.2763158
NA
## V5 0.7579351  0.6116907    0.4609392   2.711790      0.9473684
NA
## V6 0.7695211  0.5182359    0.3450197   2.825328      0.8552632
NA
```

```
## V7 0.8640216  0.6133611    0.4376869   2.698690      1.2368421
NA
## V8 0.8660586  0.6657350    0.5047568   2.825328      1.1842105
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   0.3512838    0.2482150            NA
## V2   0.4096370    0.2696987            NA
## V3   0.4476531    0.2848791            NA
## V4   0.5933337    0.4365250            NA
## V5   0.4626085    0.3485984            NA
## V6   0.3979218    0.2649196            NA
## V7   0.5287989    0.3773444            NA
## V8   0.5753053    0.4361934            NA
```

```
psychometric::alpha(TS_OF)
```

```
## [1] 0.7182452
```

Selbststeuerung (SS)

```
TS_SS <- as.data.frame(cbind(daten$dI3, daten$I7, daten$I11, daten$I16,
daten$I12, daten$I20, daten$I24, daten$I25, daten$I33)) #Trennschärfe
```

```
## Warning: Unknown or uninitialised column: `dI3`.
```

```
tab <- item.exam(TS_SS, discrim = TRUE)
tab
```

```
##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1 0.8585512  0.7413991    0.6062097   2.572052      1.4210526
NA
## V2 0.8017257  0.5595728    0.3842102   2.716157      1.0000000
NA
## V3 0.7323081  0.4618678    0.2870473   2.890830      0.7500000
NA
## V4 0.8197506  0.6375251    0.4769079   2.729258      1.1578947
NA
## V5 0.7646523  0.5083736    0.3325239   2.746725      0.8552632
NA
## V6 0.7695211  0.4090094    0.2171079   2.825328      0.6842105
NA
## V7 0.8810987  0.7917369    0.6729911   2.532751      1.5789474
NA
## V8 0.7520752  0.5153137    0.3439652   2.986900      0.8421053
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   0.6351378    0.5193245            NA
## V2   0.4476433    0.3073579            NA
## V3   0.3374902    0.2097476            NA
## V4   0.5214693    0.3900911            NA
## V5   0.3878794    0.2537094            NA
```

```
## V6   0.3140534    0.1667039            NA
## V7   0.6960736    0.5916755            NA
## V8   0.3867075    0.2581223            NA
```

```
psychometric::alpha(TS_SS)
```

```
## [1] 0.7243902
```

Reflexibilität (RE)

```
TS_RE <- as.data.frame(cbind(daten$I4, daten$I8, daten$I13, daten$I17,
daten$I22, daten$I26, daten$I30, daten$I25)) #Trennschärfe
tab <- item.exam(TS_RE, discrim = TRUE)
tab
```

```
##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1 0.6424785 0.53378483    0.3390244   3.279476      0.7236842
NA
## V2 0.8275869 0.63707031    0.4055884   2.803493      1.0657895
NA
## V3 0.7016414 0.57304274    0.3665787   3.144105      0.8289474
NA
## V4 0.8205913 0.43476640    0.1559882   3.139738      0.8289474
NA
## V5 0.8210347 0.57133895    0.3214752   2.834061      0.9078947
NA
## V6 0.6882472 0.43166768    0.2022633   3.000000      0.7105263
NA
## V7 0.7706154 0.47124656    0.2174702   3.292576      0.7631579
NA
## V8 0.8810987 0.05289115   -0.2530817   2.532751      0.1052632
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1  0.34219569    0.2173398            NA
## V2  0.52607860    0.3349260            NA
## V3  0.40119165    0.2566446            NA
## V4  0.35598571    0.1277228            NA
## V5  0.46806374    0.2633654            NA
## V6  0.29644469    0.1389029            NA
## V7  0.36235611    0.1672196            NA
## V8  0.04650046   -0.2225026            NA
```

```
psychometric::alpha(TS_RE)
```

```
## [1] 0.4483292
```

Items unter rit = 3 eliminieren.

```
TS_RE <- as.data.frame(cbind(daten$I4, daten$I8, daten$I13, daten$I22))
#Trennschärfe
```

```
tab <- item.exam(TS_RE, discrim = TRUE)
tab
```

```
##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1 0.6424785  0.6709365    0.4382513   3.279476      0.9210526
NA
## V2 0.8275869  0.7445998    0.4602567   2.803493      1.4078947
NA
## V3 0.7016414  0.5839443    0.2900692   3.144105      0.8421053
NA
## V4 0.8210347  0.7545861    0.4801633   2.834061      1.2368421
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   0.4301201    0.2809516            NA
## V2   0.6148740    0.3800699            NA
## V3   0.4088239    0.2030797            NA
## V4   0.6181872    0.3933690            NA
```

```
psychometric::alpha(TS_RE)
```

```
## [1] 0.6332534
```

SK Cronbach alpha

```
SKalpha <- as.data.frame(cbind(daten$I4, daten$I8, daten$I13, daten$I22,
daten$I4, daten$I8, daten$I13, daten$I22, daten$dI3, daten$I7, daten$I11,
daten$I16, daten$I12, daten$I20, daten$I24, daten$I25, daten$I33, daten$I2,
daten$I6, daten$I10, daten$I15, daten$I19, daten$I24, daten$I28, daten$I32,
daten$I1, daten$I5, daten$I9, daten$I14, daten$I18, daten$I21, daten$I23,
daten$I27, daten$I31))
```

```
## Warning: Unknown or uninitialised column: `dI3`.
```

```
tab <- item.exam(OCBEalpha, discrim = TRUE)
tab
```

```
##    Sample.SD Item.total Item.Tot.woi Difficulty Discrimination
Item.Criterion
## V1  1.288975  0.7032453    0.5143195   5.248908       1.934211
NA
## V2  1.317791  0.7019224    0.5069161   5.209607       1.973684
NA
## V3  1.283988  0.7404693    0.5686900   5.096070       1.973684
NA
## V4  1.302706  0.7000301    0.5071442   5.187773       2.000000
NA
## V5  1.342700  0.7159380    0.5222204   4.886463       2.065789
NA
##    Item.Reliab Item.Rel.woi Item.Validity
## V1   0.9044844    0.6614960            NA
## V2   0.9229654    0.6665496            NA
```

```
## V3   0.9486754    0.7285951            NA
## V4   0.9099401    0.6592157            NA
## V5   0.9591885    0.6996525            NA
```

```
psychometric::alpha(SKalpha)
```

```
## [1] 0.7944326
```

Interkorrelation der Skalen

```
daten_interkor <- daten[, c("MA", "NAR", "PP", "SK", "OCB")]
```

```
library(apaTables)
```

```
## Warning: Paket 'apaTables' wurde unter R Version 4.1.3 erstellt
```

```
apa.cor.table(daten_interkor,
filename = "Table1Interkor.doc",
table.number = NA,
show.conf.interval = TRUE,
show.sig.stars = TRUE,
landscape = TRUE)
```

```
##
##
## Means, standard deviations, and correlations with confidence intervals
##
##
##   Variable M    SD   1            2           3            4
##   1. MA    3.45 0.92
##
##   2. NAR   3.97 0.84 .49**
##                      [.38, .58]
##
##   3. PP    3.42 0.77 .55**        .32**
##                      [.46, .64]   [.20, .43]
##
##   4. SK    2.87 0.28 -.13*        .26**       -.38**
##                      [-.26, -.00] [.14, .38] [-.49, -.27]
##
##   5. OCB   5.38 0.64 -.19**       .22**       -.35**       .57**
##                      [-.31, -.07] [.10, .34] [-.46, -.23] [.47, .65]
##
##
## Note. M and SD are used to represent mean and standard deviation,
respectively.
## Values in square brackets indicate the 95% confidence interval.
## The confidence interval is a plausible range of population correlations
## that could have caused the sample correlation (Cumming, 2014).
##  * indicates p < .05. ** indicates p < .01.
##
```

Normalverteilung der Variablen

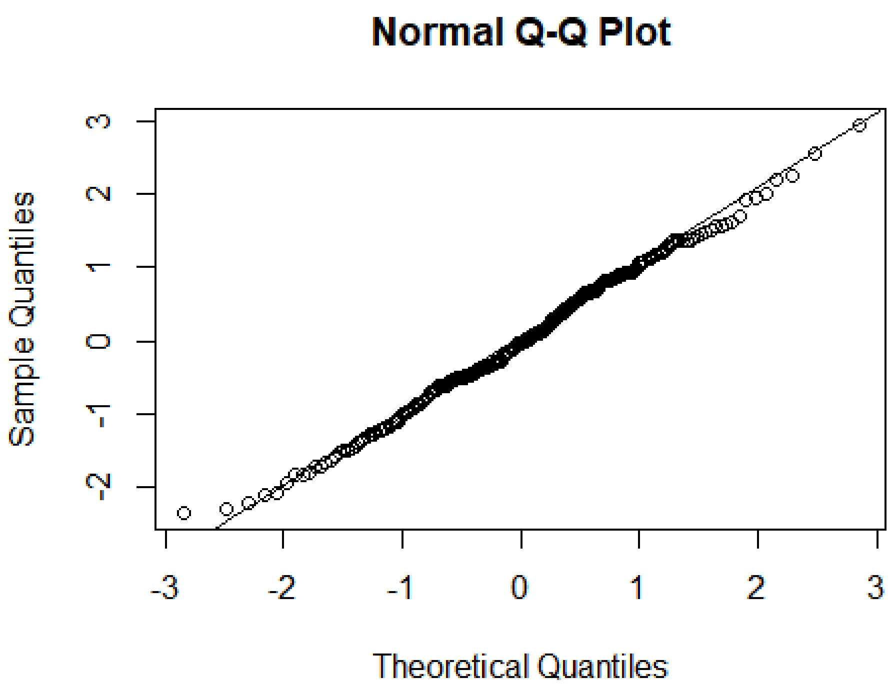
Nach Aldor-Noiman, Brown, Stine, Buja & Rolke, 2013.

Verteilung von MA

```
shapiro.test(daten$MA)

## 
##  Shapiro-Wilk normality test
## 
## data:  daten$MA
## W = 0.99494, p-value = 0.6474
```

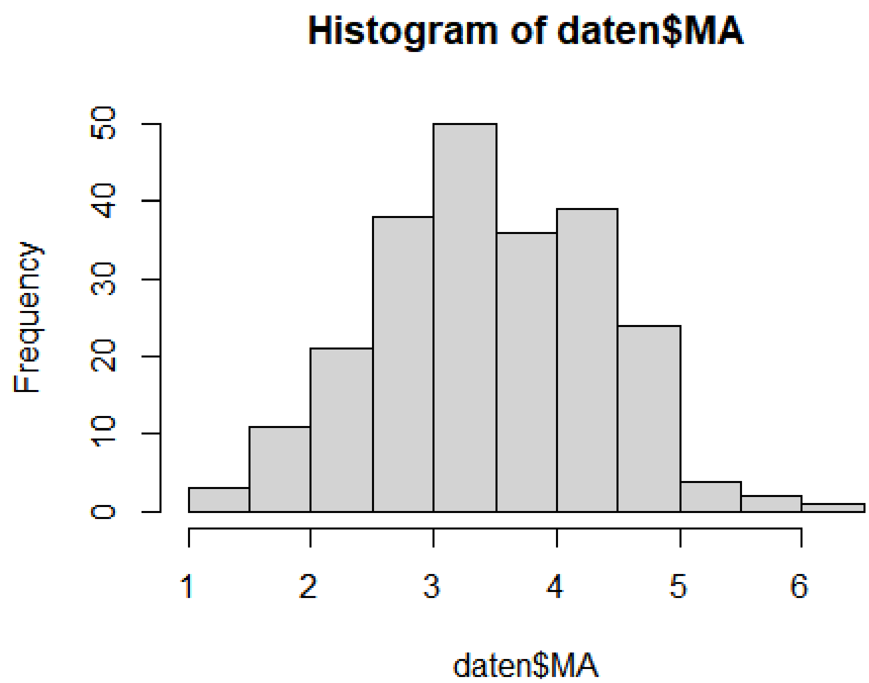
Normalverteilt, da p > .05 ist.

```
qqnorm(scale(daten$MA))
qqline(scale(daten$MA))
```



Nah an Gerade -> normalverteilt

```
hist(daten$MA)
```



-> normalverteilt

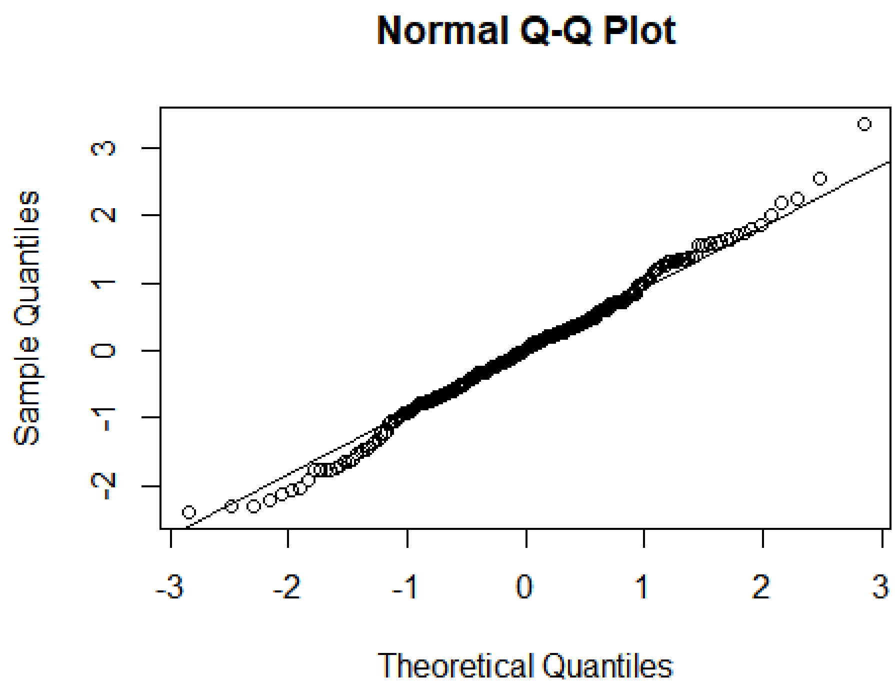
Verteilung von NAR

```
shapiro.test(daten$NAR)
```

```
##
##  Shapiro-Wilk normality test
##
## data:  daten$NAR
## W = 0.99407, p-value = 0.5046
```

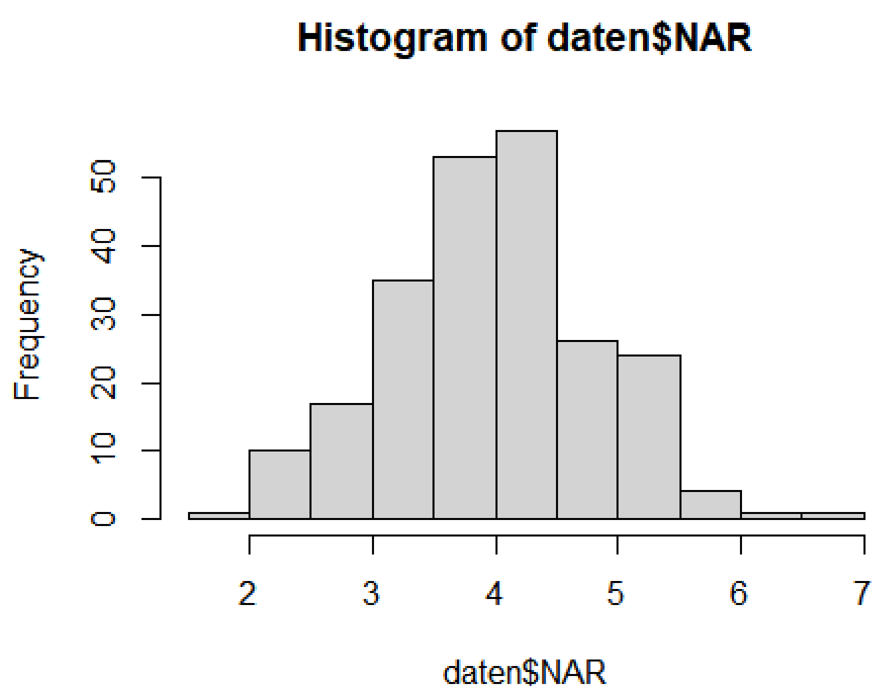
Normalverteilt, da p > .05

```
qqnorm(scale(daten$NAR))
qqline(scale(daten$NAR))
```



Normalverteilt, da nah an Gerade.

```
hist(daten$NAR)
```



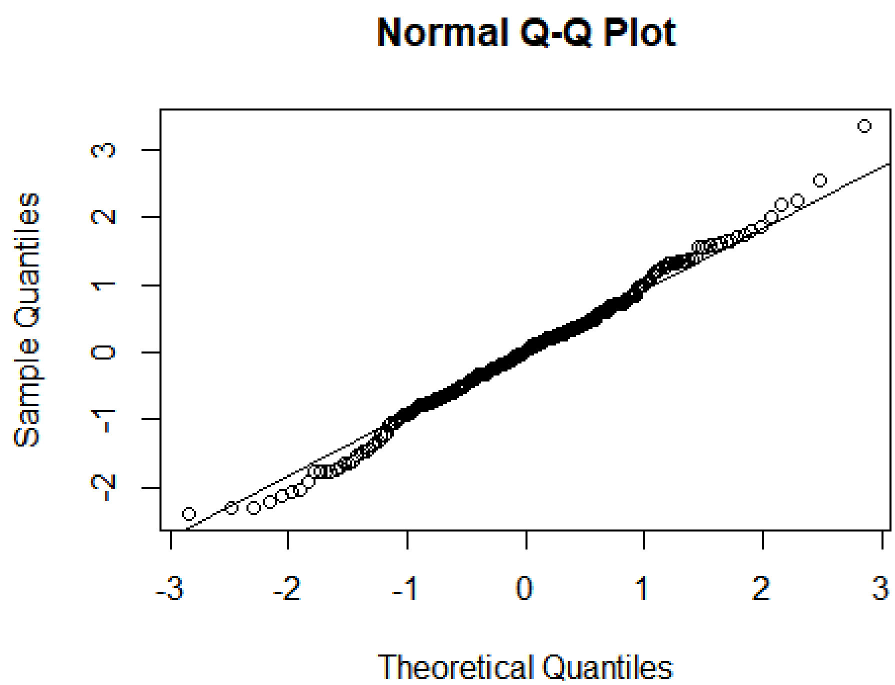
Verteilung von PP

```
shapiro.test(daten$PP)
```

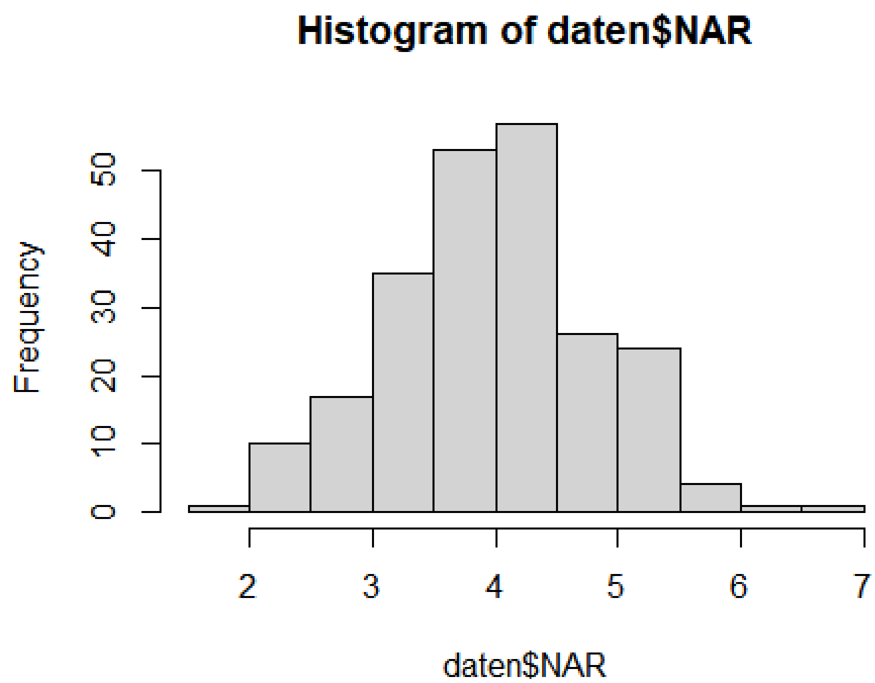
```
##
##  Shapiro-Wilk normality test
##
## data:  daten$PP
## W = 0.9956, p-value = 0.7583
```

Normalverteilt, da p > .05

```
qqnorm(scale(daten$NAR))
qqline(scale(daten$NAR))
```




```
hist(daten$NAR)
```



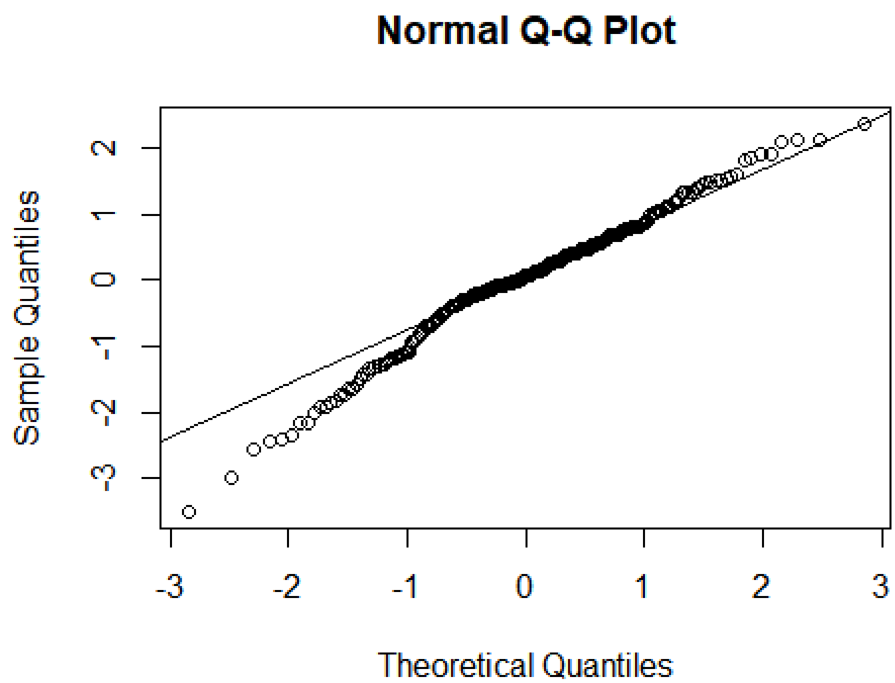
Verteilung von OCB

```
shapiro.test(daten$OCB)
```

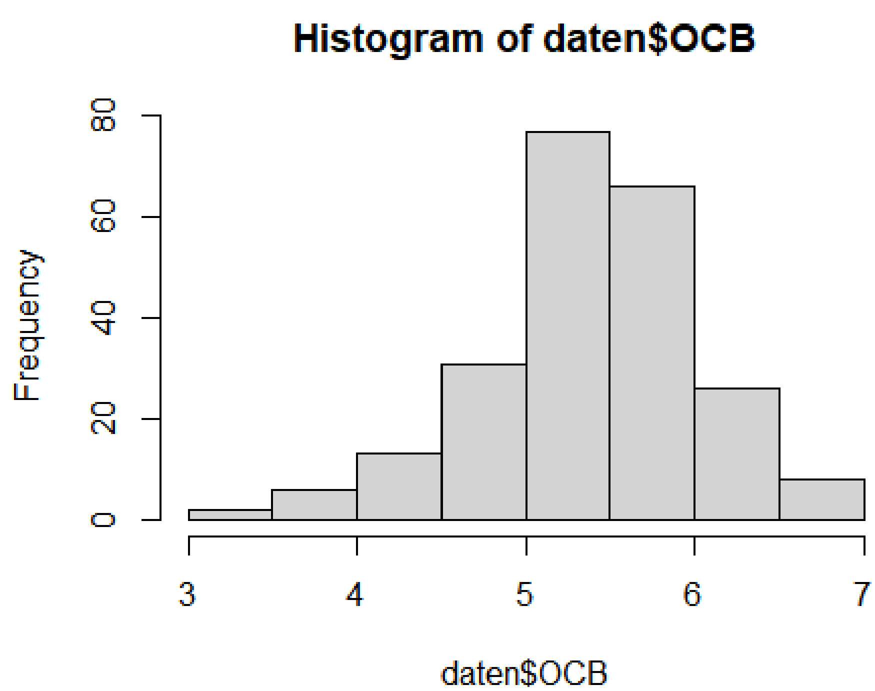
```
##
##  Shapiro-Wilk normality test
##
## data:  daten$OCB
## W = 0.97995, p-value = 0.002457
```

nicht normalverteilt, da p < .05 ist.

```
qqnorm(scale(daten$OCB))
qqline(scale(daten$OCB))
```




```
hist(daten$OCB)
```

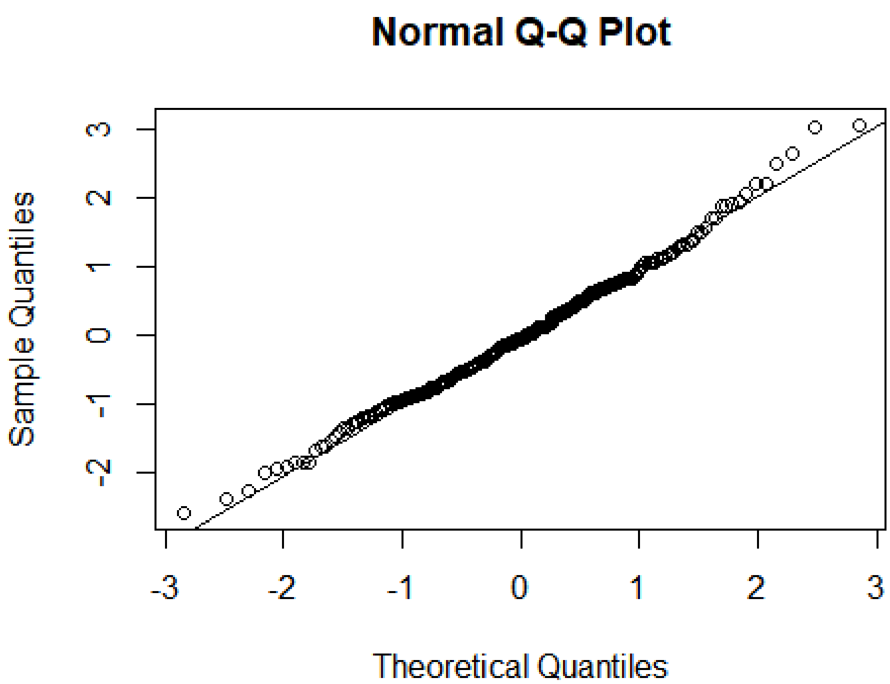


Verteilung von SK

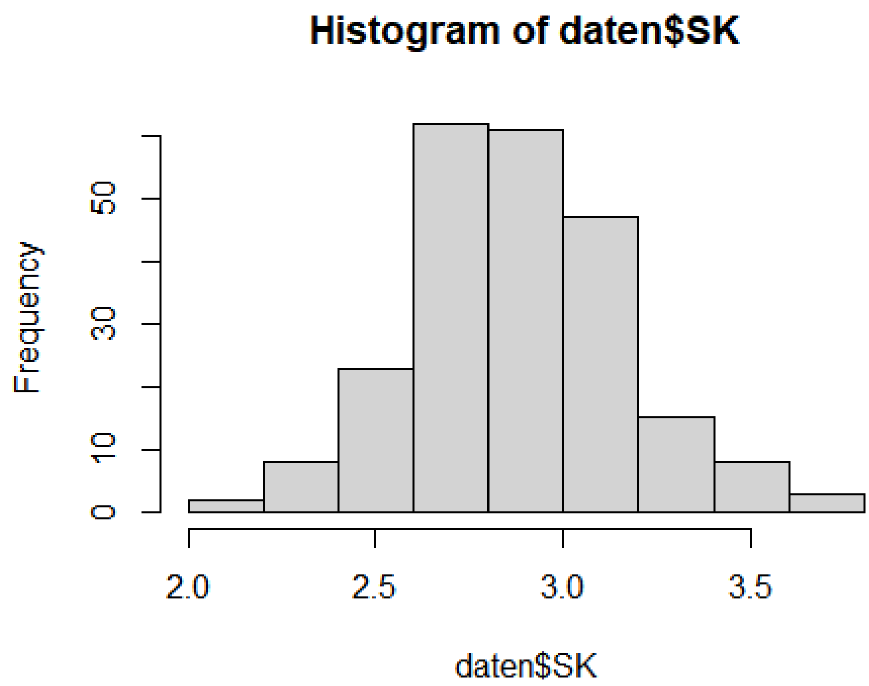
```
shapiro.test(daten$SK)
```

```
##
##  Shapiro-Wilk normality test
##
## data:  daten$SK
## W = 0.99278, p-value = 0.3275
```

```
qqnorm(scale(daten$SK))
qqline(scale(daten$SK))
```




```
hist(daten$SK)
```



Normalverteilt, da p > .05

Interpretation Normalverteilung

Normalverteilung ist bei allen Variablen gegeben bis auf OCB. Jedoch kann wegen zentralem Grenzwertsatz angenommen werden, dass Stichprobe normalverteilt ist bei N > 30 und bei wenigen Ausreißern.

Skewness und Kurtosis

```
library(moments)

## Warning: Paket 'moments' wurde unter R Version 4.1.3 erstellt

skewness(daten$OCB)

## [1] -0.4948684

kurtosis(daten$OCB)

## [1] 3.554657

jarque.test(daten$OCB)

## 
##  Jarque-Bera Normality Test
## 
## data:  daten$OCB
## JB = 12.282, p-value = 0.002152
## alternative hypothesis: greater
```

Alternativhypothese bestätigt. Nicht-Normalverteilung vorhanden bei OCB.

4 Inferenzstatisitk

```
library(psych)

## Warning: Paket 'psych' wurde unter R Version 4.1.3 erstellt

##
## Attache Paket: 'psych'

## Das folgende Objekt ist maskiert 'package:psychometric':
##
##     alpha

## Die folgenden Objekte sind maskiert von 'package:mosaic':
##
##     logit, rescale

## Die folgenden Objekte sind maskiert von 'package:ggplot2':
##
##     %+%, alpha
```

4.1 H1

H1a

Kendall

```
cor.test(daten$OCB, daten$MA, method = "kendall", alternative="greater") #
nach Kendall, positiver Zusammenhang

##
##  Kendall's rank correlation tau
##
## data:  x and y
## z = -3.5754, p-value = 0.9998
## alternative hypothesis: true tau is greater than 0
## sample estimates:
##        tau
## -0.1594047
```

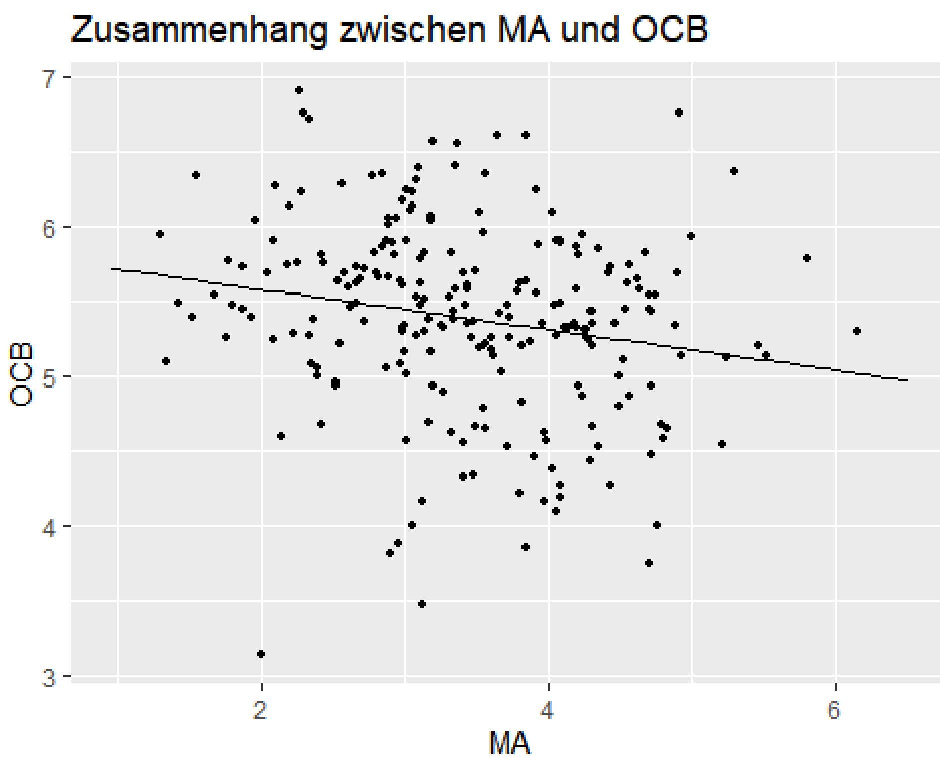
Alternative Rechnung MA ~ OCB (negativ)

```
cor.test(daten$OCB, daten$MA, method = "kendall", alternative="less") # nach
Kendall, positiver Zusammenhang

##
##  Kendall's rank correlation tau
##
## data:  x and y
```

```
## z = -3.5754, p-value = 0.0001748
## alternative hypothesis: true tau is less than 0
## sample estimates:
##        tau
## -0.1594047
```

Pearson

```
cor.test(daten$OCB, daten$MA, method = "pearson", alternative="greater") # nach Kendall, positiver Zusammenhang

##
##  Pearson's product-moment correlation
##
## data:  x and y
## t = -2.964, df = 227, p-value = 0.9983
## alternative hypothesis: true correlation is greater than 0
## 95 percent confidence interval:
##  -0.2957842  1.0000000
## sample estimates:
##        cor
## -0.1930269

cor.test(daten$OCB, daten$MA, method = "pearson", alternative="less") # nach Kendall, positiver Zusammenhang

##
##  Pearson's product-moment correlation
##
## data:  x and y
## t = -2.964, df = 227, p-value = 0.00168
## alternative hypothesis: true correlation is less than 0
## 95 percent confidence interval:
##  -1.00000000 -0.08585336
## sample estimates:
##        cor
## -0.1930269

plotModel(lm(OCB ~ MA, data=daten)) + ggtitle("Zusammenhang zwischen MA und OCB")
```



H1a kann nicht angenommen werden.

H1b

Kendall

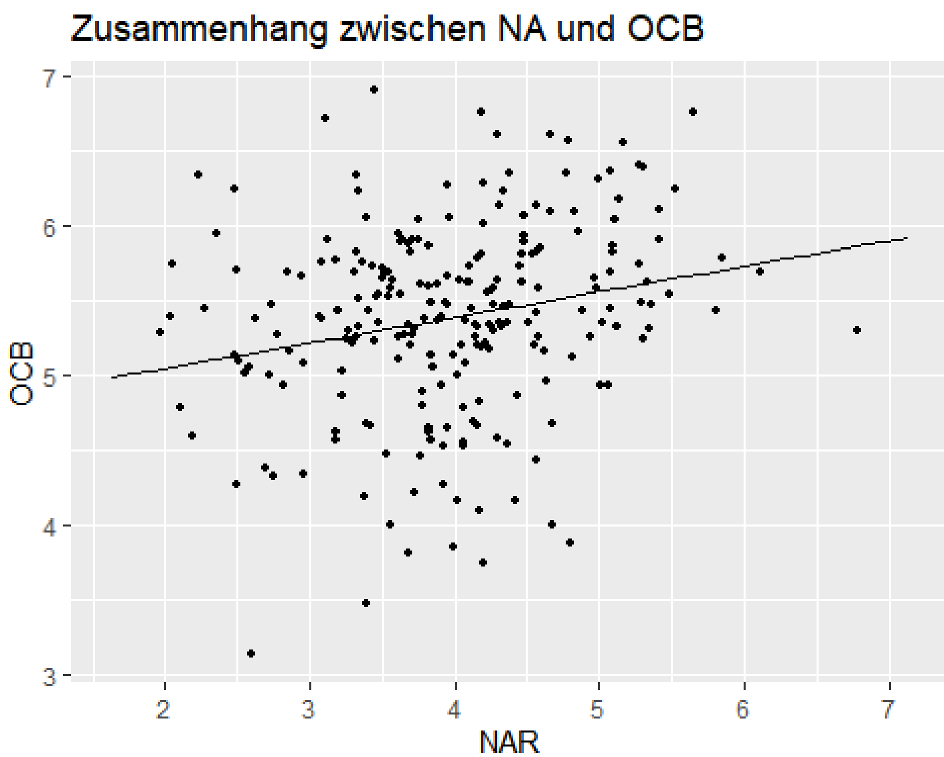
```
cor.test(daten$OCB, daten$NAR, method = "kendall", alternative="two.sided")
#zweiseitiger Test

##
##  Kendall's rank correlation tau
##
## data:  x and y
## z = 3.4191, p-value = 0.0006283
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##       tau
## 0.1522682
```

Pearson

```
cor.test(daten$OCB, daten$NAR, method = "kendall", alternative="two.sided")
#zweiseitiger Test

##
##  Kendall's rank correlation tau
##
## data:  x and y
## z = 3.4191, p-value = 0.0006283
## alternative hypothesis: true tau is not equal to 0
```

```
## sample estimates:
##       tau
## 0.1522682
```

```
plotModel(lm(OCB ~NAR, data=daten)) + ggtitle("Zusammenhang zwischen NA und
OCB")
```



H1b kann angenommen werden.

H1c

Kendall

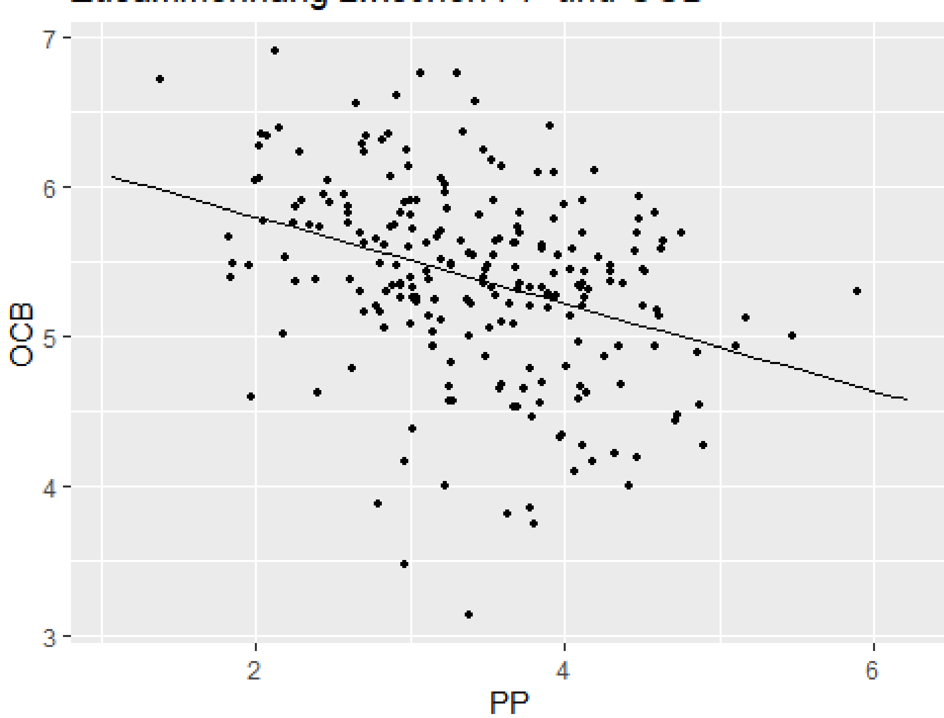
```
cor.test(daten$OCB, daten$PP, method = "kendall", alternative="less")
#einseitiger Test, negativer Zusammnehang

##
##  Kendall's rank correlation tau
##
## data:  x and y
## z = -5.7648, p-value = 4.088e-09
## alternative hypothesis: true tau is less than 0
## sample estimates:
##        tau
## -0.2569238

cor.test(daten$OCB, daten$PP, method = "pearson", alternative="less")
#einseitiger Test, negativer Zusammnehang
```

```
##
##  Pearson's product-moment correlation
##
## data:  x and y
## t = -5.6475, df = 227, p-value = 2.421e-08
## alternative hypothesis: true correlation is less than 0
## 95 percent confidence interval:
##  -1.000000 -0.251638
## sample estimates:
##        cor
## -0.3509921
```

H1c kann angenommen werden, es besteht ein negativer Zusammenhang zwischen PP und OCB mit einem moderaten negativen Zusammenhang mit r = .-26

```
plotModel(lm(OCB ~PP, data=daten)) + ggtitle("Zusammenhang zwischen PP und
OCB")
```

Zusammenhang zwischen PP und OCB



4.2 H2

```
## Warning: Paket 'processR' wurde unter R Version 4.1.3 erstellt

##
## Attache Paket: 'processR'

## Das folgende Objekt ist maskiert 'package:psych':
##
##     corPlot
```

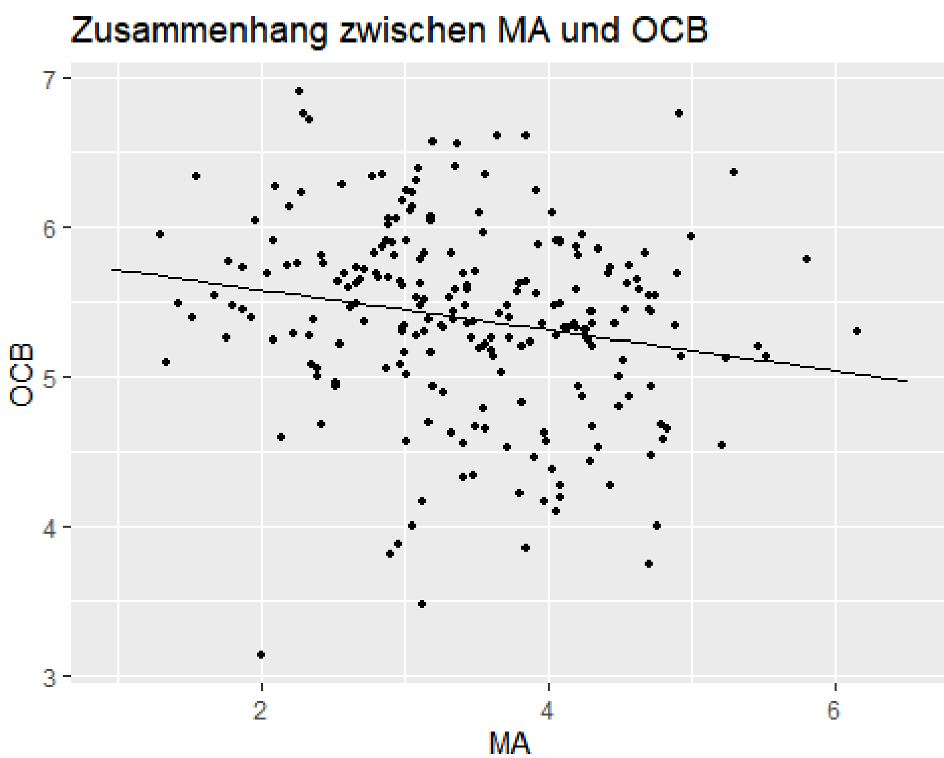
```
## Warning: Paket 'processx' wurde unter R Version 4.1.3 erstellt
```

2a: Das Alter moderiert den Zusammenhang zwischen MA und OCB. Mit zunehmenden Alter wird der Zusammenhang schwächer.

Linearität

H2a prüft Zusammenhang zwischen MA und OCB. Alter dient als Moderator.

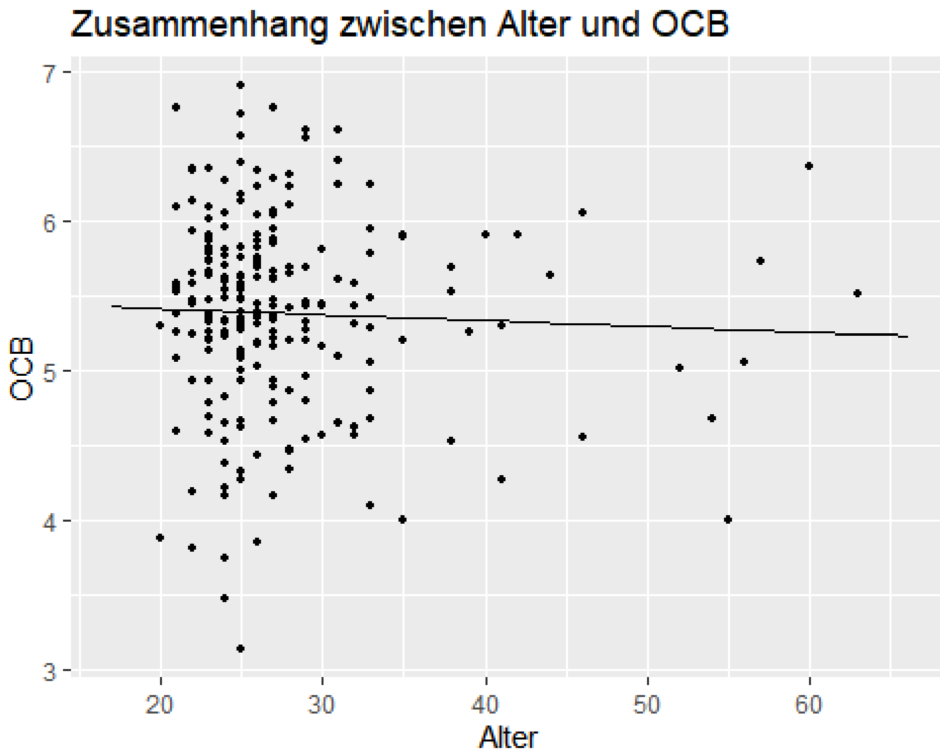
```
plotModel(lm(OCB ~ MA, data = daten)) + ggtitle("Zusammenhang zwischen MA und OCB")
```



Linearität ist vorhanden.

Zusammenhang von Alter und OCB

```
plotModel(lm(OCB ~ Alter, data = daten)) + ggtitle("Zusammenhang zwischen Alter und OCB")
```

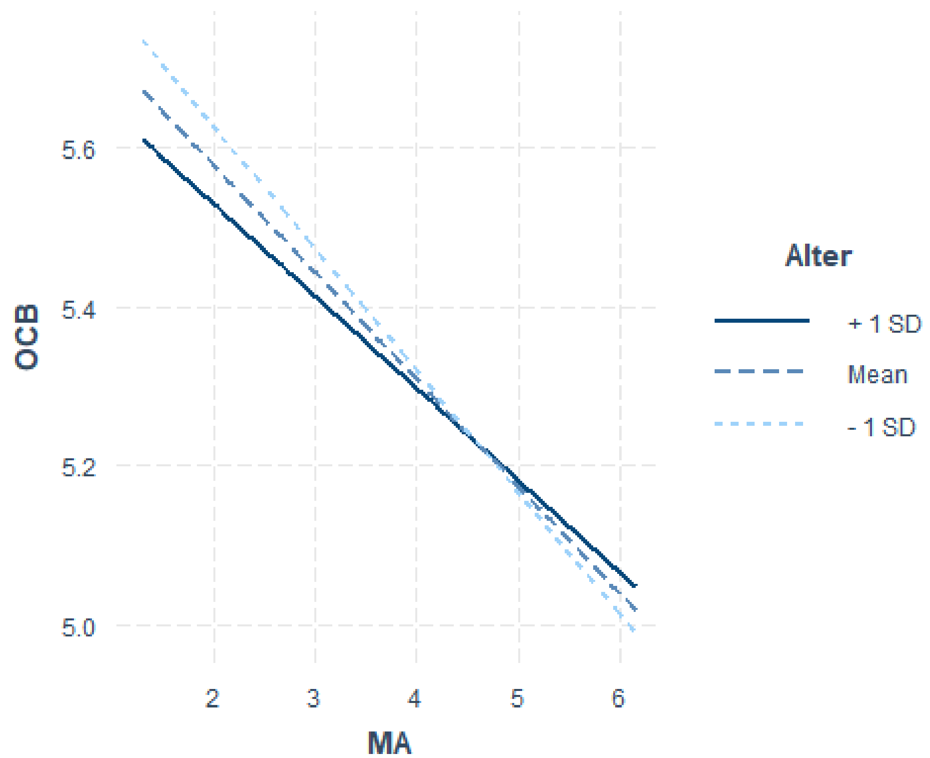


Linearität ist vorhanden.

Test H2a

Prüfung von H2a mit Regressionsanalyse:

```
mod_MAOCBAlter <- lm(OCB~MA + MA*Alter, data = daten)
library(interactions)
## Warning: Paket 'interactions' wurde unter R Version 4.1.3 erstellt
interact_plot(model = mod_MAOCBAlter, pred = MA, modx = Alter)
```



Moderation MA OCB Alter nach process

```
library(processR)
library(processx)
```

Test H2a nach Hayes MA und OCB

```
process(data = daten, y = "OCB", x = "MA", w = "Alter", model = 1, modelbt =
1, seed = 5000, center = 2)

## Error in process(data = daten, y = "OCB", x = "MA", w = "Alter", model =
1, : konnte Funktion "process" nicht finden
```

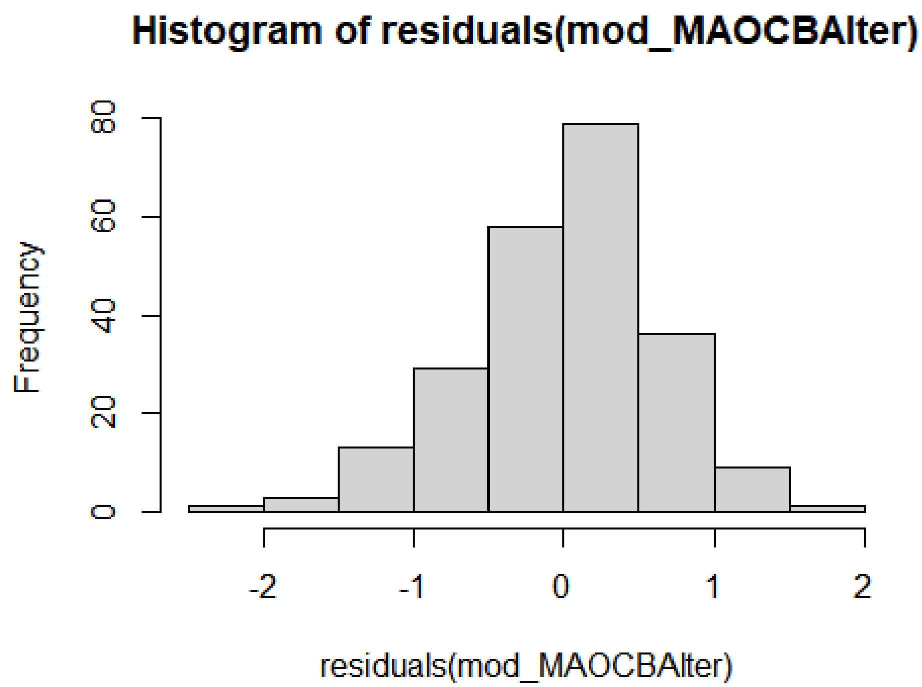
Modelle extrahieren

H2a kann nicht angenommen werden, wegen p Wert = .63.

H2a Gauß-Markow/ Hayes Annahmevoraussetzungen

Normalverteilung der Residuen H2a

```
hist(residuals(mod_MAOCBAlter))
```



Es scheint eine Normalverteilung vorzuliegen.

Hetereskedaszität H2a

H0: Es liegt Homoskedazität vor.

```
## Lade nötiges Paket: zoo

##
## Attache Paket: 'zoo'

## Die folgenden Objekte sind maskiert von 'package:base':
##
##     as.Date, as.Date.numeric

bptest(mod_MAOCBAlter)

##
##  studentized Breusch-Pagan test
##
## data:  mod_MAOCBAlter
## BP = 2.9825, df = 3, p-value = 0.3943
```

Es liegt hier ein Homoskedaszität der Residuen vor.

Autokorrelation H2a

```
dwtest(mod_MAOCBAlter)

##
##  Durbin-Watson test
```

```
##
## data:  mod_MAOCBAlter
## DW = 2.1487, p-value = 0.8665
## alternative hypothesis: true autocorrelation is greater than 0
```

Keine Autokorrelation vorhanden.

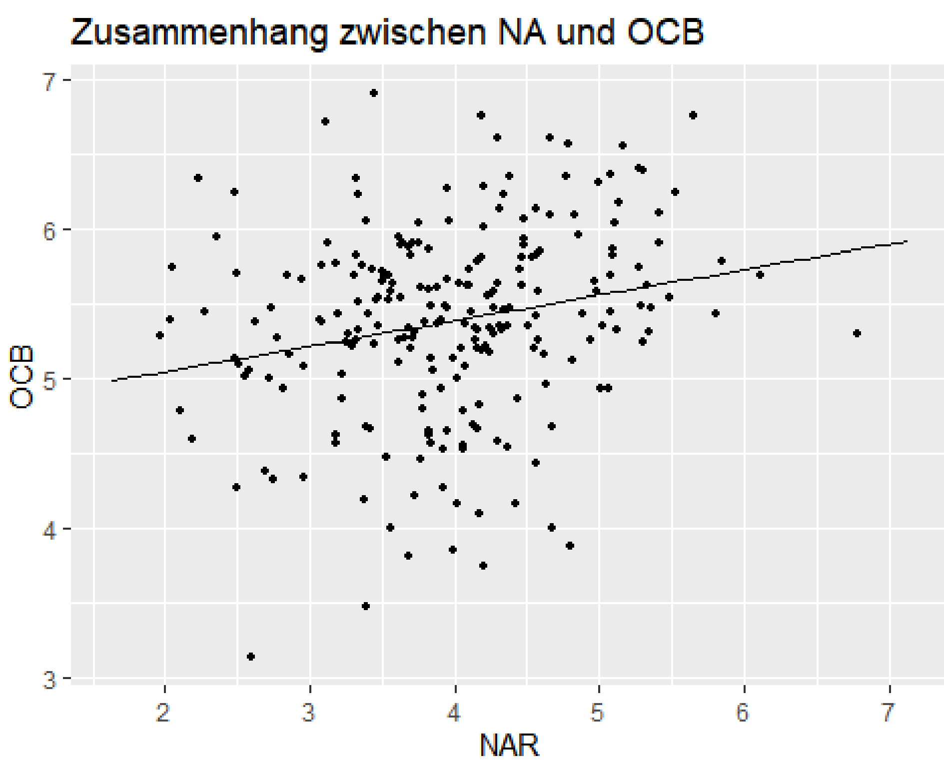
#H2b Das Alter moderiert den Zusammenhang zwischen NA und OCB. Mit zunehmenden Alter wird der Zusammenhang schwächer.

```
process(data = daten, y = "OCB", x = "NAR", w = "Alter", model = 1, modelbt =
1, seed = 50000, center = 2 )

## Error in process(data = daten, y = "OCB", x = "NAR", w = "Alter", model =
1, : konnte Funktion "process" nicht finden
```

Linearität

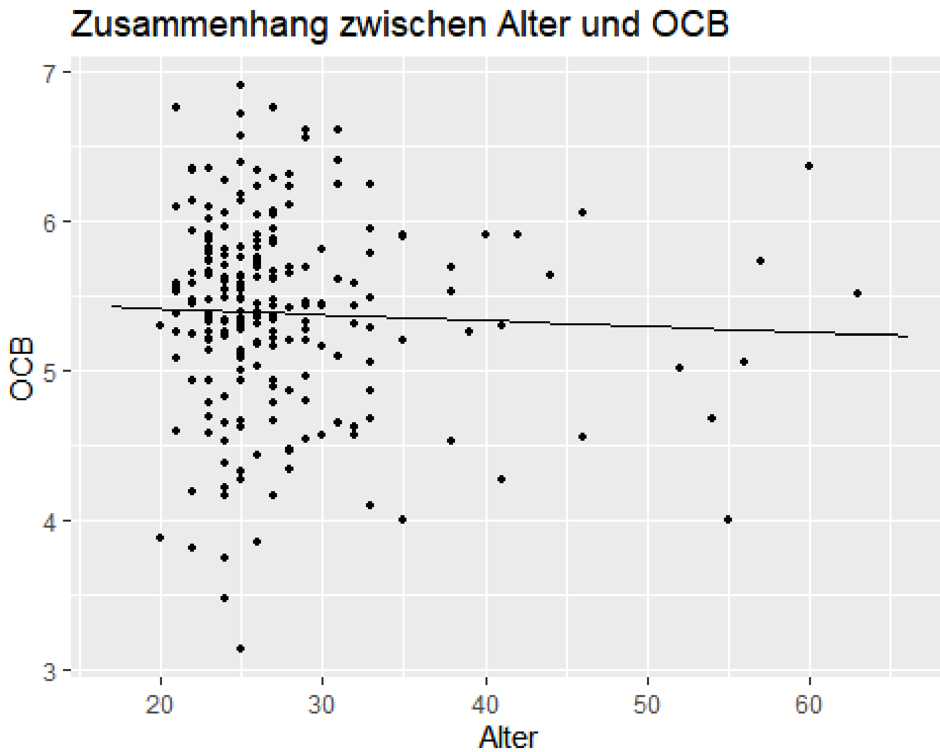
Zusammenhang NA und OCB

```
plotModel(lm(OCB ~ NAR, data = daten)) + ggtitle("Zusammenhang zwischen NA
und OCB")
```



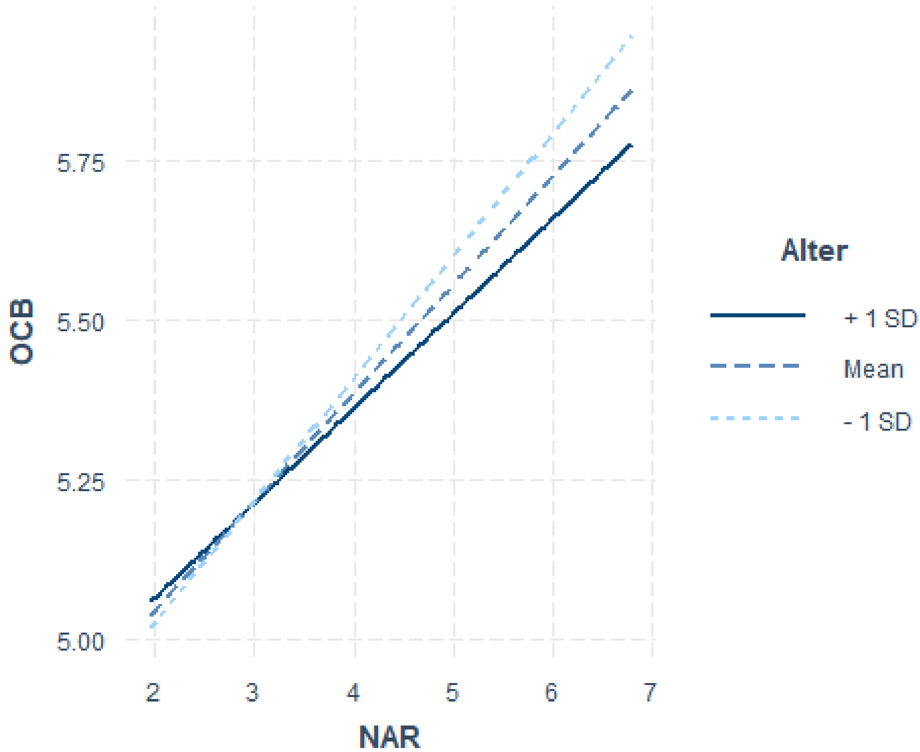
Linearität ist vorhanden

```
plotModel(lm(OCB ~ Alter, data = daten)) + ggtitle("Zusammenhang zwischen
Alter und OCB")
```



Zusammenhang NA und Alter

```
mod_NAROCBAlter <- lm(OCB~NAR +  NAR*Alter, data = daten)
summary(mod_NAROCBAlter)

## 
## Call:
## lm(formula = OCB ~ NAR + NAR * Alter, data = daten)
## 
## Residuals:
##      Min       1Q   Median       3Q      Max 
## -2.00492 -0.26998  0.02488  0.40371  1.60431 
## 
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)    
## (Intercept)  4.451968   0.749647   5.939 1.08e-08 ***
## NAR          0.257231   0.190623   1.349    0.179    
## Alter        0.009064   0.025491   0.356    0.722    
## NAR:Alter   -0.003127   0.006540  -0.478    0.633    
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
## 
## Residual standard error: 0.6275 on 225 degrees of freedom
## Multiple R-squared:  0.05166,    Adjusted R-squared:  0.03901 
## F-statistic: 4.085 on 3 and 225 DF,  p-value: 0.007521

interact_plot(model = mod_NAROCBAlter, pred = NAR, modx = Alter)
```

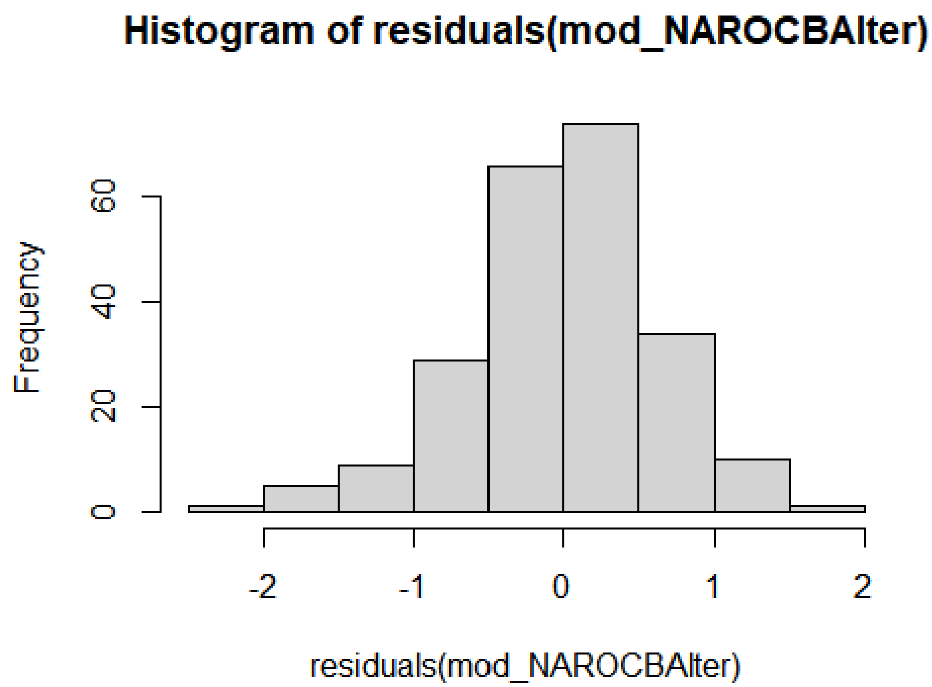


H2b kann nicht angenommen werden, da p = .63 ist.

H2b Gauß-Markow/ Hayes Anwendungsvoraussetzungen

Normalverteilung der Residuen H2b

```
hist(residuals(mod_NAROCBAlter))
```



Es scheint eine Normalverteilung vorzuliegen.

Heteroeskedazität H2b

H0: Es liegt Homoskedazität vor.

```
bptest(mod_NAROCBAlter)

##
##  studentized Breusch-Pagan test
##
## data:  mod_NAROCBAlter
## BP = 3.8301, df = 3, p-value = 0.2804
```

Es liegt hier eine Homoskedaszität der Residuuen vor.

Autokorrelation H2b

```
dwtest(mod_NAROCBAlter)

##
##  Durbin-Watson test
##
## data:  mod_NAROCBAlter
## DW = 2.0795, p-value = 0.7215
## alternative hypothesis: true autocorrelation is greater than 0
```

Tabelle erzeugen.

```
Tabelle2hb <- apa.reg.table(mod_NAROCBAlter,filename = "Tabelle2hb",
table.number = 3)
```

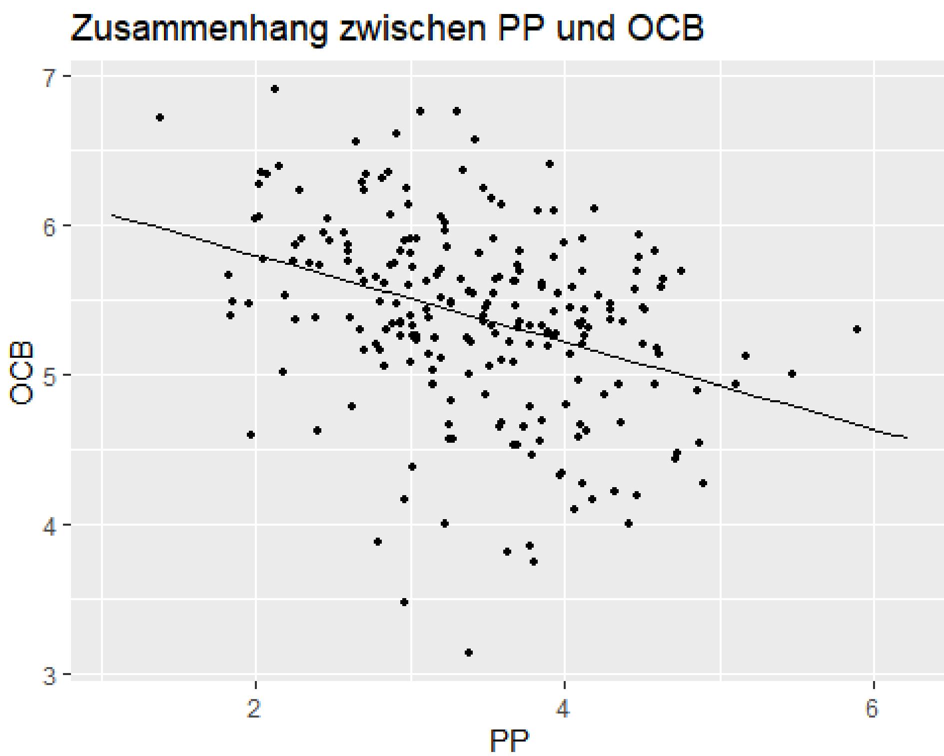
H2c

```
process(data = daten, y = "OCB", x = "PP", w = "Alter", model = 1, modelbt =
1, seed = 50000, center = 2 )

## Error in process(data = daten, y = "OCB", x = "PP", w = "Alter", model =
1, : konnte Funktion "process" nicht finden
```

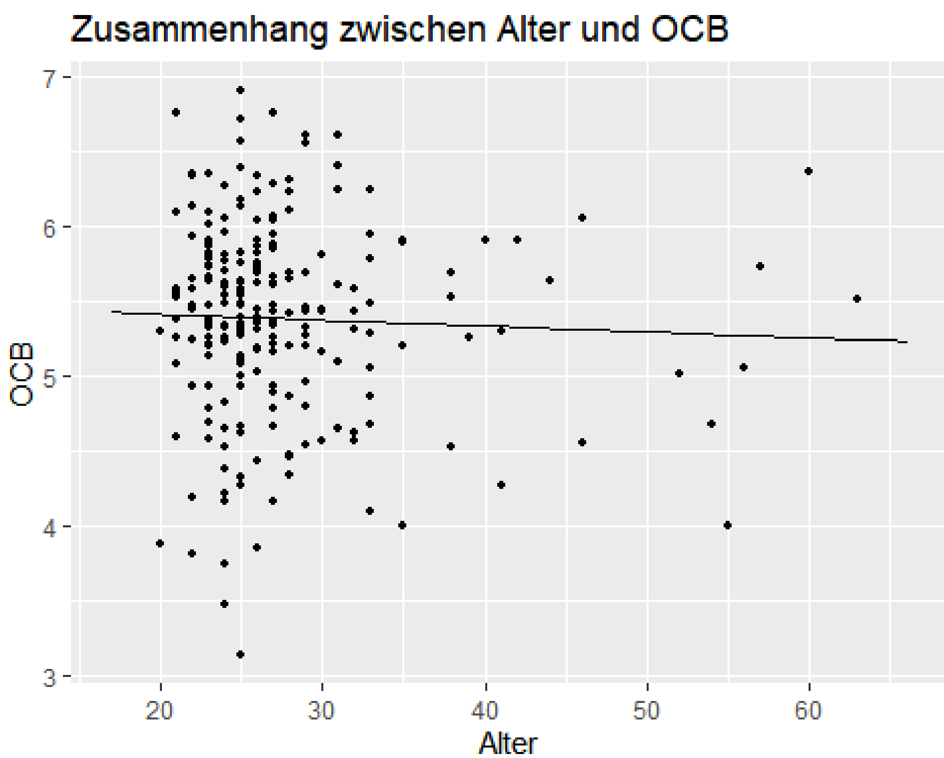
Linearität

Zusammenhang PP und OCB

```
plotModel(lm(OCB ~ PP, data = daten)) + ggtitle("Zusammenhang zwischen PP und
OCB")
```

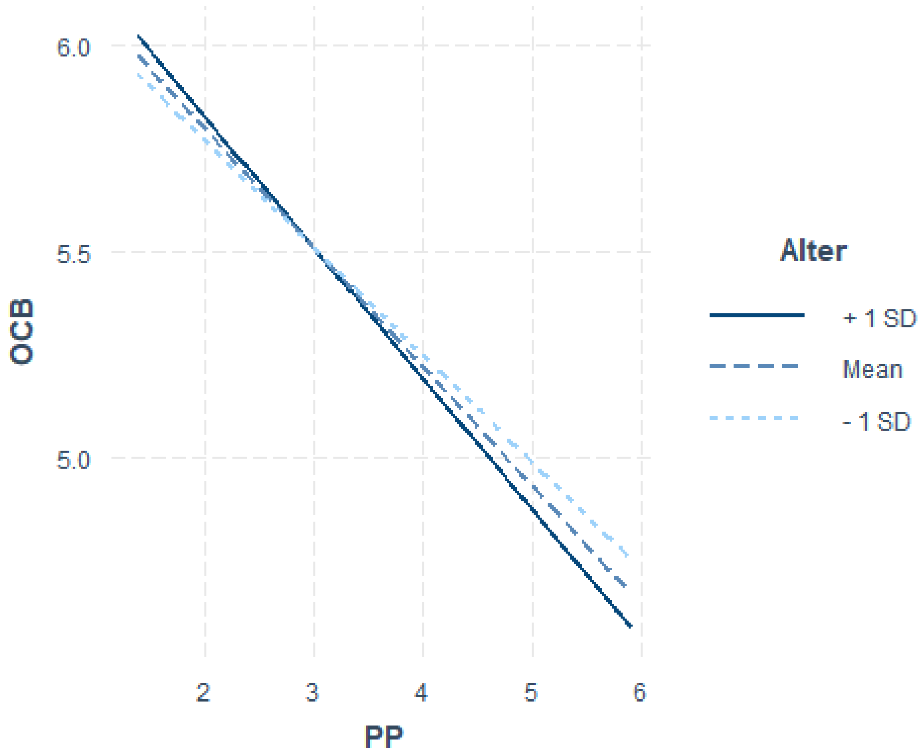



```
plotModel(lm(OCB ~ Alter, data = daten)) + ggtitle("Zusammenhang zwischen
Alter und OCB")
```



Linearität ist vorhanden

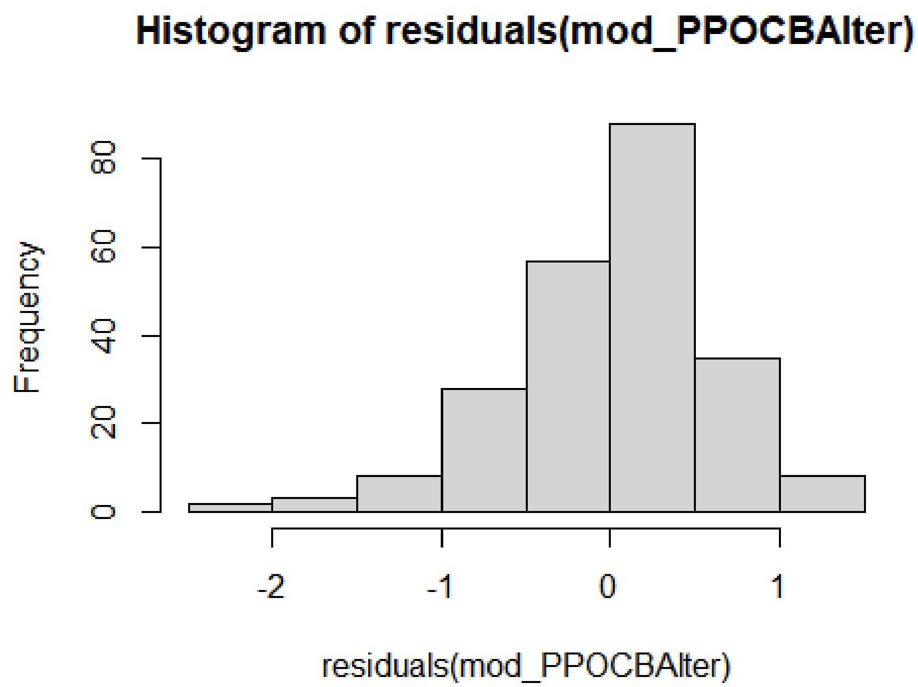
```
mod_PPOCBAlter <- lm(OCB~PP +  PP*Alter, data = daten)
summary(mod_PPOCBAlter)

##
## Call:
## lm(formula = OCB ~ PP + PP * Alter, data = daten)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.26286 -0.31036  0.06205  0.37588  1.32130
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  6.035375   0.735142   8.210 1.72e-14 ***
## PP          -0.175694   0.215170  -0.817    0.415
## Alter        0.012301   0.026066   0.472    0.637
## PP:Alter    -0.004115   0.007579  -0.543    0.588
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.6029 on 225 degrees of freedom
## Multiple R-squared:  0.1246, Adjusted R-squared:  0.1129
## F-statistic: 10.68 on 3 and 225 DF,  p-value: 1.374e-06

interact_plot(model = mod_PPOCBAlter, pred = PP, modx = Alter)
```



H2c Gauß-Markow/ Hayes Anwendungsvoraussetzungen

Normalverteilung der Residuen H2c

```
hist(residuals(mod_PPOCBAlter))
```



Es scheint eine leicht rechssteile Normalverteilung vorzuliegen.

Hetereskedaszität H2c

H0: Es liegt Homoskedazität vor.

```
bptest(mod_PPOCBAlter)

##
##  studentized Breusch-Pagan test
##
## data:  mod_PPOCBAlter
## BP = 0.8846, df = 3, p-value = 0.8291
```

Es liegt hier ein Homoskedaszität der Residuuen vor.

Autokorrelation H2c

```
dwtest(mod_PPOCBAlter)

##
##  Durbin-Watson test
##
## data:  mod_PPOCBAlter
## DW = 2.0686, p-value = 0.6975
## alternative hypothesis: true autocorrelation is greater than 0
```

Tabelle erzeugen

```
Tabelle2hcfg <- apa.reg.table(mod_PPOCBAlter,filename = "Tabelle2hcfg",
table.number = 4)
```

H3

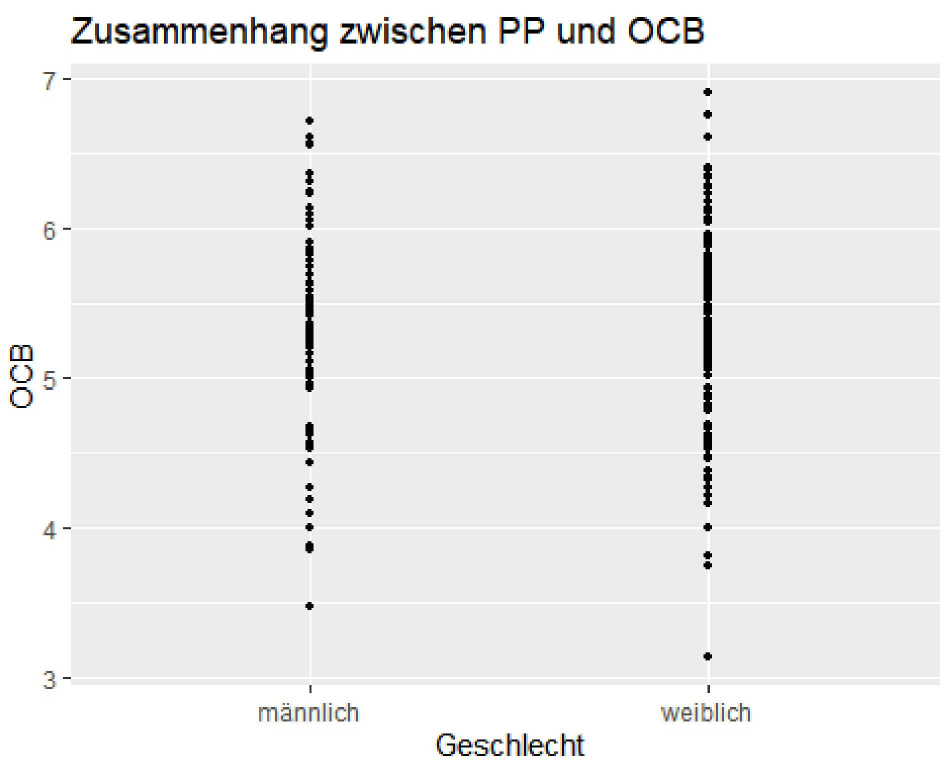
H3a: Das Geschlecht moderiert den Zusammenhang zwischen MA und OCB. Bei Männern ist der Zusammenhang stärker.

```
process(data = daten2, y = "OCB", x = "MA", w = "Geschlecht", model = 1,
modelbt = 1, seed = 50000 )

## Error in process(data = daten2, y = "OCB", x = "MA", w = "Geschlecht", :
konnte Funktion "process" nicht finden
```

Linearität

Zusammenhang MA und Geschlecht

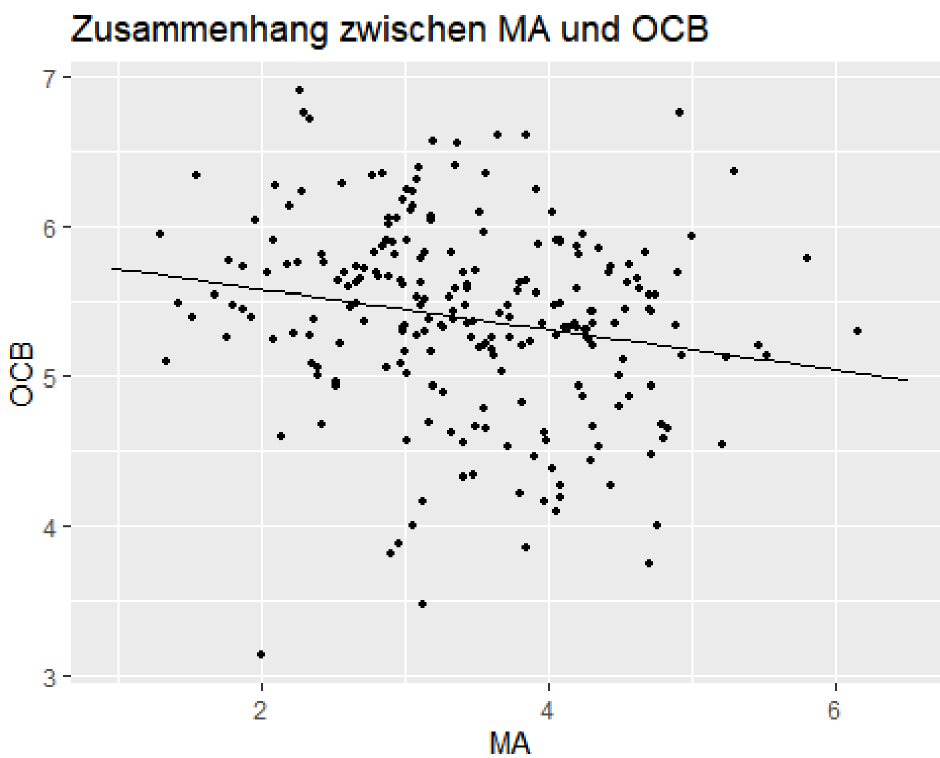
```
plotModel(lm(OCB ~ Geschlecht, data = daten)) + ggtitle("Zusammenhang
zwischen PP und OCB")
```



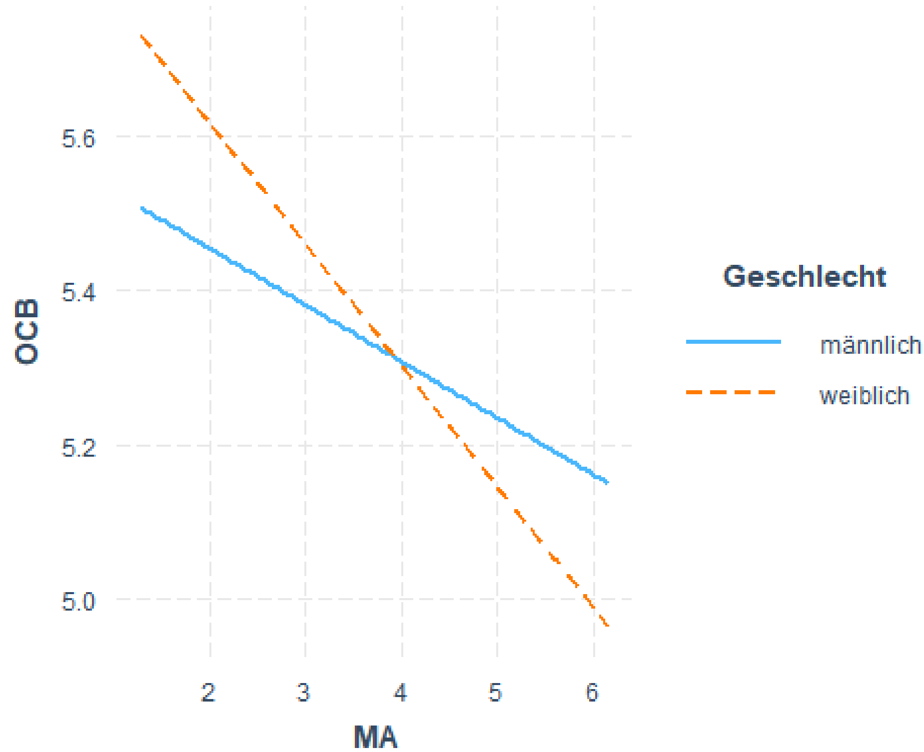
Linearität ist vorhanden

Zusammenhang MA und Geschlecht

```
plotModel(lm(OCB ~ MA, data = daten)) + ggtitle("Zusammenhang zwischen MA und
OCB")
```



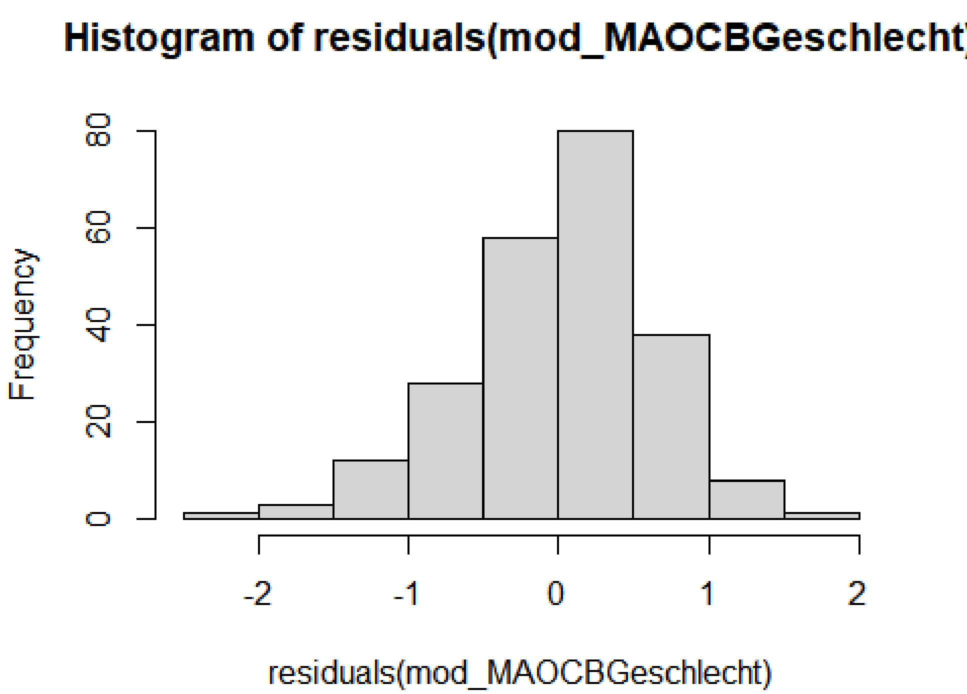

```
mod_MAOCBGeschlecht <- lm(OCB~MA +   MA*Geschlecht, data = daten)
summary(mod_MAOCBGeschlecht)

##
## Call:
## lm(formula = OCB ~ MA + MA * Geschlecht, data = daten)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.48115 -0.30616  0.07493  0.38489  1.59045
##
## Coefficients:
##                         Estimate Std. Error t value Pr(>|t|)
## (Intercept)              5.60256    0.31660  17.696   <2e-16 ***
## MA                      -0.07344    0.08389  -0.875    0.382
## Geschlechtweiblich       0.33116    0.37031   0.894    0.372
## MA:Geschlechtweiblich -0.08409    0.10051  -0.837    0.404
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.6311 on 225 degrees of freedom
## Multiple R-squared:  0.04074,    Adjusted R-squared:  0.02795
## F-statistic: 3.185 on 3 and 225 DF,  p-value: 0.02466

interact_plot(model = mod_MAOCBGeschlecht, pred = MA, modx = Geschlecht)
```



H3a Gauß-Markow/ Hayes Anwendungsvoraussetzungen

Normalverteilung der Residuen H3a

```
hist(residuals(mod_MAOCBGeschlecht))
```



Es scheint eine Normalverteilung vorzuliegen.

Hetereskedaszität H3a

H0: Es liegt Homoskedazität vor.

```
bptest(mod_MAOCBGeschlecht)

##
##  studentized Breusch-Pagan test
##
## data:  mod_MAOCBGeschlecht
## BP = 2.9802, df = 3, p-value = 0.3947
```

Es liegt hier ein Homoskedaszität der Residuuen vor.

Autokorrelation H3a

```
dwtest(mod_MAOCBGeschlecht)

##
##  Durbin-Watson test
##
## data:  mod_MAOCBGeschlecht
## DW = 2.1426, p-value = 0.8583
## alternative hypothesis: true autocorrelation is greater than 0
```

Keine Autokorrelation vorhanden

```
daten2 <- daten
daten2$Geschlecht[daten2$Geschlecht == "männlich"] <- "1" # Beobachtungen den
jeweiligen Geschlechtern zuweisen
daten2$Geschlecht[daten2$Geschlecht == "weiblich"] <- "2" # Beobachtungen den
jeweiligen Geschlechtern zuweisen
daten2$Geschlecht <- as.numeric(daten2$Geschlecht)
```

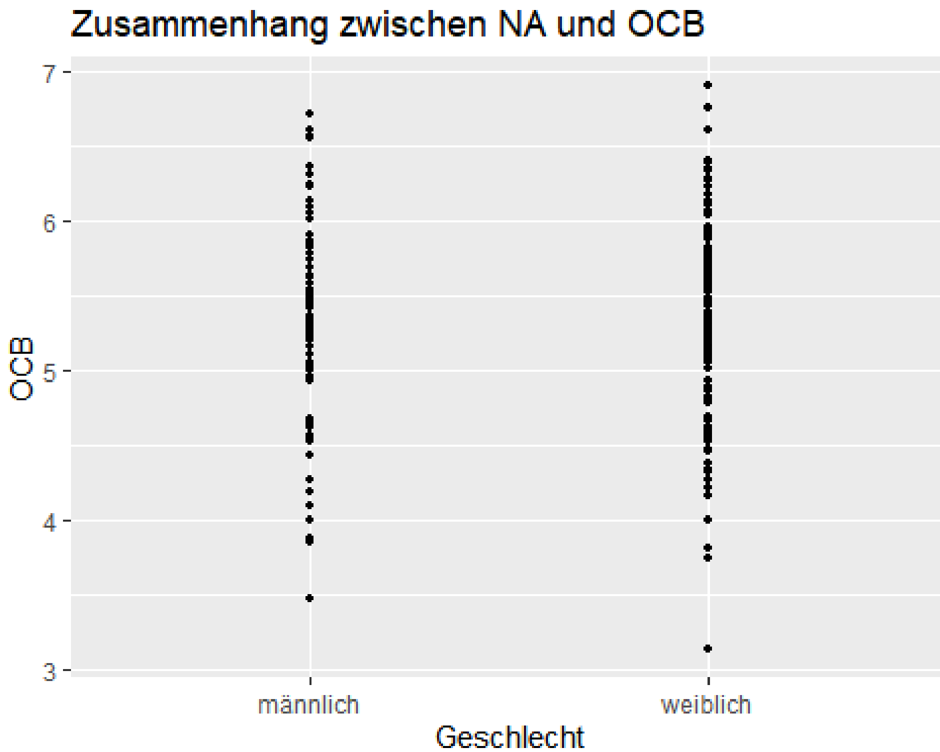
#H3b Die DDB moderiert den Zusammenhang zwischen NA und OCB. Mit einer zunehmenden DDB wird der Zusammenhang schwächer.

```
process(data = daten2, y = "OCB", x = "NAR", w = "Geschlecht", model = 1,
modelbt = 1, seed = 50000 )

## Error in process(data = daten2, y = "OCB", x = "NAR", w = "Geschlecht", :
konnte Funktion "process" nicht finden
```

Linearität

Zusammenhang NA und Geschlecht

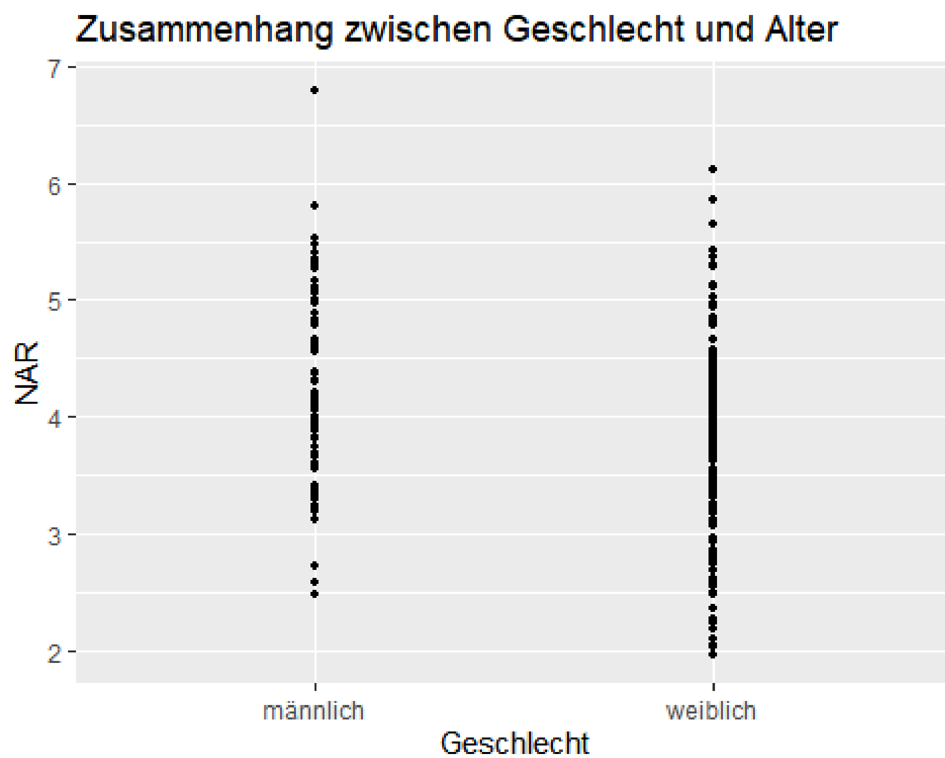
```
plotModel(lm(OCB ~ Geschlecht, data = daten)) + ggtitle("Zusammenhang
zwischen NA und OCB")
```



Linearität ist vorhanden

Zusammenhang MA und Geschlecht

```
plotModel(lm(NAR ~ Geschlecht, data = daten)) + ggtitle("Zusammenhang
zwischen Geschlecht und Alter")
```




```
mod_NAROCBH <- lm(OCB~NAR + NAR*Geschlecht, data = daten)
summary(mod_NAROCBGeschlecht)

## Error in h(simpleError(msg, call)): Fehler bei der Auswertung des
Argumentes 'object' bei der Methodenauswahl für Funktion 'summary': Objekt
'mod_NAROCBGeschlecht' nicht gefunden

interact_plot(model = mod_NAROCBGeschlecht, pred = NAR, modx = Geschlecht)

## Error in "svyglm" %in% class(model): Objekt 'mod_NAROCBGeschlecht' nicht
gefunden
```

H3b Gauß-Markow/ Hayes Anwendungsvoraussetzungen

Normalverteilung der Residuen H3b

```
hist(residuals(mod_NAROCBGeschlecht))

## Error in residuals(mod_NAROCBGeschlecht): Objekt 'mod_NAROCBGeschlecht'
nicht gefunden
```

Es scheint eine Normalverteilung vorzuliegen.

Hetereskedaszität H3b

H0: Es liegt Homoskedazität vor.

```
bptest(mod_NAROCBGeschlecht)

## Error in bptest(mod_NAROCBGeschlecht): Objekt 'mod_NAROCBGeschlecht' nicht
gefunden
```

Es liegt hier eine Homoskedaszität der Residuuen vor.

Autokorrelation H3b

```
dwtest(mod_NAROCBGeschlecht)

## Error in dwtest(mod_NAROCBGeschlecht): Objekt 'mod_NAROCBGeschlecht' nicht
gefunden
```

Keine Autokorrelation vorhanden

H3cDas Geschlecht moderiert den Zusammenhang zwischen PP und OCB. Bei Männern ist der Zusammenhang stärker.

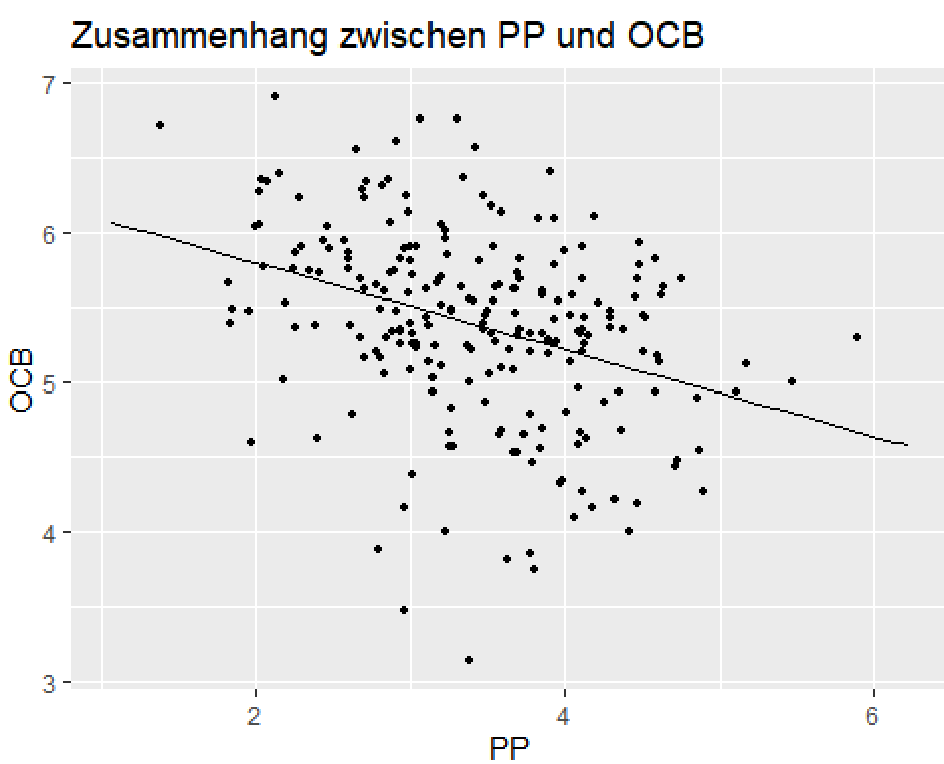
```
process(data = daten2, y = "OCB", x = "PP", w = "Geschlecht", model = 1,
modelbt = 1, seed = 50000)

## Error in process(data = daten2, y = "OCB", x = "PP", w = "Geschlecht", :
konnte Funktion "process" nicht finden
```

Linearität

Linearität ist vorhanden

Zusammenhang PP und Geschlecht

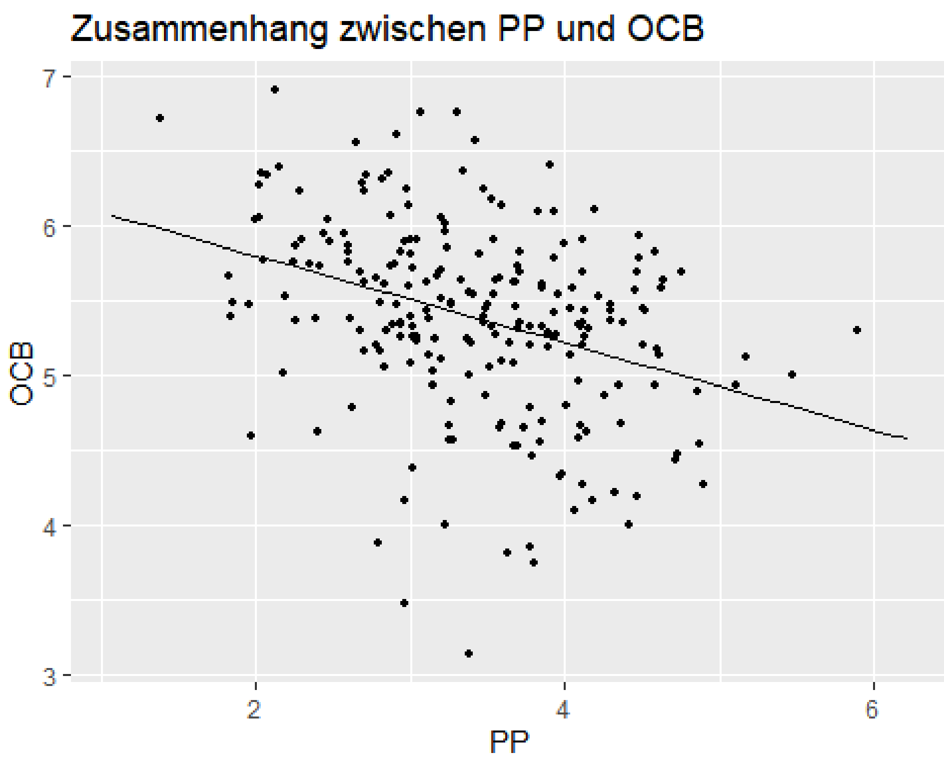
```
plotModel(lm(OCB ~ PP, data = daten)) + ggtitle("Zusammenhang zwischen PP und
OCB")
```



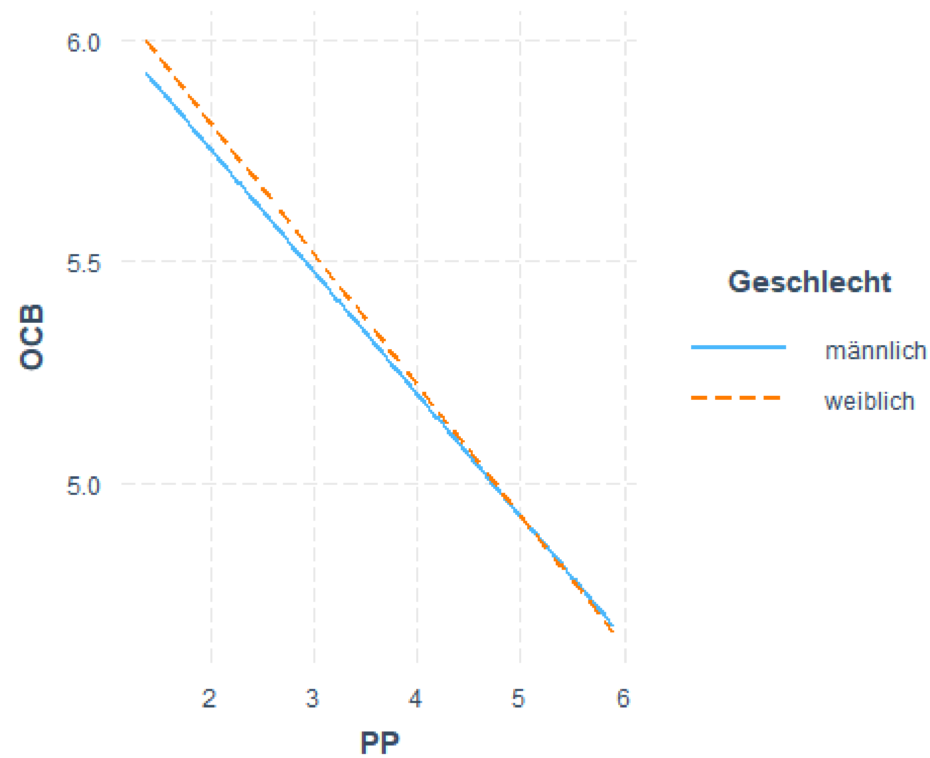
###

Zusammenhang Geschlecht und OCB

```r
plotModel(lm(OCB ~ PP, data = daten)) + ggtitle("Zusammenhang zwischen PP und OCB")
```



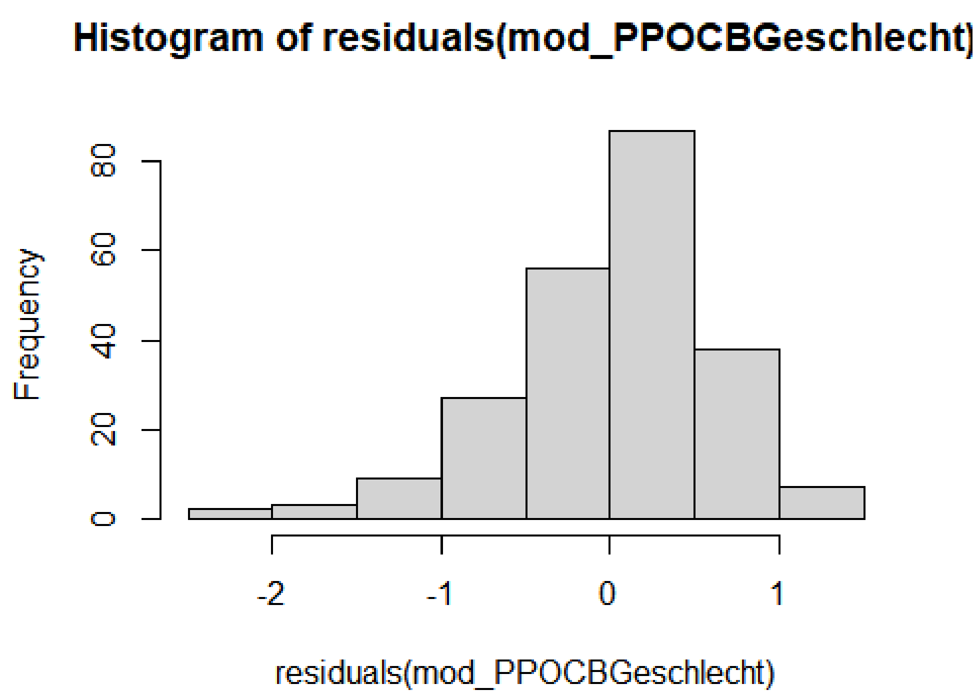

```r
mod_PPOCBGeschlecht <- lm(OCB~PP + PP*Geschlecht, data = daten)
summary(mod_PPOCBGeschlecht)

##
## Call:
## lm(formula = OCB ~ PP + PP * Geschlecht, data = daten)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.26704 -0.31522  0.06524  0.36391  1.32088
##
## Coefficients:
##                         Estimate Std. Error t value Pr(>|t|)
## (Intercept)              6.30425    0.32271  19.535  < 2e-16 ***
## PP                      -0.27563    0.08941  -3.083  0.00231 **
## Geschlechtweiblich       0.09806    0.39055   0.251  0.80198
## PP:Geschlechtweiblich -0.01927    0.10969  -0.176  0.86068
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.6032 on 225 degrees of freedom
## Multiple R-squared:  0.1238, Adjusted R-squared:  0.1122
## F-statistic:  10.6 on 3 and 225 DF,  p-value: 1.513e-06

interact_plot(model = mod_PPOCBGeschlecht, pred = PP, modx = Geschlecht)
```



H3c Gauß-Markow/ Hayes Anwendungsvoraussetzungen

Normalverteilung der Residuen H3c

```
hist(residuals(mod_PPOCBGeschlecht))
```



Es scheint eine leicht rechtssteile Normalverteilung vorzuliegen.

Hetereskedaszität H3c

H0: Es liegt Homoskedazität vor.

```
bptest(mod_PPOCBGeschlecht)

##
##  studentized Breusch-Pagan test
##
## data:  mod_PPOCBGeschlecht
## BP = 3.2263, df = 3, p-value = 0.358
```

Es liegt hier eine Homoskedaszität der Residuuen vor.

Autokorrelation H3c

```
dwtest(mod_PPOCBGeschlecht)

##
##  Durbin-Watson test
##
## data:  mod_PPOCBGeschlecht
## DW = 2.0611, p-value = 0.682
## alternative hypothesis: true autocorrelation is greater than 0
```

Keine Autokorrelation vorhanden

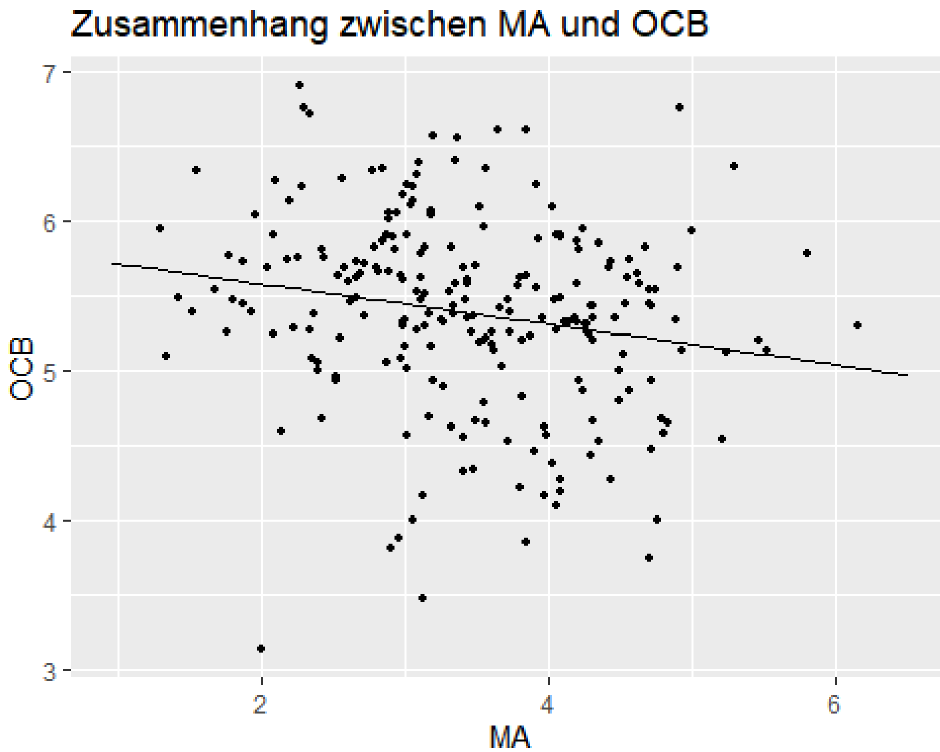
H4a Die DDB moderiert den Zusammenhang zwischen MA und OCB. Mit einer zunehmenden DDB wird der Zusammenhang stärker.

```
process(data = daten, y = "OCB", x = "MA", w = "DDB", model = 1, modelbt = 1,
seed = 50000, center = 2 )

## Error in process(data = daten, y = "OCB", x = "MA", w = "DDB", model = 1,
: konnte Funktion "process" nicht finden
```

Linearität

Zusammenhang DDB und OCB

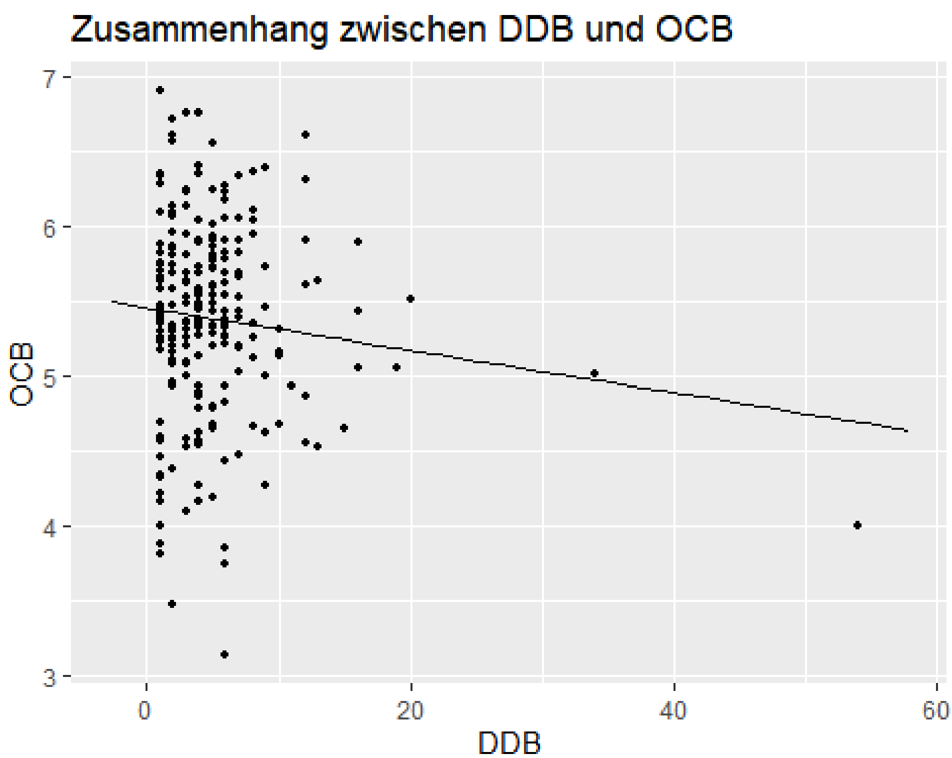
```
plotModel(lm(OCB ~ MA, data = daten)) + ggtitle("Zusammenhang zwischen MA und
OCB")
```



Linearität ist vorhanden

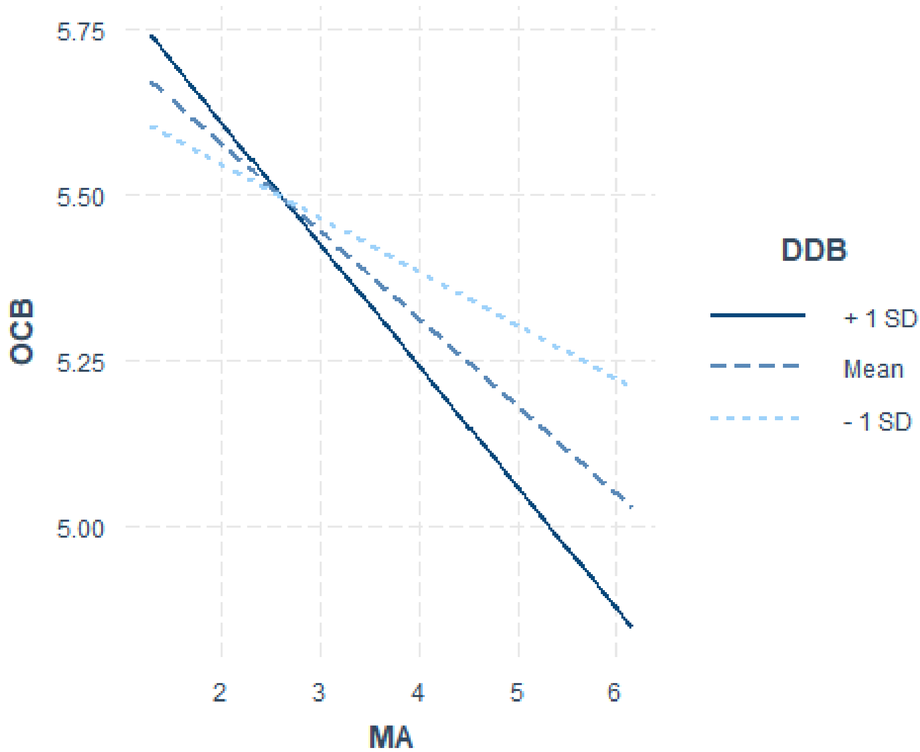
Zusammenhang MA und OCB

```
plotModel(lm(OCB ~ DDB, data = daten)) + ggtitle("Zusammenhang zwischen DDB
und OCB")
```



Linearität ist vorhanden.

```
mod_MAOCBDDB <- lm(OCB~MA + MA*DDB, data = daten)
summary(mod_MAOCBDDB)

##
## Call:
## lm(formula = OCB ~ MA + MA * DDB, data = daten)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.44582 -0.31130  0.05359  0.36234  1.53449
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  5.710152   0.233951  24.407   <2e-16 ***
## MA          -0.082002   0.062616  -1.310    0.192
## DDB          0.026173   0.035628   0.735    0.463
## MA:DDB      -0.009989   0.008917  -1.120    0.264
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.6272 on 225 degrees of freedom
## Multiple R-squared:  0.05284,    Adjusted R-squared:  0.04021
## F-statistic: 4.184 on 3 and 225 DF,  p-value: 0.006599

interact_plot(model = mod_MAOCBDDB, pred = MA, modx = DDB)

## Warning: -0.110684384094747 is outside the observed range of DDB
```

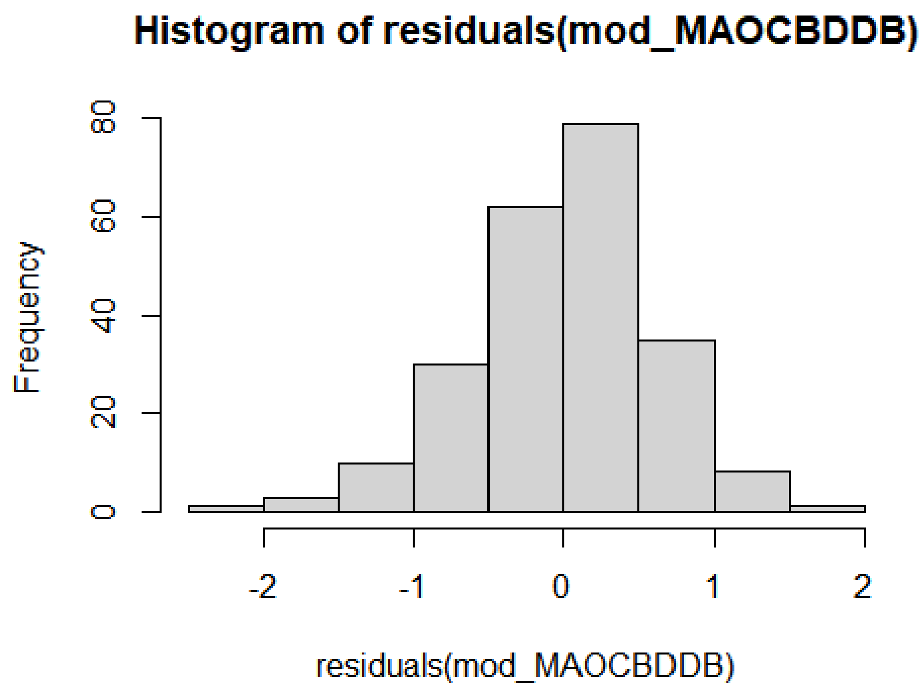


H4a abgelehnt, da p größer ist als .05.

H4a Gauß-Markow/ Hayes Anwendungsvoraussetzungen

Normalverteilung der Residuen H3c

```
hist(residuals(mod_MAOCBDDB))
```



Es scheint eine Normalverteilung vorzuliegen.

Hetereskedaszität H4a

H0: Es liegt Homoskedazität vor.

```
bptest(mod_MAOCBDDB)

##
##  studentized Breusch-Pagan test
##
## data:  mod_MAOCBDDB
## BP = 2.3591, df = 3, p-value = 0.5013
```

Es liegt hier eine Homoskedaszität der Residuuen vor.

Autokorrelation H4a

```
dwtest(mod_MAOCBDDB)

##
##  Durbin-Watson test
##
## data:  mod_MAOCBDDB
## DW = 2.1484, p-value = 0.8669
## alternative hypothesis: true autocorrelation is greater than 0
```

H4b: Die DDB moderiert den Zusammenhang zwischen NA und OCB. Mit einer zuneh-menden DDB wird der Zusammenhang schwächer.

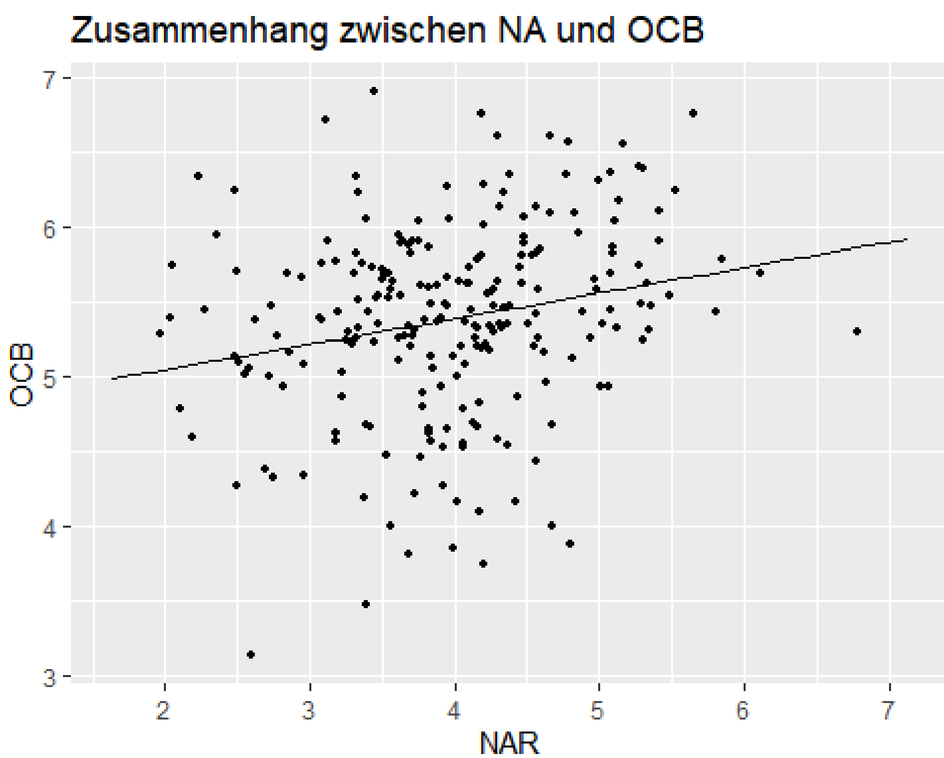
```
process(data = daten, y = "OCB", x = "NAR", w = "DDB", model = 1, modelbt =
1, seed = 50000, center = 2)
```

```
## Error in process(data = daten, y = "OCB", x = "NAR", w = "DDB", model = 1,
: konnte Funktion "process" nicht finden
```

Linearität

Zusammenhang DDB und NA

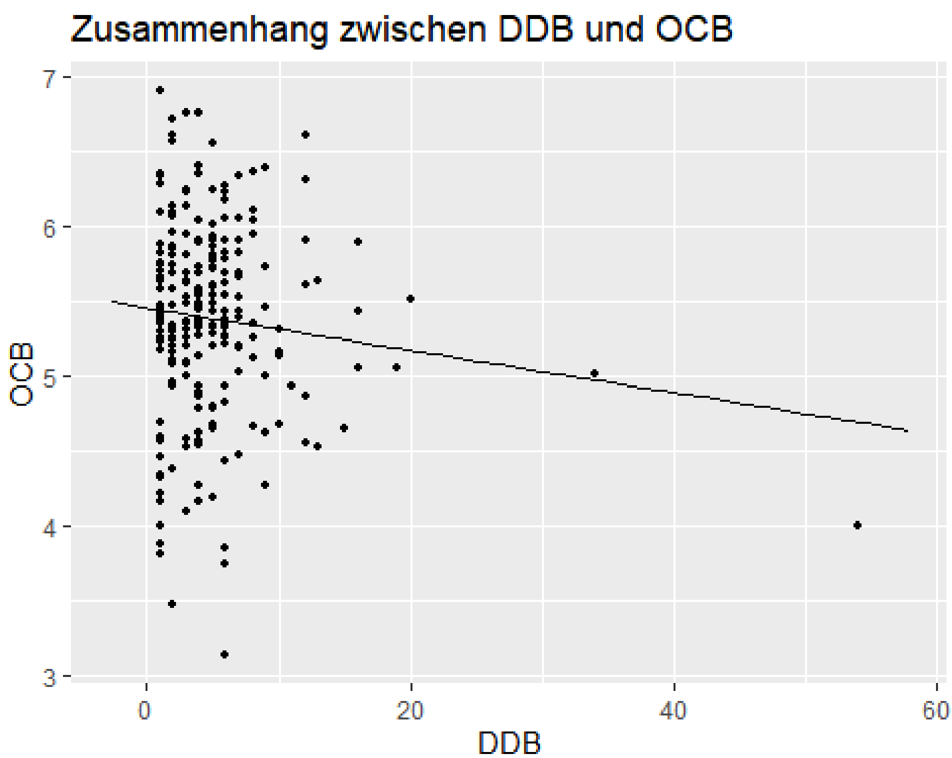
```
plotModel(lm(OCB ~ NAR, data = daten)) + ggtitle("Zusammenhang zwischen NA
und OCB")
```



Linearität ist vorhanden

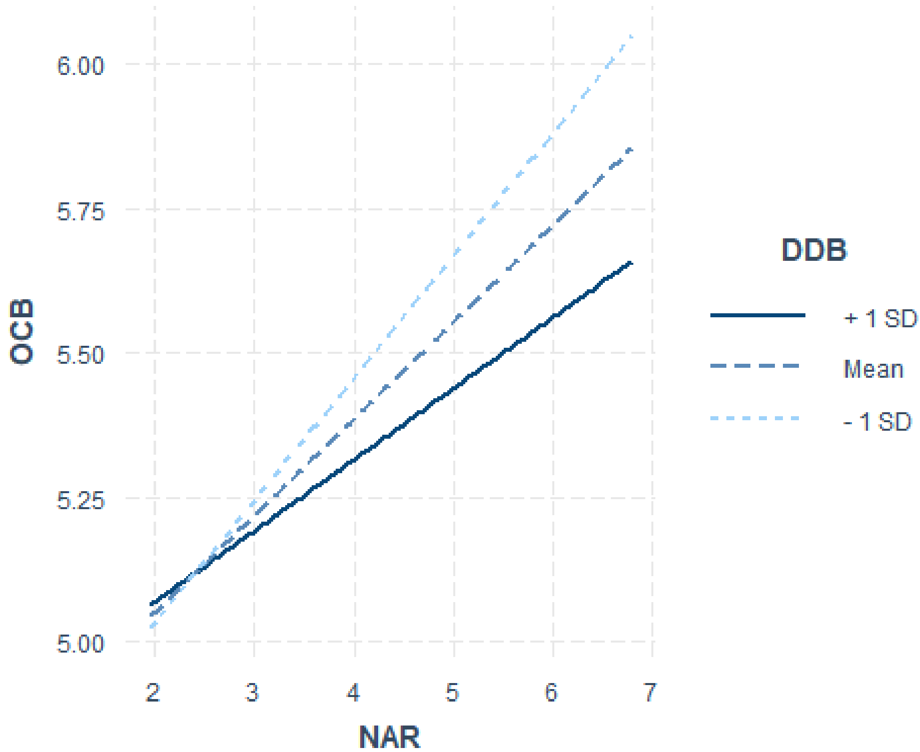
Zusammenhang DDB und OCB

```
plotModel(lm(OCB ~ DDB, data = daten)) + ggtitle("Zusammenhang zwischen DDB
und OCB")
```



Linearität ist vorhanden.

```
mod_NAROCBDDB <- lm(OCB~NAR + NAR*DDB, data = daten)
summary(mod_NAROCBDDB)

##
## Call:
## lm(formula = OCB ~ NAR + NAR * DDB, data = daten)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.01072 -0.28176  0.01111  0.40219  1.57046
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  4.610999   0.271019  17.014  < 2e-16 ***
## NAR          0.211106   0.066370   3.181  0.00168 **
## DDB          0.020830   0.037302   0.558  0.57711
## NAR:DDB     -0.008661   0.009162  -0.945  0.34548
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.623 on 225 degrees of freedom
## Multiple R-squared:  0.06537,    Adjusted R-squared:  0.05291
## F-statistic: 5.246 on 3 and 225 DF,  p-value: 0.001618

interact_plot(model = mod_NAROCBDDB, pred = NAR, modx = DDB)

## Warning: -0.110684384094747 is outside the observed range of DDB
```

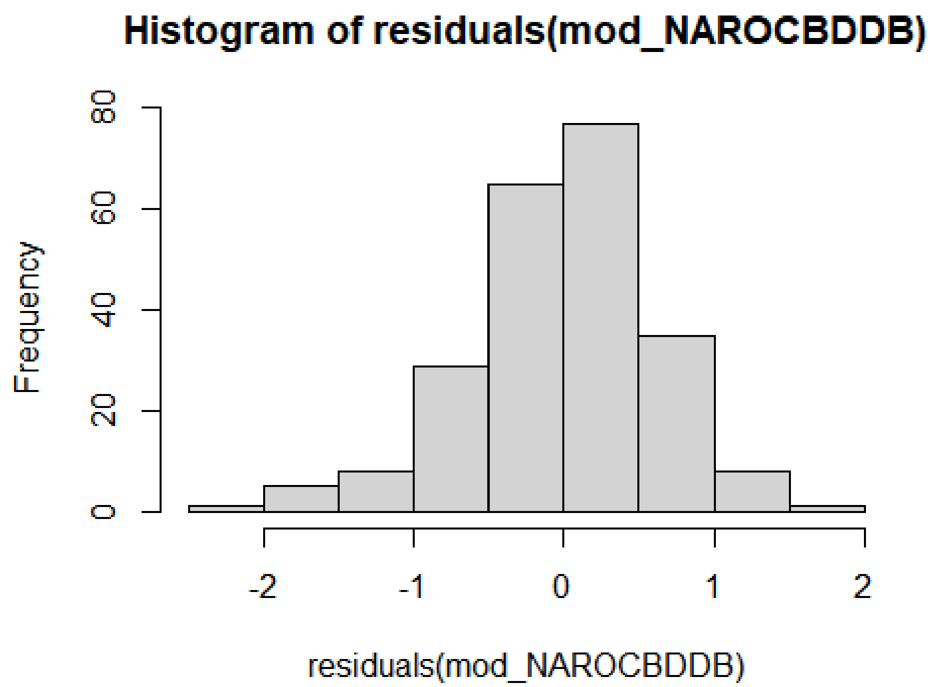


H4b abgelehnt, da p größer ist als .05.

H4b Gauß-Markow/ Hayes Anwendungsvoraussetzungen

Normalverteilung der Residuen H4b

```
hist(residuals(mod_NAROCBDDB))
```



Es scheint eine Normalverteilung vorzuliegen. Eine leicht linksschiefe Verteilung scheint existent zu sein.

Hetereskedaszität H4b

H0: Es liegt Homoskedazität vor.

```
bptest(mod_NAROCBDDB)

##
##  studentized Breusch-Pagan test
##
## data:  mod_NAROCBDDB
## BP = 3.3854, df = 3, p-value = 0.3359
```

Es liegt hier eine Homoskedaszität der Residuuen vor.

Autokorrelation H4b

```
dwtest(mod_NAROCBDDB)

##
##  Durbin-Watson test
##
## data:  mod_NAROCBDDB
## DW = 2.0652, p-value = 0.6846
## alternative hypothesis: true autocorrelation is greater than 0
```

Keine Autokorrelation vorhanden.

H4b abgelehnt, wegen Irrtumswahrscheinlichkeit.

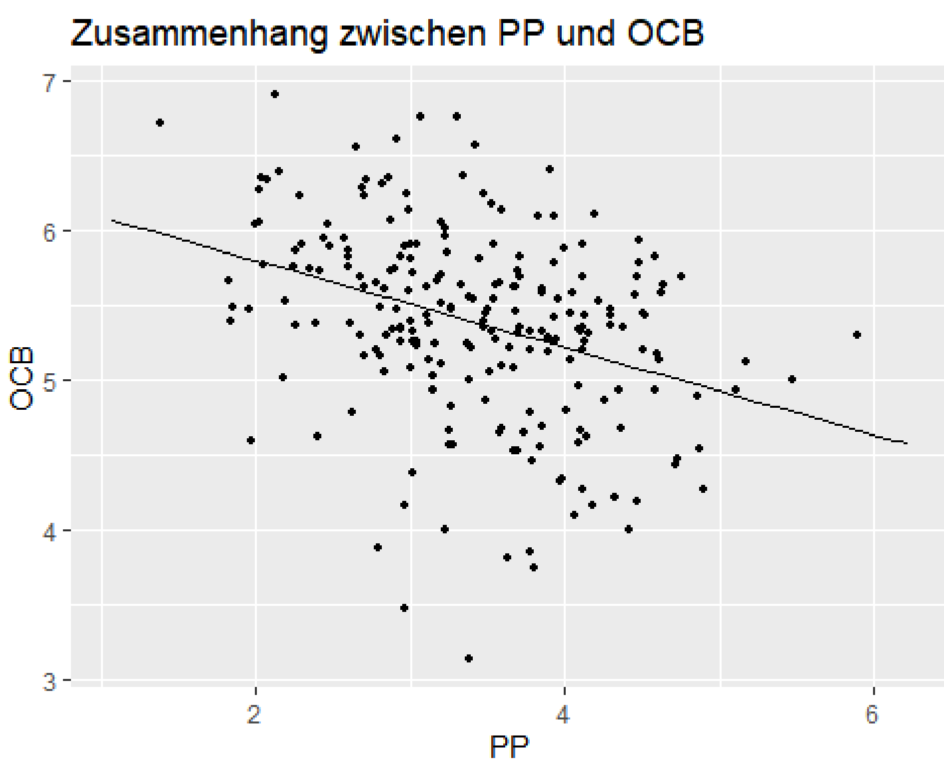
H4c Die DDB moderiert den Zusammenhang zwischen PP und OCB. Mit einer zunehmenden DDB wird der Zusammenhang schwächer.

```
process(data = daten, y = "OCB", x = "PP", w = "DDB", model = 1, modelbt = 1,
seed = 50000, center = 2)

## Error in process(data = daten, y = "OCB", x = "PP", w = "DDB", model = 1,
: konnte Funktion "process" nicht finden
```

Linearität

Zusammenhang DDB und PP

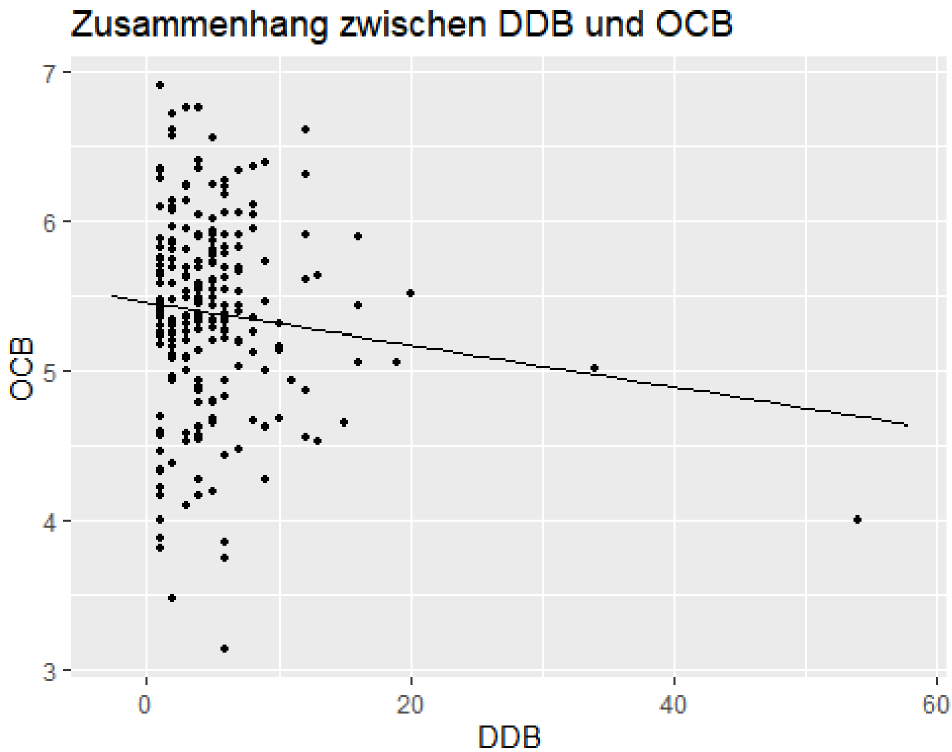
```
plotModel(lm(OCB ~ PP, data = daten)) + ggtitle("Zusammenhang zwischen PP und
OCB")
```



Linearität ist vorhanden

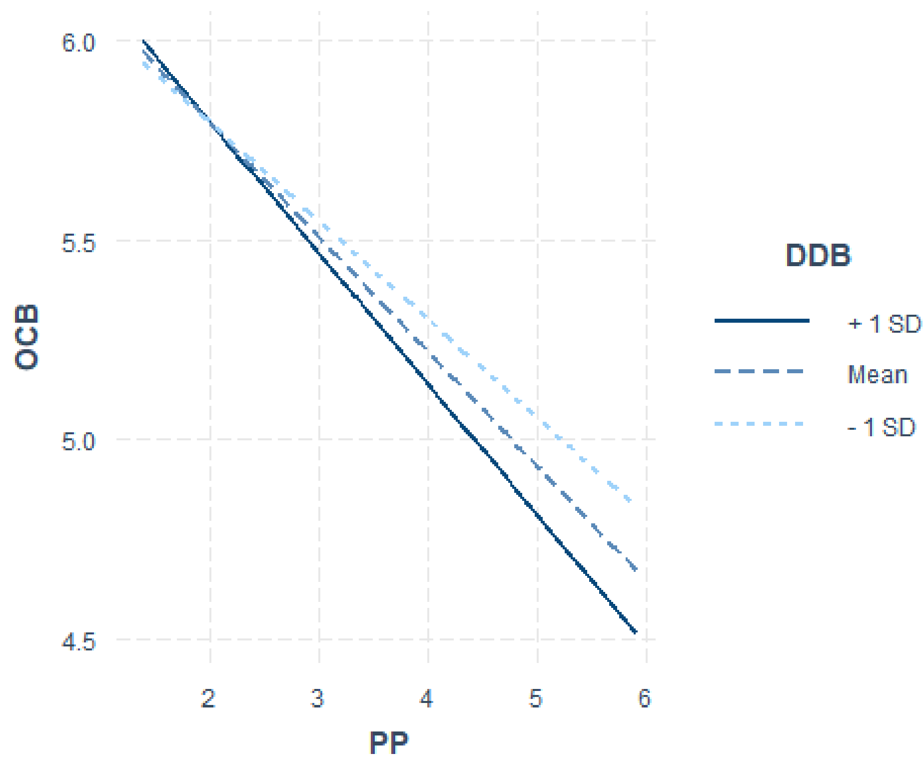
Zusammenhang DDB und OCB

```
plotModel(lm(OCB ~ DDB, data = daten)) + ggtitle("Zusammenhang zwischen DDB
und OCB")
```



Linearität ist vorhanden.

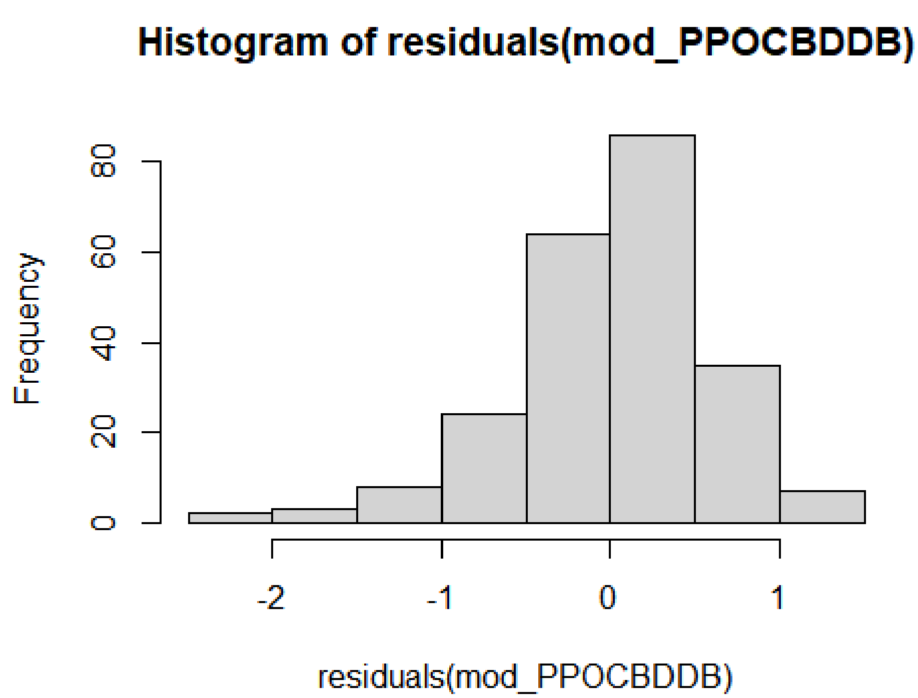
```
mod_PPOCBDDB <- lm(OCB~PP + PP*DDB, data = daten)
summary(mod_PPOCBDDB)

##
## Call:
## lm(formula = OCB ~ PP + PP * DDB, data = daten)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -2.24691 -0.31599  0.04633  0.38204  1.32028
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  6.288929   0.242467  25.937  < 2e-16 ***
## PP          -0.247846   0.067587  -3.667 0.000306 ***
## DDB          0.016004   0.032835   0.487 0.626442
## PP:DDB      -0.007980   0.008795  -0.907 0.365209
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.5986 on 225 degrees of freedom
## Multiple R-squared:  0.1371, Adjusted R-squared:  0.1256
## F-statistic: 11.92 on 3 and 225 DF,  p-value: 2.849e-07

interact_plot(model = mod_PPOCBDDB, pred = PP, modx = DDB)

## Warning: -0.110684384094747 is outside the observed range of DDB
```



H4c Gauß-Markow/ Hayes Anwendungsvoraussetzungen

Normalverteilung der Residuen H4c

```
hist(residuals(mod_PPOCBDDB))
```



Es scheint eine Normalverteilung vorzuliegen. Eine leicht linksschiefe Verteilung scheint existent zu sein.

Hetereskedaszität H4c

H0: Es liegt Homoskedazität vor.

```
bptest(mod_PPOCBDDB)

## 
##  studentized Breusch-Pagan test
## 
## data:  mod_PPOCBDDB
## BP = 1.7958, df = 3, p-value = 0.6158
```

Es liegt hier eine Homoskedaszität der Residuuen vor.

Autokorrelation H4c

```
dwtest(mod_PPOCBDDB)

## 
##  Durbin-Watson test
## 
## data:  mod_PPOCBDDB
## DW = 2.0634, p-value = 0.6835
## alternative hypothesis: true autocorrelation is greater than 0
```

Keine Autokorrelation vorhanden.

H4c abgelehnt.

H5a SK mediieren den Zusammenhang zwischen MA und OCB.

```
process(data = daten, y = "OCB", x = "MA", m = "SK", model = 4, modelbt = 1
,seed = 50000, effsize = 1, stand = 1, hc = 4)

## Error in process(data = daten, y = "OCB", x = "MA", m = "SK", model = 4, :
konnte Funktion "process" nicht finden
```

H5b SK mediieren den Zusammenhang zwischen NA und OCB.

```
process(data = daten, y = "OCB", x = "NAR", m = "SK", model = 4, modelbt = 1
,seed = 50000, hc = 4, effsize = 1, stand = 1)

## Error in process(data = daten, y = "OCB", x = "NAR", m = "SK", model = 4,
: konnte Funktion "process" nicht finden
```

#Modelle extrahieren

H5c SK mediieren den Zusammenhang zwischen NA und OCB.

```
process(data = daten, y = "OCB", x = "PP", m = "SK", model = 4, modelbt = 1
,seed = 50000, hc = 4, effsize = 1, stand = 1)
```

```
## Error in process(data = daten, y = "OCB", x = "PP", m = "SK", model = 4, :
konnte Funktion "process" nicht finden
```