PA2-code and figures

```r
library(readr)
library(haven)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```r
library(psych)
library(lavaan)
```

```
## This is lavaan 0.6-9
## lavaan is FREE software! Please report any bugs.

##
## Attaching package: 'lavaan'

## The following object is masked from 'package:psych':
##
##     cor2cov
```

```r
library(semPlot)
library(texreg)
```

```
## Version:  1.37.5
## Date:     2020-06-17
## Author:   Philip Leifeld (University of Essex)
##
## Consider submitting praise using the praise or praise_interactive functions.
## Please cite the JSS article in your publications -- see citation("texreg").
```

```r
data_60 <- read_csv("~/Downloads/data_60.csv")
```

```
## Rows: 635 Columns: 18
## -- Column specification --------------------------------------------------------
## Delimiter: ","
## dbl (18): id, x1, x2, x3, x4, m1, m2, m3, m4, m5, y1, y2, y3, y4, y5, v15, v...

##
## 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.
```

```
##Remove Unit non response
data_60 <- data_60[data_60$id != 145, ]
data_60 <- data_60[data_60$id != 188, ]
data_60 <- data_60[data_60$id != 190, ]
data_60 <- data_60[data_60$id != 258, ]
data_60 <- data_60[data_60$id != 268, ]
data_60 <- data_60[data_60$id != 299, ]
data_60 <- data_60[data_60$id != 314, ]
data_60 <- data_60[data_60$id != 361, ]
data_60 <- data_60[data_60$id != 453, ]
data_60 <- data_60[data_60$id != 549, ]


#Weird Cases

##Duplicates
data60_cl <- add_count(data_60, x1, x2, x3, x4, m1, m2, m3, m4, m5, y1, y2, y3, y4, y5,
                                name = "duplicate")

data60_cl<- data60_cl[order(-data60_cl$duplicate),]

data60_cl <- data60_cl[data60_cl$id != 13, ]
data60_cl <- data60_cl[data60_cl$id != 80, ]

data60_cl$weird <- 0
data60_cl$weird[data60_cl$duplicate == 2] <- 1

##Straight liners
data60_cl$sd <- apply(data60_cl[2:15], 1 , sd)

data60_cl$weird[data60_cl$sd == 0] <- 2
data60_cl <- data60_cl[order(-data60_cl$weird, data60_cl$id),]


##Outliers
summary(data60_cl)
```

```
##        id              x1              x2              x3             x4       
##  Min.   :  1.0   Min.   :1.000   Min.   :1.000   Min.   :1.00   Min.   :1.000  
##  1st Qu.:159.5   1st Qu.:2.000   1st Qu.:2.000   1st Qu.:2.00   1st Qu.:2.000  
##  Median :321.0   Median :3.000   Median :3.000   Median :3.00   Median :3.000  
##  Mean   :319.1   Mean   :3.064   Mean   :3.051   Mean   :3.08   Mean   :3.021  
##  3rd Qu.:478.5   3rd Qu.:4.000   3rd Qu.:4.000   3rd Qu.:4.00   3rd Qu.:4.000  
##  Max.   :635.0   Max.   :9.000   Max.   :7.000   Max.   :9.00   Max.   :8.000  
##        m1              m2              m3              m4       
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000  
##  1st Qu.:2.000   1st Qu.:2.000   1st Qu.:2.000   1st Qu.:2.000  
##  Median :3.000   Median :3.000   Median :3.000   Median :3.000  
##  Mean   :2.978   Mean   :3.079   Mean   :2.902   Mean   :2.987  
##  3rd Qu.:4.000   3rd Qu.:4.000   3rd Qu.:4.000   3rd Qu.:4.000  
##  Max.   :9.000   Max.   :9.000   Max.   :8.000   Max.   :9.000  
##        m5              y1              y2              y3       
##  Min.   :1.000   Min.   :1.000   Min.   :1.000   Min.   :1.000  
##  1st Qu.:2.000   1st Qu.:2.000   1st Qu.:2.000   1st Qu.:2.000  
##  Median :3.000   Median :3.000   Median :3.000   Median :3.000  
##  Mean   :2.899   Mean   :2.992   Mean   :3.005   Mean   :3.048  
##  3rd Qu.:4.000   3rd Qu.:4.000   3rd Qu.:4.000   3rd Qu.:4.000  
##  Max.   :9.000   Max.   :8.000   Max.   :9.000   Max.   :8.000  
##        y4              y5             v15             v16           
##  Min.   :1.000   Min.   :1.000   Min.   :0.000   Min.   :-3.174252  
##  1st Qu.:2.000   1st Qu.:2.000   1st Qu.:0.000   1st Qu.:-0.690628  
##  Median :3.000   Median :3.000   Median :0.000   Median : 0.019442  
##  Mean   :3.074   Mean   :3.034   Mean   :0.488   Mean   :-0.008646  
##  3rd Qu.:4.000   3rd Qu.:4.000   3rd Qu.:1.000   3rd Qu.: 0.615984  
##  Max.   :9.000   Max.   :8.000   Max.   :1.000   Max.   : 2.941043  
##       v17              duplicate        weird                sd        
##  Min.   :  0.05405   Min.   :1.00   Min.   :0.00000   Min.   :0.3631  
##  1st Qu.:  0.48987   1st Qu.:1.00   1st Qu.:0.00000   1st Qu.:0.8018  
##  Median :  0.98386   Median :1.00   Median :0.00000   Median :0.9169  
##  Mean   :  2.68932   Mean   :1.01   Mean   :0.00642   Mean   :0.9536  
##  3rd Qu.:  1.96512   3rd Qu.:1.00   3rd Qu.:0.00000   3rd Qu.:1.0509  
##  Max.   :150.77086   Max.   :3.00   Max.   :1.00000   Max.   :3.0751  
```

```r
data60_cl$x1[data60_cl$x1 > 5] <- NA
data60_cl$x2[data60_cl$x2 > 5] <- NA
data60_cl$x3[data60_cl$x3 > 5] <- NA
data60_cl$x4[data60_cl$x4 > 5] <- NA
data60_cl$m1[data60_cl$m1 > 5] <- NA
data60_cl$m2[data60_cl$m2 > 5] <- NA
data60_cl$m3[data60_cl$m3 > 5] <- NA
data60_cl$m4[data60_cl$m4 > 5] <- NA
data60_cl$m5[data60_cl$m5 > 5] <- NA
data60_cl$y1[data60_cl$y1 > 5] <- NA
data60_cl$y2[data60_cl$y2 > 5] <- NA
data60_cl$y3[data60_cl$y3 > 5] <- NA
data60_cl$y4[data60_cl$y4 > 5] <- NA
data60_cl$y5[data60_cl$y5 > 5] <- NA

summary(data60_cl)
```

```
##        id              x1              x2              x3       
##  Min.   :  1.0   Min.   :1.000   Min.   :1.000   Min.   :1.000  
##  1st Qu.:159.5   1st Qu.:2.000   1st Qu.:2.000   1st Qu.:2.000  
##  Median :321.0   Median :3.000   Median :3.000   Median :3.000  
##  Mean   :319.1   Mean   :3.032   Mean   :3.034   Mean   :3.048  
##  3rd Qu.:478.5   3rd Qu.:4.000   3rd Qu.:4.000   3rd Qu.:4.000  
##  Max.   :635.0   Max.   :5.000   Max.   :5.000   Max.   :5.000  
##                  NA's   :4       NA's   :3       NA's   :4      
##        x4              m1             m2             m3             m4       
##  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.:2.000   1st Qu.:2.000   1st Qu.:2.000
##  Median :3.000   Median :3.00   Median :3.000   Median :3.000   Median :3.000
##  Mean   :3.006   Mean   :2.96   Mean   :3.069   Mean   :2.881   Mean   :2.977
##  3rd Qu.:4.000   3rd Qu.:4.00   3rd Qu.:4.000   3rd Qu.:4.000   3rd Qu.:4.000
##  Max.   :5.000   Max.   :5.00   Max.   :5.000   Max.   :5.000   Max.   :5.000
##  NA’s   :2       NA’s   :2      NA’s   :1       NA’s   :3       NA’s   :1
##        m5              y1              y2             y3              y4
##  Min.   :1.000   Min.   :1.000  Min.   :1.00   Min.   :1.000   Min.   :1.000
##  1st Qu.:2.000   1st Qu.:2.000  1st Qu.:2.00   1st Qu.:2.000   1st Qu.:2.000
##  Median :3.000   Median :3.000  Median :3.00   Median :3.000   Median :3.000
##  Mean   :2.881   Mean   :2.977  Mean   :2.99   Mean   :3.035   Mean   :3.039
##  3rd Qu.:4.000   3rd Qu.:4.000  3rd Qu.:4.00   3rd Qu.:4.000   3rd Qu.:4.000
##  Max.   :5.000   Max.   :5.000  Max.   :5.00   Max.   :5.000   Max.   :5.000
##  NA’s   :2       NA’s   :2      NA’s   :2      NA’s   :2       NA’s   :5
##        y5             v15             v16                 v17
##  Min.   :1.000   Min.   :0.000  Min.   :-3.174252   Min.   :  0.05405
##  1st Qu.:2.000   1st Qu.:0.000  1st Qu.:-0.690628   1st Qu.:  0.48987
##  Median :3.000   Median :0.000  Median : 0.019442   Median :  0.98386
##  Mean   :3.013   Mean   :0.488  Mean   :-0.008646   Mean   :  2.68932
##  3rd Qu.:4.000   3rd Qu.:1.000  3rd Qu.: 0.615984   3rd Qu.:  1.96512
##  Max.   :5.000   Max.   :1.000  Max.   : 2.941043   Max.   :150.77086
##  NA’s   :3
##    duplicate        weird               sd
##  Min.   :1.00   Min.   :0.00000   Min.   :0.3631
##  1st Qu.:1.00   1st Qu.:0.00000   1st Qu.:0.8018
##  Median :1.00   Median :0.00000   Median :0.9169
##  Mean   :1.01   Mean   :0.00642   Mean   :0.9536
##  3rd Qu.:1.00   3rd Qu.:0.00000   3rd Qu.:1.0509
##  Max.   :3.00   Max.   :1.00000   Max.   :3.0751
##
```

```
data60_cl$weird[data60_cl$id == 50] <- 3
data60_cl$weird[data60_cl$id == 370] <- 3
data60_cl$weird[data60_cl$id == 405] <- 3
data60_cl$weird[data60_cl$id == 431] <- 3
data60_cl$weird[data60_cl$id == 450] <- 3
data60_cl$weird[data60_cl$id == 497] <- 3

data60_cl <- data60_cl[order(-data60_cl$weird, data60_cl$id),]


skew_x1 <- round(skew(data60_cl$x1),2)
skew_x2 <- round(skew(data60_cl$x2),2)
skew_x3 <- round(skew(data60_cl$x3),2)
skew_x4 <- round(skew(data60_cl$x4),2)

skew_m1 <- round(skew(data60_cl$m1),2)
skew_m2 <- round(skew(data60_cl$m2),2)
skew_m3 <- round(skew(data60_cl$m3),2)
skew_m4 <- round(skew(data60_cl$m4),2)
skew_m5 <- round(skew(data60_cl$m5),2)

skew_y1 <- round(skew(data60_cl$y1),2)
```

```
skew_y2 <- round(skew(data60_cl$y2),2)
skew_y3 <- round(skew(data60_cl$y3),2)
skew_y4 <- round(skew(data60_cl$y4),2)
skew_y5 <- round(skew(data60_cl$y5),2)

skew_v16 <- round(skew(data60_cl$v16),2)
skew_v17 <- round(skew(data60_cl$v17),2)


data60_sk <- data60_cl

data60_sk$Z_x1 <- scale(data60_sk$x1, center=TRUE, scale=TRUE)
data60_sk$Z_x2 <- scale(data60_sk$x2, center=TRUE, scale=TRUE)
data60_sk$Z_x3 <- scale(data60_sk$x3, center=TRUE, scale=TRUE)
data60_sk$Z_x4 <- scale(data60_sk$x4, center=TRUE, scale=TRUE)

data60_sk$Z_m1 <- scale(data60_sk$m1, center=TRUE, scale=TRUE)
data60_sk$Z_m2 <- scale(data60_sk$m2, center=TRUE, scale=TRUE)
data60_sk$Z_m3 <- scale(data60_sk$m3, center=TRUE, scale=TRUE)
data60_sk$Z_m4 <- scale(data60_sk$m4, center=TRUE, scale=TRUE)
data60_sk$Z_m5 <- scale(data60_sk$m5, center=TRUE, scale=TRUE)

data60_sk$Z_y1 <- scale(data60_sk$y1, center=TRUE, scale=TRUE)
data60_sk$Z_y2 <- scale(data60_sk$y2, center=TRUE, scale=TRUE)
data60_sk$Z_y3 <- scale(data60_sk$y3, center=TRUE, scale=TRUE)
data60_sk$Z_y4 <- scale(data60_sk$y4, center=TRUE, scale=TRUE)
data60_sk$Z_y5 <- scale(data60_sk$y5, center=TRUE, scale=TRUE)

summary(data60_sk)
```

```
##        id              x1              x2              x3
##  Min.   :  1.0   Min.   :1.000   Min.   :1.000   Min.   :1.000
##  1st Qu.:159.5   1st Qu.:2.000   1st Qu.:2.000   1st Qu.:2.000
##  Median :321.0   Median :3.000   Median :3.000   Median :3.000
##  Mean   :319.1   Mean   :3.032   Mean   :3.034   Mean   :3.048
##  3rd Qu.:478.5   3rd Qu.:4.000   3rd Qu.:4.000   3rd Qu.:4.000
##  Max.   :635.0   Max.   :5.000   Max.   :5.000   Max.   :5.000
##                  NA’s   :4       NA’s   :3       NA’s   :4
##        x4              m1             m2              m3              m4
##  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.:2.000   1st Qu.:2.000   1st Qu.:2.000
##  Median :3.000   Median :3.00   Median :3.000   Median :3.000   Median :3.000
##  Mean   :3.006   Mean   :2.96   Mean   :3.069   Mean   :2.881   Mean   :2.977
##  3rd Qu.:4.000   3rd Qu.:4.00   3rd Qu.:4.000   3rd Qu.:4.000   3rd Qu.:4.000
##  Max.   :5.000   Max.   :5.00   Max.   :5.000   Max.   :5.000   Max.   :5.000
##  NA’s   :2       NA’s   :2      NA’s   :1       NA’s   :3       NA’s   :1
##        m5              y1              y2             y3              y4
##  Min.   :1.000   Min.   :1.000   Min.   :1.00   Min.   :1.000   Min.   :1.000
##  1st Qu.:2.000   1st Qu.:2.000   1st Qu.:2.00   1st Qu.:2.000   1st Qu.:2.000
##  Median :3.000   Median :3.000   Median :3.00   Median :3.000   Median :3.000
##  Mean   :2.881   Mean   :2.977   Mean   :2.99   Mean   :3.035   Mean   :3.039
##  3rd Qu.:4.000   3rd Qu.:4.000   3rd Qu.:4.00   3rd Qu.:4.000   3rd Qu.:4.000
##  Max.   :5.000   Max.   :5.000   Max.   :5.00   Max.   :5.000   Max.   :5.000
##  NA's   :2       NA's   :2       NA's   :2      NA's   :2       NA's   :5
##        y5             v15             v16                 v17
##  Min.   :1.000   Min.   :0.000   Min.   :-3.174252   Min.   :  0.05405
##  1st Qu.:2.000   1st Qu.:0.000   1st Qu.:-0.690628   1st Qu.:  0.48987
##  Median :3.000   Median :0.000   Median : 0.019442   Median :  0.98386
##  Mean   :3.013   Mean   :0.488   Mean   :-0.008646   Mean   :  2.68932
##  3rd Qu.:4.000   3rd Qu.:1.000   3rd Qu.: 0.615984   3rd Qu.:  1.96512
##  Max.   :5.000   Max.   :1.000   Max.   : 2.941043   Max.   :150.77086
##  NA's   :3
##    duplicate        weird               sd              Z_x1.V1
##  Min.   :1.00   Min.   :0.00000   Min.   :0.3631   Min.   :-1.899616
##  1st Qu.:1.00   1st Qu.:0.00000   1st Qu.:0.8018   1st Qu.:-0.964908
##  Median :1.00   Median :0.00000   Median :0.9169   Median :-0.030201
##  Mean   :1.01   Mean   :0.03531   Mean   :0.9536   Mean   : 0.000000
##  3rd Qu.:1.00   3rd Qu.:0.00000   3rd Qu.:1.0509   3rd Qu.: 0.904507
##  Max.   :3.00   Max.   :3.00000   Max.   :3.0751   Max.   : 1.839215
##                                                    NA's   :4
##        Z_x2.V1              Z_x3.V1            Z_x4.V1
##  Min.   :-1.9287831   Min.   :-2.021582   Min.   :-1.9936613
##  1st Qu.:-0.9804520   1st Qu.:-1.034705   1st Qu.:-1.0000307
##  Median :-0.0321209   Median :-0.047829   Median :-0.0064002
##  Mean   : 0.0000000   Mean   : 0.000000   Mean   : 0.0000000
##  3rd Qu.: 0.9162102   3rd Qu.: 0.939047   3rd Qu.: 0.9872303
##  Max.   : 1.8645413   Max.   : 1.925923   Max.   : 1.9808609
##  NA's   :3            NA's   :4           NA's   :2
##        Z_m1.V1              Z_m2.V1              Z_m3.V1
##  Min.   :-1.8523246   Min.   :-1.9544331   Min.   :-1.9858209
##  1st Qu.:-0.9071368   1st Qu.:-1.0098664   1st Qu.:-0.9298955
##  Median : 0.0380510   Median :-0.0652996   Median : 0.1260298
##  Mean   : 0.0000000   Mean   : 0.0000000   Mean   : 0.0000000
##  3rd Qu.: 0.9832389   3rd Qu.: 0.8792671   3rd Qu.: 1.1819551
##  Max.   : 1.9284267   Max.   : 1.8238339   Max.   : 2.2378805
##  NA's   :2            NA's   :1            NA's   :3
##        Z_m4.V1              Z_m5.V1              Z_y1.V1
##  Min.   :-1.9128440   Min.   :-2.0094371   Min.   :-1.9083957
##  1st Qu.:-0.9455359   1st Qu.:-0.9410634   1st Qu.:-0.9433194
##  Median : 0.0217722   Median : 0.1273102   Median : 0.0217570
##  Mean   : 0.0000000   Mean   : 0.0000000   Mean   : 0.0000000
##  3rd Qu.: 0.9890803   3rd Qu.: 1.1956839   3rd Qu.: 0.9868333
##  Max.   : 1.9563885   Max.   : 2.2640576   Max.   : 1.9519096
##  NA's   :1            NA's   :2            NA's   :2
##        Z_y2.V1              Z_y3.V1              Z_y4.V1
##  Min.   :-1.8626183   Min.   :-1.9591454   Min.   :-2.025634
##  1st Qu.:-0.9267882   1st Qu.:-0.9966222   1st Qu.:-1.032109
##  Median : 0.0090418   Median :-0.0340990   Median :-0.038584
##  Mean   : 0.0000000   Mean   : 0.0000000   Mean   : 0.000000
##  3rd Qu.: 0.9448719   3rd Qu.: 0.9284241   3rd Qu.: 0.954942
##  Max.   : 1.8807020   Max.   : 1.8909473   Max.   : 1.948467
##  NA's   :2            NA's   :2            NA's   :5
##        Z_y5.V1
##  Min.   :-1.8511572
##  1st Qu.:-0.9315118
##  Median :-0.0118664
##  Mean   : 0.0000000
##  3rd Qu.: 0.9077790
##  Max.   : 1.8274244
##  NA's   :3
```

```
#Weird Variables

dfX <- data.frame (first_column  = (data60_cl$x1),
                  second_column = (data60_cl$x2),
                  third_column = (data60_cl$x3),
                  fourth_column = (data60_cl$x4)
                )

dfX <- na.exclude(dfX)
names(dfX) = c("x1", "x2", "x3", "x4")
round(cor(dfX), 2)
```

```
##      x1   x2   x3   x4
## x1 1.00 0.35 0.34 0.33
## x2 0.35 1.00 0.41 0.42
## x3 0.34 0.41 1.00 0.34
## x4 0.33 0.42 0.34 1.00
```

```
alpha(dfX)
```

```
##
## Reliability analysis
## Call: alpha(x = dfX)
##
##   raw_alpha std.alpha G6(smc) average_r S/N  ase mean   sd median_r
##        0.7       0.7    0.64      0.37 2.3 0.02    3 0.75     0.35
##
##  lower alpha upper     95% confidence boundaries
## 0.66 0.7 0.74
##
##  Reliability if an item is dropped:
##    raw_alpha std.alpha G6(smc) average_r S/N alpha se   var.r med.r
## x1      0.66      0.66    0.57      0.39 1.9    0.024 2.3e-03  0.41
## x2      0.60      0.60    0.50      0.34 1.5    0.028 2.5e-05  0.34
## x3      0.64      0.64    0.54      0.37 1.8    0.025 2.3e-03  0.35
## x4      0.64      0.64    0.54      0.37 1.8    0.025 1.5e-03  0.35
##
##  Item statistics
##      n raw.r std.r r.cor r.drop mean  sd
## x1 617  0.71  0.70  0.53   0.44  3.0 1.1
## x2 617  0.76  0.75  0.64   0.53  3.0 1.1
## x3 617  0.72  0.72  0.57   0.48  3.1 1.0
## x4 617  0.72  0.72  0.58   0.48  3.0 1.0
##
## Non missing response frequency for each item
##       1    2    3    4    5 miss
## x1 0.08 0.24 0.33 0.27 0.08    0
## x2 0.06 0.25 0.38 0.21 0.10    0
## x3 0.06 0.24 0.39 0.23 0.08    0
## x4 0.05 0.27 0.39 0.22 0.08    0
```

```
dfM <- data.frame (first_column  = (data60_cl$m1),
                   second_column = (data60_cl$m2),
                   third_column = (data60_cl$m3),
                   fourth_column = (data60_cl$m4),
                   fifth_column = (data60_cl$m5)
)
dfM <- na.exclude(dfM)
names(dfM) = c("m1", "m2", "m3", "m4", "m5")
round(cor(dfM), 2)
```

```
##       m1    m2    m3    m4    m5
## m1  1.00 -0.50  0.20  0.50  0.47
## m2 -0.50  1.00 -0.17 -0.48 -0.47
## m3  0.20 -0.17  1.00  0.16  0.13
## m4  0.50 -0.48  0.16  1.00  0.47
## m5  0.47 -0.47  0.13  0.47  1.00
```

```
alpha(dfM)
```

```
## Some items ( m2 ) were negatively correlated with the total scale and
## probably should be reversed.
## To do this, run the function again with the 'check.keys=TRUE' option
```

```
##
## Reliability analysis
## Call: alpha(x = dfM)
##
##   raw_alpha std.alpha G6(smc) average_r  S/N   ase mean   sd median_r
##      0.095      0.13    0.37      0.03 0.15 0.052    3 0.47     0.14
##
##  lower alpha upper     95% confidence boundaries
## -0.01 0.1 0.2
##
##  Reliability if an item is dropped:
##    raw_alpha std.alpha G6(smc) average_r     S/N alpha se var.r   med.r
## m1    -0.380   -0.2983   0.069   -0.0609 -0.2297    0.088 0.144 -0.0241
## m2     0.659    0.6541   0.617    0.3210  1.8911    0.022 0.031  0.3324
## m3    -0.057   -0.0076   0.352   -0.0019 -0.0076    0.062 0.279 -0.0015
## m4    -0.360   -0.2848   0.091   -0.0587 -0.2217    0.086 0.153 -0.0241
## m5    -0.273   -0.2310   0.132   -0.0492 -0.1877    0.080 0.162 -0.0057
##
##  Item statistics
##       n raw.r std.r r.cor r.drop mean   sd
## m1 619  0.71  0.70  0.73   0.35  3.0 1.06
## m2 619 -0.24 -0.26 -0.88  -0.58  3.1 1.06
## m3 619  0.54  0.55  0.25   0.15  2.9 0.95
## m4 619  0.70  0.70  0.70   0.35  3.0 1.03
## m5 619  0.66  0.67  0.64   0.32  2.9 0.94
##
## Non missing response frequency for each item
##       1    2    3    4    5 miss
## m1 0.08 0.26 0.34 0.25 0.07    0
## m2 0.06 0.25 0.34 0.26 0.09    0
## m3 0.08 0.25 0.37 0.28 0.01    0
## m4 0.08 0.25 0.35 0.26 0.06    0
## m5 0.08 0.27 0.36 0.29 0.01    0
```

```
dfY <- data.frame (first_column  = (data60_cl$y1),
                   second_column = (data60_cl$y2),
                   third_column = (data60_cl$y3),
                   fourth_column = (data60_cl$y4),
                   fifth_column = (data60_cl$y5)
)
dfY <- na.exclude(dfY)
names(dfY) = c("1y", "y2", "y3", "y4", "y5")
round(cor(dfY), 2)
```

```
##      1y   y2   y3   y4   y5
## 1y 1.00 0.51 0.55 0.58 0.14
## y2 0.51 1.00 0.52 0.54 0.12
## y3 0.55 0.52 1.00 0.60 0.14
## y4 0.58 0.54 0.60 1.00 0.14
## y5 0.14 0.12 0.14 0.14 1.00
```

```
alpha(dfY)
```

```
##
## Reliability analysis
## Call: alpha(x = dfY)
##
##   raw_alpha std.alpha G6(smc) average_r S/N   ase mean   sd median_r
##       0.75      0.76    0.74      0.38 3.1 0.016    3 0.74     0.51
##
##  lower alpha upper     95% confidence boundaries
## 0.72 0.75 0.78
##
##  Reliability if an item is dropped:
##    raw_alpha std.alpha G6(smc) average_r S/N alpha se  var.r med.r
## 1y      0.67      0.67    0.66      0.34 2.1    0.022 0.0535  0.33
## y2      0.68      0.69    0.67      0.36 2.2    0.021 0.0581  0.34
## y3      0.67      0.67    0.65      0.34 2.0    0.022 0.0515  0.32
## y4      0.66      0.66    0.64      0.33 2.0    0.023 0.0466  0.33
## y5      0.83      0.83    0.79      0.55 4.9    0.011 0.0012  0.54
##
##  Item statistics
##       n raw.r std.r r.cor r.drop mean  sd
## 1y 616  0.78  0.78  0.72   0.62    3 1.0
## y2 616  0.76  0.76  0.67   0.58    3 1.1
## y3 616  0.78  0.79  0.73   0.63    3 1.0
## y4 616  0.80  0.80  0.76   0.65    3 1.0
## y5 616  0.44  0.43  0.18   0.16    3 1.1
##
## Non missing response frequency for each item
##       1    2    3    4    5 miss
## 1y 0.07 0.26 0.38 0.21 0.08    0
## y2 0.08 0.25 0.35 0.24 0.08    0
## y3 0.07 0.21 0.43 0.20 0.09    0
## y4 0.06 0.23 0.38 0.26 0.07    0
## y5 0.06 0.28 0.32 0.23 0.10    0
```

```
##Solve M2
data60_cl$m2r[data60_cl$m2 == 1] <- 5
data60_cl$m2r[data60_cl$m2 == 2] <- 4
data60_cl$m2r[data60_cl$m2 == 3] <- 3
data60_cl$m2r[data60_cl$m2 == 4] <- 2
data60_cl$m2r[data60_cl$m2 == 5] <- 1

dfM2 <- data.frame (first_column  = (data60_cl$m1),
                    second_column = (data60_cl$m2r),
                    third_column = (data60_cl$m3),
                    fourth_column = (data60_cl$m4),
                    fifth_column = (data60_cl$m5)
)
dfM2 <- na.exclude(dfM2)
names(dfM2) = c("m1", "m2r", "m3", "m4", "m5")
round(cor(dfM2), 2)
```

```
##       m1  m2r   m3   m4   m5
## m1  1.00 0.50 0.20 0.50 0.47
## m2r 0.50 1.00 0.17 0.48 0.47
## m3  0.20 0.17 1.00 0.16 0.13
## m4  0.50 0.48 0.16 1.00 0.47
## m5  0.47 0.47 0.13 0.47 1.00
```

```
alpha(dfM2)
```

```
## 
## Reliability analysis   
## Call: alpha(x = dfM2)
## 
##   raw_alpha std.alpha G6(smc) average_r S/N   ase mean  sd median_r
##       0.74      0.73    0.71      0.36 2.8 0.016  2.9 0.7     0.47
## 
##  lower alpha upper     95% confidence boundaries
## 0.71 0.74 0.77 
## 
##  Reliability if an item is dropped:
##     raw_alpha std.alpha G6(smc) average_r S/N alpha se   var.r med.r
## m1       0.65      0.65    0.61      0.31 1.8    0.023 0.03047  0.32
## m2r      0.66      0.65    0.62      0.32 1.9    0.022 0.03092  0.33
## m3       0.79      0.79    0.74      0.48 3.7    0.014 0.00024  0.48
## m4       0.66      0.66    0.62      0.32 1.9    0.022 0.03065  0.33
## m5       0.68      0.67    0.63      0.34 2.0    0.021 0.03000  0.34
## 
##  Item statistics 
##       n raw.r std.r r.cor r.drop mean   sd
## m1  619  0.78  0.77  0.70   0.60  3.0 1.06
## m2r 619  0.76  0.75  0.68   0.58  2.9 1.06
## m3  619  0.46  0.48  0.24   0.21  2.9 0.95
## m4  619  0.75  0.75  0.67   0.58  3.0 1.03
## m5  619  0.72  0.73  0.64   0.55  2.9 0.94
##
## Non missing response frequency for each item
##        1    2    3    4    5 miss
## m1  0.08 0.26 0.34 0.25 0.07    0
## m2r 0.09 0.26 0.34 0.25 0.06    0
## m3  0.08 0.25 0.37 0.28 0.01    0
## m4  0.08 0.25 0.35 0.26 0.06    0
## m5  0.08 0.27 0.36 0.29 0.01    0
```

```
#Scale Construction
##Construct new Scales
data60_cl$X <- rowMeans(data60_cl[,c(2,3,4,5)])

data60_cl$M <- rowMeans(data60_cl[,c(6,8,9,10,22)])

data60_cl$Y <- rowMeans(data60_cl[,c(11,12,13,14,15)])


#Analyses
##Q1 & Q2
model.1 <- "
M ~ a*X
Y  ~ b*M + cp*X
indirect := a*b
direct   := cp
total    := a*b + cp
"
mediation <- sem(model.1, data = data60_cl, se = "bootstrap", bootstrap=1000)

summary(mediation, ci=T, standardized=T, rsquare=T, fit.measures=F)
```

```
## lavaan 0.6-9 ended normally after 14 iterations
##
##   Estimator                                         ML
##   Optimization method                           NLMINB
##   Number of model parameters                         5
##
##                                                   Used       Total
##   Number of observations                           616         623
##
## Model Test User Model:
##
##   Test statistic                                 0.000
##   Degrees of freedom                                 0
##
## Parameter Estimates:
##
##   Standard errors                            Bootstrap
##   Number of requested bootstrap draws             1000
##   Number of successful bootstrap draws            1000
##
```

```
## Regressions:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##   M ~
##     X          (a)    0.185    0.050    3.698    0.000    0.089    0.280
##   Y ~
##     M          (b)    0.344    0.062    5.533    0.000    0.228    0.471
##     X         (cp)    0.170    0.057    2.962    0.003    0.051    0.273
##    Std.lv  Std.all
##
##     0.185    0.197
##
##     0.344    0.327
##     0.170    0.172
##
## Variances:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##    .M                 0.473    0.030   15.858    0.000    0.414    0.534
##    .Y                 0.459    0.031   14.786    0.000    0.398    0.521
##    Std.lv  Std.all
##     0.473    0.961
##     0.459    0.841
##
## R-Square:
##                    Estimate
##     M                 0.039
##     Y                 0.159
##
## Defined Parameters:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##     indirect          0.064    0.026    2.428    0.015    0.024    0.126
##     direct            0.170    0.057    2.961    0.003    0.051    0.273
##     total             0.234    0.043    5.420    0.000    0.145    0.317
##    Std.lv  Std.all
##     0.064    0.065
##     0.170    0.172
##     0.234    0.237
```

```r
##Q3 & Q4
model.2 <- "
M ~ a*X + d1*v15 +f1*v16
Y  ~ b*M + cp*X + d2*v15 +f2*v16
indirect := a*b
direct   := cp
total    := a*b + cp
"
covariates <- sem(model.2, data = data60_cl, se = "bootstrap", bootstrap=1000)

summary(covariates, ci=T, standardized=T, rsquare=T, fit.measures=F)
```

```
## lavaan 0.6-9 ended normally after 18 iterations
##
##   Estimator                                         ML
##   Optimization method                           NLMINB
##   Number of model parameters                         9
```

```
##
##                                                   Used       Total
##   Number of observations                           616         623
##
## Model Test User Model:
##
##   Test statistic                                 0.000
##   Degrees of freedom                                 0
##
## Parameter Estimates:
##
##   Standard errors                            Bootstrap
##   Number of requested bootstrap draws             1000
##   Number of successful bootstrap draws            1000
##
## Regressions:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##   M ~
##     X          (a)    0.193    0.046    4.162    0.000    0.104    0.284
##     v15       (d1)    0.167    0.053    3.132    0.002    0.059    0.274
##     v16       (f1)    0.155    0.025    6.179    0.000    0.105    0.202
##   Y ~
##     M          (b)    0.270    0.057    4.699    0.000    0.164    0.391
##     X         (cp)    0.195    0.054    3.597    0.000    0.085    0.293
##     v15       (d2)    0.259    0.053    4.853    0.000    0.155    0.365
##     v16       (f2)    0.167    0.029    5.822    0.000    0.109    0.221
##    Std.lv  Std.all
##
##     0.193    0.206
##     0.167    0.119
##     0.155    0.220
##
##     0.270    0.256
##     0.195    0.197
##     0.259    0.175
##     0.167    0.224
##
## Variances:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##    .M                 0.443    0.028   15.790    0.000    0.387    0.496
##    .Y                 0.419    0.027   15.319    0.000    0.359    0.467
##    Std.lv  Std.all
##     0.443    0.900
##     0.419    0.768
##
## R-Square:
##                    Estimate
##     M                 0.100
##     Y                 0.232
##
## Defined Parameters:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##     indirect          0.052    0.022    2.408    0.016    0.019    0.104
##     direct            0.195    0.054    3.595    0.000    0.085    0.293
##     total             0.246    0.042    5.928    0.000    0.172    0.331
##    Std.lv  Std.all
##     0.052    0.053
##     0.195    0.197
##     0.246    0.250
```

```
##Q5
model.3 <- "
M ~ a*X + d1*v15 +f1*v16
Y  ~ b*M + cp*X + d2*v15 +f2*v16
v17 ~ g1*M + g2*Y
indirect := a*b
direct   := cp
total    := a*b + cp
"
covariate17 <- sem(model.3, data = data60_cl, se = "bootstrap", bootstrap=1000)
summary(covariate17, ci=T, standardized=T, rsquare=T, fit.measures=F)
```

```
## lavaan 0.6-9 ended normally after 31 iterations
##
##   Estimator                                         ML
##   Optimization method                           NLMINB
##   Number of model parameters                        12
##
##                                                   Used       Total
##   Number of observations                           616         623
##
## Model Test User Model:
##
##   Test statistic                                67.638
##   Degrees of freedom                                 3
##   P-value (Chi-square)                           0.000
##
## Parameter Estimates:
##
##   Standard errors                            Bootstrap
##   Number of requested bootstrap draws             1000
##   Number of successful bootstrap draws            1000
##
## Regressions:
##                      Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##   M ~
##     X          (a)      0.193    0.048    3.985    0.000    0.098    0.292
##     v15       (d1)      0.167    0.052    3.206    0.001    0.073    0.275
##     v16       (f1)      0.155    0.025    6.176    0.000    0.108    0.205
##   Y ~
##     M          (b)      0.270    0.060    4.500    0.000    0.162    0.392
##     X         (cp)      0.195    0.055    3.527    0.000    0.082    0.292
##     v15       (d2)      0.259    0.053    4.883    0.000    0.161    0.364
##     v16       (f2)      0.167    0.028    5.874    0.000    0.108    0.224
##   v17 ~
##     M         (g1)     -5.687    1.781   -3.193    0.001   -8.973   -2.057
##     Y         (g2)      5.074    1.666    3.046    0.002    1.597    8.268
##    Std.lv  Std.all
```

```
##
##     0.193    0.206
##     0.167    0.119
##     0.155    0.220
##
##     0.270    0.256
##     0.195    0.197
##     0.259    0.175
##     0.167    0.224
##
##    -5.687   -0.411
##     5.074    0.386
##
## Variances:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##    .M                 0.443    0.028   16.081    0.000    0.388    0.496
##    .Y                 0.419    0.028   15.207    0.000    0.358    0.467
##    .v17              75.201   30.068    2.501    0.012   21.460  138.925
##    Std.lv  Std.all
##     0.443    0.900
##     0.419    0.768
##    75.201    0.797
##
## R-Square:
##                    Estimate
##     M                 0.100
##     Y                 0.232
##     v17               0.203
##
## Defined Parameters:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##     indirect          0.052    0.023    2.295    0.022    0.019    0.108
##     direct            0.195    0.055    3.525    0.000    0.082    0.292
##     total             0.246    0.042    5.859    0.000    0.163    0.327
##    Std.lv  Std.all
##     0.052    0.053
##     0.195    0.197
##     0.246    0.250
```

```
#Weird
data60_weird <- data60_cl
data60_weird1 <- data60_cl
data60_weird3 <- data60_cl
data60_weird <- data60_weird[order(-data60_weird$weird, data60_weird$id),]

data60_weird <- data60_weird[data60_weird$id != 22, ]
data60_weird <- data60_weird[data60_weird$id != 217, ]
data60_weird <- data60_weird[data60_weird$id != 345, ]
data60_weird <- data60_weird[data60_weird$id != 425, ]

data60_weird <- data60_weird[data60_weird$id != 50, ]
data60_weird <- data60_weird[data60_weird$id != 370, ]
data60_weird <- data60_weird[data60_weird$id != 405, ]
data60_weird <- data60_weird[data60_weird$id != 431, ]
```

```r
data60_weird <- data60_weird[data60_weird$id != 450, ]
data60_weird <- data60_weird[data60_weird$id != 497, ]

data60_weird1 <- data60_weird1[data60_weird1$id != 50, ]
data60_weird1 <- data60_weird1[data60_weird1$id != 370, ]
data60_weird1 <- data60_weird1[data60_weird1$id != 405, ]
data60_weird1 <- data60_weird1[data60_weird1$id != 431, ]
data60_weird1 <- data60_weird1[data60_weird1$id != 450, ]
data60_weird1 <- data60_weird1[data60_weird1$id != 497, ]

data60_weird3 <- data60_weird3[data60_weird3$id != 22, ]
data60_weird3 <- data60_weird3[data60_weird3$id != 217, ]
data60_weird3 <- data60_weird3[data60_weird3$id != 345, ]
data60_weird3 <- data60_weird3[data60_weird3$id != 425, ]


mediation.W <- sem(model.1, data = data60_weird, se = "bootstrap", bootstrap=1000)
summary(mediation.W, ci=T, standardized=T, rsquare=T, fit.measures=F)
```

```
## lavaan 0.6-9 ended normally after 14 iterations
##
##   Estimator                                         ML
##   Optimization method                           NLMINB
##   Number of model parameters                         5
##
##                                                   Used       Total
##   Number of observations                           612         613
##
## Model Test User Model:
##
##   Test statistic                                 0.000
##   Degrees of freedom                                 0
##
## Parameter Estimates:
##
##   Standard errors                            Bootstrap
##   Number of requested bootstrap draws             1000
##   Number of successful bootstrap draws            1000
##
## Regressions:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##   M ~
##     X          (a)    0.238    0.044    5.408    0.000    0.153    0.328
##   Y ~
##     M          (b)    0.418    0.060    7.020    0.000    0.304    0.539
##     X         (cp)    0.100    0.055    1.816    0.069   -0.010    0.203
##    Std.lv  Std.all
##
##     0.238    0.254
##
##     0.418    0.397
##     0.100    0.101
##
```

```
## Variances:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##    .M                 0.443    0.027   16.283    0.000    0.392    0.497
##    .Y                 0.427    0.030   14.341    0.000    0.368    0.484
##    Std.lv  Std.all
##     0.443    0.936
##     0.427    0.812
##
## R-Square:
##                    Estimate
##     M                 0.064
##     Y                 0.188
##
## Defined Parameters:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##     indirect          0.099    0.028    3.499    0.000    0.051    0.162
##     direct            0.100    0.055    1.815    0.070   -0.010    0.203
##     total             0.200    0.042    4.738    0.000    0.117    0.282
##    Std.lv  Std.all
##     0.099    0.101
##     0.100    0.101
##     0.200    0.202
```

```
covariates.W <- sem(model.2, data = data60_weird, se = "bootstrap", bootstrap=1000)
summary(covariates.W, ci=T, standardized=T, rsquare=T, fit.measures=F)
```

```
## lavaan 0.6-9 ended normally after 19 iterations
##
##   Estimator                                         ML
##   Optimization method                           NLMINB
##   Number of model parameters                         9
##
##                                                   Used       Total
##   Number of observations                           612         613
##
## Model Test User Model:
##
##   Test statistic                                 0.000
##   Degrees of freedom                                 0
##
## Parameter Estimates:
##
##   Standard errors                            Bootstrap
##   Number of requested bootstrap draws             1000
##   Number of successful bootstrap draws            1000
##
## Regressions:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##   M ~
##     X          (a)    0.240    0.046    5.278    0.000    0.155    0.333
##     v15       (d1)    0.143    0.054    2.669    0.008    0.032    0.254
##     v16       (f1)    0.143    0.026    5.574    0.000    0.092    0.190
##   Y ~
##     M          (b)    0.344    0.056    6.159    0.000    0.241    0.459
##     X         (cp)    0.123    0.051    2.386    0.017    0.013    0.215
##     v15       (d2)    0.276    0.052    5.302    0.000    0.170    0.378
##     v16       (f2)    0.170    0.027    6.179    0.000    0.117    0.224
##    Std.lv  Std.all
##
##     0.240    0.256
##     0.143    0.104
##     0.143    0.207
##
##     0.344    0.327
##     0.123    0.124
##     0.276    0.190
##     0.170    0.233
##
## Variances:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##    .M                 0.418    0.028   15.080    0.000    0.363    0.473
##    .Y                 0.384    0.026   14.812    0.000    0.330    0.428
##    Std.lv  Std.all
##     0.418    0.884
##     0.384    0.730
##
## R-Square:
##                    Estimate
##     M                 0.116
##     Y                 0.270
##
## Defined Parameters:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##     indirect          0.083    0.026    3.176    0.001    0.041    0.144
##     direct            0.123    0.051    2.385    0.017    0.013    0.215
##     total             0.205    0.039    5.305    0.000    0.124    0.277
##    Std.lv  Std.all
##     0.083    0.084
##     0.123    0.124
##     0.205    0.208
```

```
covariate17.W <- sem(model.3, data = data60_weird, se = "bootstrap", bootstrap=1000)
summary(covariate17.W, ci=T, standardized=T, rsquare=T, fit.measures=F)
```

```
## lavaan 0.6-9 ended normally after 29 iterations
##
##   Estimator                                         ML
##   Optimization method                           NLMINB
##   Number of model parameters                        12
##
##                                                   Used       Total
##   Number of observations                           612         613
##
## Model Test User Model:
##
##   Test statistic                                45.169
##   Degrees of freedom                                 3
##   P-value (Chi-square)                           0.000
```

```
##
## Parameter Estimates:
##
##   Standard errors                            Bootstrap
##   Number of requested bootstrap draws             1000
##   Number of successful bootstrap draws            1000
##
## Regressions:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##   M ~
##     X          (a)    0.240    0.044    5.438    0.000    0.155    0.331
##     v15       (d1)    0.143    0.053    2.696    0.007    0.040    0.250
##     v16       (f1)    0.143    0.024    5.871    0.000    0.096    0.190
##   Y ~
##     M          (b)    0.344    0.058    5.971    0.000    0.243    0.471
##     X         (cp)    0.123    0.053    2.323    0.020    0.016    0.221
##     v15       (d2)    0.276    0.052    5.288    0.000    0.173    0.377
##     v16       (f2)    0.170    0.027    6.336    0.000    0.117    0.224
##   v17 ~
##     M         (g1)   -3.215    1.427   -2.253    0.024   -6.174   -0.560
##     Y         (g2)    2.804    1.401    2.002    0.045    0.137    5.735
##    Std.lv  Std.all
##
##     0.240    0.256
##     0.143    0.104
##     0.143    0.207
##
##     0.344    0.327
##     0.123    0.124
##     0.276    0.190
##     0.170    0.233
##
##    -3.215   -0.330
##     2.804    0.304
##
## Variances:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##    .M                 0.418    0.026   16.167    0.000    0.361    0.464
##    .Y                 0.384    0.025   15.319    0.000    0.330    0.428
##    .v17              39.632   17.123    2.314    0.021    7.281   75.499
##    Std.lv  Std.all
##     0.418    0.884
##     0.384    0.730
##    39.632    0.883
##
## R-Square:
##                    Estimate
##     M                 0.116
##     Y                 0.270
##     v17               0.117
##
## Defined Parameters:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##     indirect          0.083    0.026    3.213    0.001    0.042    0.142
##     direct            0.123    0.053    2.322    0.020    0.016    0.221
##     total             0.205    0.040    5.098    0.000    0.128    0.285
##    Std.lv  Std.all
##     0.083    0.084
##     0.123    0.124
##     0.205    0.208
```

```
#Omitted Variable Bias

screenreg(list(mediation, mediation.W),
          custom.model.name =
            c("Model 1: Normal",
              "Model 2: Adjusted for Weird"),
          single.row = TRUE, digits = 3)
```

```
##
## ==================================================================
##                  Model 1: Normal       Model 2: Adjusted for Weird
## ------------------------------------------------------------------
## M ~ X               0.185 (0.050) ***     0.238 (0.044) ***
## Y ~ M               0.344 (0.062) ***     0.418 (0.060) ***
## Y ~ X               0.170 (0.057) **      0.100 (0.055)
## M ~~ M              0.473 (0.030) ***     0.443 (0.027) ***
## Y ~~ Y              0.459 (0.031) ***     0.427 (0.030) ***
## X ~~ X              0.560 (0.000)         0.538 (0.000)
## indirect := a*b     0.064 (0.026) *       0.099 (0.028) ***
## direct := cp        0.170 (0.057) **      0.100 (0.055)
## total := a*b+cp     0.234 (0.043) ***     0.200 (0.042) ***
## ------------------------------------------------------------------
## agfi                1.000                 1.000
## AIC              2565.701              2464.546
## BIC              2587.817              2486.630
## cfi                 1.000                 1.000
## chisq               0.000                 0.000
## npar                5.000                 5.000
## rmsea               0.000                 0.000
## rmsea.conf.high     0.000                 0.000
## srmr                0.000                 0.000
## tli                 1.000                 1.000
## converged           1                     1
## ngroups             1                     1
## nobs              616                   612
## norig             623                   613
## nexcluded           7                     1
## ==================================================================
## *** p < 0.001; ** p < 0.01; * p < 0.05
```

```
screenreg(list(covariates, covariates.W),
          custom.model.name =
            c("Model 1: Normal",
              "Model 2: Adjusted for Weird"),
          single.row = TRUE, digits = 3)
```

```
##
```

```
## ==================================================================
##                     Model 1: Normal       Model 2: Adjusted for Weird
## ------------------------------------------------------------------
## M ~ X               0.193 (0.046) ***     0.240 (0.046) ***
## M ~ v15             0.167 (0.053) **      0.143 (0.054) **
## M ~ v16             0.155 (0.025) ***     0.143 (0.026) ***
## Y ~ M               0.270 (0.057) ***     0.344 (0.056) ***
## Y ~ X               0.195 (0.054) ***     0.123 (0.051) *
## Y ~ v15             0.259 (0.053) ***     0.276 (0.052) ***
## Y ~ v16             0.167 (0.029) ***     0.170 (0.027) ***
## M ~~ M              0.443 (0.028) ***     0.418 (0.028) ***
## Y ~~ Y              0.419 (0.027) ***     0.384 (0.026) ***
## X ~~ X              0.560 (0.000)         0.538 (0.000)
## X ~~ v15           -0.016 (0.000)        -0.010 (0.000)
## X ~~ v16           -0.010 (0.000)         0.001 (0.000)
## v15 ~~ v15          0.250 (0.000)         0.250 (0.000)
## v15 ~~ v16         -0.018 (0.000)        -0.020 (0.000)
## v16 ~~ v16          0.988 (0.000)         0.989 (0.000)
## indirect := a*b     0.052 (0.022) *       0.083 (0.026) **
## direct := cp        0.195 (0.054) ***     0.123 (0.051) *
## total := a*b+cp     0.246 (0.042) ***     0.205 (0.039) ***
## ------------------------------------------------------------------
## agfi                1.000                 1.000
## AIC              2477.338              2372.295
## BIC              2517.147              2412.045
## cfi                 1.000                 1.000
## chisq               0.000                 0.000
## npar                9.000                 9.000
## rmsea               0.000                 0.000
## rmsea.conf.high     0.000                 0.000
## srmr                0.000                 0.000
## tli                 1.000                 1.000
## converged           1                     1
## ngroups             1                     1
## nobs              616                   612
## norig             623                   613
## nexcluded           7                     1
## ==================================================================
## *** p < 0.001; ** p < 0.01; * p < 0.05
```

```
screenreg(list(covariate17, covariate17.W),
          custom.model.name =
            c("Model 1: Normal",
              "Model 2: Adjusted for Weird"),
          single.row = TRUE, digits = 3)
```

```
##
## ===================================================================
##                     Model 1: Normal        Model 2: Adjusted for Weird
## -------------------------------------------------------------------
## M ~ X               0.193  (0.048) ***     0.240  (0.044) ***
## M ~ v15             0.167  (0.052) **      0.143  (0.053) **
## M ~ v16             0.155  (0.025) ***     0.143  (0.024) ***
## Y ~ M               0.270  (0.060) ***     0.344  (0.058) ***
## Y ~ X               0.195  (0.055) ***     0.123  (0.053) *
## Y ~ v15             0.259  (0.053) ***     0.276  (0.052) ***
## Y ~ v16             0.167  (0.028) ***     0.170  (0.027) ***
## v17 ~ M            -5.687  (1.781) **     -3.215  (1.427) *
## v17 ~ Y             5.074  (1.666) **      2.804  (1.401) *
## M ~~ M              0.443  (0.028) ***     0.418  (0.026) ***
## Y ~~ Y              0.419  (0.028) ***     0.384  (0.025) ***
## v17 ~~ v17         75.201 (30.068) *      39.632 (17.123) *
## X ~~ X              0.560  (0.000)         0.538  (0.000)
## X ~~ v15           -0.016  (0.000)        -0.010  (0.000)
## X ~~ v16           -0.010  (0.000)         0.001  (0.000)
## v15 ~~ v15          0.250  (0.000)         0.250  (0.000)
## v15 ~~ v16         -0.018  (0.000)        -0.020  (0.000)
## v16 ~~ v16          0.988  (0.000)         0.989  (0.000)
## indirect := a*b     0.052  (0.023) *       0.083  (0.026) **
## direct := cp        0.195  (0.055) ***     0.123  (0.053) *
## total := a*b+cp     0.246  (0.042) ***     0.205  (0.040) ***
## -------------------------------------------------------------------
## agfi                0.555                  0.689
## AIC              6892.688               6367.015
## BIC              6945.767               6420.016
## cfi                 0.847                  0.888
## chisq              67.638                 45.169
## npar               12.000                 12.000
## rmsea               0.187                  0.152
## rmsea.conf.high     0.227                  0.192
## srmr                0.063                  0.053
## tli                 0.389                  0.553
## converged           1                      1
## ngroups             1                      1
## nobs              616                    612
## norig             623                    613
## nexcluded           7                      1
## ===================================================================
## *** p < 0.001; ** p < 0.01; * p < 0.05
```

```
##Omitted Var Bias 1

mediation.W1 <- sem(model.1, data = data60_weird1, se = "bootstrap", bootstrap=1000)
summary(mediation.W1, ci=T, standardized=T, rsquare=T, fit.measures=F)
```

```
## lavaan 0.6-9 ended normally after 14 iterations
##
##   Estimator                                         ML
##   Optimization method                           NLMINB
##   Number of model parameters                         5
##
##                                                   Used       Total
##   Number of observations                           616         617
##
## Model Test User Model:
##
##   Test statistic                                 0.000
##   Degrees of freedom                                 0
```

```
##
## Parameter Estimates:
##
##   Standard errors                             Bootstrap
##   Number of requested bootstrap draws              1000
##   Number of successful bootstrap draws             1000
##
## Regressions:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##   M ~
##     X          (a)    0.185    0.049    3.774    0.000    0.089    0.283
##   Y ~
##     M          (b)    0.344    0.061    5.655    0.000    0.239    0.477
##     X         (cp)    0.170    0.057    3.003    0.003    0.055    0.270
##    Std.lv  Std.all
##
##     0.185    0.197
##
##     0.344    0.327
##     0.170    0.172
##
## Variances:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##    .M                 0.473    0.030   15.851    0.000    0.412    0.532
##    .Y                 0.459    0.030   15.383    0.000    0.397    0.512
##    Std.lv  Std.all
##     0.473    0.961
##     0.459    0.841
##
## R-Square:
##                    Estimate
##     M                 0.039
##     Y                 0.159
##
## Defined Parameters:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##     indirect          0.064    0.026    2.486    0.013    0.025    0.126
##     direct            0.170    0.057    3.002    0.003    0.055    0.270
##     total             0.234    0.043    5.405    0.000    0.150    0.319
##    Std.lv  Std.all
##     0.064    0.065
##     0.170    0.172
##     0.234    0.237
```

```
covariates.W1 <- sem(model.2, data = data60_weird1, se = "bootstrap", bootstrap=1000)
summary(covariates.W1, ci=T, standardized=T, rsquare=T, fit.measures=F)
```

```
## lavaan 0.6-9 ended normally after 18 iterations
##
##   Estimator                                         ML
##   Optimization method                           NLMINB
##   Number of model parameters                         9
##
##                                                   Used       Total
##   Number of observations                           616         617
##
## Model Test User Model:
##
##   Test statistic                                 0.000
##   Degrees of freedom                                 0
##
## Parameter Estimates:
##
##   Standard errors                            Bootstrap
##   Number of requested bootstrap draws             1000
##   Number of successful bootstrap draws            1000
##
## Regressions:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##   M ~
##     X          (a)    0.193    0.048    3.991    0.000    0.095    0.283
##     v15       (d1)    0.167    0.055    3.034    0.002    0.056    0.276
##     v16       (f1)    0.155    0.026    6.063    0.000    0.105    0.204
##   Y ~
##     M          (b)    0.270    0.060    4.463    0.000    0.156    0.404
##     X         (cp)    0.195    0.056    3.481    0.001    0.076    0.295
##     v15       (d2)    0.259    0.052    5.004    0.000    0.153    0.357
##     v16       (f2)    0.167    0.028    6.040    0.000    0.112    0.218
##    Std.lv  Std.all
##
##     0.193    0.206
##     0.167    0.119
##     0.155    0.220
##
##     0.270    0.256
##     0.195    0.197
##     0.259    0.175
##     0.167    0.224
##
## Variances:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##    .M                 0.443    0.028   15.751    0.000    0.385    0.496
##    .Y                 0.419    0.028   15.070    0.000    0.360    0.466
##    Std.lv  Std.all
##     0.443    0.900
##     0.419    0.768
##
## R-Square:
##                    Estimate
##     M                 0.100
##     Y                 0.232
##
## Defined Parameters:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##     indirect          0.052    0.023    2.296    0.022    0.017    0.105
##     direct            0.195    0.056    3.479    0.001    0.076    0.295
##     total             0.246    0.041    5.953    0.000    0.161    0.326
##    Std.lv  Std.all
##     0.052    0.053
##     0.195    0.197
##     0.246    0.250
```

```
covariate17.W1 <- sem(model.3, data = data60_weird1, se = "bootstrap", bootstrap=1000)
summary(covariate17.W1, ci=T, standardized=T, rsquare=T, fit.measures=F)
```

```
## lavaan 0.6-9 ended normally after 31 iterations
##
##   Estimator                                         ML
##   Optimization method                           NLMINB
##   Number of model parameters                        12
##
##                                                   Used       Total
##   Number of observations                           616         617
##
## Model Test User Model:
##
##   Test statistic                                67.638
##   Degrees of freedom                                 3
##   P-value (Chi-square)                           0.000
##
## Parameter Estimates:
##
##   Standard errors                            Bootstrap
##   Number of requested bootstrap draws             1000
##   Number of successful bootstrap draws            1000
##
## Regressions:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##   M ~
##     X          (a)    0.193    0.047    4.071    0.000    0.099    0.284
##     v15       (d1)    0.167    0.051    3.293    0.001    0.058    0.264
##     v16       (f1)    0.155    0.025    6.287    0.000    0.107    0.200
##   Y ~
##     M          (b)    0.270    0.060    4.479    0.000    0.158    0.391
##     X         (cp)    0.195    0.053    3.689    0.000    0.089    0.299
##     v15       (d2)    0.259    0.053    4.914    0.000    0.159    0.366
##     v16       (f2)    0.167    0.027    6.080    0.000    0.111    0.221
##   v17 ~
##     M         (g1)   -5.687    1.695   -3.356    0.001   -9.149   -2.532
##     Y         (g2)    5.074    1.587    3.197    0.001    1.946    8.267
##    Std.lv  Std.all
##
##     0.193    0.206
##     0.167    0.119
##     0.155    0.220
##
##     0.270    0.256
##     0.195    0.197
##     0.259    0.175
##     0.167    0.224
##
##    -5.687   -0.411
##     5.074    0.386
##
## Variances:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##    .M                 0.443    0.028   15.979    0.000    0.388    0.497
##    .Y                 0.419    0.028   15.077    0.000    0.360    0.470
##    .v17              75.201   28.936    2.599    0.009   25.236  135.692
##    Std.lv  Std.all
##     0.443    0.900
##     0.419    0.768
##    75.201    0.797
##
## R-Square:
##                    Estimate
##     M                 0.100
##     Y                 0.232
##     v17               0.203
##
## Defined Parameters:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##     indirect          0.052    0.022    2.367    0.018    0.018    0.106
##     direct            0.195    0.053    3.687    0.000    0.089    0.299
##     total             0.246    0.040    6.158    0.000    0.170    0.326
##    Std.lv  Std.all
##     0.052    0.053
##     0.195    0.197
##     0.246    0.250
```

```
screenreg(list(mediation.W, mediation.W1),
          custom.model.name =
            c("Model 1: All Weird removed",
              "Model 2: Flatliners removed"),
          single.row = TRUE, digits = 3)
```

```
##
## ========================================================================
##                  Model 1: All Weird removed  Model 2: Flatliners removed
## ------------------------------------------------------------------------
## M ~ X               0.238 (0.044) ***           0.185 (0.049) ***
## Y ~ M               0.418 (0.060) ***           0.344 (0.061) ***
## Y ~ X               0.100 (0.055)               0.170 (0.057) **
## M ~~ M              0.443 (0.027) ***           0.473 (0.030) ***
## Y ~~ Y              0.427 (0.030) ***           0.459 (0.030) ***
## X ~~ X              0.538 (0.000)               0.560 (0.000)
## indirect := a*b     0.099 (0.028) ***           0.064 (0.026) *
## direct := cp        0.100 (0.055)               0.170 (0.057) **
## total := a*b+cp     0.200 (0.042) ***           0.234 (0.043) ***
## ------------------------------------------------------------------------
## agfi                1.000                       1.000
## AIC              2464.546                    2565.701
## BIC              2486.630                    2587.817
## cfi                 1.000                       1.000
## chisq               0.000                       0.000
## npar                5.000                       5.000
## rmsea                   0.000                       0.000
## rmsea.conf.high         0.000                       0.000
## srmr                    0.000                       0.000
## tli                     1.000                       1.000
## converged               1                           1
## ngroups                 1                           1
## nobs                  612                         616
## norig                 613                         617
## nexcluded               1                           1
## ========================================================================
## *** p < 0.001; ** p < 0.01; * p < 0.05
```

```r
screenreg(list(covariates.W, covariates.W1),
          custom.model.name =
            c("Model 1: All Weird removed",
              "Model 2: Flatliners removed"),
          single.row = TRUE, digits = 3)
```

```
##
## ========================================================================
##                   Model 1: All Weird removed  Model 2: Flatliners removed
## ------------------------------------------------------------------------
## M ~ X                   0.240 (0.046) ***           0.193 (0.048) ***
## M ~ v15                 0.143 (0.054) **            0.167 (0.055) **
## M ~ v16                 0.143 (0.026) ***           0.155 (0.026) ***
## Y ~ M                   0.344 (0.056) ***           0.270 (0.060) ***
## Y ~ X                   0.123 (0.051) *             0.195 (0.056) ***
## Y ~ v15                 0.276 (0.052) ***           0.259 (0.052) ***
## Y ~ v16                 0.170 (0.027) ***           0.167 (0.028) ***
## M ~~ M                  0.418 (0.028) ***           0.443 (0.028) ***
## Y ~~ Y                  0.384 (0.026) ***           0.419 (0.028) ***
## X ~~ X                  0.538 (0.000)               0.560 (0.000)
## X ~~ v15               -0.010 (0.000)              -0.016 (0.000)
## X ~~ v16                0.001 (0.000)              -0.010 (0.000)
## v15 ~~ v15              0.250 (0.000)               0.250 (0.000)
## v15 ~~ v16             -0.020 (0.000)              -0.018 (0.000)
## v16 ~~ v16              0.989 (0.000)               0.988 (0.000)
## indirect := a*b         0.083 (0.026) **            0.052 (0.023) *
## direct := cp            0.123 (0.051) *             0.195 (0.056) ***
## total := a*b+cp         0.205 (0.039) ***           0.246 (0.041) ***
## ------------------------------------------------------------------------
## agfi                    1.000                       1.000
## AIC                  2372.295                    2477.338
## BIC                  2412.045                    2517.147
## cfi                     1.000                       1.000
## chisq                   0.000                       0.000
## npar                    9.000                       9.000
## rmsea                   0.000                       0.000
## rmsea.conf.high         0.000                       0.000
## srmr                    0.000                       0.000
## tli                     1.000                       1.000
## converged               1                           1
## ngroups                 1                           1
## nobs                  612                         616
## norig             613                         617
## nexcluded           1                           1
## ========================================================================
## *** p < 0.001; ** p < 0.01; * p < 0.05
```

```
screenreg(list(covariate17.W, covariate17.W1),
          custom.model.name =
            c("Model 1: All Weird removed",
              "Model 2: Flatliners removed"),
          single.row = TRUE, digits = 3)
```

```
##
## ========================================================================
##                  Model 1: All Weird removed  Model 2: Flatliners removed
## ------------------------------------------------------------------------
## M ~ X               0.240  (0.044) ***          0.193  (0.047) ***
## M ~ v15             0.143  (0.053) **           0.167  (0.051) ***
## M ~ v16             0.143  (0.024) ***          0.155  (0.025) ***
## Y ~ M               0.344  (0.058) ***          0.270  (0.060) ***
## Y ~ X               0.123  (0.053) *            0.195  (0.053) ***
## Y ~ v15             0.276  (0.052) ***          0.259  (0.053) ***
## Y ~ v16             0.170  (0.027) ***          0.167  (0.027) ***
## v17 ~ M            -3.215  (1.427) *           -5.687  (1.695) ***
## v17 ~ Y             2.804  (1.401) *            5.074  (1.587) **
## M ~~ M              0.418  (0.026) ***          0.443  (0.028) ***
## Y ~~ Y              0.384  (0.025) ***          0.419  (0.028) ***
## v17 ~~ v17         39.632 (17.123) *           75.201 (28.936) **
## X ~~ X              0.538  (0.000)              0.560  (0.000)
## X ~~ v15           -0.010  (0.000)             -0.016  (0.000)
## X ~~ v16            0.001  (0.000)             -0.010  (0.000)
## v15 ~~ v15          0.250  (0.000)              0.250  (0.000)
## v15 ~~ v16         -0.020  (0.000)             -0.018  (0.000)
## v16 ~~ v16          0.989  (0.000)              0.988  (0.000)
## indirect := a*b     0.083  (0.026) **           0.052  (0.022) *
## direct := cp        0.123  (0.053) *            0.195  (0.053) ***
## total := a*b+cp     0.205  (0.040) ***          0.246  (0.040) ***
## ------------------------------------------------------------------------
## agfi                0.689                       0.555
## AIC              6367.015                    6892.688
## BIC              6420.016                    6945.767
## cfi                 0.888                       0.847
## chisq              45.169                      67.638
## npar               12.000                      12.000
## rmsea               0.152                       0.187
## rmsea.conf.high     0.192                       0.227
## srmr                0.053                       0.063
## tli                 0.553                       0.389
## converged           1                           1
## ngroups             1                           1
## nobs              612                         616
## norig             613                         617
## nexcluded           1                           1
## ========================================================================
## *** p < 0.001; ** p < 0.01; * p < 0.05
```

```r
##Omitted Variable Bias Weird3


mediation.W3 <- sem(model.1, data = data60_weird3, se = "bootstrap", bootstrap=1000)
summary(mediation.W3, ci=T, standardized=T, rsquare=T, fit.measures=F)
```

```
## lavaan 0.6-9 ended normally after 14 iterations
##
##   Estimator                                         ML
##   Optimization method                           NLMINB
##   Number of model parameters                         5
##
##                                                   Used       Total
##   Number of observations                           612         619
##
## Model Test User Model:
##
##   Test statistic                                 0.000
##   Degrees of freedom                                 0
##
## Parameter Estimates:
##
##   Standard errors                            Bootstrap
##   Number of requested bootstrap draws             1000
##   Number of successful bootstrap draws            1000
##
## Regressions:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##   M ~
##     X          (a)    0.238    0.046    5.204    0.000    0.144    0.326
##   Y ~
##     M          (b)    0.418    0.060    6.978    0.000    0.306    0.541
##     X         (cp)    0.100    0.056    1.797    0.072   -0.019    0.201
##    Std.lv  Std.all
##
##     0.238    0.254
##
##     0.418    0.397
##     0.100    0.101
##
## Variances:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##    .M                 0.443    0.028   15.895    0.000    0.388    0.498
##    .Y                 0.427    0.032   13.514    0.000    0.362    0.492
##    Std.lv  Std.all
##     0.443    0.936
##     0.427    0.812
##
## R-Square:
##                    Estimate
##     M                 0.064
##     Y                 0.188
##
```

```
## Defined Parameters:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##     indirect          0.099    0.030    3.358    0.001    0.050    0.163
##     direct            0.100    0.056    1.796    0.072   -0.019    0.201
##     total             0.200    0.042    4.780    0.000    0.113    0.280
##    Std.lv  Std.all
##     0.099    0.101
##     0.100    0.101
##     0.200    0.202
```

```
covariates.W3 <- sem(model.2, data = data60_weird3, se = "bootstrap", bootstrap=1000)
summary(covariates.W3, ci=T, standardized=T, rsquare=T, fit.measures=F)
```

```
## lavaan 0.6-9 ended normally after 19 iterations
##
##   Estimator                                         ML
##   Optimization method                           NLMINB
##   Number of model parameters                         9
##
##                                                   Used       Total
##   Number of observations                           612         619
##
## Model Test User Model:
##
##   Test statistic                                 0.000
##   Degrees of freedom                                 0
##
## Parameter Estimates:
##
##   Standard errors                            Bootstrap
##   Number of requested bootstrap draws             1000
##   Number of successful bootstrap draws            1000
##
## Regressions:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##   M ~
##     X          (a)    0.240    0.046    5.212    0.000    0.149    0.327
##     v15       (d1)    0.143    0.052    2.731    0.006    0.043    0.250
##     v16       (f1)    0.143    0.025    5.837    0.000    0.098    0.194
##   Y ~
##     M          (b)    0.344    0.059    5.814    0.000    0.228    0.464
##     X         (cp)    0.123    0.053    2.319    0.020    0.017    0.222
##     v15       (d2)    0.276    0.053    5.196    0.000    0.167    0.378
##     v16       (f2)    0.170    0.028    6.073    0.000    0.116    0.225
##    Std.lv  Std.all
##
##     0.240    0.256
##     0.143    0.104
##     0.143    0.207
##
##     0.344    0.327
##     0.123    0.124
##     0.276    0.190
##     0.170    0.233
```

```
##
## Variances:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##    .M                 0.418    0.028   14.881    0.000    0.362    0.475
##    .Y                 0.384    0.025   15.456    0.000    0.332    0.430
##    Std.lv  Std.all
##     0.418    0.884
##     0.384    0.730
##
## R-Square:
##                    Estimate
##     M                 0.116
##     Y                 0.270
##
## Defined Parameters:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##     indirect          0.083    0.026    3.127    0.002    0.037    0.140
##     direct            0.123    0.053    2.318    0.020    0.017    0.222
##     total             0.205    0.039    5.307    0.000    0.128    0.281
##    Std.lv  Std.all
##     0.083    0.084
##     0.123    0.124
##     0.205    0.208
```

```
covariate17.W3 <- sem(model.3, data = data60_weird3, se = "bootstrap", bootstrap=1000)
summary(covariate17.W3, ci=T, standardized=T, rsquare=T, fit.measures=F)
```

```
## lavaan 0.6-9 ended normally after 29 iterations
##
##   Estimator                                         ML
##   Optimization method                           NLMINB
##   Number of model parameters                        12
##
##                                                   Used       Total
##   Number of observations                           612         619
##
## Model Test User Model:
##
##   Test statistic                                45.169
##   Degrees of freedom                                 3
##   P-value (Chi-square)                           0.000
##
## Parameter Estimates:
##
##   Standard errors                            Bootstrap
##   Number of requested bootstrap draws             1000
##   Number of successful bootstrap draws            1000
##
## Regressions:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##   M ~
##     X           (a)   0.240    0.044    5.448    0.000    0.154    0.326
##     v15        (d1)   0.143    0.052    2.765    0.006    0.048    0.252
##     v16        (f1)   0.143    0.025    5.740    0.000    0.092    0.193
##   Y ~
##     M          (b)    0.344    0.059    5.868    0.000    0.237    0.470
##     X         (cp)    0.123    0.053    2.294    0.022    0.006    0.220
##     v15       (d2)    0.276    0.051    5.400    0.000    0.168    0.373
##     v16       (f2)    0.170    0.028    6.024    0.000    0.110    0.224
##   v17 ~
##     M         (g1)   -3.215    1.398   -2.300    0.021   -5.846   -0.530
##     Y         (g2)    2.804    1.374    2.040    0.041    0.216    5.584
##    Std.lv  Std.all
##
##     0.240    0.256
##     0.143    0.104
##     0.143    0.207
##
##     0.344    0.327
##     0.123    0.124
##     0.276    0.190
##     0.170    0.233
##
##    -3.215   -0.330
##     2.804    0.304
##
## Variances:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##    .M                 0.418    0.026   15.820    0.000    0.365    0.470
##    .Y                 0.384    0.026   14.951    0.000    0.328    0.430
##    .v17              39.632   16.888    2.347    0.019    6.933   73.262
##    Std.lv  Std.all
##     0.418    0.884
##     0.384    0.730
##    39.632    0.883
##
## R-Square:
##                    Estimate
##     M                 0.116
##     Y                 0.270
##     v17               0.117
##
## Defined Parameters:
##                    Estimate  Std.Err  z-value  P(>|z|) ci.lower ci.upper
##     indirect          0.083    0.026    3.193    0.001    0.040    0.142
##     direct            0.123    0.053    2.293    0.022    0.006    0.220
##     total             0.205    0.041    5.024    0.000    0.125    0.281
##    Std.lv  Std.all
##     0.083    0.084
##     0.123    0.124
##     0.205    0.208
```

```
screenreg(list(mediation.W, mediation.W3),
          custom.model.name =
            c("Model 1: All Weird removed",
              "Model 2: Partly Item Non Response removed"),
          single.row = TRUE, digits = 3)
```

```
##
## ======================================================================================
##                    Model 1: All Weird removed  Model 2: Partly Item Non Response removed
## --------------------------------------------------------------------------------------
## M ~ X               0.238 (0.044) ***           0.238 (0.046) ***
## Y ~ M               0.418 (0.060) ***           0.418 (0.060) ***
## Y ~ X               0.100 (0.055)               0.100 (0.056)
## M ~~ M              0.443 (0.027) ***           0.443 (0.028) ***
## Y ~~ Y              0.427 (0.030) ***           0.427 (0.032) ***
## X ~~ X              0.538 (0.000)               0.538 (0.000)
## indirect := a*b     0.099 (0.028) ***           0.099 (0.030) ***
## direct := cp        0.100 (0.055)               0.100 (0.056)
## total := a*b+cp     0.200 (0.042) ***           0.200 (0.042) ***
## --------------------------------------------------------------------------------------
## agfi                1.000                       1.000
## AIC              2464.546                    2464.546
## BIC              2486.630                    2486.630
## cfi                 1.000                       1.000
## chisq               0.000                       0.000
## npar                5.000                       5.000
## rmsea               0.000                       0.000
## rmsea.conf.high     0.000                       0.000
## srmr                0.000                       0.000
## tli                 1.000                       1.000
## converged           1                           1
## ngroups             1                           1
## nobs              612                         612
## norig             613                         619
## nexcluded           1                           7
## ======================================================================================
## *** p < 0.001; ** p < 0.01; * p < 0.05
```

```r
screenreg(list(covariates.W, covariates.W3),
          custom.model.name =
            c("Model 1: All Weird removed",
              "Model 2: Partly Item Non Response removed"),
          single.row = TRUE, digits = 3)
```

```
##
## ======================================================================================
##                    Model 1: All Weird removed  Model 2: Partly Item Non Response removed
## --------------------------------------------------------------------------------------
## M ~ X               0.240 (0.046) ***           0.240 (0.046) ***
## M ~ v15             0.143 (0.054) **            0.143 (0.052) **
## M ~ v16             0.143 (0.026) ***           0.143 (0.025) ***
## Y ~ M               0.344 (0.056) ***           0.344 (0.059) ***
## Y ~ X               0.123 (0.051) *             0.123 (0.053) *
## Y ~ v15             0.276 (0.052) ***           0.276 (0.053) ***
## Y ~ v16             0.170 (0.027) ***           0.170 (0.028) ***
## M ~~ M              0.418 (0.028) ***           0.418 (0.028) ***
## Y ~~ Y              0.384 (0.026) ***           0.384 (0.025) ***
## X ~~ X              0.538 (0.000)               0.538 (0.000)
## X ~~ v15           -0.010 (0.000)              -0.010 (0.000)
## X ~~ v16            0.001 (0.000)               0.001 (0.000)
## v15 ~~ v15          0.250 (0.000)              0.250 (0.000)
## v15 ~~ v16         -0.020 (0.000)             -0.020 (0.000)
## v16 ~~ v16          0.989 (0.000)              0.989 (0.000)
## indirect := a*b     0.083 (0.026) **           0.083 (0.026) **
## direct := cp        0.123 (0.051) *            0.123 (0.053) *
## total := a*b+cp     0.205 (0.039) ***          0.205 (0.039) ***
## --------------------------------------------------------------------------------------
## agfi                1.000                      1.000
## AIC              2372.295                   2372.295
## BIC              2412.045                   2412.045
## cfi                 1.000                      1.000
## chisq               0.000                      0.000
## npar                9.000                      9.000
## rmsea               0.000                      0.000
## rmsea.conf.high     0.000                      0.000
## srmr                0.000                      0.000
## tli                 1.000                      1.000
## converged           1                          1
## ngroups             1                          1
## nobs              612                        612
## norig             613                        619
## nexcluded           1                          7
## ======================================================================================
## *** p < 0.001; ** p < 0.01; * p < 0.05
```

```
screenreg(list(covariate17.W, covariate17.W3),
          custom.model.name =
            c("Model 1: All Weird removed",
              "Model 2: Partly Item Non Response removed"),
          single.row = TRUE, digits = 3)
```

```
##
## ======================================================================================
##                  Model 1: All Weird removed  Model 2: Partly Item Non Response removed
## --------------------------------------------------------------------------------------
## M ~ X               0.240  (0.044) ***          0.240  (0.044) ***
## M ~ v15             0.143  (0.053) **           0.143  (0.052) **
## M ~ v16             0.143  (0.024) ***          0.143  (0.025) ***
## Y ~ M               0.344  (0.058) ***          0.344  (0.059) ***
## Y ~ X               0.123  (0.053) *            0.123  (0.053) *
## Y ~ v15             0.276  (0.052) ***          0.276  (0.051) ***
## Y ~ v16             0.170  (0.027) ***          0.170  (0.028) ***
## v17 ~ M            -3.215  (1.427) *           -3.215  (1.398) *
## v17 ~ Y             2.804  (1.401) *            2.804  (1.374) *
## M ~~ M              0.418  (0.026) ***          0.418  (0.026) ***
## Y ~~ Y              0.384  (0.025) ***          0.384  (0.026) ***
## v17 ~~ v17         39.632 (17.123) *           39.632 (16.888) *
## X ~~ X              0.538  (0.000)              0.538  (0.000)
## X ~~ v15           -0.010  (0.000)             -0.010  (0.000)
## X ~~ v16            0.001  (0.000)              0.001  (0.000)
## v15 ~~ v15          0.250  (0.000)              0.250  (0.000)
## v15 ~~ v16         -0.020  (0.000)             -0.020  (0.000)
## v16 ~~ v16          0.989  (0.000)              0.989  (0.000)
## indirect := a*b     0.083  (0.026) **           0.083  (0.026) **
## direct := cp        0.123  (0.053) *            0.123  (0.053) *
## total := a*b+cp     0.205  (0.040) ***          0.205  (0.041) ***
## --------------------------------------------------------------------------------------
## agfi                0.689                       0.689
## AIC              6367.015                    6367.015
## BIC              6420.016                    6420.016
## cfi                 0.888                       0.888
## chisq              45.169                      45.169
## npar               12.000                      12.000
## rmsea               0.152                       0.152
## rmsea.conf.high     0.192                       0.192
## srmr                0.053                       0.053
## tli                 0.553                       0.553
## converged           1                           1
## ngroups             1                           1
## nobs              612                         612
## norig             613                         619
## nexcluded           1                           7
## ======================================================================================
## *** p < 0.001; ** p < 0.01; * p < 0.05
```