Assignment 02

Your name

2025-04-16

##   
## Attaching package: 'psych'

## The following objects are masked from 'package:ggplot2':  
##   
## %+%, alpha

# Question 0

# Residualized Gain Scores

## Write out the equation for the residualized gain model.

## Run the model for pairs of consecutive occasions (T1 and T2; T2 and T3) and save the residualized gain scores

## Create a table summarizing results of the models

|  |  | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
|  | Est. | 2.5 % | 97.5 % | S.E. | t | p |
| (Intercept) | 19.300\*\*\* | 18.652 | 19.948 | 0.330 | 58.536 | <0.001 |
| factor(redcap\_event\_name)2 | -6.918\*\*\* | -7.866 | -5.969 | 0.482 | -14.340 | <0.001 |
| R2 | 0.327 |  |  |  |  |  |

|  |  | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
|  | Est. | 2.5 % | 97.5 % | S.E. | t | p |
| (Intercept) | 12.382\*\*\* | 11.549 | 13.214 | 0.423 | 29.243 | <0.001 |
| factor(redcap\_event\_name)3 | -0.188 | -1.378 | 1.001 | 0.605 | -0.311 | 0.756 |
| R2 | 0.000 |  |  |  |  |  |

## Summary Statistics for the residualized gain scores

Residualized gain scores for T2 - T1

|  | vars | n | mean | sd | median | trimmed | mad | min | max | range | skew | kurtosis | se |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X1 | 1 | 426 | 0 | 5 | -0.3 | 0 | 5.8 | -12.4 | 15.6 | 28 | 0 | -0.1 | 0.2 |

Residualized gain scores for T3 - T2

|  | vars | n | mean | sd | median | trimmed | mad | min | max | range | skew | kurtosis | se |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X1 | 1 | 390 | 0 | 6 | -0.4 | -0.1 | 6.2 | -12.4 | 15.8 | 28.2 | 0.2 | -0.6 | 0.3 |

# Trend Scores

## Equations

## 1 2  
## [1,] -0.5661385 0.5883484  
## [2,] -0.2264554 -0.7844645  
## [3,] 0.7925939 0.1961161  
## attr(,"coefs")  
## attr(,"coefs")$alpha  
## [1] 2.500000 3.846154  
##   
## attr(,"coefs")$norm2  
## [1] 1.00000 3.00000 19.50000 28.03846  
##   
## attr(,"degree")  
## [1] 1 2  
## attr(,"class")  
## [1] "poly" "matrix"

## Compute the linear and quadratic trend scores for your data.

# Coefficients for linear and quadratic trends  
linear <- c(-0.679, -0.226, 0.793)  
quadratic <- c(0.588, -0.784, 0.196)  
  
mydata2\_wide <- reshape(mydata2,  
 timevar = "redcap\_event\_name",  
 idvar = "record\_id",  
 direction = "wide")  
  
mydata2\_wide$linear\_trend <- with(mydata2\_wide,  
 insomina\_severity.1 \* linear[1] +  
 insomina\_severity.2 \* linear[2] +  
 insomina\_severity.3 \* linear[3]  
)  
  
mydata2\_wide$quadratic\_trend <- with(mydata2\_wide,  
 insomina\_severity.1 \* quadratic[1] +  
 insomina\_severity.2 \* quadratic[2] +  
 insomina\_severity.3 \* quadratic[3]  
)

|  | vars | n | mean | sd | median | trimmed | mad | min | max | range | skew | kurtosis | se |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Time1 | 1 | 227 | 19.3 | 4.1 | 19.0 | 19.4 | 4.4 | 8.0 | 28.0 | 20.0 | -0.2 | -0.5 | 0.3 |
| Time2 | 2 | 199 | 12.4 | 5.8 | 12.0 | 12.3 | 5.9 | 0.0 | 28.0 | 28.0 | 0.1 | -0.4 | 0.4 |
| Time3 | 3 | 191 | 12.2 | 6.1 | 12.0 | 12.0 | 7.4 | 1.0 | 28.0 | 27.0 | 0.2 | -0.7 | 0.4 |
| Linear | 4 | 191 | -6.2 | 3.6 | -5.5 | -6.1 | 3.7 | -15.6 | 2.0 | 17.6 | -0.3 | -0.4 | 0.3 |
| Quadratic | 5 | 191 | 4.1 | 3.6 | 3.7 | 3.9 | 4.1 | -3.5 | 13.5 | 17.1 | 0.4 | -0.5 | 0.3 |

|  | Time1 | Time2 | Time3 | Linear | Quadratic |
| --- | --- | --- | --- | --- | --- |
| Time1 | 1.00 | 0.43 | 0.51 | -0.25 | 0.28 |
| Time2 | 0.43 | 1.00 | 0.77 | 0.34 | -0.72 |
| Time3 | 0.51 | 0.77 | 1.00 | 0.68 | -0.31 |
| Linear | -0.25 | 0.34 | 0.68 | 1.00 | -0.37 |
| Quadratic | 0.28 | -0.72 | -0.31 | -0.37 | 1.00 |