STAI Stability Analysis

Franziska Werner

29 10 2021

# Methods

@spielberger2010

## Participants

* trial 1: 105 participants
* trial 2: 87 participants

-> add: age, sex and education?

## Material

* description of context in which data was collected

## Data analysis

Analysis was conducted in R (R Core Team, 2017) and figures were produced using the package ggplot2 (Wickham, 2009).

# Results

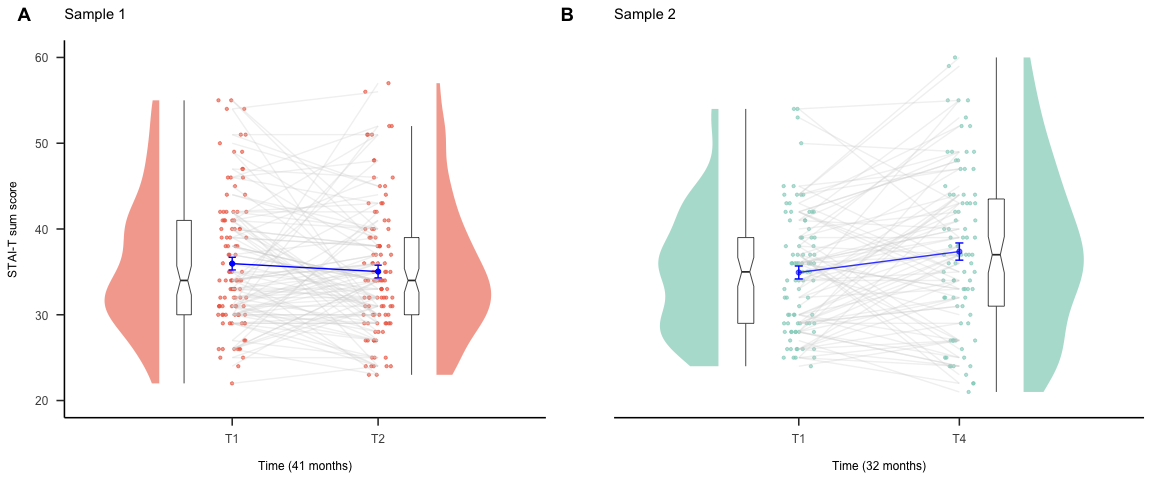


Illustration of STAI-T scores for (A) Study 1 in red and (B) Study 2 in green which depicts the sample average (blue) at both time-points (A: 41 month apart; B: 32 month apart), individual data points (A: red dots, B: green dots) as well as box and density plots at both time points. Note that the STAI-T scores of the same individual at both measurement time points are connected through a grey line.

(#tab:unnamed-chunk-8)

*Item Analysis and item stability.*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Item | Discrimination | Difficulty | Discrimination | Difficulty | ICC(2,1) | LL | UL |
| 1 | .33 | .46 | .58 | .47 | .26\*\* | .10 | .40 |
| 2 | .39 | .54 | .44 | .53 | .43\*\* | .29 | .56 |
| 3 | .57 | .40 | .41 | .37 | .26\*\* | .10 | .40 |
| 4 | .52 | .30 | .57 | .30 | .14 | -.02 | .30 |
| 5 | .37 | .45 | .36 | .43 | .40\*\* | .25 | .52 |
| 6 | .44 | .57 | .43 | .56 | .04 | -.12 | .20 |
| 7 | .45 | .53 | .45 | .52 | .32\*\* | .17 | .46 |
| 8 | .46 | .39 | .60 | .39 | .29\*\* | .14 | .43 |
| 9 | .49 | .55 | .53 | .51 | .36\*\* | .21 | .49 |
| 10 | .63 | .41 | .57 | .41 | .28\*\* | .12 | .42 |
| 11 | .60 | .42 | .67 | .40 | .41\*\* | .27 | .54 |
| 12 | .43 | .47 | .49 | .45 | .52\*\* | .39 | .63 |
| 13 | .35 | .47 | .47 | .45 | .35\*\* | .20 | .48 |
| 14 | .46 | .45 | .49 | .44 | .32\*\* | .17 | .46 |
| 15 | .43 | .37 | .55 | .39 | .35\*\* | .20 | .48 |
| 16 | .53 | .42 | .63 | .40 | .29\*\* | .14 | .43 |
| 17 | .45 | .45 | .50 | .44 | .29\*\* | .14 | .43 |
| 18 | .55 | .41 | .51 | .40 | .23\*\* | .07 | .38 |
| 19 | .67 | .48 | .62 | .44 | .39\*\* | .25 | .52 |
| 20 | .46 | .46 | .43 | .46 | .39\*\* | .24 | .52 |

*Note.* Total number of participants was . Cronbach’s resulted in .87 and .89 for the first and the second measurement. \ The definition choice was absolute agreement. \ \* < .05 \*\* < .01

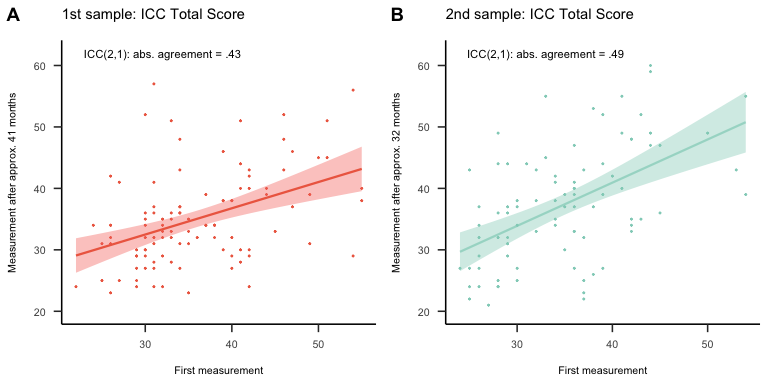
(#tab:unnamed-chunk-11)

*Item Analysis and item stability.*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Item | Discrimination | Difficulty | Discrimination | Difficulty | ICC(2,1) | LL | UL |
| 1 | .54 | .47 | .63 | .49 | .48\*\* | .33 | .61 |
| 2 | .46 | .57 | .39 | .56 | .37\*\* | .21 | .51 |
| 3 | .40 | .34 | .54 | .37 | .30\*\* | .13 | .45 |
| 4 | .34 | .31 | .58 | .32 | .10 | -.08 | .27 |
| 5 | .35 | .43 | .49 | .41 | .45\*\* | .29 | .58 |
| 6 | .50 | .57 | .41 | .58 | .22\* | .05 | .38 |
| 7 | .35 | .45 | .58 | .52 | .38\*\* | .22 | .52 |
| 8 | .50 | .39 | .57 | .41 | .30\*\* | .14 | .46 |
| 9 | .51 | .51 | .67 | .56 | .35\*\* | .19 | .49 |
| 10 | .66 | .41 | .67 | .46 | .49\*\* | .34 | .62 |
| 11 | .66 | .43 | .61 | .44 | .52\*\* | .38 | .64 |
| 12 | .44 | .43 | .59 | .47 | .47\*\* | .33 | .60 |
| 13 | .26 | .45 | .60 | .46 | .48\*\* | .34 | .61 |
| 14 | .33 | .46 | .47 | .49 | .13 | -.05 | .30 |
| 15 | .39 | .37 | .64 | .42 | .18\* | .01 | .34 |
| 16 | .64 | .40 | .73 | .46 | .37\*\* | .21 | .51 |
| 17 | .48 | .42 | .60 | .48 | .37\*\* | .21 | .52 |
| 18 | .48 | .46 | .58 | .43 | .44\*\* | .29 | .58 |
| 19 | .57 | .45 | .73 | .50 | .49\*\* | .34 | .61 |
| 20 | .44 | .42 | .56 | .52 | .23\*\* | .06 | .38 |

*Note.* Total number of participants was . Cronbach’s resulted in .87 and .92 for the first and the fourth measurement. \ The definition choice was absolute agreement. \ \* < .05 \*\* < .01

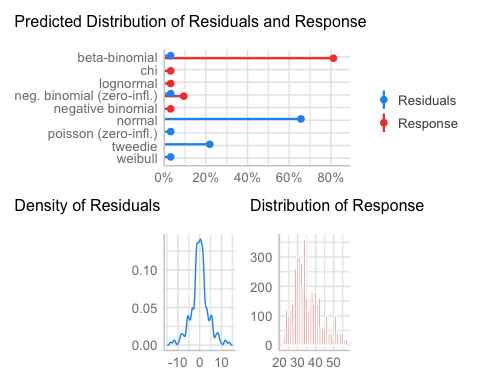
## `geom\_smooth()` using formula 'y ~ x'  
## `geom\_smooth()` using formula 'y ~ x'



Retest Reliability. Shown are correlations in achieved total score between two measurements for sample one (A) and sample two (B). Single points represent individual participants.

The twofactorial ANOVA showed a temporal effect on the total score (, , , ), whereas the individual items had no effect (, , , ).

## Mixed Model Sample 1



## Type III Analysis of Variance Table with Satterthwaite's method  
## Sum Sq Mean Sq NumDF DenDF F value Pr(>F)   
## timepoint 896.1 896.1 1 4056 53.188 3.626e-13 \*\*\*  
## item 0.0 0.0 19 4056 0.000 1   
## timepoint:item 0.0 0.0 19 4056 0.000 1   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

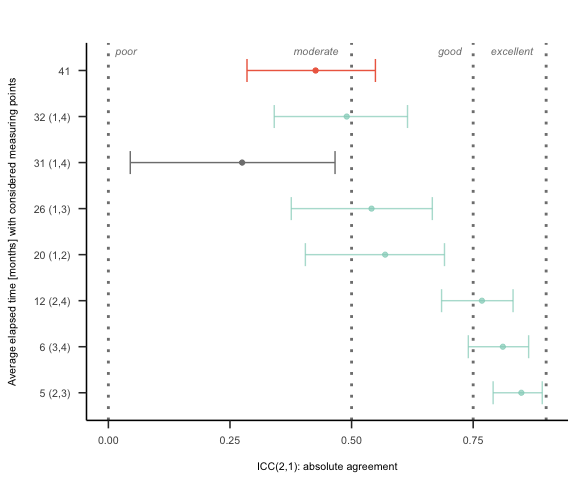
## # Effect Size for ANOVA (Type III)  
##   
## Parameter | Eta2 (partial) | 90% CI  
## ----------------------------------------------  
## timepoint | 0.01 | [0.01, 0.02]  
## item | 3.84e-28 | [0.00, 0.00]  
## timepoint:item | 5.50e-33 | [0.00, 0.00]

The twofactorial ANOVA showed that it made no difference in terms of total score whether participants completed the STAI-T before, during, or after lockdown (, , , ). Therefore, further analysis is done without differentiating between the three subgroups. Instead, we consider the complete data set.

## Mixed Model Sample 2

## Type III Analysis of Variance Table with Satterthwaite's method  
## Sum Sq Mean Sq NumDF DenDF F value Pr(>F)   
## timePoint 79.36 79.36 1 81 2.3635 0.128104   
## partLockdown 30.43 15.22 2 81 0.4531 0.637240   
## sex 322.18 322.18 1 81 9.5947 0.002682 \*\*  
## timePoint:partLockdown 96.10 48.05 2 81 1.4310 0.245047   
## timePoint:sex 28.27 28.27 1 81 0.8418 0.361611   
## partLockdown:sex 40.46 20.23 2 81 0.6025 0.549870   
## timePoint:partLockdown:sex 118.92 59.46 2 81 1.7707 0.176744   
## ---  
## Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

## # Effect Size for ANOVA (Type III)  
##   
## Parameter | Eta2 (partial) | 90% CI  
## ----------------------------------------------------------  
## timePoint | 0.03 | [0.00, 0.11]  
## partLockdown | 0.01 | [0.00, 0.06]  
## sex | 0.11 | [0.02, 0.22]  
## timePoint:partLockdown | 0.03 | [0.00, 0.11]  
## timePoint:sex | 0.01 | [0.00, 0.07]  
## partLockdown:sex | 0.01 | [0.00, 0.07]  
## timePoint:partLockdown:sex | 0.04 | [0.00, 0.12]



ICC for different samples and different time intervals with 95 % confidence intervals. The gray entry indicates the results for the STAI-S, the red one represents the results for the first sample (STAI-T) and the turquoise one represents the results for the second sample (STAI-T) with its different time intervals. Missing data in brackets indicate that there were only two mesaurements in total.