

# STANDARDIZED SCORES AND UNIVARIATE OUTLIERS

2024-01-04

## STEP 1

Create a dataframe with the composite variables you plan to include in your analyses

```
data <- read_csv("Cues to Infidelity - MEN ONLY 7.12.23.csv")

## Rows: 239 Columns: 554
## -- Column specification -----
## Delimiter: ","
## chr   (6): StartDate, EndDate, RecordedDate, M_SC_MRSI_1, M_SC_MRSI_4_2, M_S...
## dbl (462): USE, CUES, SEX_CUES, EMO_CUES, MISC_CUES, REACT, SUS, SOI, VAI_A...
## lgl  (86): Q566_1, Q566_2, W_PDIS_A_1, W_PDIS_A_2, W_PDIS_A_3, W_PDIS_A_4, W...
##
## 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.
df <- data.frame(data$REACT, data$SUS, data$SOI, data$SMIRB)

head(df, 10)

##      data.REACT data.SUS  data.SOI data.SMIRB
## 1          5.375 1.066667 0.8888889  1.000000
## 2          4.625 1.133333 2.4444444  1.857143
## 3          4.625 1.066667 1.8888889  2.428571
## 4          5.125 1.533333 1.7777778  1.000000
## 5          5.500 1.666667 1.5555556  4.142857
## 6          3.750 1.400000 1.1111111  1.000000
## 7          1.750 1.400000 1.0000000  1.285714
## 8          5.125 1.600000 2.1111111  2.000000
## 9          6.375 2.400000 3.4444444  2.428571
## 10         4.875 3.133333 4.5555556  3.000000
```

## STEP 2

Calculate z-scores for each composite variable

```
df$Z_REACT <- (df$data.REACT - mean(df$data.REACT)) / sd(df$data.REACT)
df$Z_SUS <- (df$data.SUS - mean(df$data.SUS)) / sd(df$data.SUS)
df$Z_SOI <- (df$data.SOI - mean(df$data.SOI)) / sd(df$data.SOI)
df$Z_SMIRB <- (df$data.SMIRB - mean(df$data.SMIRB)) / sd(df$data.SMIRB)

head(df, 10)
```

```
##      data.REACT data.SUS  data.SOI data.SMIRB      Z_REACT      Z_SUS
## 1          5.375 1.066667 0.8888889  1.000000  0.53573446 -0.906620006
## 2          4.625 1.133333 2.4444444  1.857143 -0.20581304 -0.793520665
```

```
## 3      4.625 1.066667 1.888889 2.428571 -0.20581304 -0.906620006
## 4      5.125 1.533333 1.777778 1.000000 0.28855196 -0.114924615
## 5      5.500 1.666667 1.555556 4.142857 0.65932571 0.111274068
## 6      3.750 1.400000 1.111111 1.000000 -1.07095179 -0.341123298
## 7      1.750 1.400000 1.000000 1.285714 -3.04841179 -0.341123298
## 8      5.125 1.600000 2.111111 2.000000 0.28855196 -0.001825273
## 9      6.375 2.400000 3.444444 2.428571 1.52446445 1.355366826
## 10     4.875 3.133333 4.555556 3.000000 0.04136946 2.599459584
##      Z_SOI      Z_SMIRB
## 1 -1.07914209 -1.10529065
## 2  0.47724129 -0.11970450
## 3 -0.07860992 0.53735293
## 4 -0.18978016 -1.10529065
## 5 -0.41212064 2.50852523
## 6 -0.85680161 -1.10529065
## 7 -0.96797185 -0.77676193
## 8  0.14373056 0.04455986
## 9  1.47777346 0.53735293
## 10 2.58947587 1.19441037
```

### STEP 3

Check for values above or below +3 or -3, which indicate 3 standard deviations away from the mean

```
head(df[order(df$Z_REACT),], 10)
```

```
##      data.REACT data.SUS  data.SOI data.SMIRB  Z_REACT  Z_SUS  Z_SOI
## 16      1.000 1.066667 0.777778 1.857143 -3.789959 -0.9066200 -1.19031233
## 79      1.000 1.066667 2.111111 1.000000 -3.789959 -0.9066200 0.14373056
## 151     1.000 1.200000 1.000000 2.000000 -3.789959 -0.6804213 -0.96797185
## 210     1.000 1.200000 1.222222 1.000000 -3.789959 -0.6804213 -0.74563137
## 238     1.000 1.066667 1.555556 2.714286 -3.789959 -0.9066200 -0.41212064
## 191     1.375 1.333333 2.444444 1.000000 -3.419186 -0.4542226 0.47724129
## 11      1.625 1.200000 2.111111 1.571429 -3.172003 -0.6804213 0.14373056
## 7       1.750 1.400000 1.000000 1.285714 -3.048412 -0.3411233 -0.96797185
## 223     1.875 1.266667 1.888889 1.571429 -2.924821 -0.5673220 -0.07860992
## 14      2.375 1.533333 2.888889 3.142857 -2.430456 -0.1149246 0.92192225
##      Z_SMIRB
## 16 -0.11970450
## 79 -1.10529065
## 151 0.04455986
## 210 -1.10529065
## 238 0.86588165
## 191 -1.10529065
## 11 -0.44823322
## 7 -0.77676193
## 223 -0.44823322
## 14 1.35867472
```

```
head(df[order(df$Z_SUS),], 10)
```

```
##      data.REACT data.SUS  data.SOI data.SMIRB  Z_REACT  Z_SUS  Z_SOI
## 1      5.375 1.066667 0.888889 1.000000 0.53573446 -0.90662 -1.07914209
## 3      4.625 1.066667 1.888889 2.428571 -0.20581304 -0.90662 -0.07860992
## 15     5.125 1.066667 1.666667 1.000000 0.28855196 -0.90662 -0.30095040
## 16     1.000 1.066667 0.777778 1.857143 -3.78995929 -0.90662 -1.19031233
```

```
## 25      5.625 1.066667 1.4444444 2.000000 0.78291696 -0.90662 -0.52329089
## 30      6.000 1.066667 0.6666667 1.000000 1.15369070 -0.90662 -1.30148258
## 36      5.125 1.066667 0.8888889 1.000000 0.28855196 -0.90662 -1.07914209
## 45      4.875 1.066667 2.8888889 1.428571 0.04136946 -0.90662 0.92192225
## 47      5.000 1.066667 1.6666667 1.000000 0.16496071 -0.90662 -0.30095040
## 52      5.125 1.066667 0.7777778 2.142857 0.28855196 -0.90662 -1.19031233
##      Z_SMIRB
## 1 -1.10529065
## 3 0.53735293
## 15 -1.10529065
## 16 -0.11970450
## 25 0.04455986
## 30 -1.10529065
## 36 -1.10529065
## 45 -0.61249758
## 47 -1.10529065
## 52 0.20882422
```

```
head(df[order(df$Z_SOI),], 10)
```

```
##      data.REACT data.SUS  data.SOI data.SMIRB      Z_REACT      Z_SUS      Z_SOI
## 17      5.625 1.333333 0.6666667 2.000000 0.78291696 -0.4542226 -1.301483
## 19      6.125 1.533333 0.6666667 1.142857 1.27728195 -0.1149246 -1.301483
## 30      6.000 1.066667 0.6666667 1.000000 1.15369070 -0.9066200 -1.301483
## 34      6.750 1.533333 0.6666667 1.857143 1.89523820 -0.1149246 -1.301483
## 66      5.875 1.066667 0.6666667 1.000000 1.03009945 -0.9066200 -1.301483
## 82      5.875 1.466667 0.6666667 2.571429 1.03009945 -0.2280240 -1.301483
## 128     4.875 1.133333 0.6666667 1.000000 0.04136946 -0.7935207 -1.301483
## 136     5.250 1.066667 0.6666667 1.000000 0.41214321 -0.9066200 -1.301483
## 150     5.250 1.066667 0.6666667 2.428571 0.41214321 -0.9066200 -1.301483
## 153     5.625 1.333333 0.6666667 1.142857 0.78291696 -0.4542226 -1.301483
##      Z_SMIRB
## 17 0.04455986
## 19 -0.94102629
## 30 -1.10529065
## 34 -0.11970450
## 66 -1.10529065
## 82 0.70161729
## 128 -1.10529065
## 136 -1.10529065
## 150 0.53735293
## 153 -0.94102629
```

```
head(df[order(df$Z_SMIRB),], 10)
```

```
##      data.REACT data.SUS  data.SOI data.SMIRB      Z_REACT      Z_SUS      Z_SOI
## 1      5.375 1.066667 0.8888889      1 0.53573446 -0.9066200 -1.0791421
## 4      5.125 1.533333 1.7777778      1 0.28855196 -0.1149246 -0.1897802
## 6      3.750 1.400000 1.1111111      1 -1.07095179 -0.3411233 -0.8568016
## 12     4.750 1.266667 2.3333333      1 -0.08222179 -0.5673220 0.3660710
## 15     5.125 1.066667 1.6666667      1 0.28855196 -0.9066200 -0.3009504
## 20     4.875 1.200000 2.3333333      1 0.04136946 -0.6804213 0.3660710
## 30     6.000 1.066667 0.6666667      1 1.15369070 -0.9066200 -1.3014826
## 36     5.125 1.066667 0.8888889      1 0.28855196 -0.9066200 -1.0791421
## 46     5.750 1.266667 4.3333333      1 0.90650821 -0.5673220 2.3671354
```

```
## 47      5.000 1.066667 1.666667      1  0.16496071 -0.9066200 -0.3009504
##      Z_SMIRB
## 1  -1.105291
## 4  -1.105291
## 6  -1.105291
## 12 -1.105291
## 15 -1.105291
## 20 -1.105291
## 30 -1.105291
## 36 -1.105291
## 46 -1.105291
## 47 -1.105291
```

#### STEP 4

If necessary and appropriate for your analyses, remove these cases from the dataframe

```
df_no_uni_outliers <- df[-(which(df$Z_REACT < -3 | df$Z_REACT > 3)),]
```

```
head(df_no_uni_outliers, 10)
```

```
##      data.REACT data.SUS  data.SOI data.SMIRB      Z_REACT      Z_SUS
## 1      5.375 1.066667 0.8888889  1.000000  0.53573446 -0.906620006
## 2      4.625 1.133333 2.4444444  1.857143 -0.20581304 -0.793520665
## 3      4.625 1.066667 1.8888889  2.428571 -0.20581304 -0.906620006
## 4      5.125 1.533333 1.7777778  1.000000  0.28855196 -0.114924615
## 5      5.500 1.666667 1.5555556  4.142857  0.65932571  0.111274068
## 6      3.750 1.400000 1.1111111  1.000000 -1.07095179 -0.341123298
## 8      5.125 1.600000 2.1111111  2.000000  0.28855196 -0.001825273
## 9      6.375 2.400000 3.4444444  2.428571  1.52446445  1.355366826
## 10     4.875 3.133333 4.5555556  3.000000  0.04136946  2.599459584
## 12     4.750 1.266667 2.3333333  1.000000 -0.08222179 -0.567321981
##      Z_SOI      Z_SMIRB
## 1  -1.07914209 -1.10529065
## 2   0.47724129 -0.11970450
## 3  -0.07860992  0.53735293
## 4  -0.18978016 -1.10529065
## 5  -0.41212064  2.50852523
## 6  -0.85680161 -1.10529065
## 8   0.14373056  0.04455986
## 9   1.47777346  0.53735293
## 10  2.58947587  1.19441037
## 12  0.36607105 -1.10529065
```